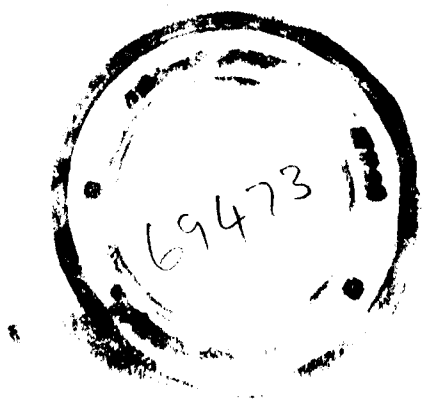
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R. C. O. MATTHEWS

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THE ECONOMIC JOURNAL

MARCH 1956

THE BRITISH BOOM, 1954–55

IT IS central to the method of economics to give precise definitions to certain aggregates or categories of phenomena by means of expressions that usually consist of, or are compounded from, the terms of common speech. These may, however, sometimes be given a special twist, in order to adapt them to the purpose in hand. Examples of such expressions are factor of production, velocity of circulation of money, aggregate demand. One essential skill of the good economist consists in his choice out of all the vast multiplicity of aggregates or categories, which could in principle be defined precisely, those particular aggregates or categories, the precise definition of which serves to clarify one's understanding of that galimatias of heterogeneous events that constitutes the economic life of the community. These expressions, having served their purposes as tools of scientific thought, are often handed back into circulation in ordinary discourse. The fact that these and not other categories were chosen for naming, thus being rendered eventually into familiar concepts, has its influence in turn on the direction taken by discussions about public policy.

In the study of inflation and of the trade cycle, the general price level has been an important concept. Analysis has concerned itself with the causes of its oscillations, and policy with preventing them. Some might regard a "disinflationary" policy as essentially meaning a policy directed to preventing the general price level from rising (or to causing it to fall back after an antecedent rise). In recent years there has been firmly placed at the centre of the systematic study of these matters the notion of general level of activity. I do not suggest that nineteenth-century economists were unaware of fluctuations in this general level or that they gave it no attention; but it was not used as a concept of central significance, whether as cause or effect, in the strict analysis of the economic equilibrium and disturbances thereto. Students of the trade cycle were bound by the very nature of their subject to give it increasing attention; gradually they came to treat it more systematically; the work of Sir Dennis Robertson constituted an important landmark in this process; finally, Keynes, by the vigour of his impact, rendered a systematic treatment of the causes and effects of changes in the general level of activity common form in trade-cycle analysis.

I would suggest that the "time interval between order and delivery" is a concept of no less central significance than the "price level" or the "level

of activity," and that it should play its part in analysis, namely in the functional equations that we set out as purporting to account for the course of fluctuations. It will no doubt be held that economists are well aware of the fluctuations in this time interval. But they have so far tended to regard them as a by-product of more fundamental changes, just as the older economists tended to regard the fluctuations in output as a whole as a by-product of the price oscillations which were their central theme.

I would suggest further that the increase in this time interval has been the most important feature, both as regards cause and effect, in the British boom of 1954–55, and that increases in the price level and in the level of activity have played relatively minor roles. Unfortunately precise and comprehensive information on this important magnitude is lacking, and the availability of information may, naturally and properly, have much influence on the direction in which economists turn their attention. In the nineteenth century there was more information on prices than on the level of production; now that has been remedied. It would be very helpful to economic studies, and thereby improve the quality of the advice that economists may see fit to tender in times of perplexity, like the present, if the authorities would obtain information for publication under this head by means of recurrent sample inquiries.

It is a familiar fact that Keynes, when analysing the causes tending to produce over-full or under-full employment, gave more attention to the latter alternative, having regard to the circumstances of the time. He argued that there was a possibility of equilibrium with under-full employment. What would happen if the propensity to invest, the rate of interest and the multiplier had values such that aggregate demand exceeded the supply potential? It is not clear whether he conceived that there would be a corresponding equilibrium at the high level. To elucidate this one may turn back to his earlier work, *The Treatise on Money*. In the terms which he then used, an excess of investment over saving caused a proportionate rise in general prices. This generated " windfall profit," which sufficed to finance the excess investment. The same price rise curbed consumption, thus imposing what in the language of other writers has been called " forced saving " on consumers. The difference between what they would, in the absence of inflation, have consumed, and what they do, in the face of higher prices, consume, constitutes a reduction in consumer command over productive resources, and this command is transferred to entrepreneurs undertaking investment. The excess of investment is financed, whether directly or via intermediaries, by this windfall profit, which automatically suffices for the purpose. If entrepreneurs take any of this windfall profit out in the form of higher consumption, prices will rise still higher, and by the doctrine of the " widow's cruse " windfall profit will rise accordingly, so that those bent upon investment have their way and funds are found for them.

This doctrine of the boom appears to be carried forward in essentials into the *General Theory*. When there is unemployment, an increment of investment has its main effect in expanding employment; but as we approach a

full-employment ceiling the increase in demand, due to the increment of investment and to its operation through the multiplier, has a divided effect increasing employment somewhat but also raising prices; finally, at the point of absolutely full employment, any further increment of demand has its whole effect in producing a price rise. The excess of aggregate effective demand over the supply potential may be called the " inflationary gap," and prices will rise to, and presumably stay at, a level such that aggregate expenditure exceeds the aggregate cost of production, including a normal profit, by the amount of the gap. This might be conceived to be a position of equilibrium. This inflation of prices is independent of any increase in rates of factor rewards; if these are also raised (*e.g.*, if the money value of the " wage unit " goes up), the whole price structure will be raised accordingly, but, in the absence of any new forces acting upon the propensity to consume or the propensity to invest, the " gap," viz., the excess of aggregate expenditure over aggregate costs, including normal profit, will remain the same.

When the war came and gave us practical experience of inflation, the operation of such an inflationary process as that postulated above was deliberately obstructed by war-time controls. We might describe a system in which prices were allowed to rise in the manner described above as " open " inflation and the war-time system as " suppressed " inflation. While such measures as taxation and the restriction of private investment tend to narrow the " gap," price controls and rationing, formal or informal, do not do so. The former types of control may be said to cure or reduce inflation at the source by reducing the " gap," while the latter only " suppress " its consequences; they ensure that the gap that remains, instead of finding expression in a certain rise of prices, finds expression of equivalent value in unsatisfied demand. At the consumer end we have consumers queuing outside shops and some arriving too late to obtain what they require, while within the productive process we have delayed delivery in respect of orders placed.

These symptoms of " suppressed " inflation continued after the War, and were then supposed to be connected with the continuance of controls in the form of price regulation, the allocation of materials and, in certain cases, rationing. The essential feature of suppressed inflation is unsatisfied demand, and the continuance of this was supposed to be bound up with the controls that prevented the operation of what is regarded as the normal function of the price system—to equate demand and supply. (The other types of control were also continued in this period, viz., those tending to reduce the gap, such as controls over new investment and budget surpluses.)

In due course the symptoms of suppression tended to disappear, and controls directed to " suppression " were removed at about the same time. By 1953 delivery dates were in the majority of cases normal.

But then in 1954 the old symptoms began to reappear within the field of producer goods, although the system of controls had not been reintroduced. Even in the earlier period we may judge that the delays were not fully accounted for by the controls. We now have to consider the proposition

that such delays, hitherto regarded, not as the effects of an inflationary gap, but as the effects of measures designed to suppress its consequences, are part of the normal functioning of an inflationary economy, even when no deliberate attempt is made to suppress the inflation. If an inflationary gap appears when employment is very near the full-employment ceiling, as in 1954, it may be that, normally, it is not wholly, or even mainly, reflected in a proportionate rise of prices, but rather in a growth of delivery delay, and thus of unsatisfied demand.

There is some connection between this analysis of an inflationary situation and doctrines that have been discussed in the very different field of entrepreneurial price policy in conditions of imperfect competition. Hot on a new track, the early proponents of the theory of imperfect competition supposed that entrepreneurs would equate marginal cost with short-period marginal revenue. Further consideration showed that in the majority of cases they were unlikely to do this, if it meant raising prices substantially above the cost of production; they would bring long-period marginal revenue into account, and this would mean a lower pricing policy. So in the analysis of inflation the idea that the inflationary gap would find full expression in a proportionate rise of prices implied that the representative entrepreneur would, as the inflationary situation developed, raise his price sufficiently to equate demand to supply and keep his order books of normal length. It is reasonable to suppose that he does nothing of the kind. He pursues a conservative pricing policy and allows his order book to lengthen.

There is nothing irrational in this. For in imperfect competition the paramount consideration is the bad effect on long-period marginal revenue entailed by the loss of a customer. Now it is quite true that the quotation of long delivery dates may lose custom; it has been losing custom in British export markets during the last year. Nonetheless, it will not lose so much custom as raising prices sufficiently to keep order books short; by definition such a policy would involve shedding all customers whose needs cannot be met within a normal delivery period; if every effort is made to retain those customers by letting delivery delays grow, some will indeed be lost, but not so many as by raising prices enough to equate short-period demand to short-period supply; the fact that the length of the order book does grow is a proof of that. Therefore if the prime object is not to alienate customers, the entrepreneur, faced by a choice of evils, will tend to let his order book grow.

We may ask how this phenomenon will affect the balance between investment and consumption. It appeared that, by the Keynesian analysis of inflation beyond the ceiling of full employment, investment would win the forced saving induced by the rise of prices would enable resources to be diverted to the financing of the investment plans. Perhaps this argument should not be pressed too far. A steep rise of prices, involving producer goods as well as consumer goods, might cause some investment projects to be abandoned even in the heyday of a boom. Yet, on the whole, this analysis implies that it is consumption rather than investment that is squeezed out by the inflationary process.

The matter is altogether different if the inflationary gap finds its expression mainly in unsatisfied demand. In this case it is more probable that investment will be squeezed and consumption win through. Once again one must be careful not to be too categorical. On the whole, it seems that the phenomenon of delivery delays is more prominent in the sphere of sales to producers than in that of sales to consumers. In the phase since controls were largely abandoned in Britain, delivery delay to the final consumer has been less prominent, although there have been notable exceptions, as in the provision of a telephone. One reason for this difference may be that consumers are less specific in their requirements; they go shopping and take the varieties of goods available as the ultimate data; if they cannot find precisely what they may remember buying before the war, they accept substitutes. In the field of investment, the requirement is usually more specific; a producer must perforce wait for the equipment that he needs for his productive process. The extent to which delay obtains in the two fields may depend also on where the new inflationary force has arisen. If, after a condition of near-equilibrium, there is a sudden spurt in investment demand, then one may expect the phenomenon of delay to obtain mainly in the sphere of investment goods. Symptoms of suppressed inflation will appear in the sphere in which the supply potential is inadequate to match the new demand.

. . . . . .

By the autumn of 1954 it was evident that the British economy was becoming subject to severe inflationary pressure. After a period of fair balance between supply and demand long delivery delays of the kind so familiar between 1945 and 1951 reappeared. The expression " delivery delay " has a twofold meaning: there is the time interval involved in the date for delivery actually quoted by the firm which accepts an order, and there is the failure of the firm to deliver at the quoted date. The former kind of lengthening became especially notable in the second half of 1954. The lack of precise statistical data in this field has already been mentioned; industrial reporting is not always reliable, but in this case it was so widespread as to be broadly trustworthy. It is supported by one notable published series. In the year from July 1954 to June 1955 orders for metal-working machine tools were 88% above the annual rate in the preceding eighteen months, but production rose by only 5·7% between those periods.[1]

Our next task is to inquire into the cause of this increase of pressure during 1954. The published figure for factory building " starts " indicates that we then became involved in an industrial investment boom of very great magnitude. It is not the building aspect of this figure that is important, since new factory building is but a small part of the total demand upon the building industry. What is important is the associated demands for

[1] Orders in a given year are taken to be equal to deliveries in that year plus orders on hand at the end of the year minus orders on hand at the end of the preceding year. By this reckoning orders for machine tools rose from the annual rate of £48,064,000 to £90,725,000. (Figures from *Monthly Digest of Statistics*.)

industrial equipment. Furthermore, the figure for starts, representing the final decisions to push on with extension plans, may be taken as an indicator of the still wider class of decisions to acquire new equipment, whether these were associated with new building or not. There is no reason to suppose that there was a greater propensity to order new factory building than to order new equipment generally. The figures for industrial building starts measured in square feet are set out in Table I. The increase shown in the

TABLE I

Industrial Building Starts [1]

	Square feet (index numbers).
1949–53 average	100
1949	106·2
1950	121·6
1951	110·5
1952	64·8
1953	96·8
July 1, 1954–June 30, 1955	177·3

[1] *Monthly Bulletin of Statistics.*

final figure is spectacular. If this is a fair indicator of the increased tempo of orders for new equipment, it would be clearly impossible for the economy not to run into strong inflationary pressure. A sudden increase in a large sector of demand amounting to almost 80% in one year is clearly quite unmanageable.

These factories will take various times to build. It appears that a fair average figure is in the neighbourhood of two years. Orders for the associated equipment may in some cases be placed before the building starts; others will come along during the course of the building. We may accordingly expect the economy to be subject to acute pressure for some two years after the end of 1954. And this pressure will take the form mainly of delivery delay, since it would be impossible for the engineering industry to expand supply by 80%. This delivery delay has an unfortunate effect on the external balance; it means that currently Britain is not furnishing supplies promptly, and it also means a loss of custom, which may be permanent, since, if delivery dates become too lengthy, foreign buyers seek other sources of supply. Indeed, it is well known that they have recently been doing so; thus the increase in orders as recorded understates in such circumstances the total increase in demand. The delivery delays also entail waste and inefficiency in productive processes at home.

In this connection it is important to make a distinction which is not always fully appreciated by commentators. Those who claim that it is important to curb investment do not seek to reduce at all the amount of investment that is occurring; on the contrary, it is probably desirable for Britain in her present phase to expand investment year by year. What it is urgently important to reduce is the quantity of *orders on investment account*. It

s the excess of orders on investment account over the maximum supply ›otential of the industries making the investment goods which causes the nflationary pressure, the delivery delays and the loss of export markets. It nay be well to have orders on investment account running slightly ahead of he supply potential of the relevant industries, so as to keep them under a :onstant incentive to expand. This incentive seems to have been lost during he recession of 1952. But if the increase in orders goes far beyond any ›ossibility of expansion, then nothing but harm is done. Indeed, it is ›robably true to say that by reducing orders upon investment account (very drastically indeed) one would increase the amount of achieved investment. Delivery delay is bound to cause inefficiency if essential components are not forthcoming. Associated with this is the impossibility of expanding really skilled man-power sufficiently to meet requirements, so that firms are retarded by the lack of availability of skills; those available do not always, in a time of acute man-power shortage, find their way to the places where their skills are most needed in relation to the efficient operation of the economy as a whole.

There can be little doubt that this sudden expansion has been the main cause of the inflationary pressures; the strain has been concentrated upon manufacturing industry. Attention has been called to the increase of consumption. This may have been a little too great in relation to the increase of production, but its contribution to the inflationary situation has been relatively trivial. This is shown in Table II.

TABLE II

Consumption at 1948 *Prices, and Index of Industrial Production* [1]

Date.	Consumption expenditure.	Consumption of household goods and clothing.	Production index.
	Percentage increase over same quarter in preceding year.		
1954:			
1st quarter	+3·4	+ 4·2	+7·2
2nd quarter	+3·6	+ 6·5	+7·5
3rd quarter	+4·3	+10·2	+6·5
4th quarter	+6·3	+10·6	+5·7
1955:			
1st quarter	+4·8	+ 7·7	+6·1
2nd quarter	+3·1	+ 3·3	+5·7
3rd quarter	+2·7	+ 2·1	+3·3
	Percentage increase in whole year from fourth quarter 1954 to third quarter 1955 (inc.) over preceding year		
	+4·3	+6·0	+5·4

[1] *Monthly Bulletin of Statistics.*

It is not fair to compare the increase of consumption expenditure with the production index, because various kinds of services play so large a part in the former, and the consumption of these may not have expanded as much as that of material objects. The increase in the consumption of household goods and clothing is given in the second column, because these items are

shown separately in the *Monthly Bulletin of Statistics*. However, in considering the balance between consumption and production one should not consider only the direct consumption of material goods, for part of the demand going from consumption on to manufacturing industry is constituted by the demand for various material goods required by consumers' services. The true index of consumption for a proper comparison with the index of production probably lies somewhere between the first and second columns shown in Table II. The abatement in the increase of consumption shown after the first quarter of 1955 is welcome. However one regards these figures, it is clear that the increase in demand on consumer account is quite small by comparison with the 77% increase in demand on investment account shown by Table I.

In this connection there is a point of first-rate importance which should always be borne in mind. There is a widespread impression that aggregate consumer demand is very large by comparison with the demand on account of new equipment, so that an excess demand on the former account of 1% or 2% might have an effect of comparable magnitude with that of a far greater percentage increase in demand on investment account; and when we are thinking of a strain on manufacturing industry, we have to exclude that part of investment demand which comes under the heading, building and construction—including, of course, residential building. Our tireless authors of *National Income and Expenditure*, to whom all economists owe so great a debt, have recently been publishing an input–output table, which throws a light upon this matter. The table in the current issue (1955) relates to 1950. The pattern has no doubt shifted since then, but the figures there provided may serve to give us rough proportions, which are all that we need for the argument. From the data there provided (Table 17) I have constructed the following table by a method described in the footnote.[1]

[1] We are concerned with the output of items 3, 4, 5 and 7 of Table 17. The distribution of the final output between persons, public authorities, fixed capital and exports is shown clearly. Stocks have been omitted, both because they are not large enough to affect the broad proportions that we seek to ascertain and because their changes in 1950 would not be representative of other years. The intermediate output has been distributed by reference to the information given in the left-hand side of the table. Let total sales by 3, 4, 5 and 7, as shown in column 1 (£183 million) be x_1. Let the amount of the output of 1 distributed to intermediate output, persons, public authorities, fixed capital and exports respectively be called a_1, b_1, c_1, d_1 and e_1. Of the output of 3, 4, 5 and 7 sold to 1, $\frac{x_1 b_1}{a_1 + b_1 + c_1 + d_1 + e_1}$ has been assigned to persons, $\frac{x_1 c_1}{a_1 + b_1 + c_1 + d_1 + e_1}$ to public authorities, $\frac{x_1 d_1}{a_1 + b_1 + c_1 + d_1 + e_1}$ to capital and $\frac{x_1 e_1}{a_1 + b_1 + c_1 + d_1 + e_1}$ to exports, leaving a residue of $-\frac{x_1 a_1}{a_1 + b_1 + c_1 + d_1 + e_1}$ still unassigned. A similar procedure was then applied to the intermediate output, x_2 (= £83 million), of 3, 4, 5 and 7, as shown in column 2, which was distributed in like manner, leaving a residue of $x_2 a_2$. A similar procedure was applied to all ten columns. This left a residue of $x_1 a_1 + x_2 a_2 + \ldots + x_{10} a_{10}$. This total amount (= £624 million) was then distributed between persons, public authorities, fixed capital and exports in the proportions shown in line 14 of Table 17. The procedure clearly implies approximation, but the error should not affect the proportions shown in the resulting table in the text sufficiently to frustrate its purpose in the argument.

TABLE III

Distribution of Product of Manufacturing Industry, Excluding Food, Drink and Tobacco, in 1950

Consumption	39
Government	9
Fixed capital	19
Exports	33
	100

From this it appears that, if we exclude food, drink and tobacco, the total demand made by all consumers on manufacturing industry is only about double that made by the provision of manufactured equipment for industry. Accordingly, an increase of orders on the latter account approximating to 80% has a far greater effect in imposing a strain on manufacturing industry than an increase in consumer demand of the order of 4% or even 7%.

In general comment much importance has been attached to the rises in wage-rates and wage earnings. There is no doubt that any tendency for wages year by year to rise more than productivity would be very injurious to the economy, and there cannot be too much effort of education and propaganda to drive this point home. The figures, however, do not indicate that wages had so risen prior to the end of 1954; but by that date inflationary pressures were already operating in full force. Consequently up to that point wage increases can be ruled out as a causal factor. During 1954 the index of wage-rates rose by 4·3% and wage earnings per person rose by 7·3%; during that period the index of manufacturing production rose by 9·6%, and it can be calculated that productivity per person employed in manufacturing industry rose by 6·7%. To get a broader basis it may be well to compare 1954 as a whole with 1953: wage-rates rose by 4·3%, wage earnings by 6·1%, the index of manufacturing production by 8·1% and productivity per person employed in manufacturing industry by 5·4%. The wage increases between 1952 and 1953 were of the same order; between 1950 and 1952 the wage increases were somewhat larger, but this was the inevitable and, given the event, the desirable result of the devaluation of sterling in 1949. Right to the end of 1954 no chronic tendency for wages to outstrip productivity by an appreciable amount can be found. It is true that if wages continue to rise fully in proportion to manufacturing productivity, the cost of living will tend to rise, since distribution and other services are not likely to increase their "productivity" as much as manufacturing industry, but nevertheless have to share the burden of wage increases, which they are unable to "absorb." For instance, with the rise of 8·1% in manufacturing production between 1953 and 1954 may be compared the rise of 4·3% in the gross domestic product at constant prices, as calculated for us by the Central Statistical Office.[1] For this reason it might be regarded as

[1] *National Income and Expenditure* (1955), Table 12.

undesirable for wages to rise so fast; but a rise of wages of this amount should not affect our power to compete overseas, since it is the British ex-factory prices that matter, provided that wage developments in foreign competitor countries are similar.

In the spring of 1955 there were excessive wage increases. Between April 1954 and April 1955 the index of wage-rates rose by 7·9%, average wage earnings by 9·4%, while manufacturing production rose by 8·6% and productivity per person by 5·5%. Thus there was an " excess " rise of wage earnings of 3·7%. If we are considering the causes of inflationary pressures in 1955, then we can say, having regard to the proportions shown in Table III above, that even the wage increases in 1955 were only of trivial importance by comparison with investment boom involving, as it did, an increase of the order of magnitude of 80%.

There has been a tendency to overstress the importance of the wage increases. It is natural and even justifiable to overstress an evil, if it may have very injurious consequences in the long run, as a chronically excessive rate of wage increases could have. But in this case the effect of that over-emphasis has been unfortunate. Foreigners, lacking full information about the British investment boom, came to believe during 1955 that the British troubles were mainly due to their being the victims of uncontrollable wage increases, re-enforced by strikes, and that these might render another devaluation of sterling necessary. This undermined confidence in sterling in the later part of the year. We have shown that so far there is no evidence of a *chronic* tendency for an excessive rate of increase. The great inflationary pressures of 1955 rendered that year exceptional. The rises in wages that occurred in the winter of 1954-55 may be attributed at least as much to weak employer resistance as to the strength of labour demands; employers were inclined to grant the increases readily on account of the extreme labour shortage and the urgency and profitability of business in a time of large excessive aggregate demand. It is important to note that even if there are one or two further rounds of excessive wage increases—for the avoidance of which we devoutly hope—sterling is still undervalued by so substantial a margin, owing to the devaluation of 1949, that foreigners can rest assured that, even if the worst happens on the wages front, a further devaluation will not come into question for a long time.

Accordingly, the nature of the British boom of 1954–55 may be stated in very simple terms as follows. In 1954 entrepreneurs made simultaneous decisions to expand capacity by an amount that was far in excess of what could possibly be supplied. This resulted in a great lengthening of delivery dates and delivery delays and an acute man-power shortage. Investment on the proposed scale has not, of course, been achieved; that was quite impossible. Meanwhile the external balance has suffered and domestic waste has been caused by the delivery delays. Exports have not indeed fallen; on the contrary, they have risen; but they have not risen in proportion to the expansion of world markets, so that the British share has been declining, and they have not risen sufficiently to purchase the imports required by an ex-

panding economy or to provide that excess of exports over imports that is needed to finance overseas investment.

. . . . . .

We may ask why this spurt suddenly occurred in 1954. It would be agreeable if we could find the cause in the normal working of the " acceleration principle." The figures shown in the three right-hand columns of Table IV have some tendency to support such an explanation. The

TABLE IV

Consumption and Exports at 1948 *Market Prices* [1]

Year.	1948 = 100.		Percentage increase over highest preceding year.		
	Consumption expenditure.	Consumption of manufactures, excluding food, drink and tobacco.[2]	Consumption expenditure.	Consumption of manufactures, excluding food, drink and tobacco.[2]	Exports.
1948	100	100	—	—	—
1949	100·2	108·5	+2·2	+8·5	+12·0
1950	104·5	113·8	+2·3	+4·6	+13·9
1951	103·8	106·4	—	—	+ 5·2
1952	102·7	103·8	—	—	—
1953	106·4	112·7	+1·8	—	—
1954	111·3	122·6	+4·6	+8·8	+ 3·4

[1] *National Income and Expenditure* (1955).
[2] This index has a wider coverage than that supplied in the second column of Table II.

accelerated rise in consumption began in 1953, but in the sphere of manufacture did not yet overtop the highest preceding year.

Econometricians have claimed that they do not find swings in investment as large as would be required by the acceleration principle. Those of us who have argued that the acceleration principle plays an important causal role in the trade cycle would not expect such swings. It is not to realised investment that one must look to see a reflection of the acceleration principle, but, in a boom, to unfulfilled orders on investment account; and in the slump one sees its reflection in the growth of redundant capacity. It is not the amount of realised investment but the difference between this and investment *orders* that exerts the dynamic force in the upward phase. It is depressing to find in general treatises a reiteration of the alleged negative result of the econometricians' investigations, since the idea that this has significance is based on a complete *ignoratio elenchi*. In the present boom investment has shown a healthy trend of increase; but it is in unfulfilled investment orders that we must seek a manifestation of our disequilibrium and of the effect of the acceleration principle.

It would not, however, be sensible to attribute exclusive causation to the acceleration principle. A wider view should also be taken. One may once again think in terms of a representative entrepreneur. For a number of years after the War he was beset with special problems, including multi-

farious shortages and controls. Then came the Korean outbreak and the new defence programme. The crisis of 1951 was followed by a minor depression in 1952. Thereafter he experienced a period of relief from controls and of steady progress, free of crises. During this period he may at last have had the leisure to get round to taking longer views; he had reason to hope that markets would continue to expand, and various projects of modernisation had matured in his mind. It is not unnatural that by 1954 a large number of entrepreneurs were ready to go forward at about the same time. Unfortunately these decisions, coming all at once, were more than the economy could stand.

It has been expedient to check the boom for two sets of reasons. First, there are the immediate reasons that have already been indicated: the congestion has an unfavourable effect on the external balance and causes inefficiency at home. The situation is not so bad that it is expedient to bring the expansion to a sudden and violent halt, leaving factories half finished. Rather it is important to prevent the inception of new plans until the existing backlog has been cleared off. Unfortunately the figure for factory building starts shows but little sign of abatement in the second quarter of 1955,[1] so that a sharper squeeze was evidently needed to curtail the level of new decisions to expand. It is not to be expected that restrictive measures will purge the system of inflationary pressure at all quickly. It hardly seems that we can expect much easement until fairly late in 1956.

Secondly, important as it is to rescue the economy from the disadvantages of inflationary pressure, there is a still graver issue at stake. What of the succeeding slump?

We may set out three possibilities in ascending order of gravity. I am not able to have an opinion about which is the correct one.

(1) It may be the case that as many new factories will be needed every year as were started in the period from July 1954 to June 1955. This would be the most favourable possible assumption. Even on this assumption, the sudden spurt in 1954–55 was bad and restraint is desirable. If it is really true that, as a permanent feature of our economy, about 80% more new factories should be built every year than were actually started on an average in the five years before 1954, it would still be wrong suddenly to increase the rate of starts by 80% in one year. The stepping up to a higher tempo of investment should proceed more gradually, say, at 10% or 15% or even 20% per annum. On this hypothesis restraint now is needed on the principle of *reculer pour mieux sauter*. It is idle to suppose that the situation could be met by a campaign for the drastic reduction of consumption in the national interest; for to offset the increased investment orders consumption would have to be reduced by more than 35%, and that did not happen even during the Second World War. Furthermore, the resources could not be switched from the production of consumption goods to investment goods in one year. Physical limitations make the expansion of investment of the magnitude now being attempted utterly impossible.

[1] After full returns are in, it may prove to be above the first quarter.

(2) An alternative hypothesis is that all the factories that have been started will be fully needed but that there will not be a need for so many new factories every year in future. In this case we have to face the possibility of a serious slump in the engineering industry when present plans have been completed. Furthermore, much of the expansion of capacity is within the industries making producer goods.

(3) A still graver hypothesis is that the investment boom to date has been spiced with optimism and that markets will not suffice to give full employment to all the new factories.

The boom has now become world-wide. We have to face the possibility of a world-wide recession within the next two or three years. Having regard to the fact that, as shown in Table III, one-third of the output of our manufacturing industry goes abroad, this would be a seriously aggravating factor.

In connection with the three possibilities listed above, attention should be given to the man-power situation. In recent years the population within the age group from fifteen years of age to sixty-four has been almost exactly stationary and will remain so—save in the event of massive immigration—for a quinquennium. Even afterwards the increases will be only small. But what is called the " working population," that is, the employed and the unemployed taken together, has by no means been stationary in recent years. This is because persons previously unoccupied have been drawn into paid occupations. The majority of these have been women, but men have also made a substantial contribution—presumably mainly by the deferment of the retiring age. It is possible that the inflow of women will continue for a further period; but there can hardly continue to be a substantial inflow of men. The increase in working population, male and female together, has

TABLE V

	Population of U.K. from fifteen to sixty-four years of age (inclusive).			" Working Population."		
	Male and female.	Male.	Female.	Male and female.	Male.	Female.
June 1948	100	100	100	100	100	100
Dec. 1952	99·8	99·9	99·8	102·3	101·4	104·1
June 1953	99·8	100	99·7	102·6	101·5	105·1
Dec. 1953	99·8	100	99·6	103·1	101·7	106·0
June 1954	99·8	100·1	99·6	103·4	102·0	108·0
Dec. 1954	} No Change Probable			104·6	102·5	109·0
June 1955				104·8	102·6	109·5

[1] *Monthly Bulletin of Statistics.*

been running at about 1% during the last 2½ years, with an acceleration in 1954. The likelihood of a slowing down in this rate of increase gives rise to serious reflections.

It is claimed that the new factories are in many cases intended to replace

obsolete factories which will be scrapped, and that they are on balance labour-saving. It is just possible that the aggregate of the nation's industrial plant, as enlarged by this very high level of recent factory building, will require no more personnel to man it fully than did the old. But it is impossible not to be uneasy on this score. May it be that stands are now being created which there will not be personnel to fill? This will not necessarily lead to a still more acute man-power shortage than we have at present, to be shown by a rising figure for "unfilled vacancies," for it is necessary simultaneously to look at the demand side of the picture.

The rate of increase in consumption that has been occurring recently is in part associated with the rising number of persons in paid occupations. If the creation of capacity has been at all geared, in accordance with the acceleration principle, to the rising trend of consumption, and if in the coming phase there is no substantial increase in the number of persons in paid occupations, there will be disappointment on the demand side.

TABLE VI

Civil Employment and Consumption [1]

	Number in civil employment at June.	Consumer expenditure, whole year.	Percentage increase in consumer expenditure over preceding highest year.	Consumer expenditure per person in civil employment.	Percentage increase in consumer expenditure per person in civil employment over preceding highest year.
1950	100	100	—	100	—
1951	101·0	99·3	—	98·3	—
1952	100·6	98·3	—	97·7	—
1953	101·1	102	+2	100·9	+0·9
1954	102·8	106·4	+4·3	103·6	+2·7

[1] *National Income and Expenditure* (1955), and *Monthly Bulletin of Statistics*.

Table VI shows consumer expenditure per person in civil employment. While this has shown an increase, the increase is not so strong as that in consumer expenditure. This suggests that, if it proves impossible to pull a still higher proportion of the population of working age into paid occupations, there may be a disappointment on the side of increasing markets.

. . . . .

It appeared to me in November 1954 that monetary restriction had become expedient.[1] It is possible that economic experts, who have access to all the information available at the centre of government, might have been in a position to perceive that investment orders were becoming excessive at a somewhat earlier date. The Bank Rate was raised in February, but the credit squeeze was not severe. Certain subsequent hesitations on the part of the banking system to react as expected have now become a familiar story. It seems likely that the monetary policy, although not inducing much restriction of plans, did avail to prevent a further expansion. Orders for machine tools ceased to expand in May. Unless reporting is very much in arrears, factory building starts did not show a normal seasonal rise in the second quarter. The railway strike, however, may also have been a factor here.

[1] See R. F. Harrod, "A Drift Towards Inflation?" *Financial Times*, November 30.

It is possible that some reluctance and hesitation in the restraint of investment may have been due in part to an attitude of some economists in recent years, which has been decidedly favourable to investment. There is debate whether economists, as such, ought ever to give advice. I believe that it is incumbent upon them to do so. But it is arguable that it should be confined to cases where the grounds for the recommendation can be perceived only by one who has a professional understanding of the working of the economic system. There are other kinds of advice, such as to work hard and live soberly, which, although no doubt conducive to economic prosperity, do not belong to the special province of the economist, since, without being an economist, one can appreciate the value of these maxims. It seems that what has almost amounted to a crusade among certain economists in favour of a greater tempo of investment belongs to this category.

Even the economists' crusade in favour of saving, which was so characteristic of the nineteenth century, was somewhat more professional; for while each individual might understand well enough that saving would advance his long-run interests, it was not so clear, save to the professional, how his saving also conduced to the increase of the wealth of the whole community. It surely is clear how investment conduces to wealth.

There is a further distinction between the nineteenth-century crusade for saving and the recent crusade for more investment. In the great majority of cases saving is homogeneous; one saves by compressing expenditure in terms of pounds, shillings and pence below income, and the residue can be applied to a wide variety of purposes. Investment, by contrast, is heterogeneous; one has to invest in this or that particular piece of capital. Consequently, an overall exhortation in favour of investment may lead to inappropriate investment, or to investment at inappropriate times. It must be remembered that in the ordinary course of things less critical vigilance is applied to expenditures that can be entered into a capital account than to current expenditures. Accordingly there is a greater propensity to wastefulness in the investment field than in the consumer field. Some reporters have urged that the British have much to learn from the Americans in this matter, that the Americans have developed a more rigid economy in relation to investment items than we have, and that this may be one factor in their superior efficiency. The somewhat indiscriminate advocacy in certain quarters of investment as being a good thing as such may have had a bad effect in retarding the development and enforcement of an official policy designed to check the excessive tempo of investment in the crucial period of the winter of 1954/5.

There have been cross currents in policy during 1955 owing to the presence of the sterling problem. The rise in the Bank Rate in February was

in part designed to have a favourable effect in the markets for official and transferable sterling by providing an incentive to encourage non-resident holders; and in this regard the policy was highly successful for the time being. The good work was, however, to some extent undone during the discussions in Paris in June, when it was suggested that the margins for sterling might be widened at a later date. This produced a most unfortunate effect on the markets. The British Chancellor subsequently felt impelled to make statements to restore confidence, and notably a strong statement in regard to margins at the meeting of the International Monetary Fund at Istanbul. It appears to have become evident there that, in order to restore confidence abroad, it would be expedient for the authorities to impose some plainly visible sacrifices on the British public. Hence the " Second Budget." This should be regarded as belonging rather to the chain of events connected with the sterling markets than to those connected with internal inflationary pressures. In relation to this former purpose it appears to have been successful.

Those without access to the very latest figures cannot judge how effectively the credit squeeze is working at present (November 1955). One would suppose a considerable intensification to be desirable. Its purpose would by no means be to reduce the tempo of investment, but rather to reduce the vast excess of investment orders over the supply potential, however greatly that be stretched. It should do so by causing a growing number of firms to have sufficient anxiety about their own liquidity to postpone for the time being the inception of extension plans that they are otherwise ready to make. Inceptions should be deferred until such time as the congestion created by the violent spurt in starts in 1954–55 has been reduced.

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THE DYNAMICS OF HIRE-PURCHASE CREDIT

THE reintroduction of restrictions on hire-purchase credit in 1955, after their complete removal some months earlier, gave rise to a lively controversy on the principles involved. Unfortunately, the attitude of most of those taking part in the argument was determined either by ideological dogmatism in favour or against controls in general, or by ethical bias against " living beyond our means," or by social considerations in favour of " giving lower income groups a chance to raise their standard of living." Although practical economic aspects of the problem received a good deal of attention, its broader theoretical aspects were neglected. Yet a careful study of the theoretical background goes a long way towards providing the answer to the policy problem involved.

The facts which must be taken into consideration are as follows:

(1) The expansion in the volume and relative importance of hire-purchase transactions since the War, and the prospects of a further expansion.

(2) The essentially self-aggravating character of the system.

(3) The inadequacy of conventional devices of monetary policy to regulate hire-purchase credit.

Theoretical aspects of hire-purchase receive much more attention in the United States than in Britain,[1] partly because the system is much more highly developed there, and partly because detailed statistical material has there been available for some time.[2] To mention only a few, monographs by Professor Seligman,[3] Professor Haberler,[4] Mr. Nugent,[5] Professor Reavis Cox,[6] a collection of essays published by the American Academy of Political and Social Science [7] and the published proceedings of the National Consumer Credit Conferences [8] contain much interesting theoretical material.

Strangely enough, even though some of the findings of American econo-

[1] British contributions to the theory of hire-purchase credit include W. F. Crick, *The Economics of Instalment Trading and Hire-purchase* (London, 1929), and J. E. Meade, *Consumers' Credit and Unemployment* (London, 1938).

[2] The *Federal Reserve Bulletin*, in addition to its monthly figures, publishes annual " Surveys of Consumer Finances."

[3] E. R. A. Seligman, *The Economics of Instalment Selling. A Study in Consumers' Credit*, 2 vols. (New York, 1927).

[4] Gottfried Haberler, *Consumer Instalment Credit and Economic Fluctuations* (New York: National Bureau of Economic Research, 1942).

[5] Rolf Nugent, *Consumer Credit and Economic Stability* (New York, 1939).

[6] Reavis Cox, *The Economics of Instalment Buying* (New York, 1948).

[7] Paul F. Douglass (Editor), " Consumer Credit," *Annals of the American Academy of Political and Social Science*, Vol. 196, March 1938.

[8] These annual conferences are sponsored jointly by the National Consumer Finance Association and other commercial and banking associations concerned with hire-purchase credit. They are held each year at a different University. Both theoretical and practical experts take part in the proceedings.

mists have important bearing on macro-economic theory, they failed almost completely to find their way into the general body of macro-economics. Most American economists interested in broader theoretical problems regard the writings on theoretical aspects of hire-purchase as being too specialised to be of interest to them. Yet hire-purchase credit presents some important problems that would deserve the attention of those concerned with dynamic economic theory in most senses of that term in which it is variously employed.

Thus the time lag involved in hire-purchase provides an outstanding instance of an equation in which the magnitudes refer to different points of time in an essential way. Moreover, changes in the volume of hire-purchase are liable to make for uneven growth. In addition, the study of theoretical aspects of hire-purchase calls essentially for process analysis. Last but by no means least, there are inherent in the hire-purchase system influences which are liable to exaggerate cyclical movements to an extent that may, in given circumstances, jeopardise the very existence of our economic, social and political system.

A most important theoretical question involved is whether expansion of hire-purchase has invalidated or is liable to invalidate Keynes' " fundamental psychological rule," according to which, when the real income of a community is increased, it will increase its consumption by a smaller absolute amount so that a greater absolute amount is saved. He added that this result is produced " unless a large and unusual change is occurring at the same time in other factors." [1] The question is, has the spectacular expansion of hire-purchase since before the War in the United States and in this country provided the " large and unusual change," the possibility of which Keynes allowed for?

Before the expansion of hire-purchase, propensity to consume was practically the obverse of propensity to save. To-day propensity to consume depends as much on the propensity to incur debts as on the propensity to save. Consumer spending depends not only on decisions whether to save or to spend current income and accumulated past income but also on decisions whether to spend future income in advance. The range of possible changes in the propensity to consume has therefore widened.

Investigation covering the period 1929–41 by the National Bureau of Economic Research ascertained that each change of 1% in the amount of national income caused the change of over 2·3% in automobile sales credit and 3% in credit used for the purchase of other durable goods against deferred payments.[2] The conclusion reached from these figures is that the volume of hire-purchase is related not to changes in total income but to changes in " discretionary " income—that is, the amount that remains at the consumer's disposal after paying taxes and after covering their requirement of essentials.

[1] *General Theory*, p. 96.

[2] Avram Kisselgoff, " The Qualitative Analysis of the Demand for Instalment Sales Credit, Proceedings of the Consumer Credit Conference, *University of Illinois Bulletin*, Vol. 48, June 195 p. 148.

Any increase of the real income of a community involves a larger increase in its discretionary income. With the rising standard of living, more and more tends to become available for the acquisition of durable goods through hire-purchase transactions. It is possible to visualise an increase in the relative importance of hire-purchase in the volume of credit to a level at which the propensity to consume would rise to unity and above. Whether or not that stage has been actually reached, it is well within the realm of practical possibility, having regard to the expansionary trend of hire-purchase.

It seems reasonable to assume that, temporary setbacks apart, that trend will continue. There is every reason to expect a continuous secular increase of the real national income, accompanied by a more than proportionate increase of discretionary income. With the rising standard of living additional income classes will be placed in a position to pledge their future discretionary incomes for the acquisitions of consumer durable goods. Hire-purchase is bound to continue to be stimulated also by further inventions of tempting new " gadgets," by the further development of the Welfare State, reducing the need for individual saving and by the discouragement of saving as a result of moderate but virtually continuous inflation. It seems probable that the system is still far from having reached maturity even in the United States, let alone Britain and other countries, and that its expansion due to its continued institutional development is liable to be super-imposed on the effects of the secular increase in the standard of living.

Although cyclical set-backs in this expansion are apt to occur from time to time, forecasts that a saturation point is liable to be reached in the not too distant future appear to be unfounded. With the rising standard of living pedal bicycles are replaced by motor bicycles; the latter are replaced by cheap popular cars, which again are replaced, as and when discretionary incomes increase further, by more and more expensive types of cars. When every family possesses a television set, they will aim at acquiring much more expensive sets for coloured television. There is virtually no limit to potential demand for consumer durable goods obtainable through hire-purchase; at any rate, the limit is so remote that it could safely be ignored by this generation and the next. Whether or not this potential demand will develop into effective demand depends largely on the extent of the increase in discretionary income. And, as we saw above, discretionary income is liable to continue to increase, it seems reasonable to expect that from time to time the increase in the marginal propensity to hire-purchase will surpass an increase in the marginal propensity to save that results from an increase in the national income. Keynes' " fundamental psychological rule," on which, according to him, the stability of the economic system essentially depends, would then become invalidated by the " large and unusual change " envisaged by him. The extent of its validity has already become materially reduced as a result of the more equalitarian distribution of income, and this must have contributed to no slight degree to post-War inflation.

Hire-purchase expansion or contraction, so far from carrying its own corrective, is to a large degree self-aggravating. Before examining this

aspect of the subject we propose to deal briefly with the static theory of hire-purchase. It rests on three assumptions:

(1) Hire-purchase merely puts forward the date of purchases without affecting their total volume in the long run.

(2) Hire-purchase merely diverts consumer demand from non-durable goods to durable goods.

(3) Hire-purchase merely diverts financial resources from the financing of production to the financing of consumption.

The view that hire-purchase does nothing more than advance the date of purchases is based on the assumption that everybody who buys against deferred payments would, in the absence of hire-purchase facilities, save a corresponding part of his income and would buy eventually the same quantity of goods against cash payment. Even if we were to accept this assumption—disregarding the likelihood that a large proportion of consumers would not have the strength of character to exercise self-denial by saving regular amounts corresponding to the instalment payments—it would be obvious that aggregate demand is liable to be affected by the timing of purchases. The average age at which consumers are able to buy a car cannot be a matter of indifference from the point of view of the total volume of purchases. By enabling consumers to buy without waiting until they have saved the necessary amount hire-purchase results in a net expansion of demand.[1]

The view that hire-purchase merely puts forward the date of purchases and also the view that it merely diverts demand from non-durables to durables, overlooks the effects of the multiplier and those of time lag between input and output. A substantial increase in hire-purchase transactions, by leading to replacement orders, sets the multiplier effect into motion, so that the total demand for goods in general is liable to increase considerably more than the actual increase in the volume of hire-purchase transactions. This is ignored by those who believe that the increase of demand created by an increase in hire-purchase is reversed subsequently by the effects of a decline in consumers' purchasing power resulting from the payments of the instalments. Such a curtailment of purchasing power is liable to be offset by the multiplier effect of the original increase, which may begin to operate long before the repayment of the instalment credit is completed. An increase in the volume of purchases of television sets or motor cars need not therefore result in a corresponding decline in the purchase of clothing or food.

To the effect of the multiplier that of the time lag between input and output is added. In many industries producing consumer durable goods this time lag during which additional payments are made for raw materials and labour, but no additional goods become available to the consumer, extends over many months. During a period of expanding production resulting from an increase in the volume of hire-purchase transactions the increase in incomes and purchasing power is not matched simultaneously by a corresponding increase in the supply of goods. During a period of non-stop rise in hire-purchase, the output is always bound to lag behind the incomes

[1] Cox, *op. cit.*, p. 392. But, inconsistently enough, Cox expresses the opposite view on p. 424.

:ed by the additional input. The inflationary effect of this " pipeline " tends to stimulate demand.

The static theory according to which an expansion of hire-purchase, so far . causing an increase in production, tends to curtail it by diverting :al resources from investment, would hold good only under a system in h credit resources are subject to a rigidly maintained maximum limit. brings us to the question of how far the volume of hire-purchase can be rolled through devices of monetary policy. Under an elastic monetary :y—such as has been pursued in Britain, apart from a few relatively brief vals, for nearly a quarter of a century—the expansion of financial ırces employed in hire-purchase business does not mean a curtailment e amounts available for financing investment. All necessary funds can vailable for all purposes. It is only under systems of rigid money and ng periods of credit restrictions that an expansion in the volume of hire-hase is liable to cause a curtailment in the volume of bank credits and -term capital available for financing investment. This effect is all the : likely to be produced if official control over the volume of hire-purchase ught to be exercised by conventional devices of monetary policy.

Changes in the terms of producer credits are to a large degree counter-cal, because during booms interest rates tend to rise and during slumps depressions they tend to decline. On the other hand, consumer credit s in general and hire-purchase credits in particular tend to exaggerate ıps and downs of the business cycle.[1] During prosperous periods, when ively few bad debts are incurred, sellers are prepared to grant more al hire-purchase terms. They are prepared to accept smaller initial sits, or waive the deposit altogether, and to increase the length of the yment period. During periods of depression hire-purchase is further ouraged by a tightening of the terms, owing to the increased risk. Hire-hase charges, too, are inclined to change in the same sense. They are when interest rates in general decline under the influence of bad trade, they tend to decline when trade is good. In the absence of official vention hire-purchase credit terms tend to offset to some degree the ıter-cyclical influence of the terms of producer credits.

The increase in the relative importance of hire-purchase credits may not dequately indicated by the published statistics which cannot, of course, :ate causal relationship. Even if an expansion of hire-purchase is nally induced by a previous expansion of income—which need not ıys necessarily be the case; an expansion may be induced by the inven- of some new " gadget "—after the first " round " the relations are apt to me reciprocal. An increase of production stimulated by hire-purchase ınsion leads to further increase of income which in turn means more -purchase. During periods of hire-purchase expansion cash purchases, onal income and savings also expand to a comparable extent. A prior ınsion of income through an increase in hire-purchase is liable to induce ncrease of cash purchases and also an increase of saving.

Owing to the growing importance of hire-purchase and its self-aggravating

[1] Nugent, *op. cit.*, p. 143.

character, there is a strong case in favour of official intervention to regulate its volume. There remains to be considered whether this end could be adequately achieved by conventional devices of monetary policy. It is important to realise that such devices are much less effective in the sphere of hire-purchase than in other spheres.

To appreciate the above point it is necessary to examine the difference between the operation of the system of hire-purchase financed with the aid of bank credit or with the aid of funds provided outside banks.

In so far as hire-purchase is financed by bank credits, the effect of changes in its volume largely depends on whether under the prevailing monetary policy there is a rigid limit to the volume of credit, or whether it is allowed to expand with growing commercial requirements. Under the gold standard, and also under an inconvertible paper currency during periods of a restrictionist monetary policy, any increase in bank credits to finance hire-purchase business is liable to leave the total volume of credit substantially unaffected, because it must be accompanied by corresponding curtailments of credit to other borrowers.[1] Indeed, since credit is a two-dimensional magnitude—being affected not only by the amount granted but also by the length of period of which it is granted—and since bank credits for financing hire-purchase business have to be granted for comparatively long periods, the same amount of bank credit finances a smaller amount of production of goods sold against deferred payments than of goods sold for cash or on normal credit terms.

Under an elastic monetary system bank credit for financing hire-purchase can, of course, be expanded without having to curtail bank credit for other business purposes. Like other forms of bank credits, those granted for the financing of hire-purchase create their own deposits. The additional deposits remain in existence so long as the volume of credits granted for financing hire-purchase business remain at its increased level. It is only if and when repayments of such credits exceed new credits that the additional deposits they had created become cancelled out. The volume of such credits is well under the control of the monetary authorities. They are in a position to prevent its expansion or to enforce its contraction by the various monetary-policy devices which can compel the banking community to lower the total of its credits. While the automatic effect of raising interest rates on the volume of hire-purchase credits is apt to be limited, any measures to curtail the total volume of credit is liable to induce the banks to reduce facilities granted for financing hire-purchase business. Moreover, the banks may be "requested" by the authorities to reinforce conventional monetary devices by selective discrimination against hire-purchase credits.

While in the United States the greater part of hire-purchase business is financed directly or indirectly by the banks,[2] in Britain it is financed largely

[1] Haberler, *op. cit.*, pp. 8–9, 33, 38.

[2] Even in so far as funds are provided by finance companies, in the United States they have easy access to the money market, and their paper is eligible for re-discount. Thus in the United States a large proportion of the non-banking credits used for the financing of hire-purchase come from the general pool of funds (Haberler, *op. cit.*, p. 34).

out of non-banking resources. The British banks have always abstained from granting any direct credits for hire-purchase financing, though indirectly they have been financing that type of business to some extent by granting credits to hire-purchase finance houses. What is much more important, a large part of the credits granted to the industrial and commercial firms for general purposes is liable to be employed by the borrowers for financing hire-purchase credits. To a very large extent, however, hire-purchase business is financed by the firms' own resources, supplemented, when necessary, by new capital issues, or by credit facilities from hire-purchase finance companies. The latter, in addition to their own capital resources, attract deposits by paying interest rates well in excess of those paid by the banks.

Admittedly, whatever form the financing of hire-purchase credits with the aid of non-banking credits may assume, it must involve the use of bank deposits. The firms directly concerned, or the hire-purchase finance companies, may draw upon their own bank balances. Or they may issue new capital and the investors pay for the securities by drawing upon their balances, or by selling other securities, the buyers of which draw on their balances. If hire-purchase finance companies pay attractive interest rates on deposits, holders of bank deposits may transfer to them their funds in order to take advantage of the higher yield. All this does not mean that the use of these deposits for financing hire-purchase, directly or indirectly, reduces the total deposits held by the banking system as a whole. Under our modern banking system the withdrawal of deposits is liable to affect the total deposits only if the depositors withdraw notes for hoarding purposes. If the withdrawals are for the purpose of financing purchases, or for granting non-banking credits, the amounts withdrawn either find their way back into the banking system very soon, or they never leave the banking system at all even though they are transferred from one account to another or from one bank to another.

This means that an expansion of non-banking credits for financing hire-purchase business leaves the total of bank credits unchanged. Unlike an expansion of bank credits for that purpose, it does not create additional bank deposits. What it does is to leave the total of bank deposits unchanged, thereby enabling the banks to maintain the same volume of credit even during periods of restrictive monetary policy. The increased volume of non-banking credits for hire-purchase is therefore additional to the unchanged volume of bank credits. In other words, an expansion of non-banking credits in connection with hire-purchase transactions leaves the volume of bank deposits unchanged but increases their velocity of circulation. Idle deposits are converted into active deposits.

While the authorities can maintain a reasonably effective control over bank credits financing hire-purchase, their control over non-banking credits for that purpose is very loose and indirect. A general tightening of money conditions, by reducing the amount of bank credits granted for general purposes, may force the firms concerned to employ their own funds, which

would otherwise be available for financing hire-purchase credits, for financing their other requirements which had hitherto been financed by bank credits. Hire-purchase finance companies are always in a position, however, to attract more deposits by raising their deposit rates, thereby increasing the temptation for holders of idle bank deposits to transfer their funds to them. Owing to the wide margin between cash terms and hire-purchase terms, they are in a position to increase deposit rates considerably. Moreover, industrial or commercial firms of standing are in a position to raise new capital even during a period of credit restrictions.

In order to be able to reduce hire-purchase credits to a desired degree, the monetary authorities have to apply a very drastic degree of general credit restrictions, precisely because otherwise non-banking hire-purchase credits remain relatively unaffected. Under a moderate credit squeeze non-banking hire-purchase credits remain unaffected, or they may even continue to expand. If the authorities aim at reducing the amount of hire-purchase transactions they have to enforce a much higher degree of general curtailment of bank credits in order to achieve a desired reduction of hire-purchase financed by the banks, so as to offset any increase in hire-purchase financed outside the banks.

In countries such as Great Britain, where hire-purchase is financed largely by non-banking credits, there is, therefore, justification for selective credit restrictions discriminating against bank credits financing hire-purchase, and even for the direct regulation of hire-puchase business. Otherwise, owing to the limited ability of the authorities to control closely the volume of hire-purchase business financed by non-banking resources, trade in general has to be penalised by the application of unduly severe general credit restrictions to a degree which is unwarranted by general business conditions as distinct from conditions prevailing in the sphere of hire-purchase business.

From the above argument if follows that there is, in this country at any rate, a strong case in favour of direct intervention to influence the volume of hire-purchase credits. By means of intervention it might be possible to convert hire-purchase from being a disturbing influence tending to aggravate booms and slumps, into a counter-cyclical device. For considerations of space I cannot go into detailed proposals, but there are fiscal and other devices by which the authorities should be able not only to curtail the volume of hire-purchase during booms but, what is much more difficult, also to encourage its expansion during depression.[1]

It is to be hoped that the decision of the Board of Trade to publish figures relating to hire-purchase business will increase the interests of economists in the subject, and that its theoretical as well as practical aspects will receive the attention they deserve.

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[1] Meade, in his *Consumers' Credit and Unemployment*, outlined an ingenious formula, even though he rejected it in favour of another solution.

THE TAKE-OFF INTO SELF-SUSTAINED GROWTH[1]

I

THE purpose of this article is to explore the following hypothesis: that the process of economic growth can usefully be regarded as centering on a relatively brief time interval of two or three decades when the economy and the society of which it is a part transform themselves in such ways that economic growth is, subsequently, more or less automatic. This decisive transformation is here called the take-off.[2]

The take-off is defined as the interval during which the rate of investment increases in such a way that real output *per capita* rises and this initial increase carries with it radical changes in production techniques and the disposition of income flows which perpetuate the new scale of investment and perpetuate thereby the rising trend in *per capita* output. Initial changes in method require that some group in the society have the will and the authority to install and diffuse new production techniques;[3] and a perpetuation of the growth process requires that such a leading group expand in authority and that the society as a whole respond to the impulses set up by the initial changes, including the potentialities for external economies. Initial changes in the scale and direction of finance flows are likely to imply a command over income flows by new groups or institutions; and a perpetuation of growth requires that a high proportion of the increment to real income during the take-off period be returned to productive investment. The take-off requires, therefore, a society prepared to respond actively to new possibilities for productive enterprise; and it is likely to require political, social and institutional changes which will both perpetuate an initial increase in the scale of investment and result in the regular acceptance and absorption of innovations.

In short, this article is an effort to clarify the economics of industrial revolution when an industrial revolution is conceived of narrowly with respect to time and broadly with respect to changes in production functions.

[1] I wish to acknowledge with thanks the helpful criticisms of an earlier draft by G. Baldwin, F. Bator, K. Berrill, A. Enthoven, E. E. Hagen, C. P. Kindleberger, L. Lefeber, W. Malenbaum, E. S. Mason and M. F. Millikan.

[2] This argument is a development from the line of thought presented in *The Process of Economic Growth* (New York, 1952), Chapter 4, especially pp. 102–5. The concept of three stages in the growth process centering on the take-off is defined and used for prescriptive purposes in *An American Policy in Asia* (New York, 1955), Chapter 7.

[3] We shall set aside in this article the question of how new production techniques are generated from pure science and invention, a procedure which is legitimate, since we are examining the growth process in national (or regional) economies over relatively short periods. We shall largely set aside also the question of population pressure and the size and quality of the working force, again because of the short period under examination; although, evidently, even over short periods, the rate of population increase will help determine the level of investment required to yield rising output *per capita* (see below, p. 28, note 2). By and large, this article is concerned with capital formation at a particular stage of economic growth; and of the array of propensities defined in *The Process of Economic Growth* it deals only with the propensity to accept innovations and the propensity to seek material advance, the latter in relation to the supply of finance only.

II. Three Stages in the Growth Process

The historian examining the story of a particular national economy is inevitably impressed by the long-period continuity of events. Like other forms of history, economic history is a seamless web. The cotton-textile developments in Britain of the 1780s and 1790s have a history stretching back for a half century at least; the United States of the 1840s and 1850s had been preparing itself for industrialisation since the 1790s, at the latest; Russia's remarkable development during the two pre-1914 decades goes back to 1861 for its foundations, if not to the Napoleonic Wars or to Peter the Great; the remarkable economic spurt of Meiji Japan is incomprehensible outside the context of economic developments in the latter half of the Tokugawa era; and so on. It is wholly legitimate that the historian's influence should be to extend the story of the British industrial revolution back into the seventeenth century and forward far into the nineteenth century; and that Heckscher should embrace Sweden's transition in a chapter entitled, "The Great Transformation (1815–1914)."[1] From the perspective of the economic historian the isolation of a take-off period is, then, a distinctly arbitrary process. It is to be judged, like such other arbitrary exercises as the isolation of business cycles and secular trends, on whether it illuminates more of the economic process than it conceals; and it should be used, if accepted, as a way of giving a rough framework of order to the inordinately complicated biological problem of growth rather than as an exact model of reality.

There is difficulty in this set of conceptions for the statistical analyst of economic development as well as for the historian. At first sight the data mobilised, for example, by Clark, Kuznets, Buchanan and Ellis exhibit a continuum of degrees of development both within countries over time and as among countries at a given period of time, with no *prima facie* case for a clearly marked watershed in the growth process.[2] In part this statistical result arises from the fact that historical data on national product and its components are only rarely available for an economy until after it has passed into a stage of more or less regular growth; that is, after the take-off. In part it arises from the fact that, by and large, these authors are more concerned with different levels of *per capita* output (or welfare)—and the structural characteristics that accompany them—than with the growth process itself. The data they mobilise do not come to grips with the inner determinants of growth. The question raised here is not how or why levels of output *per capita* have differed but rather how it has come about that particular economies have moved from stagnation—to slow, piece-meal advance—to

[1] E. F. Heckscher, *An Economic History of Sweden*, Tr. G. Ohlin, (Cambridge, Massachusetts, 1954), Chapter 6.

[2] Colin Clark, *The Conditions of Economic Progress* (London, 1951, second edition); Simon Kuznets, "International Differences in Capital Formation and Financing" (mimeographed; Conference on Capital Formation and Economic Growth, November 1953) (National Bureau of Economic Research, New York, 1953); Norman Buchanan and Howard Ellis, *Approaches to Economic Development* (Twentieth Century Fund, New York, 1955). See also the United Nations data presented as a frontispiece to H. F. Williamson and John A. Buttrick, *Economic Development* (New York, 1954).

tuation where growth was the normal economic condition. Our criterion
e is not the absolute level of output *per capita* but its rate of change.
In this argument the sequence of economic development is taken to
sist of three periods: a long period (up to a century or, conceivably,
re) when the preconditions for take-off are established; the take-off
lf, defined within two or three decades; and a long period when growth
omes normal and relatively automatic. These three divisions would, of
rse, not exclude the possibility of growth giving way to secular stagnation
lecline in the long term. It would exclude from the concept of a growing
nomy, however, one which experiences a brief spurt of expansion which
ıot subsequently sustained; for example, the United States industrial
ım of the War of 1812 or the ill-fated spurts of certain Latin American
nomies in the early stages of their modern history.
Take-offs have occurred in two quite different types of societies; and,
refore, the process of establishing preconditions for take-off has varied.
the first and most general case the achievement of preconditions for take-
required major change in political and social structure and, even, in
ctive cultural values. In the vocabulary of *The Process of Economic*
wth, important changes in the propensities preceded the take-off. In
second case take-off was delayed not by political, social and cultural
tacles but by the high (and even expanding) levels of welfare that could
achieved by exploiting land and natural resources. In this second case
e-off was initiated by a more narrowly economic process, as, for example,
the northern United States, Australia and, perhaps, Sweden. In the
:abulary of *The Process of Economic Growth*, the take-off was initiated
marily by a change in the yields; although subsequent growth brought with
:hanges in the propensities as well. As one would expect in the essentially
logical field of economic growth, history offers mixed as well as pure cases.
In the first case the process of establishing preconditions for take-off
ght be generalised in impressionistic terms as follows:
We start with a reasonably stable and traditional society containing an
nomy mainly agricultural, using more or less unchanging production
thods, saving and investing productively little more than is required to
et depreciation. Usually from outside the society, but sometimes out of
own dynamics, comes the idea that economic progress is possible; and
s idea spreads within the established *élite* or, more usually, in some dis-
antaged group whose lack of status does not prevent the exercise of some
nomic initiative. More often than not the economic motives for seeking
nomic progress converge with some non-economic motive, such as the
ire for increased social power and prestige, national pride, political
bition and so on. Education, for some at least, broadens and changes
uit the needs of modern economic activity. New enterprising men come
ward willing to mobilise savings and to take risks in pursuit of profit,
ably in commerce. The commercial markets for agricultural products,
nestic handicrafts and consumption-goods imports widen. Institutions
mobilising capital appear; or they expand from primitive levels in the

scale, surety and time horizon for loans. Basic capital is expanded, notably in transport and communications, often to bring to market raw materials in which other nations have an economic interest, often financed by foreign capital. And, here and there, modern manufacturing enterprise appears, usually in substitution for imports.

Since public-health measures are enormously productive in their early stages of application and, as innovations go, meet relatively low resistance in most cultures, the death rate may fall and the population begin to rise, putting pressure on the food supply and the institutional structure of agriculture, creating thereby an economic depressant or stimulus (or both in turn), depending on the society's response.[1]

The rate of productive investment may rise up to 5% of national income;[2] but this is unlikely to do much more than keep ahead of the population increase. And, in general, all this activity proceeds on a limited basis, within an economy and a society still mainly characterised by traditional low-productivity techniques and by old values and institutions which developed in conjunction with them. The rural proportion of the population is likely to stand at 75% or over.

In the second case, of naturally wealthy nations, with a highly favorable balance between population and natural resources and with a population deriving by emigration from reasonably acquisitive cultures, the story of establishing the preconditions differs mainly in that there is no major problem of overcoming traditional values inappropriate to economic growth and the inert or resistant institutions which incorporate them; there is less difficulty in developing an *élite* effective in the investment process; and there is no population problem.[3] Technically, much the same slow-moving process of change occurs at high (and, perhaps, even expanding) levels of *per capita* output, and with an extensive growth of population and output still based on rich land and other natural resources. Take-off fails to occur mainly because the comparative advantage of exploiting productive land and other natural resources delays the time when self-reinforcing industrial growth can profitably get under way.[4]

[1] Historically, disruptive population pressure has been generated in pretake-off societies not only by the easy spread of highly productive measures of public health but also by the easy acceptance of high-yield new crops, permitting a fragmentation of land-holdings, earlier marriage and a rise in the birth rate; *e.g.*, Ireland and China.

[2] The relation of the investment rate to growth depends, of course, on the rate of population rise. With stagnant population or slow rise a 5% investment rate could yield substantial growth in real output *per capita*, as indeed it did in pre-1914 France. On the other hand, as noted below (p. 36) investment rates much higher than 5% can persist in primitive economies which lack the preconditions for growth, based on capital imports, without initiating sustained growth. For some useful arithmetic on the scale and composition of capital requirements in a growing economy with a 1% population increase see A. K. Cairncross, *Home and Foreign Investment* (Cambridge, 1953), Chapter 1.

[3] Even in these cases there have often been significant political and social restraints which had to be reduced or eliminated before take-off could occur; for example, in Canada, the Argentine and the American South.

[4] Theoretically, such fortunate societies could continue to grow in *per capita* output until diminishing returns damped down their progress. Theoretically, they might even go on as growing non-industrial societies, absorbing agricultural innovations which successfully countered diminishing returns. Something like this process might describe, for example, the rich agricultural regions of the United States. But, in general, it seems to be the case that the conditions required to sustain a progressive increase in agricultural productivity will also lead on to self-reinforcing industrial growth. This result emerges not merely from the fact that many agricultural improvements are labor-saving, and that industrial employment can be stimulated by the availability of surplus labor and is required to draw it off; it also derives from the fact that the production and use of materials and devices which raise agricultural productivity in themselves stimulate the growth of a self-sustaining industrial sector.

The beginning of take-off can usually be traced to a particular sharp stimulus. The stimulus may take the form of a political revolution which affects directly the balance of social power and effective values, the character of economic institutions, the distribution of income, the pattern of investment outlays and the proportion of potential innovations actually applied; that is, it operates through the propensities. It may come about through a technological (including transport) innovation, which sets in motion a chain of secondary expansion in modern sectors and has powerful potential external economy effects which the society exploits. It may take the form of a newly favorable international environment, such as the opening of British and French markets to Swedish timber in the 1860s or a sharp relative rise in export prices and/or large new capital imports, as in the case of the United States from the late 1840s, Canada and Russia from the mid-1890s; but it may also come as a challenge posed by an unfavorable shift in the international environment, such as a sharp fall in terms of trade (or a wartime blockage of foreign trade) requiring the rapid development of manufactured import substitutes, as in the case of the Argentine and Australia in the 1930s and during the Second World War.[1] All these latter cases raise sharply the profitability of certain lines of enterprise and can be regarded as changes in the yields.

What is essential here, however, is not the form of stimulus but the fact that the prior development of the society and its economy result in a positive sustained, and self-reinforcing, response to it: the result is not a once-over change in production functions or in the volume of investment, but a higher proportion of potential innovations accepted in a more or less regular flow, and a higher rate of investment.

In short, the forces which have yielded marginal bursts of activity now expand and become quantitatively significant as rapid-moving trends. New industries expand at high rates, yielding profits which are substantially reinvested in new capacity; and their expansion induces a more general expansion of the modern sectors of the economy where a high rate of plough-back prevails. The institutions for mobilising savings (including the fiscal and sometimes the capital-levy activities of government) increase in scope and efficiency. New techniques spread in agriculture as well as in industry, as increasing numbers of persons are prepared to accept them and the deep

[1] Historically, the imposition of tariffs has played an important role in take-offs, *e.g.*, the American Tariffs of 1828 (cotton textiles) and 1841–42 (rail iron); the Russian tariffs of the 1890s, etc. Although these actions undoubtedly served to assist take-off in leading sectors, they usually reflected an energy and purpose among key entrepreneurial groups which would, in any case, probably have done the trick.

changes they bring to ways of life. A new class of business-men (usuall private, sometimes public servants) emerges and acquires control over th key decisions determining the use of savings. New possibilities for expor develop and are exploited; new import requirements emerge. Th economy exploits hitherto unused backlogs in technique and natural re sources. Although there are a few notable exceptions, all this momentur historically attracted substantial foreign capital.

The use of aggregative national-income terms evidently reveals little c the process which is occurring. It is nevertheless useful to regard as necessary but not sufficient condition for the take-off the fact that the prc portion of net investment to national income (or net national product rises from (say) 5% to over 10%, definitely outstripping the likely populatio pressure (since under the assumed take-off circumstances the capital–outpu ratio is low),[1] and yielding a distinct rise in real output *per capita*. Whethe real consumption *per capita* rises depends on the pattern of income distribu tion and population pressure, as well as on the magnitude, character an productivity of investment itself.

As indicated in the accompanying table (see p. 31), I believe it possibl to identify at least tentatively such take-off periods for a number of countrie which have passed into the stage of growth.

The third stage is, of course, the long, fluctuating story of sustaine economic progress. Overall capital per head increases as the econom matures. The structure of the economy changes increasingly. The initia key industries, which sparked the take-off, decelerate as diminishing return operate on the original set of industrial tricks and the original band c pioneering entrepreneurs give way to less single-minded industrial leade in those sectors; but the average rate of growth is maintained by a successio of new, rapidly growing sectors, with a new set of pioneering leaders. Th proportion of the population in rural pursuits declines. The economy finc its (changing) place in the international economy. The society makes suc terms as it will with the requirements for maximising modern and efficier production, balancing off, as it will, the new values against those retardin values which persist with deeper roots, or adapting the latter in such way as to support rather than retard the growth process. This sociologica

[1] The author is aware of the substantial ambiguities which overhang the concept of the capital output ratio and, especially, of the dangers of applying an overall aggregate measure. But sinc the arithmetic of economic growth requires some such concept, implicitly or explicitly, we ha better refine the tool rather than abandon it. In the early stages of economic development tw contrary forces operate on the capital–output ratio. On the one hand there is a vast requiremer of basic overhead capital in transport, power, education, etc. Here, due mainly to the long perio over which such investment yields its return, the apparent (short-run) capital–output ratio is higl On the other hand, there are generally large unexploited backlogs of known techniques and availab natural resources to be put to work; and these backlogs make for a low capital–output rati We can assume formally a low capital–output ratio for the take-off period because we are assumin that the preconditions have been created, including a good deal of social overhead capital. I fact, the aggregate marginal capital–output ratio is likely to be kept up during the take-off by th requirement of continuing large outlays for overhead items which yield their return only over lon periods. Nevertheless, a ratio of 3–1 or 3·5–1 on average seems realistic as a rough bench-mar until we have learned more about capital–output ratios on a sectoral basis.

calculus interweaves with basic resource endowments to determine the pace of deceleration.

It is with the problems and vicissitudes of such growing economies of the third stage (and especially with cyclical fluctuations and the threat of chronic unemployment) that the bulk of modern theoretical economics is concerned, including much recent work on the formal properties of growth models. The student of history and of contemporary underdeveloped areas [1]

Some Tentative, Approximate Take-off Dates

Country.	Take-off.	Country.	Take-off.
Great Britain	1783–1802	Russia	1890–1914
France	1830–1860	Canada	1896–1914
Belgium	1833–1860	Argentine [3]	1935–
United States [1]	1843–1860	Turkey [4]	1937–
Germany	1850–1873	India [5]	1952–
Sweden	1868–1890	China [5]	1952–
Japan [2]	1878–1900		

[1] The American take-off is here viewed as the upshot of two different periods of expansion: the first, that of the 1840s, marked by railway and manufacturing development, mainly confined to the East—this occurred while the West and South digested the extensive agricultural expansion of the previous decade; the second the great railway push into the Middle West during the 1850s marked by a heavy inflow of foreign capital. By the opening of the Civil War the American economy of North and West, with real momentum in its heavy-industry sector, is judged to have taken off.

[2] Lacking adequate data, there is some question about the timing of the Japanese take-off. Some part of the post-1868 period was certainly, by the present set of definitions, devoted to firming up the preconditions for take-off. By 1914 the Japanese economy had certainly taken off. The question is whether the period from about 1878 to the Sino-Japanese War in the mid-1890s is to be regarded as the completion of the preconditions or as take-off. On present evidence, I incline to the latter view.

[3] In one sense the Argentine economy began its take-off during the First World War. But by and large, down to the pit of the post-1929 depression, the growth of its modern sector, stimulated during the war, tended to slacken; and, like a good part of the Western World, the Argentine sought during the 1920s to return to a pre-1914 normalcy. It was not until the mid-1930s that a sustained take-off was inaugurated, which by and large can now be judged to have been successful despite the structural vicissitudes of that economy.

[4] Against the background of industrialisation measures inaugurated in the mid-1930s the Turkish economy has exhibited remarkable momentum in the past five years founded in the increase in agricultural income and productivity. It still remains to be seen whether these two surges, conducted under quite different national policies, will constitute a transition to self-sustaining growth, and whether Turkey can overcome its current structural problems.

[5] As noted in the text it is still too soon (for quite different reasons) to judge either the Indian or Chinese Communist take-off efforts successful.

[1] A number of so-called underdeveloped areas may have, in fact, either passed through the take-off process or are in the midst of it, *e.g.*, Mexico, Brazil, Turkey, the Argentine and India. I would commend for consideration—certainly no more until the concept of take-off is disproved or verified—the dropping of the concept of "underdeveloped areas" and the substitution for it of a quadripartite distinction among economies: traditional; pretake-off; take-off; and growing. Against the background of this set of distinctions we might then consider systematically two separable questions now often confused. First, the stage of growth, as among growing economies. It is legitimate to regard Mexico and the United States, Great Britain and Australia, France and Japan, as growing economies, although they stand at very different points along their national growth curves, where the degree of progress might be measured by some kind of index of output (or capital) per head. Second, the foreseeable long-run potential of growing economies. Over the long pull, even after they are "fully developed," the *per capita* output levels that different economies are likely to achieve will undoubtedly vary greatly, depending notably on resource endowments in relation to population. The arraying of levels of output *per capita* for different economies, now conventional, fails to distinguish these three elements; that is, the current rate of growth; the stage of growth; and the foreseeable horizon for growth.

is more likely to be concerned with the economics of the first two stages; that is, the economics of the preconditions and the take-off. If we are to have a serious theory of economic growth or (more likely) some useful theories about economic growth, they must obviously seek to embrace these two early stages—and notably the economics of the take-off. The balance of this article is designed to mobilise tentatively and in a preliminary way what an economic historian can contribute to the economics of take-off.

III. The Take-off Defined and Isolated

There are several problems of choice involved in defining the take-off with precision. We might begin with one arbitrary definition and consider briefly the two major alternatives.

For the present purposes the take-off is defined as requiring all three of the following related conditions:

(*a*) a rise in the rate of productive investment from (say) 5% or less to over 10% of national income (or net national product);

(*b*) the development of one or more substantial manufacturing [1] sectors, with a high rate of growth;

(*c*) the existence or quick emergence of a political, social and institutional framework which exploits the impulses to expansion in the modern sector and the potential external economy effects of the take-off and gives to growth an on-going character.

The third condition implies a considerable capability to mobilise capital from domestic sources. Some take-offs have occurred with virtually no capital imports; *e.g.*, Britain and Japan. Some take-offs have had a high component of foreign capital; *e.g.*, the United States, Russia and Canada. But some countries have imported large quantities of foreign capital for long periods, which undoubtedly contributed to creating the precondition for take-off, without actually initiating take-off; *e.g.*, the Argentine before 1914, Venezuela down to recent years, the Belgian Congo currently. In short, whatever the role of capital imports, the preconditions for take-off include an initial ability to mobilise domestic savings productively, as well as a structure which subsequently permits a high marginal rate of savings.

This definition is designed to isolate the early stage when industrialisation takes hold rather than the later stage when industrialisation becomes a more massive and statistically more impressive phenomenon. In Britain, for example, there is no doubt that it was between 1815 and 1850 that industrialisation fully took hold. If the criterion chosen for take-off was the period of most rapid overall industrial growth, or the period when large scale industry matured, all our take-off dates would have to be set forward: Britain, for example, to 1819–48; the United States to 1868–93; Sweden

[1] In this context "manufacturing" is taken to include the processing of agricultural products or raw materials by modern methods; *e.g.*, timber in Sweden; meat in Australia; dairy products in Denmark. The dual requirement of a "manufacturing" sector is that its processes set in motion a chain of further modern sector requirements and that its expansion provides the potentiality for external economy effects.

to 1890–1920; Japan to 1900–20; Russia to 1928–40. The earlier dating is chosen here because it is believed, on present (often inadequate) evidence, that the decisive transformations (including a decisive shift in the investment rate) occur in the first industrial phases; and later industrial maturity can be directly traced back to foundations laid in these first phases.

This definition is also designed to rule out from the take-off the quite substantial economic progress which can occur in an economy before a truly self-reinforcing growth process gets under way. British economic expansion between (say) 1750 and 1783, Russian economic expansion between (say) 1861 and 1890, Canadian economic expansion between 1867 and the mid-1890s—such periods—for which there is an equivalent in the economic history of almost every growing economy—were marked by extremely important, even decisive, developments. The transport network expanded, and with it both internal and external commerce; new institutions for mobilising savings were developed; a class of commercial and even industrial entrepreneurs began to emerge; industrial enterprise on a limited scale (or in limited sectors) grew. And yet, however essential these pretake-off periods were for later development, their scale and momentum were insufficient to transform the economy radically or, in some cases, to outstrip population growth and to yield an increase in *per capita* output.

With a sense of the considerable violence done to economic history, I am here seeking to isolate a period when the scale of productive economic activity reaches a critical level and produces changes which lead to a massive and progressive structural transformation in economies and the societies of which they are a part, better viewed as changes in kind than merely in degree.

IV. Evidence on Investment Rates in the Take-off

The case for the concept of take-off hinges, in part, on quantitative evidence on the scale and productivity of investment in relation to population growth. Here, as noted earlier, we face a difficult problem; investment data are not now available historically for early stages in economic history. Following is such case as there is for regarding the shift from a productive investment rate of about 5% of NNP to 10% or more as central to the process.[1]

[1] In his important article, "Economic Development with Unlimited Supplies of Labour," *Manchester School*, May 1954, W. Arthur Lewis indicates a similar spread as defining the transition to economic growth:

> "The central problem in the theory of economic development is to understand the process by which a community which was previously saving and investing 4 or 5% of its national income or less, converts itself into an economy where voluntary saving is running at about 12–15% of national income or more. This is the central problem because the central fact of economic development is rapid capital accumulation (including knowledge and skills with capital). We cannot explain any 'industrial' revolution (as the economic historians pretend to do) until we can explain why saving increased relatively to national income."

Presumably Mr. Lewis based this range on empirical observation of contemporary "underdeveloped" areas on which some data are presented below. As in note 2, p. 28, above, it should be emphasised that the choice of investment proportions to symbolise the transition to growth hinges on the assumptions made about the rate of population increase.

1. *A* Prima Facie *Case*

If we take the aggregate marginal capital–output ratio for an economy in its early stage of economic development at 3·5–1 and if we assume, as is not abnormal, a population rise of 1–1·5% per annum it is clear that something between 3·5 and 5·25% of NNP must be regularly invested if NNP *per capita* is to be sustained. An increase of 2% per annum in NNP *per capita* requires, under these assumptions, that something between 10·5 and 12·5% of NNP be regularly invested. By definition and assumption, then, a transition from relatively stagnant to substantial, regular rise in NNP *per capita*, under typical population conditions, requires that the proportion of national product productively invested move from somewhere in the vicinity of 5% to something in the vicinity of 10%.

2. *The Swedish Case*

In the appendix to his paper on international differences in capital formation, cited above, Kuznets gives gross and net capital formation figures in relation to gross and net national product for a substantial group of countries where reasonably good statistical data exist. Excepting Sweden, these data do not go back clearly to pretake-off stages.[1] The Swedish data begin in the decade 1861–70; and the Swedish take-off is to be dated from the latter years of the decade.

Kuznets' table of calculations for Sweden follows:

Decade.	Domestic GCF GNP (%).	Domestic NCF NNP (%).	Depreciation to DGCF (%).
1. 1861–70	5·8	3·5–	(42)
2. 1871–80	8·8	5·3	(42)
3. 1881–90	10·8	6·6	(42)
4. 1891–1900 . . .	13·7	8·1	43·9
5. 1901–10	18·0	11·6	40·0
6. 1911–20	20·2	13·5	38·3
7. 1921–30	19·0	11·4	45·2

Note (Kuznets): Based on estimates in Eric Lindahl, Einan Dahlgren and Karin Kock, *National Income of Sweden, 1861–1930* (London: P. J. Kingston, 1937), Parts One and Two, particularly the details in Part Two.

These underlying totals of capital formation exclude changes in inventories.

While gross totals are directly from the volumes referred to above, depreciation for the first three decades was not given. We assumed that it formed 42% of gross domestic capital formation.

[1] The Danish data are on the margin. They begin with the decade 1870–79, probably the first decade of take-off itself. They show net and gross domestic capital formation rates well over 10%. In view of the sketch of the Danish economy presented in Kjeld Bjerke's "Preliminary Estimates of the Danish National Product from 1870–1950" (Preliminary paper mimeographed for 1953 Conference of the International Association for Research on Income and Wealth), pp. 32–4, it seems likely that further research would identify the years 1830–70 as a period when the preconditions were actively established, 1870–1900 as a period of take-off. This view is supported by scattered and highly approximate estimates of Danish National Wealth which exhibit a remarkable surge in capital formation between 1864 and 1884.

Estimates of National Wealth in Denmark

	1,000 millions of kroner.	Source.
1864	3·5	Falbe-Hansen, *Danmarks statistik*, 1885.
1884	6·5	Falbe-Hansen, *Danmarks statistik*, 1885.
1899	7·2	Tax-commission of 1903.
1909	10·0	Jens Warming, *Danmarks statistik*, 1913.
1927	24·0	Jens Warming, *Danmarks erhvervs- or samfundsliv*, 1930.
1939	28·8	Economic expert committee of 1943, *Økonomiske efterkrigsproblemer*, 1945.
1950	54·5	N. Banke, N. P. Jacobsen og Vedel-Petersen, *Danske erhvervsliv*, 1951.

(Furnished in correspondence by Einar Cohn and Kjeld Bjerke.) It should again be emphasised, however, that we are dealing with a hypothesis whose empirical foundations are still fragmentary.

3. *The Canadian Case*

The data developed by O. J. Firestone [1] for Canada indicates a similar transition for net capital formation in its take-off (say, 1896–1914); but the gross investment proportion in the period from Confederation to the mid-nineties was higher than appears to have marked other periods when the preconditions were established, possibly due to investment in the railway net, abnormally large for a nation of Canada's population, and to relatively heavy foreign investment, even before the great capital import boom of the pre-1914 decade:

Canada: Gross and Net Investment in Durable Physical Assets as Percentage of Gross and Net National Expenditure (for Selected Years).

	$\frac{GCF}{GNP}$	$\frac{NCF}{NNP}$	Capital consumption as percentage of gross investment.
1870	15·0	7·1	56·2
1900	13·1	4·0	72·5
1920	16·6	10·6	41·3
1929	23·0	12·1	53·3
1952	16·8	9·3	49·7

4. *The Pattern of Contemporary Evidence in General* [2]

In the years after 1945 the number of countries for which reasonably respectable national income (or product) data exist has grown; and with such data there have developed some tolerable savings and investment

[1] O. J. Firestone, *Canada's Economic Development, 1867–1952, with Special Reference to Changes in the Country's National Product and National Wealth*, paper prepared for the International Association for Research in Income and Wealth, 1953, to which Mr. Firestone has kindly furnished me certain revisions, shortly to be published. By 1900 Canada already had about 18,000 miles of railway line; but the territory served had been developed to a limited degree only. By 1900 Canada already had a net balance of foreign indebtedness over $1 billion. Although this figure was almost quadrupled in the next two decades, capital imports represented an important increment to domestic capital sources from the period of Confederation down to the pre-1914 Canadian boom, which begins in the mid-1890s.

[2] I am indebted to Mr. Everett Hagen for mobilising the statistical data in this section, except where otherwise indicated.

estimates for countries at different stages of the growth process. Within the category of nations usually grouped as "underdeveloped" one can distinguish four types.[1]

(*a*) *Pretake-off economies*, where the apparent savings and investment rates, including limited net capital imports, probably come to under 5% of net national product. In general, data for such countries are not satisfactory, and one's judgment that capital formation is low must rest on fragmentary data and partially subjective judgment. Examples are Ethiopia, Kenya, Thailand, Cambodia, Afghanistan and perhaps Indonesia.[2]

(*b*) *Economies attempting take-off*, where the apparent savings and investment rates, including limited net capital imports, have risen over 5% of net national product.[3] For example, Mexico (1950) NCF/NDP 7·2%; Chile (1950) NCF/NDP 9·5%; Panama (1950) NCF/NDP 7·5%; Philippines (1952) NCF/NDP 6·4%; Puerto Rico (1952) NCF (Private)/NDP 7·6%; India (1953) NCF/NDP, perhaps about 7%. Whether the take-off period will, in fact, be successful remains in most of these cases still to be seen.

(*c*) *Growing economies*, where the apparent savings and investment rates, including limited net capital imports, have reached 10% or over; for example, Colombia (1950) NCF/NDP, 16·3%.

(*d*) *Enclave economies* (1) cases where the apparent savings and investment rates, including substantial net capital imports, have reached 10% or over, but the domestic preconditions for sustained growth have not been achieved. These economies, associated with major export industries, lack the third condition for take-off suggested above (p. 32). They include the Belgian Congo (1951) NCF/NDP 21·7%; Southern Rhodesia (1950) GCF/GDP 45·5%, (1952) GCF/GDP 45·4%. (2) Cases where net capital exports are large. For example, Burma (1938) NCF/NDP, 7·1%; net capital exports/NDP, 11·5%; Nigeria (1950–51) NCF/NDP 5·1%; net capital exports/NDP, 5·6%.

[1] The percentages given are of net capital formation to net domestic product. The latter is the product net of depreciation of the geographic area. It includes the value of output produced in the area, regardless of whether the income flows abroad. Since indirect business taxes are not deducted, it tends to be larger than national income; hence the percentages are lower than if national income was used as the denominator in computing them.

[2] The Office of Intelligence Research of the Department of State, Washington, D.C., gives the following estimated ratios of investment (presumably gross) to GNP in its Report No. 6672 of August 25, 1954, p. 3, based on latest data available to that point, for countries which would probaly fall in the pretake-off category:

	%		%
Afghanistan	5	Pakistan	6
Ceylon	5	Indonesia	5

[3] The Department of State estimates (*ibid.*) for economies which are either attempting take-off which have, perhaps, passed into a stage of regular growth include:

	%		%
The Argentine	13	Colombia	14
Brazil	14	Philippines	8
Chile	11	Venezuela	23

Venezuela has been for some time an "enclave economy," with a high investment rate concentrated in a modern export sector whose growth did not generate general economic momentum in the Venezuelan economy; but in the past few years Venezuela may have moved over into the category of economies experiencing an authentic take-off.

5. *The Cases of India and Communist China*

The two outstanding contemporary cases of economies attempting purposefully to take-off are India and Communist China, both operating under national plans. The Indian First Five Year Plan projects the growth process envisaged under assumptions similar to those in paragraph 1, p. 34, above. The Indian Planning Commission estimated investment as 5% of NNP in the initial year of the plan, 1950–51.[1] Using a 3/1 marginal capital–output ratio, they envisaged a marginal savings rate of 20% for the First Five Year Plan, a 50% rate thereafter, down to 1968–69, when the average proportion of income invested would level off at 20% of NNP. As one would expect, the sectoral composition of this process is not fully worked out in the initial plan; but the Indian effort may well be remembered in economic history as the first take-off defined *ex ante* in national product terms.

We know less of the Chinese Communist First Five Year Plan than we do of the concurrent Indian effort, despite the recent publication of production goals for some of the major sectors of the Chinese economy.[2] Roundly, it would appear that, from a (probably) negative investment rate in 1949, the Chinese Communist regime had succeeded by 1952 in achieving a gross rate of about 12%; a net rate of about 7%.

On arbitrary assumptions, which have a distinct upward bias, these figures can be projected forward for a decade yielding rates of about 20% gross, 17% net by 1962.

So far as the aggregates are concerned, what we can say is that the Indian planned figures fall well within the range of *prima facie* hypothesis and historical experience, if India in fact fulfils the full requirements for take-off, notably the achievement of industrial momentum. The Chinese Communist figures reflect accurately an attempt to force the pace of history, evident throughout Peking's domestic policy, whose viability is still to be demonstrated. In particular, Peking's agricultural policy may fail to produce the minimum structural balance required for a successful take-off, requiring radical revision of investment allocations and policy objectives at a later stage.

We have, evidently, much still to learn about the quantitative aspects of this problem; and, especially, much further quantitative research and imaginative manipulation of historical evidence will be required before the hypothesis tentatively advanced here can be regarded as proved or disproved.

[1] Government of India, Planning Commission, *The First Five Year Plan*, 1952, Vol. I, Chapter 1.

[2] These comments are based on the work of Alexander Eckstein and the author in *The Prospects for Communist China* (New York and London, 1954), Part 5, pp. 222 ff. The statistical calculations are the work of Mr. Eckstein.

What we can say is that *prima facie* thought and a scattering of historical and contemporary evidence suggests that it is not unreasonable to consider the take-off as including as a necessary but not sufficient condition a quantitative transition in the proportion of income productively invested of the kind indicated here.

V. The Inner Structure of the Take-off

Whatever the importance and virtue of viewing the take-off in aggregative terms—embracing national output, the proportion of output invested, and an aggregate marginal capital–output ratio—that approach tells us relatively little of what actually happens and of the causal processes at work in a take-off; nor is the investment-rate criterion conclusive.

Following the definition of take-off (pp. 32–33 above), we must consider not merely how a rise in the investment rate is brought about, from both supply and demand perspectives, but how rapidly growing manufacturing sectors emerged and imparted their primary and secondary growth impulses to the economy.

Perhaps the most important thing to be said about the behavior of these variables in historical cases of take-off is that they have assumed many different forms. There is no single pattern. The rate and productivity of investment can rise, and the consequences of this rise can be diffused into a self-reinforcing general growth process by many different technical and economic routes, under the ægis of many different political, social and cultural settings, driven along by a wide variety of human motivations.

The purpose of the following paragraphs is to suggest briefly, and by way of illustration only, certain elements of both uniformity and variety in the variables whose movement has determined the inner structure of the take-off.

1. *The Supply of Loanable Funds*

By and large, the loanable funds required to finance the take-off have come from two types of sources: from shifts in the control over income flows, including income-distribution changes and capital imports;[1] and from the plough-back of profits in rapidly expanding particular sectors.

The notion of economic development occurring as the result of income shifts from those who will spend (hoard [2] or lend) less productively to those who will spend (or lend) more productively is one of the oldest and most

[1] Mr. Everett Hagen has pointed out that the increase in savings may well arise from a shift in the propensity to save, as new and exciting horizons open up, rather than merely from a shift of income to groups with a higher (but static) propensity to save. He may well be right. This is, evidently, a matter for further investigation.

[2] Hoarding can, of course, be helpful to the growth process by depressing consumption and freeing resources for investment if, in fact, non-hoarding persons or institutions acquire the resources and possess the will to expand productive investment. A direct transfer of income is, evidently, not required.

fundamental notions in economics. It is basic to the *Wealth of Nations*,[1] and it is applied by W. Arthur Lewis in his recent elaboration of the classical model.[2] Lewis builds his model in part on an expansion of the capitalist sector, with the bulk of additional savings arising from an enlarging pool of capitalist profits.

Historically, income shifts conducive to economic development have assumed many forms. In Meiji Japan and also in Czarist Russia the substitution of government bonds for the great landholders' claim on the flow of rent payments lead to a highly Smithian redistribution of income into the hands of those with higher propensities to seek material advance and to accept innovations. In both cases the real value of the government bonds exchanged for land depreciated; and, in general, the feudal landlords emerged with a less attractive arrangement than had first appeared to be offered. Aside from the confiscation effect, two positive impulses arose from land reform: the state itself used the flow of payments from peasants, now diverted from landlords' hands, for activity which encouraged economic development; and a certain number of the more enterprising former landlords directly invested in commerce and industry. In contemporary India and China we can observe quite different degrees of income transfer by this route. India is relying to only a very limited extent on the elimination of large incomes unproductively spent by large landlords; although this element figures in a small way in its program. Communist China has systematically transferred all non-governmental pools of capital into the hands of the State, in a series of undisguised or barely disguised capital levies; and it is drawing heavily for capital resources on the mass of middle and poor peasants who remain.[3]

In addition to confiscatory and taxation devices, which can operate effectively when the State is spending more productively than the taxed individuals, inflation has been important to several take-offs. In Britain of the late 1790s, the United States of the 1850s, Japan of the 1870s there is no doubt that capital formation was aided by price inflation, which shifted resources away from consumption to profits.

The shift of income flows into more productive hands has, of course, been aided historically not only by government fiscal measures but also by banks and capital markets. Virtually without exception, the take-off periods have been marked by the extension of banking institutions which expanded the supply of working capital; and in most cases also by an expansion in the range of long-range financing done by a central, formally organised, capital market.

Although these familiar capital-supply functions of the State and private institutions have been important to the take-off, it is likely to prove the case,

[1] See, especially, Smith's observations on the "perversion" of wealth by "prodigality"—that is, unproductive consumption expenditures—and on the virtues of "parsimony" which transfers income to those who will increase "the fund which is destined for the maintenance of productive hands." Routledge edition, London, 1890, pp. 259–60.

[2] *Op. cit.*, especially pp. 156–9.

[3] *Prospects for Communist China*, Part 4.

on close examination, that a necessary condition for take-off was the existence of one or more rapidly growing sectors whose entrepreneurs (private or public) ploughed back into new capacity a very high proportion of profits. Put another way, the demand side of the investment process, rather than the supply of loanable funds, may be the decisive element in the take-off, as opposed to the period of creating the preconditions, or of sustaining growth once it is under way. The distinction is, historically, sometimes difficult to make, notably when the State simultaneously acts both to mobilise supplies of finance and to undertake major entrepreneurial acts. There are, nevertheless, periods in economic history when quite substantial improvements in the machinery of capital supply do not, in themselves, initiate a take-off, but fall within the period when the preconditions are created: *e.g.*, British banking developments in the century before 1783; Russian banking developments before 1890, etc.

One extremely important version of the plough-back process has taken place through foreign trade. Developing economies have created from their natural resources major export industries; and the rapid expansion in exports has been used to finance the import of capital equipment and to service the foreign debt during the take-off. United States, Russian and Canadian grain fulfilled this function, Swedish timber and pulp, Japanese silk, etc. Currently Chinese exports to the Communist Bloc, wrung at great administrative and human cost from the agricultural sector, play this decisive role. It should be noted that the development of such export sectors has not in itself guaranteed accelerated capital formation. Enlarged foreign-exchange proceeds have been used in many familiar cases to finance hoards (as in the famous case of Indian bullion imports) or unproductive consumption outlays.

It should be noted that one possible mechanism for inducing a high rate of plough-back into productive investment is a rapid expansion in the effective demand for domestically manufactured consumers' goods, which would direct into the hands of vigorous entrepreneurs an increasing proportion of income flows under circumstances which would lead them to expand their own capacity and to increase their requirements for industrial raw materials, semi-manufactured products and manufactured components.

A final element in the supply of loanable funds is, of course, capital imports. Foreign capital has played a major role in the take-off stage of many economies: *e.g.*, the United States, Russia, Sweden, Canada. The cases of Britain and Japan indicate, however, that it cannot be regarded as an essential condition. Foreign capital was notably useful when the construction of railways or other large overhead capital items with a long period of gestation, played an important role in the take-off. After all, whatever its strategic role, the proportion of investment required for growth which goes into industry is relatively small compared to that required for utilities, transport and the housing of enlarged urban populations. And foreign capital can be mightily useful in helping carry the burden of these overhead items either directly or indirectly.

What can we say, in general, then, about the supply of finance during the take-off period? First, as a precondition, it appears necessary that the community's surplus above the mass-consumption level does not flow into the hands of those who will sterilise it by hoarding, luxury consumption or low-productivity investment outlays. Second, as a precondition, it appears necessary that institutions be developed which provide cheap and adequate working capital. Third, as a necessary condition, it appears that one or more sectors of the economy must grow rapidly, inducing a more general industrialisation process; and that the entrepreneurs in such sectors plough back a substantial proportion of their profits in further productive investment, one possible and recurrent version of the plough-back process being the investment of proceeds from a rapidly growing export sector.

The devices, confiscatory and fiscal, for ensuring the first and second preconditions have been historically various. And, as indicated below, the types of leading manufacturing sectors which have served to initiate the take-off have varied greatly. Finally, foreign capital flows have, in significant cases, proved extremely important to the take-off, notably when lumpy overhead capital construction of long gestation period was required; but take-offs have also occurred based almost wholly on domestic sources of finance.

2. *The Sources of Entrepreneurship*

It is evident that the take-off requires the existence and the successful activity of some group in the society which accepts borrowers' risk, when such risk is so defined as to include the propensity to accept innovations. As noted above, the problem of entrepreneurship in the take-off has not been profound in a limited group of wealthy agricultural nations whose populations derived by emigration mainly from north-western Europe. There the problem of take-off was primarily economic; and when economic incentives for industrialisation emerged commercial and banking groups moved over easily into industrial entrepreneurship. In many other countries, however, the development of adequate entrepreneurship was a more searching social process.

Under some human motivation or other, a group must come to perceive it to be both possible and good to undertake acts of capital investment; and, for their efforts to be tolerably successful, they must act with approximate rationality in selecting the directions toward which their enterprise is directed. They must not only produce growth but tolerably balanced growth. We cannot quite say that it is necessary for them to act as if they were trying to maximise profit; for the criteria for private profit maximisation do not necessarily converge with the criteria for an optimum rate and pattern of growth in various sectors.[1] But in a growing economy, over

[1] For a brief discussion of this point see the author's "Trends in the Allocation of Resources in Secular Growth," Chapter 15, *Economic Progress*, ed. Leon H. Dupriez, with the assistance of Douglas C. Hague (Louvain, 1955), pp. 378–9. For a more complete discussion see W. Fellner, "Individual Investment Projects in Growing Economies" (mimeographed), paper presented to the Center for International Studies Social Science Research Council Conference on Economic Growth, October 1954, Cambridge, Massachusetts.

periods longer than the business cycle, economic history is reasonably tolerant of deviations from rationality, in the sense that excess capacity is finally put to productive use. Leaving aside the question of ultimate human motivation, and assuming that the major overhead items are generated, if necessary, by some form of state initiative (including subsidy), we can say as a first approximation that some group must successfully emerge which behaves as if it were moved by the profit motive, in a dynamic economy with changing production functions; although risk being the slippery variable, it is under such assumptions Keynes' dictum should be borne in mind: "If human nature felt no temptation to take a chance, no satisfaction (profit apart) in constructing a factory, a railway, a mine or a farm, there might not be much investment merely as a result of cold calculation." [1]

In this connection it is increasingly conventional for economists to pay their respects to the Protestant ethic.[2] The historian should not be ungrateful for this light on the grey horizon of formal growth models. But the known cases of economic growth which theory must seek to explain take us beyond the orbit of Protestantism. In a world where Samurai, Parsees, Jews, North Italians, Turkish, Russian, and Chinese Civil Servants (as well as Huguenots, Scotsmen and British North-countrymen) have played the role of a leading *élite* in economic growth John Calvin should not be made to bear quite this weight. More fundamentally, allusion to a positive scale of religious or other values conducive to profit-maximising activities is an insufficient sociological basis for this important phenomenon. What appears to be required for the emergence of such *élites* is not merely an appropriate value system but two further conditions: first, the new *élite* must feel itself denied the conventional routes to prestige and power by the traditional less acquisitive society of which it is a part; second, the traditional society must be sufficiently flexible (or weak) to permit its members to seek material advance (or political power) as a route upwards alternative to conformity.

Although an *élite* entrepreneurial class appears to be required for take-off, with significant power over aggregate income flows and industrial investment decisions, most take-offs have been preceded or accompanied by radical change in agricultural techniques and market organisation. By and large the agricultural entrepreneur has been the individual land-owning farmer. A requirement for take-off is, therefore, a class of farmers willing and able to respond to the possibilities opened up for them by new techniques, land-holding arrangements, transport facilities, and forms of market and credit organisation. A small purposeful *élite* can go a long way in initiating economic growth; but, especially in agriculture (and to some extent in the industrial working force), a wider-based revolution in outlook must come about.[3]

[1] *General Theory*, p. 150.

[2] See, for example, N. Kaldor, "Economic Growth and Cyclical Fluctuations," ECONOMIC JOURNAL, March 1954, p. 67.

[3] Like the population question, agriculture is mainly excluded from this analysis, which considers the take-off rather than the whole development process. Nevertheless, it should be noted that, as a matter of history, agricultural revolutions have generally preceded or accompanied the take-off. In theory we can envisage a take-off which did not require a radical improvement in agricultural productivity: if, for example, the growth and productivity of the industrial sector permitted a withering away of traditional agriculture and a substitution for it of imports. In fact, agricultural revolutions have been required to permit rapidly growing (and urbanising) populations to be fed without exhausting foreign exchange resources in food imports or creating excessive hunger in the rural sector; and as noted at several points in this argument, agricultural revolutions have in fact played an essential and positive role, not merely by both releasing workers to the cities, and feeding them, but also by earning foreign exchange for general capital-formation purposes.

Whatever further empirical research may reveal about the motives which have led men to undertake the constructive entrepreneurial acts of the take-off period, this much appears sure: these motives have varied greatly, from one society to another; and they have rarely, if ever, been motives of an unmixed material character.

3. *Leading Sectors in the Take-off*

The author has presented elsewhere the notion that the overall rate of growth of an economy must be regarded in the first instance as the consequence of differing growth rates in particular sectors of the economy, such sectoral growth rates being in part derived from certain overall demand parameters (*e.g.*, population, consumers' income, tastes, etc.), in part from the primary and secondary effects of changing supply factors, when these are effectively exploited.[1]

On this view the sectors of an economy may be grouped in three categories:

(*a*) *Primary growth sectors*, where possibilities for innovation or for the exploitation of newly profitable or hitherto unexplored resources yield a high growth rate and set in motion expansionary forces elsewhere in the economy.

(*b*) *Supplementary growth sectors*, where rapid advance occurs in direct response to—or as a requirement of—advance in the primary growth sectors; *e.g.*, coal, iron and engineering in relation to railroads. These sectors may have to be tracked many stages back into the economy, as the Leontief input–output models would suggest.

(*c*) *Derived growth sectors*, where advance occurs in some fairly steady relation to the growth of total real income, population, industrial production or some other overall, modestly increasing parameter. Food output in relation to population, housing in relation to family formation are classic derived relations of this order.

Very roughly speaking, primary and supplementary growth sectors derive their high momentum essentially from the introduction and diffusion of changes in the cost–supply environment (in turn, of course, partially influenced by demand changes); while the derived-growth sectors are

[1] *Process of Economic Growth*, Chapter 4, especially pp. 97–102; and, in greater detail, "Trends in the Allocation of Resources in Secular Growth," see above, p. 41, n. 1.

linked essentially to changes in demand (while subject also to continuing changes in production functions of a less dramatic character).

At any period of time it appears to be true even in a mature and growing economy that forward momentum is maintained as the result of rapid expansion in a limited number of primary sectors, whose expansion has significant external economy and other secondary effects. From this perspective the behaviour of sectors during the take-off is merely a special version of the growth process in general; or, put another way, growth proceeds by repeating endlessly, in different patterns, with different leadings sectors, the experience of the take-off. Like the take-off, long-term growth requires that the society not only generate vast quantities of capital for depreciation and maintenance, for housing and for a balanced complement of utilities and other overheads, but also a sequence of highly productive primary sectors, growing rapidly, based on new production functions. Only thus has the aggregate marginal capital–output ratio been kept low.

Once again history is full of variety: a considerable array of sectors appears to have played this key role in the take-off process.

The development of a cotton-textile industry sufficient to meet domestic requirements has not generally imparted a sufficient impulse in itself to launch a self-sustaining growth process. The development of modern cotton-textile industries in substitution for imports has, more typically, marked the pretake-off period, as for example in India, China and Mexico.

There is, however, the famous exception of Britain's industrial revolution. Baines' table on raw-cotton imports and his comment on it are worth quoting, covering as they do the original leading sector in the first take-off: [1]

Rate of Increase in the Import of Cotton-wool, in Periods of Ten Years From 1741–1831.

	%.		%.
1741–1751	81	1791–1801	67½
1751–1761	21½	1801–1811	39½
1761–1771	25½	1811–1821	93
1771–1781	75¾	1821–1831	85
1781–1791	319½		

From 1697 to 1741, the increase was trifling: between 1741 and 1751 the manufacture, though still insignificant in extent, made a considerable spring: during the next twenty years, the increase was moderate: from 1771 to 1781, owing to the invention of the jenny and the water-frame, a rapid increase took place: in the ten years from 1781 to 1791, being those which immediately followed the invention of the mule and the expiration of Arkwrights's patent, the rate of advancement was prodigiously accelerated, being nearly 320%: and from that time to the present, and especially since the close of the war, the increase, though considerably moderated, has been rapid and steady far beyond all precedent in any other manufacture.

Why did the development of a modern factory system in cotton textiles lead on in Britain to a self-sustaining growth process, whereas it failed to do so in other cases? Part of the answer lies in the fact that, by the late eighteenth century, the preconditions for take-off in Britain were very fully developed. Progress in textiles, coal, iron and even steam power had been

[1] E. Baines, *History of the Cotton Manufacture* (London, 1835), p. 348.

considerable through the eighteenth century; and the social and institutional environment was propitious. But two further technical elements helped determine the upshot. First, the British cotton-textile industry was large in relation to the total size of the economy. From its modern beginnings, but notably from the 1780s forward, a very high proportion of total cotton-textile output was directed abroad, reaching 60% by the 1820s.[1] The evolution of this industry was a more massive fact, with wider secondary repercussions, than if it were simply supplying the domestic market. Industrial enterprise on this scale had secondary reactions on the development of urban areas, the demand for coal, iron and machinery, the demand for working capital and ultimately the demand for cheap transport, which powerfully stimulated industrial development in other directions.[2]

Second, a source of effective demand for rapid expansion in British cotton textiles was supplied, in the first instance, by the sharp reduction in real costs and prices which accompanied the technological developments in manufacture and the cheapening real cost of raw cotton induced by the cotton gin. In this Britain had an advantage not enjoyed by those who came later; for they merely substituted domestic for foreign-manufactured cotton textiles. The substitution undoubtedly had important secondary effects by introducing a modern industrial sector and releasing in net a pool of foreign exchange for other purposes; but there was no sharp fall in the real cost of acquiring cotton textiles and no equivalent lift in real income.

The introduction of the railroad has been historically the most powerful single initiator of take-offs.[3] It was decisive in the United States, Germany and Russia; it has played an extremely important part in the Swedish, Japanese and other cases. The railroad has had three major kinds of impact on economic growth during the take-off period. First, it has lowered internal transport costs, brought new areas and products into commercial markets and, in general, performed the Smithian function of widening the market. Second, it has been a prerequisite in many cases to the development of a major new and rapidly enlarging export sector which, in turn, has served to generate capital for internal development; as, for example, the American railroads of the 1850s, the Russian and Canadian railways before 1914. Third, and perhaps most important for the take-off itself, the development of railways has led on to the development of modern coal, iron and engineering industries. In many countries the growth of modern basic industrial sectors can be traced in the most direct way to the requirements for building

[1] The volume (official value) of British cotton goods exports rose from £355,060 in 1780 to £7,624,505 in 1802 (Baines, *op. cit.*, p. 350). See also the calculation of R. C. O. Matthews, *A Study in Trade Cycle History* (Cambridge, 1954), pp. 127–9.

[2] If we are prepared to treat New England of the first half of the nineteenth century as a separable economy, its take-off into sustained growth can be allocated to the period, roughly, 1820–50 and, again, a disproportionately large cotton-textile industry based substantially on exports (that is, from New England to the rest of the United States) is the regional foundation for sustained growth.

[3] For a detailed analysis of the routes of impact of the railroad on economic development see Paul H. Cootner, *Transport Innovation and Economic Development: The Case of the U.S. Steam Railroads*, 1953, unpublished doctoral thesis, M.I.T.

and, especially, for maintaining substantial railway systems. When a society has developed deeper institutional, social and political prerequisites for take-off, the rapid growth of a railway system with these powerful triple effects has often served to lift it into self-sustaining growth. Where the prerequisities have not existed, however, very substantial railway building has failed to initiate a take-off, as, for example, in India, China, pre-1895 Canada, pre-1914 Argentine, etc.

It is clear that an enlargement and modernisation of Armed Forces could play the role of a leading sector in take-off. It was a factor in the Russian, Japanese and German take-offs; and it figures heavily in current Chinese Communist plans. But historically the role of modern armaments has been ancillary rather than central to the take-off.

Quite aside from their role in supplying foreign exchange for general capital-formation purposes, raw materials and foodstuffs can play the role of leading sectors in the take-off if they involve the application of modern processing techniques. The timber industry, built on the steam saw, fulfilled this function in the first phase of Sweden's take-off, to be followed shortly by the pulp industry. Similarly, the shift of Denmark to meat and dairy products, after 1873, appears to have reinforced the development of a manufacturing sector in the economy, as well as providing a major source of foreign exchange. And as Lockwood notes, even the export of Japanese silk thread had important secondary effects which developed modern production techniques.[1]

> "To satisfy the demands of American weaving and hosiery mills for uniform, high-grade yarn, however, it was necessary to improve the quality of the product, from the silkworm egg on through to the bale of silk. In sericulture this meant the introduction of scientific methods of breeding and disease control; in reeling it stimulated the shift to large filatures equipped with machinery; in marketing it led to large-scale organization in the collection and sale of cocoons and raw silk . . . it exerted steady pressure in favor of the application of science, machinery, and modern business enterprise."

The role of leading sector has been assumed, finally, by the accelerated development of domestic manufacture of consumption goods over a wide range in substitution for imports, as, for example, in Australia, the Argentine and perhaps in contemporary Turkey.

What can we say, then, in general about these leading sectors? Historically, they have ranged from cotton textiles, through heavy-industry complexes based on railroads and military end products, to timber, pulp, dairy products and finally a wide variety of consumers' goods. There is, clearly, no one sectoral sequence for take-off, no single sector which constitutes the magic key. There is no need for a growing society to recapitulate the structural sequence and pattern of Britain, the United States or Russia. Four basic factors must be present:

1. There must be enlarged effective demand for the product or products of sectors which yield a foundation for a rapid rate of growth in output. Historically this has been brought about initially by the transfer of income from consumption or hoarding to productive investment; by capital imports; by a sharp increase in the productivity of current investment inputs, yielding an increase in consumers' real income expended on domestic manufactures; or by a combination of these routes.

2. There must be an introduction into these sectors of new production functions as well as an expansion of capacity.

3. The society must be capable of generating capital initially required to detonate the take-off in these key sectors; and especially, there must be a high rate of plough-back by the (private or state) entrepreneurs controlling capacity and technique in these sectors and in the supplementary growth sectors they stimulated to expand.

4. Finally, the leading sector or sectors must be such that their expansion and technical transformation induce a chain of Leontief input–output requirements for increased capacity and the potentiality for new production functions in other sectors, to which the society, in fact, progressively responds.

[1] W. W. Lockwood, *The Economic Development of Japan* (Princeton, 1954), pp. 338–9.

VI. Conclusion

This hypothesis is, then, a return to a rather old-fashioned way of looking at economic development. The take-off is defined as an industrial revolution, tied directly to radical changes in methods of production, having their decisive consequence over a relatively short period of time.

This view would not deny the role of longer, slower changes in the whole process of economic growth. On the contrary, take-off requires a massive set of preconditions going to the heart of a society's economic organisation and its effective scale of values. Moreover, for the take-off to be successful, it must lead on progressively to sustained growth; and this implies further deep and often slow-moving changes in the economy and the society as a whole.

What this argument does assert is that the rapid growth of one or more new manufacturing sectors is a powerful and essential engine of economic transformation. Its power derives from the multiplicity of its forms of impact, when a society is prepared to respond positively to this impact. Growth in such sectors, with new production functions of high productivity, in itself tends to raise output per head; it places incomes in the hands of men who will not merely save a high proportion of an expanding income but who will plough it into highly productive investment; it sets up a chain of effective demand for other manufactured products; it sets up a requirement for enlarged urban areas, whose capital costs may be high, but whose population and market organisation help to make industrialisation an on-going process; and, finally, it opens up a range of external economy effects which, in the end, help to produce new leading sectors when the initial impulse of the take-off's leading sectors begins to wane.

We can observe in history and in the contemporary world important changes in production functions in non-manufacturing sectors which have powerful effects on whole societies. If natural resources are rich enough or the new agricultural tricks are productive enough such changes can even outstrip population growth and yield a rise in real output per head. Moreover, they may be a necessary prior condition for take-off or a necessary concomitant for take-off. Nothing in this analysis should be read as deprecating the importance of productivity changes in agriculture to the whole process of economic growth. But in the end take-off requires that a society find a way to apply effectively to its own peculiar resources what D. H. Robertson once called the tricks of manufacture; and continued growth requires that it so organise itself as to continue to apply them in an unending flow, of changing composition. Only thus, as we have all been correctly taught, can that old demon, diminishing returns, be held at bay.

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THE ACCELERATOR AND THE OVERINVESTMENT AND UNDERCONSUMPTION MODELS[1]

TRADITIONAL pre-Keynesian business-cycle theory emphasised two principal types of theories to account for the upper turning point: the overinvestment theories, on the one hand, and the underconsumption theories, on the other. Although Professor Haberler's *Prosperity and Depression*, completed in 1935, surveys a number of cycle theories which might not be considered to fall under one or the other of these headings, it remains true that these were the basic interpretations of cyclical downturns. These theories could both be expressed in terms of the neo-Wicksellian saving-investment framework, but because of the difficulties involved in literary exposition, it was sometimes difficult to obtain an articulate impression of their essential properties. Both types of explanation gave as the *proximate* cause of the downturn the failure of the economy to sustain investment.

The Keynesian episode led to substantial progress in the analysis of the determinants of aggregate demand. Most of what might be considered an advance, however, related to consumption behaviour. The *General Theory* had little to add regarding investment behaviour, and thus made few contributions to this central problem of cyclical fluctuations. As in the traditional body of business-cycle theory, investment was said to be determined by the marginal efficiency of investment function, on the one hand, and the interest rate, on the other. This, of course, was merely a tautological statement derived from the long-run profit-maximisation axiom. However, Keynes did lay stress on the forward-looking nature of investment decisions. Thus, it was principally through changes in profit expectations and consequently in investment that the multiplied changes in the level of activity were brought about. But the *formal* apparatus never explained what profit expectations were geared to. They appeared to float in an ether.

The acceleration principle appeared quite early in the history of business-cycle theory,[2] but for the most part is was utilised in the explanation of the demand for particular types or classes of products.[3] Only Frisch [4] had used it in a true macro-economic sense. In spite of the fact that Keynesian economics had very little to contribute specifically concerning the determinants of the inducement to invest, it did provide the multiplier principle via

[1] I am indebted to Professor William Fellner of Yale University and my colleague Professor Fred Weston for reading earlier drafts of some of the materials appearing in this paper. Many helpful suggestions were provided by my colleague Professor Karl Brunner in connection with certain theoretical issues.

[2] Albert Aftalion was apparently one of the first to deal with the acceleration principle.

[3] *E.g.*, the demand for railroad equipment, housing, etc.

[4] R. Frisch, "Propagation Problems and Impulse Problems in Dynamic Economics," *Economic Essays in Honor of Gustav Cassel* (London: George Allen and Unwin, 1933).

the consumption function. Given fluctuations in investment, the multiplier process told us that they might be built into even greater fluctuations in income. Harrod was quick to see the possibilities of a closed macrodynamic system capable of generating cyclical fluctuations. He immediately combined the accelerator and the multiplier.[1] It remained for Samuelson to give this theory of cyclical fluctuations a formal mathematical presentation.[2] The latest variant of this economic model is that recently proposed by Hicks.[3] One of the most interesting aspects of his theory is that it is implicitly of the overinvestment variety. Moreover, Harrod in his original formulation stressed what amounted to an underconsumption explanation of the upper turning point, although he recognised other possibilities. Thus it would appear that despite post-Keynesian developments, the earlier ideas remain of substantial significance.

Many economists have not been very enthusiastic about the acceleration principle as a theory of investment. For one thing, it was thought necessarily to relate the inducement to invest only to aggregate consumer demand, and consequently to involve an underconsumption bias. Furthermore, a number of qualifications which were usually considered in the literal discussions of the accelerator tended to be overlooked when it appeared in a formal model. Hicks and others have recently made substantial progress in making some of the necessary amendments to the acceleration hypothesis in pure form so as to make it more acceptable as a basis for explaining investment decisions.

We propose here to show that the accelerator is consistent with either the overinvestment or the underconsumption explanation of upper turning points when properly amended. As representative of the most modern views, the Hicksian cyclical framework will be examined in terms of these traditional alternative explanations of cyclical downturns. As a prerequisite, we will consider briefly some of the recent modifications of the acceleration hypothesis that have been suggested with a view to removing some of its obvious deficiencies as a short-run theory of induced investment. We turn first to a consideration of the essential basis of the theory of acceleration.

The Technological Foundations of the Accelerator

The acceleration principle is rooted in capital and production theory. The basic reasoning underlying it relates more to a supply proposition than to a demand proposition. Going back to the basic nature of capital, it gives

[1] R. F. Harrod, *The Trade Cycle* (Oxford: The Clarendon Press, 1936).

[2] Paul A. Samuelson, "A Synthesis of the Principle of Acceleration and the Multiplier," *Journal of Political Economy*, XLII (1939), 786–97, and "Interactions between the Multiplier Analysis and the Principle of Acceleration," *Review of Economic Statistics*, XXI (1939), 75–8. Harrod's version, however, implies a non-linear system, although he did not have an explicit mathematical formulation. Samuelson employs a mathematical model which leads to a linear difference equation.

[3] J. R. Hicks, *A Contribution to the Theory of the Trade Cycle* (Oxford: The Clarendon Press, 1950), and related literature cited below.

recognition to the fact that in modern industrial communities the flow of products is secured by processes which utilise a substantial flow of capital services. The foundation of the accelerator is concerned in general with the technical relationship between a *flow* of output, on the one hand, and a *stock* from which capital services are derived, on the other. This theory in pure form implies that for every rate of output per unit of time there is a unique corresponding equilibrium capital stock which will yield the requisite capital services per unit of time needed to produce the output flow. More specifically, the ratio of output to capital is assumed to remain fixed.[1] Thus an expansion in the product output flow can be accomplished only by a proportionate increase in the capital-service input flow, which in turn implies a proportionately larger capital stock. The latter reflects the assumption that the capital services flowing per unit of time are proportionate to the size of the real capital stock.

Two issues arise at the outset as to the relevance of this hypothesis in the economic environment. Let us consider these briefly under the assumption that the economy possesses the properties of a single product firm on the supply side in order to define away the aggregation problem. In this monoproduct economy the single product produced by the firm may be used either for consumption or investment.

First, given the techniques of production and organisation, what conditions must be fulfilled in order that the ratio of output to capital remain unchanged as output increases? To posit that this ratio remains unchanged under these circumstances suggests either that relative factor prices, including the interest rate, remain unchanged or that the properties of the production function are such that the technical coefficients of production with respect to both capital and labour are invariant. Even if the relative prices of capital and labour services remained unchanged with an expansion of physical output, it would be necessary to have a linear homogeneous production function for the ratio of output to capital to remain constant. Thus it seems unlikely that the assumption of potentially variable proportions between capital and labour can be considered to be consistent with the specified circumstances. The alternative assumption of fixed capital and labour coefficients [2] seems more reasonable on *a priori* grounds if one is to logically account for the fixed output–capital ratio.

Second, allowing for technical progress, what form may technical innovations take and yet leave the ratio of output to capital unchanged? The answer apparently is that innovations must neither be capital-saving nor capital-using.[3] That is, technical innovations must not change the capital coefficient, even though the labour coefficient is reduced.

The rigid technological formulation cited above, which is in the nature of a supply proposition, is then transformed into a demand proposition relating

[1] Formally, however, the condition that need be imposed is somewhat less stringent than this. See below, p. 52, note 2.

[2] *I.e.*, the capital-service input per unit of output and the labour-service input per unit of output.

[3] *I.e.*, must not change the capital-service input per unit of output.

to the demand for investment goods. This is done as follows: The truncated [1] production function

$$X = \delta K \tag{1}$$

makes output, X, proportional to the size of the capital stock, K. Taking the inverse of this function gives the capital demand function,

$$K = \epsilon X \tag{2}$$

namely, the capital stock considered proportional to output, where the average capital coefficient, $\epsilon = 1/\delta$. Finally, taking the derivative of the latter function with respect to time gives the investment function,

$$I = \dot{K} = \epsilon \dot{X} \tag{3}$$

Thus we have the acceleration hypothesis: *Net investment, I, is equal to the marginal capital coefficient, ϵ, multiplied by the time-rate of change in the level of output, $\dot{X}$.*[2] Therefore, from statements about the relationship between the capital stock and productive capacity is derived a theory of the inducement to invest.

The Accelerator and the Inducement to Invest

The capital and production theory foundations of the accelerator leave much to be desired when one attempts to erect upon them a theory of investment. This is particularly true when one is concerned with the explanation of investment behaviour in the cyclical short run.[3] Most of the recent amendments to the acceleration principle in pure form are attempts to remove some of the deficiencies implicit in these foundations.

It is conventional in present-day business-cycle analysis to distinguish between autonomous investment and induced investment. Profit expectations, of course, constitute the motivation underlying both types of investment. Autonomous investment is that part of total net investment which is dependent on technical innovation as well as product innovation.[4] Thus if the acceleration principle is used, it is intended to explain only investment of the induced variety. This treatment of the two types of investment calls for an amendment in the formulation derived above. Now one must define a

[1] Truncated in the sense that the economic variables representing other factor inputs have been suppressed. Thus, in more general terms we might have the production function $X = X(K, E)$, where X = output, K = the capital stock and E = the labour-service input.

[2] Of course, it is not a necessary condition for the marginal capital coefficient to be constant that the average capital coefficient also be constant. If the capital demand function (and truncated production function) was a linear relation, the marginal capital coefficient would be constant with a rise in output, even though the average capital coefficient would be changing. This possibility is not considered here because it is difficult to conceive of such a functional form in terms of economic behaviour. Moreover, it is conventional to define capital widening and capital deepening (or shallowing) with respect to K/X rather than dK/dX as output rises. Cf. R. G. Hawtrey, *Capital and Employment* (London: Longmans, Green, 1937), pp. 35 f. However, the circumstance mentioned may be of importance in empirical work.

[3] Our discussion pertains to investment empirically classified as "plant and equipment" expenditures.

[4] An innovation may be defined from the point of view of the firm as the setting up of a new

new *acceleration coefficient*, β, the numerical value of which will always be smaller than the marginal capital coefficient, ϵ. Since any investment in the cyclical short run associated with new production functions is classified as of the autonomous variety from a motivational standpoint, the accelerator as a behaviour parameter is concerned only with capital widening[1] premised on a rise in output. Of course, all investment, whether autonomous or induced, will possess some productivity *ex post*—that is, after it has become part of the capital structure of the economy. But this is a matter quite apart from that with which the accelerator purports to deal. The acceleration principle is concerned with the explanation of one component of aggregate demand, namely, investment. It does not deal explicitly with the implications of investment for the growth of productive capacity of the system. This is true despite the fact that the basic reasoning behind the accelerator does relate to production theory. Typically, contemporary theories of employment and business cycles have no formally specified aggregate supply side. It has been this deficiency in part which has led to the recent interest in progressive equilibrium. However, the latter treatment of economic growth is very arbitrary in character and does not consider, even in a logical way, the aggregate supply side of the economy.[2] This aspect of macro-economics is beyond the scope of our present interest. We conclude, then, that if autonomous investment, A, is taken account of separately, *net induced investment, I, is equal to the acceleration coefficient, β, multiplied by the time-rate of change in the level of output, $\dot{X}$.* Consequently, the induced investment function takes the form

$$I = \beta \dot{X} \tag{4}$$

Three major amendments to the acceleration principle in pure form are now generally recognised as essential if it is to be used as an explanation of investment behaviour in the cyclical short run. First, it is obvious that the accelerator cannot continue to induce investment once full employment is achieved.[3] As a matter of fact, it is apt to work with less than full effectiveness as real resource scarcities make themselves apparent in the upswing of the business cycle.[4] The existence of monetary scarcities will have a similar effect.[5]

[1] To the extent that new production functions involve different capital–output ratios than the old ones, the acceleration coefficient will change in a secular sense, as further investment is induced subsequently in firms utilising the more capital-intensive production processes.

[2] See the present writer's "Capital Theory and Progressive Equilibrium," *American Economic Review*, XLI (1951), 145–56, for a discussion of these matters.

[3] Let $C = C(X)$ be the consumption function, where C = consumption. Then using symbols previously introduced, we also have $I = \beta \dot{X}$ as the investment function and $X = C + I$. Autonomous investment is neglected here for purposes of simplicity. Now if the production function is $X = X(K, E)$, then the ceiling or full-employment output, $\bar{X}$, is defined by $\bar{X} = X(K, \bar{E})$, where $\bar{E}$ is full employment. Also $\bar{C} = C(\bar{X})$, where $\bar{C}$ = consumption corresponding to $\bar{X}$. $\bar{I} = \bar{X} - \bar{C}$ = investment corresponding to $\bar{X}$. Consequently, the accelerator holds only when $I \leqslant \bar{I}$. $\bar{I}$ is the maximum investment that is possible. The alternative possibility of a constraint on consumption is neglected. It will be noted that both the full-employment output and investment ceilings are endogenously determined in part.

[4] Richard M. Goodwin, "The Non-linear Accelerator and the Persistence of Business Cycles," *Econometrica*, XIX (1951), 1–17; Hicks, *op. cit.*, pp. 96–8.

[5] S. C. Tsiang, "Accelerator, Theory of the Firm and the Business Cycle," *Quarterly Journal of Economics*, LXV (1951), 324–41.

Second, since gross investment can never be negative, the degree to which the accelerator can bring about negative induced investment in the downswing of the business cycle is limited.[1] Consequently, if the fall in output should call for a greater disinvestment in capital per unit of time than the amount of replacement, this amount cannot take place " now," but must be " added on behind." [2] Thus, all the disinvestment consistent with the fall in output will eventually take place *ceteris paribus*, but the amount of disinvestment per unit of time has a limiting value. Therefore, we have a certain asymmetry in the operation of the accelerator over the cycle.

Third, unplanned excess plant capacity will tend to inhibit investment. We know from the theory of the firm that in the short run the rate of output may be varied substantially within a given scale of operations in most cases. Although there may be some optimum rate of output, the degree of utilisation of existing facilities is capable of wide variation. In many instances, overtime work or multiple shifts may be considered alternatives to the expansion of plant capacity. Ordinarily some excess plant capacity will be planned for, because it is often advisable to build ahead of current demand in order to be able to take care of temporary increases in demand. Moreover, the substantial indivisibility of capital facilities likewise tends to bring about building in advance of the growth of demand. Once the planned excess plant capacity has been absorbed, investment will tend to be induced, provided expectations are held that the increase in demand is more or less permanent and that the cost functions of the firm with the plant expansion are more favourable than the original ones at higher rates of output.[3]

In connection with this last amendment to the pure form of the accelerator, it should be pointed out that the acceleration principle implies a certain theory of expectations formation. The inducement to invest by business firms is dependent on their *profit expectations*. Consequently it is the expectations of future demand rather than just current demand which are relevant for investment decisions. Now implicit in the usual accelerator formulation is the idea that all increases in current demand are permanent.[4] Actually the past is relevant only as a guide to the future. All expectations about future demand are rigidly tied to the behaviour of current and perhaps past demand.[5] This, of course, is a very limiting assumption, particularly when it is recognised how high a degree of uncertainty is associated with expectations of

[1] J. Tinbergen, " Statistical Evidence on the Acceleration Principle," *Economica*, V, new series (1938), 164–76. This was also recognised earlier by Clark, Kuznets and Frisch. Specifically the floor or lower constraint is determined by the condition $I \geqslant -R(K, X)$, where R = replacement investment.

[2] Hicks, *op. cit.*, pp. 45–7.

[3] *I.e.*, the maximum expected present value of the firm with the cost functions corresponding to the expanded plant capacity is greater.

[4] A. D. Knox, " The Acceleration Principle and the Theory of Investment: A Survey," *Economica*, XIV new series (1952), 269–97.

[5] On the treatment of expectations in connection with the accelerator see particularly Lloyd A. Metzler, " The Nature and Stability of Inventory Cycles," *Review of Economic Statistics*, XXIII (1941), 113–29, and David McCord Wright, " A Neglected Approach to the Acceleration Principle," *Review of Economic Statistics*, XXXII (1941), 100–1.

ure demand. For most firms, sales forecasting is exceedingly difficult, rticularly because it must be based on a forecast of general business conions. Where the income-elasticity of demand for the product of the firm ubstantial, uncertainty will be very high with the inability to appraise the nomic outlook. Under these circumstances a business firm is likely to igh heavily the contingency of a decrease in future demand and its attent effect on profitability. The major reason why many business firms ploy no systematic form of capital budgeting rests on these considerations. vertheless, in certain types of business activity, such as public utilities, nay be possible for firms to determine a predictable secular trend in their mand. In these cases long-run sales forecasting and capital budgeting y be partially feasible.

We may conclude from the above remarks that a " flexible accelerator " [1] ecessary in order to account in a meaningful way for investment behaviour er the business cycle. Thus the investment function might be considered take the following form:

$$I = \psi[K(X) - \int_{-\infty}^{t} I(\tau)d\tau] \tag{5}$$

e capital demand function, $K(X)$, specifies the equilibrium capital stock, corresponding to alternative output levels. This is the element in the uation pertaining to the acceleration hypothesis.[2] Since adaptations of capital stock to output changes take time, there is usually a discrepancy a given point of time between the *desired* capital stock and the *actual* capital ck in existence. The actual capital stock is represented by $\int_{-\infty}^{t} I(\tau)d\tau$.

is assumed that an adjustment is made in the capital stock via net investnt in accordance with the discrepancy between the desired or planned pital stock, on the one hand, and the actual or existing capital stock, on the ner. The adjustment mechanism is defined by the function ψ.[3] When equilibrium capital stock is greater than the actual capital stock, net vestment is positive, and vice versa. Investment will be zero when they equal. Moreover, the current rate of net investment (positive or nega-e) will be dependent upon the extent of the excess or deficiency of capital, de from planned excess capacity. Thus the inhibiting effect of under-

[1] Cf. Richard M. Goodwin, " Secular and Cyclical Aspects of the Multiplier and the Accelerator," *me Employment and Public Policy* (New York: W. W. Norton & Co. Inc., 1948), pp. 108–32.

[2] This is a more general form than that discussed previously. The specific form usually ociated with the acceleration principle is βX. Of course, the desired capital stock might also perly be considered to be a function of relative factor prices, including the interest rate.

[3] Again, here, ψ represents the most general form of adjustment function. A special case uld make the adjustment proportional to the discrepancy between the equilibrium capital stock l the actual capital stock in existence. Thus $I = \rho[K(X) - K^*]$, where ρ is the reaction cocient and K^* is the existing capital stock. Cf. Thomas C. Schelling, *National Income Behavior* ew York: McGraw-Hill Book Co. Inc., 1951), pp. 262 f; and Hollis B. Chenery, " Overcapacity l the Acceleration Principle," *Econometrica*, XX (1952), 1–28.

utilisation of plant capacity on investment is accounted for in this formulation. Of course, this dynamic investment function is subject to both an upper and a lower constraint as discussed previously.[1]

It will be noted that if this investment function is included in a model system consisting of a consumption function and the definition of real income or output, we have essentially a servomechanism. In this case there are two feedbacks from the investment process: first, the " capital stock effect," which tends to be stabilising, and second, the " income effect," which tends to be destabilising. While the former tends to reduce the initial discrepancy between the desired capital stock and the actual stock, the latter tends to increase it. The " income effect " operates via the consumption function or multiplier and the accelerator. From what we know about the cyclical behaviour of our own economy, this hypothesis concerning the stabilising and destabilising effects of investment appears plausible.

If the accelerator is to be considered an essential part of the mechanism generating cyclical fluctuations, most of the amendments mentioned must be added to the hypothesis as it appears in pure form. The earlier literal discussions of the principle tended to recognise the necessity for such modifications.[2] More recent formal macrodynamic models of cyclical behaviour have added precision by specifying the exact nature of the basic hypothesis involved, but have tended to draw attention away from the aspects which constitute the amendments. Most economic models have used equation (4) as the investment function or a difference-equation variant thereof. Very limited use has been made in such model systems of investment functions of the form presented as equation (5). Moreover, only recently has specific attention been directed to the inability of the accelerator to operate at a full-employment output level or when output declines at such a rate as to call for disinvestment which exceeds current replacement investment. These qualifications to the operation of the acceleration principle in pure form, as well

[1] Cf. Richard M. Goodwin, " Econometrics in Business Cycle Analysis," Chapter 22, in Alvin H. Hansen's *Business Cycles and National Income* (New York: W. W. Norton & Co. Inc., 1951), 436–68. Several alternative hypotheses concerning investment behaviour suggest themselves. Paul A. Samuelson, " Dynamic Process Analysis," *A Survey of Contemporary Economics*, ed. by Howard S. Ellis (Philadelphia and Toronto: The Blakiston Company, 1948), pp. 361–3, posits an adjustment process such that the time-rate of change in investment is proportional to the discrepancy between the desired and actual capital stock. In more general terms the hypothesis would be $\dot{I} = \phi[K(X) - K^*]$. This type of function will tend to make the system over- and under-shoot its equilibrium capital stock in the process of " hunting " for such a position following a disturbance. Another possibility has been mentioned by Schelling, *op. cit.*, pp. 263 f. The time-rate of change in investment is made proportional to the difference between desired investment and actual investment on the grounds that there will be a lag in the response of investment due to the time required to plan and execute investment projects. Specifying a more general adjustment mechanism, F, we have $\dot{I} = F\{\phi[K(X) - K^*] - I^*\}$, where ϕ now defines desired investment and I^* is actual investment. The writer believes that these hypotheses have less to commend them on *a priori* grounds than the one discussed above.

[2] See John M. Clark, " Business Acceleration and the Law of Demand: A Technical Factor of Economic Cycles," *Journal of Political Economy*, XXV (1917), 217–35, and *Strategic Factors in Business Cycles* (New York: National Bureau of Economic Research, 1934), pp. 33–44, 170–82. A summary of some of the qualifications is to be found in Gottfried Haberler, *Prosperity and Depression*, 3rd ed. (Geneva: League of Nations, 1941), pp. 96 f.

as others to be considered subsequently, are necessary if it is to play a meaningful role in modern business-cycle theory.

The Underconsumption and Overinvestment Patterns

As has been mentioned earlier, much attention has recently been given in business-cycle analysis to the behavioural characteristics of a macro-economic model combining the acceleration and multiplier principles. The basic ideas of such a model system stem from Harrod,[1] but they have been clarified and further developed by Samuelson [2] and Hicks.[3] Our purpose here will be an attempt to interpret the two traditional patterns of business-cycle theory in existence before *The General Theory* in terms of this multiplier–accelerator mechanism. We refer, of course, to the overinvestment and underconsumption theories. Before turning explicitly to these matters, however, a few remarks are in order concerning a particular form that the accelerator sometimes takes as an investment function in business-cycle models.

It has been traditional to relate net investment to the time-rate of change in consumption in the economy.[4] Net investment, I, is equal to an acceleration coefficient, θ, multiplied by the time-rate of change in consumption, $\dot{C}$. This makes the induced investment function

$$I = \theta\dot{C} \tag{6}$$

In this case the *primary* demand is identified with the demand for consumers' goods, while the *derived* demand is identified with the demand for capital goods. Now it should be obvious that this is not even good theory. Capital goods are used to produce capital goods, just as they are used to produce consumers' goods. There is no difference either from the technical side of production or from the standpoint of economic motivation. Capital goods are produced with production functions involving an input of capital services just as are consumers' goods, and these capital-service inputs are derived from capital goods. It is profitable, in general, to produce capital goods for the investment-goods industries, just as it is profitable to produce capital goods for the consumption-goods industries. In these circumstances, profit expectations, and consequently investment decisions, are geared in part

[1] Harrod, *op. cit.*

[2] Samuelson, " A Synthesis of the Principle of Acceleration and the Multiplier," *op. cit.*, and " Interactions between the Multiplier Analysis and the Principle of Acceleration," *op. cit.*

[3] Hicks, *op. cit.*

[4] Albert Aftalion was apparently the first to make such an application. For more recent applications see R. Frisch, " The Interrelation between Capital Production and Consumer-taking," *Journal of Political Economy*, XXXIX (1931), 646–54, and " Propagation Problems and Impulse Problems in Dynamic Economics," *op. cit.*; Samuelson, " A Synthesis of the Principle of Acceleration and the Multiplier," *op. cit.*, and " Interactions between the Multiplier Analysis and the Principle of Acceleration," *op. cit.*; Alvin H. Hansen, *Fiscal Policy and Business Cycles* (New York: W. W. Norton & Co. Inc., 1941), pp. 261–88; and *Economic Stability in the Post-war World* (Geneva: League of Nations, 1945), pp. 47–52, 143–5.

to the demand for other capital goods.[1] It is strange that this bias relating to the motivation underlying the inducement to invest should have existed even among economists who used the acceleration principle with an over-investment theory of the business cycle.[2] Such a formulation of the demand for capital goods represents an illogical underconsumption bias, even if it is used in a framework where the other properties of the underconsumption theory are not present. Thus, investment should be related to the time-rate of change in output as a whole, rather than consumption alone. The most recent writings concerning the acceleration principle now recognise this earlier deficiency in the theory.[3]

It is possible to relate the two traditional patterns of business-cycle theory, namely, the underconsumption theory and the overinvestment theory, to the theory of acceleration. From a position of depression we may assume a burst of autonomous investment [4] starts a cumulative expansion process via the interaction of the multiplier–accelerator mechanism.[5] The upper turning point is explained on different grounds, depending upon whether the overinvestment theory or the underconsumption theory is involved.

In the underconsumption theory the downturn is caused by a decline in the marginal propensity to consume as the income level rises. Although the time-rate of increase in autonomous investment may remain unchanged for a time, the multiplier effect becomes less and less and likewise the acceleration effect.[6] To be a *true* underconsumption doctrine, the above process must become effective *before* real factor scarcities or monetary scarcities become a significant force in the economic environment.

[1] This, of course, is not to be taken to deny the possibility of indirect repercussions on the capital-goods industries from the consumer-goods industries. It might be remarked in passing that innovations take place in capital-goods industries as well as in consumer-goods industries.

[2] For example, Haberler, *op. cit.*, *passim*.

[3] See, for example, Thomas C. Schelling, "Capital Growth and Equilibrium," *American Economic Review*, XXXVII (1947), 871, note 16; Evsey D. Domar, "Investment, Losses, and Monopolies," *Income, Employment, and Public Policy* (New York: W. W. Norton & Co. Inc., 1948), p. 44, note 16; Hicks, *op. cit.*, p. 38.

[4] Or, more generally, any increase in autonomous expenditures; *e.g.*, an upward shift in the consumption function.

[5] These underconsumption and overinvestment theories have never been explicitly formulated in terms of the multiplier–accelerator mechanism. Samuelson, "A Synthesis of the Principle of Acceleration and the Multiplier," *op. cit.*, "Interactions between the Multiplier Analysis and the Principle of Acceleration," *op. cit.*, has given a mathematical model involving a linear difference equation. However, for our purposes it would be necessary that the model possess a curvilinear consumption function in which the marginal propensity to consume declines with a rising income level. Thus, using the notation introduced on p. 53, note 3, the consumption function must possess the following properties: $0 < C'(X) < 1$, $C''(X) < 0$. Moreover, it would be necessary to have the *numerical values* of the parameters of this consumption function and the acceleration coefficient specified as well as the level of and rate of growth of autonomous investment before we could identify the behaviour characteristics of the system as representing either that of the over-investment theories or the underconsumption theories. Furthermore, the system would have to take on non-linear properties at the critical income levels where real resource scarcities or monetary scarcities were encountered.

[6] The marginal efficiency of induced investment is reduced because of the decreasing time-rate of increase in consumption. The acceleration [illegible]

A question arises as to why the marginal propensity to consume should be assumed to decline as the income level rises in the underconsumption theory. One might logically account for this decline in a number of ways under the circumstances posed by the cyclical short run. In the popular version developed by Harrod [1] it is supposed to be largely a result of the consideration that income distribution changes significantly over the business cycle. Starting from a low degree of resource utilisation, the real-factor-supply functions as well as the loanable-funds-supply function will be perfectly elastic within the relevant range in regard to factor prices and the interest rate, respectively. If the short-run cost functions of individual firms are of the "typical" shape,[2] an increase in aggregate demand will lead to a rise in profit margins, and a change in income distribution in favor of profit-income recipients as against non-profit-income recipients.[3]

Furthermore, Harrod has argued that the degree of monopoly power of the representative firm varies over the cycle.[4] The degree of monopoly power is said to rise in the upswing and to fall in the downswing. Since when the firm is in short-run equilibrium, *i.e.*, maximising short-run profits, the degree of monopoly power is equal to the reciprocal of the price-elasticity of demand,[5] this is another way of saying that the price-elasticity of demand for the product of the representative firm falls in the expansion phase and rises in the contraction phase of the cycle. This is said to be the consequence of the fact that households are less (more) price conscious as the level of their income rises (falls).[6] Thus, there is a shift toward profits in the upswing, and vice versa.

It is usually maintained that the propensity to consume of the typical non-wage-income recipient is less than that of the typical wage-income recipient. Consequently, if there is a continuous shift in marginal income distribution in favor of the former group, the marginal propensity to consume of all income recipients in the community will continuously decline with a rise in aggregate income.[7]

[1] R. F. Harrod, *op. cit.*

[2] *I.e.*, curvilinear due to diminishing returns in the short run.

[3] This statement is strictly valid only if we specify iso-elastic changes in demand.

[4] Cf. R. F. Harrod, "Doctrines of Imperfect Competition," *Quarterly Journal of Economics*, XLVIII (1933–34), 442–70.

[5] Let P = product price, Γ = total cost and R = total revenue. Then $P(X)$ is the demand function, $\Gamma(X)$ is the total cost function and $R = P(X) \cdot X$ is the total revenue function.

$$\mu = \frac{P(X) - \Gamma'(X)}{P(X)} \quad \text{and} \quad \eta = \frac{P(X)}{X' \cdot P'(X)}$$

where μ = the degree of monopoly power and η = the price-elasticity of demand. Since the equilibrium condition is $R'(X) = \Gamma'(X)$ or $P(X) + X \cdot P'(X) = \Gamma'(X)$, then $\mu = -\frac{1}{\eta}$ See A. P. Lerner, "The Concept of Monopoly and the Measurement of Monopoly Power," *Review of Economic Studies*, I (1934), 157–75.

[6] This obviously overlooks repercussions in other directions from the complex nature of market structures. It was for this reason that we rephrased Harrod's proposition in terms of the degree of monopoly power.

[7] The presumption underlying the underconsumption theory is that the shift to profits will not prevent the marginal efficiency of investment from falling.

Turning to the overinvestment doctrine, we find there are two explanations as to why an expansion may be brought to a halt: one relates to real resource scarcities while the other emphasises monetary scarcities. With the real overinvestment theory, the downturn is caused by real-factor scarcities—successive bottlenecks are encountered in various sectors of the economy. These real-factor scarcities not only inhibit induced investment by reducing the acceleration coefficient but may also reduce autonomous investment.[1] Even if autonomous investment and income had a constant time-rate of increase momentarily, induced investment would be less because the acceleration coefficient has been reduced. To have a *true* real overinvestment theory we would have to demonstrate that real factor scarcities become important *before* the marginal propensity to consume declines substantially or monetary scarcities become significant. Of course, the former would not be involved if the consumption function is linear in the relevant income range.

The monetary overinvestment variant of the general overinvestment school explains the downturn by a rise in interest rates stemming from monetary scarcities—banking-system reserves are finite or the monetary authorities are unwilling to allow a cumulative inflation to proceed. A rise in interest rates will not only inhibit induced investment by reducing the acceleration coefficient, just as in the real overinvestment version, but may likewise lead to a reduction in autonomous investment.[2] To have a *true* monetary overinvestment theory it has to be shown that monetary scarcities become significant *before* either real-resource scarcities or a declining marginal propensity to consume become effective.

Although the acceleration coefficient is reduced in both varieties of overinvestment theories, the reason for such reduction is different in the two overinvestment cases in terms of the inducement to invest. In the real overinvestment theory the marginal efficiency of investment function shifts downward [3] because real-factor prices rise relative to product prices while in the monetary overinvestment theory the marginal efficiency of investment function does not shift downward. The circumstance in the latter case which reduces the acceleration coefficient is the rise in interest rates. It should be understood that these remarks are intended to try to show whether a change in the acceleration coefficient is to be interpreted as a change in the marginal efficiency of investment function or a change in interest rates. Obviously, the marginal efficiency of investment function will be changed by any change in the time-rate of change in income as well. Thus, in the underconsumption

[1] Real-factor scarcities or bottlenecks should not be interpreted as absolute scarcities. There may exist some degree of price-elasticity of factor supplies greater than zero, but it is implied that factor prices will rise rapidly and have an unfavorable impact on profit expectations. The marginal efficiency of both autonomous and induced investment is reduced.

[2] As in the case of real-factor scarcities, monetary scarcities do not have to be absolute. In the monetary overinvestment theory the interest rate eventually rises and reduces the time-rate of increase of autonomous investment and also inhibits induced investment by lowering the acceleration coefficient. The marginal efficiency of induced investment is not reduced, however, until the time-rate of increase of income is reduced.

[3] So far as induced investment is concerned. The marginal efficiency of autonomous investment is also reduced.

theory it is the decreasing time-rate of increase in consumption (or perhaps income) which leads to adverse profit expectations and a decline in the inducement to invest.

The Hicksian Framework

The relationship between the modern multiplier-accelerator mechanism and the traditional overinvestment and underconsumption patterns may be further illuminated by a brief examination of the theory of cyclical fluctuations recently proposed by Hicks.[1] He operates with generalised consumption and investment functions involving distributed lags. Consumption is made a weighted sum of previous incomes plus an autonomous element, while induced investment is made a weighted sum of previous income changes. The latter, of course, constitutes a generalised accelerator. All this leads to a basic income equation where current income equals autonomous investment and autonomous consumption plus a weighted sum of previous incomes.

The basic income equation is: [2]

$$(7) \qquad X_t = A_t + \sum_{k=1}^{n} \alpha_k X_{t-k} + \sum_{k=1}^{n-1} \beta_k [X_{t-k} - X_{t-k-1}] + B$$

Hicks, however, points out that most of his conclusions can be derived from a simplified special case. This reduced system he calls the " elementary case " and is formally identical to that previously formulated by Samuelson.[3]

$$(8) \qquad X_t = A_t + \alpha X_{t-1} + \beta(X_{t-1} - X_{t-2})$$

Much of the analysis in his book runs in terms of the latter model rather than in terms of the generalised multiplier-accelerator mechanism.

There is, however, a subtle difference between the model system of Samuelson and the " elementary case " of Hicks. The former postulates the investment function to be

$$(9) \qquad I_t = \theta(C_t - C_{t-1})$$

where C = consumption. Induced investment of a given period is proportional to the change in consumption between the preceding period and the period in question. Now the investment function used by Hicks in his reduced system is

$$(10) \qquad I_t = \beta(X_{t-1} - X_{t-2})$$

[1] Hicks, *op. cit.*

[2] Where X = income, A = autonomous investment, B = autonomous consumption, α_k = the short-run marginal propensity to consume, β_k = the short-run acceleration coefficient, $\sum_{k=1}^{n} \alpha_k$ = the long-run marginal propensity to consume, and $\sum_{k=1}^{n} \beta_k$ = the long-run acceleration coefficient.

Ibid., Mathematical Appendix, Appendix to Chapter V, pp. 182–3.

[3] See Samuelson, " Interactions between the Multiplier Analysis and the Principle of Acceleration," *op. cit.* Samuelson, however, relates induced investment to the change in consumption rather than to the change in income, *i.e.*, $I_t = \theta\ (C_t - C_{t-1})$. Therefore, his acceleration coefficient, θ, is equivalent to β/α. The constant B in equation (7) may be considered to be absorbed in A_t in equation (8).

In this case, induced investment of a given period is proportional to the change in income between the preceding period and the period before that. If the consumption function is $C_t = \alpha X_{t-1}$, its substitution in equation (9) leads to equation (10), providing $\beta = \theta\alpha$. The theoretical difference between structural equations (9) and (10) turns on the *a priori* grounds for considering changes in consumption to induce investment with no lag while in the other formulation changes in income induce investment with a one-period lag. The latter structural relation specifies a different time-response of investment as compared to the former. This is true since the counterpart of Samuelson's investment function, where total income instead of just consumption induces investment, would be of the form

$$I_t = \lambda(X_t - X_{t-1}) \tag{11}$$

Here we have a case in point of the well-known fact that a theory is not completely specified until both the lags in the structural relations and the numerical value of the structural parameters are given. In the present instance, both systems involve the same linear difference equation, but unless $\alpha\theta = \beta$ they might be taken to represent different theories of cyclical fluctuation.

Hicks distinguishes between two types of income behaviour which he believes are most probable. The first is the pure explosive ceiling case, while the second is the explosive oscillatory case. As is well known, the type of income behaviour generated by such a model system is dependent upon the numerical values of the structural parameters, namely, the marginal propensity to consume, on the one hand, and the acceleration coefficient, on the other.[1] Hicks excludes as likely possibilities all combinations of numerical values of these parameters except those which give either pure explosive behaviour or divergent cyclical oscillations as the result of a displacement.[2]

Of the two cases, Hicks places most emphasis on the purely explosive case. This, of course, corresponds to what we have interpreted previously as the real overinvestment theory, although Hicks does not identify it as such. The system is unstable in this case, and once it reaches the full-employment ceiling, real-resource scarcities, particularly labour scarcities, preclude it from further expansion. Technically the system at this point becomes non-linear and the acceleration coefficient is momentarily depressed. This means that induced investment is inhibited and that therefore income will not increase at the previous time-rate. Consequently, induced investment will be further reduced. Furthermore, as mentioned before, the time-rate of increase in autonomous investment may likewise be adversely affected by the real-factor scarcities, and thus slow up the income growth.

Although Hicks emphasises downturns of the real overinvestment variety,

[1] Samuelson, "Interactions between the Multiplier Analysis and the Principle of Acceleration," *op. cit.* See especially the α, β/α map on p. 268. We use β/α here in place of Samuelson's β in order to be consistent with the notation adopted in our discussion. Hicks demonstrates that in general all the conclusions with respect to stability that apply to the stationary model of Samuelson likewise apply in a progressive model. See Hicks, *op. cit.*, Chapters VI and VII.

[2] Hicks, *op. cit.*, pp. 88–95.

he does recognise the possibility that an upper turning may be brought about by monetary scarcities, that is, that the conditions envisaged by the monetary overinvestment theory may prevail.[1] Monetary scarcities depress the acceleration coefficient and eventually a downturn results. Hicks, however, feels that monetary forces are apt to reinforce a downswing after it has begun as a result of other causes rather than be the primary cause of an upper turning-point. Nevertheless, it is clear that his framework is broad enough to take account of the possibility that the monetary situation might dominate the upper turning point.

The divergent oscillatory case makes possible an explanation of why downturns may take place before real-factor scarcities or monetary scarcities are encountered. If the initial displacement is slight and the acceleration coefficient is of just sufficient magnitude to give divergent oscillations, the first one or two cycles may not be of sufficient amplitude to hit the full-employment ceiling. And if one of these cycles should lead to a sufficient fall in income, the accelerator would become inoperative on the downswing. The economy would move directly to depression without reaching full employment.[2]

A question arises as to whether it is possible to consider this second case—the situation where the expansion peters out of its own accord—as representative of the underconsumptionist point of view of cyclical downturns. The writer feels that it should not be so considered. It seems more likely, as has been pointed out previously, that the true underconsumption theory of business cycles requires a non-linear consumption function *if* it is to be cast in terms of the multiplier-accelerator mechanism. With a declining marginal propensity to consume as the income level rises, the absolute time-rate of increase in consumption will be declining in the expansion phase, even if the absolute time-rate of increase in income remained unchanged. And, of course, all induced investment is assumed to be geared to the time-rate of increase in consumption.

On the other hand, one might consider a downturn to fit the underconsumption conception merely if it could not be made to fit under one or the other of the overinvestment conceptions.[3] A survey of cyclical downturns of the past might be made with regard to the conditions of the labour markets and the monetary situation immediately preceding such downturns.

[1] Hicks, *op. cit.*, pp. 125, 159.

[2] Gene H. Fisher, "A Simple Econometric Model for the United States, 1947–1950," *Review of Economics and Statistics*, XXXIV (1952), 46–8, and "Comments on Stochastic Macro-economic Models," *American Economic Review*, XLII (1952), 528–39, has attempted to fit the Samuelson (Hicks) income model to national-income data by the method of least squares. His statistical estimates of the α and β structural parameters are 0·61 and 0·48 respectively, on the basis of annual data for the period 1929–41 and 0·7 and 0·71, respectively, on the basis of quarterly data for the period 1947–50. Unfortunately, the empirical findings of such econometric studies cannot be the basis for rejecting a combination of α and β which would give an explosive system of the Hicksian variety. This is so since one fits a free linear system to the statistical data which may have been generated by an explosive linear system subject to constraints. For the range of variation of the variables for which the constraints apply, the original linear system is superseded by other systems.

[3] Because all empirical consumption functions derived from economic time series data persist in being linear!

The difficulties of empirical verification of particular cyclical patterns are attested to by the downturn of 1937 in the United States. This turning point might be considered on first thought to qualify very easily as an excellent candidate for underconsumptionist honours. But even a superficial examination of the case points to a number of circumstances which make the overinvestment position appear plausible even here. The rapid and extensive union organisation tended to tighten a number of critical labour markets, and the monetary authorities raised reserve requirements several times in rapid succession.[1] Although some economists would maintain that these phenomena should not be interpreted as being synonymous with labour scarcities and monetary scarcities, respectively, as conceived in the traditional overinvestment theories, a less rigid view would not preclude such an interpretation.

The interpretation of the overinvestment and underconsumption models within the multiplier-accelerator framework does substantial violence to these theories. Such an approach is not very significant from the standpoint of bringing out what most underconsumptionists meant to say. Actually, the underconsumption theory *à la* Hobson is not concerned with the cyclical short run but is a type of secular theory. It is also true that the use of the acceleration principle in a simplified macro-economic model tends to omit probably the most significant aspects of the overinvestment theories. These theories deal with structural maladjustments [2] as do all non-underconsumption theories. The cause of the downturn can run from specific maladjustments to aggregate demand rather than from aggregate demand directly. Such explanations of cyclical behaviour are to a large extent concerned with micro-economic phenomena—specific bottlenecks and resource immobilities, and perhaps we should add subtle forms of particular qualitative restrictions on monetary expansion. However, it is probably not too inadequate if we cast the overinvestment theory in terms of a macrodynamic system, provided we keep in mind the structural aspects. The accelerator can be of use in this sense, especially if we relate induced investment to the time-rate of change in income rather than to just consumption alone.

Conclusions

It is clear that the explanation of the turning points, particularly the downturn, remains a key problem in business-cycle theory. Pre-Keynesian business-cycle theory had reached substantial agreement on the expansion and contraction process, although the multiplier-accelerator mechanism tended to clarify these earlier notions. But the problem of whether cyclical behaviour should be interpreted as the result of an economic structure generating a "free cycle" or a "constrained cycle" remained unanswered as it does today. As a result of the building blocks provided by Harrod, a more articulate formulation of the overinvestment and underconsumption patterns has been made possible. Hicks has refined the analysis, but his primary explanation of the upper turning point can be interpreted as that of the real overinvestment theorists. The fundamental ideas underlying his work are not new. They are still pre-Keynesian in substance. This, however, has not always been recognised because of the new form they have taken.

The determinants of the inducement to invest are very imperfectly understood. Although we know fairly well what economic variables are apt to be of potential significance with respect to the investment decisions of an individual firm, we are unable to evaluate their relative influence. Moreover, the general equilibrium implications for investment remain extremely controversial. In view of this state of affairs, it is easy to be overcritical of the acceleration principle as a theory of induced investment. It is necessary to have a "flexible accelerator" which changes through the various phases of cyclical development if it is to be at all meaningful in business-cycle analysis. As a minimum, an allowance must be made for the inhibiting effects of unplanned excess plant capacity and real and monetary resource scarcities on the inducement to invest.

The accelerator easily lends itself to business-cycle model building. In particular, the multiplier-accelerator mechanism attempts to focus attention on certain aspects of the economic process thought to be strategic with respect to cyclical fluctuations. This framework is consistent with either the overinvestment or the underconsumption theories, providing the "other economic variables" pertinent to these theories are allowed for in connection with the acceleration hypothesis. The most recent contributions to business-cycle theory tend to do just this. However, it is not likely that our understanding of the investment process will be greatly strengthened by any strictly macro-economic approach. Fortunately, the received body of business-cycle analysis is not so limited.

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[1] Moreover, labour immobilities become strategic considerations as full employment is approached. Starting from a low level of employment, the labour-supply function facing individual industries and sectors of the economy is close to being perfectly elastic, and this high elasticity is not dependent on labour mobility. However, near full employment the degree of labour mobility is an important determinant of the elasticity of the labour supply to individual industries. Geographic and occupational immobilities tend to make the labour-supply function less elastic, and may lead to a downturn before full employment is reached. Thus, the correct interpretation of the ceiling is a range.

[2] Cf. Haberler, *op. cit.*, pp. 29–105, 345–405; William Fellner, "Employment Theory and Business Cycles," *A Survey of Contemporary Economics*, ed. by Howard S. Ellis (Philadelphia and Toronto: The Blakiston Company, 1948), pp. 49–98.

AN APPROXIMATION TO THE AGGREGATE SAVING FUNCTION[1]

1.1. THE extensive literature on the theory of the determinants of personal saving contains one thread of thought that has become increasingly explicit in recent years: the arguments of Ramsey, Harrod, Graaff, Tobin, Hamburger and Friedman[2] all point to the connections between an individual's rate of saving at a moment in time and the total resources that he expects to command during his life. Recently, Modigliani and the present writer have joined the fray with a hypothesis relating individual saving to the income, assets, expectations and age of the consumer. This hypothesis is based upon the traditional utility-maximising approach to individual consumer behaviour. It is supported by evidence from both cross-section and time-series studies that have been published by others.[3] The true test of any scientific hypothesis, however, is prediction; and it is the purpose of this paper to present an empirical approximation to the aggregate saving function that arose from our hypothesis and to demonstrate the approximation's successes at conditional forecasting.[4]

2.1. The present value of an individual's total expected resources is the sum of the present values of his marketable assets, his current and expected future return from his own labour, neglecting bequests.[5] We shall consider these resources as a budget restraint on the individual's current and planned future consumption. Given the individual's utility function relating his utility to current and prospective levels of consumption during the different periods covering his expected life, the maximisation of the function subject to the budget restraint may be supposed to lead to unique values of consumption in each future year. In particular, it is shown in the two papers by Modigliani and this writer that if the individual utility function is homogeneous of first degree in levels of consumption at different ages, the relationship between consumption at a particular age and total lifetime resources is simply one of proportionality. Then for a consumer of age t having a given earning pattern and life expectancy, the current individual consumption c_t, will depend on his current non-property income, y_t; on his average expected future non-property income, y_t^e; and on the present value of his assets, a_t. Property income of course affects consumption, but does not need separate mention, because its capitalised value is included in the present value of assets, a_t, and its effect is carried by assets. The individual consumption of a person at age t is thus

$$c_t = \beta_{1t} y_t + \beta_{2t} y_t^e + \beta_{3t} a_t \quad . \quad . \quad . \quad . \quad . \quad (1)$$

where the variables are all measured in constant purchasing power and the parameters β_{1t}, β_{2t} and β_{3t} depend on the consumer's age, t, and on his life expectancy and his earning pattern.[1]

2.2. The aggregate consumption function may be derived from the individual function by the straightforward summation of the equations (1) over all age groups, provided that every age group has the same average income pattern and life and earning expectations. At any time therefore,

$$C = \beta_1' Y + \beta_2' Y^e + \beta_3' A \quad . \quad . \quad . \quad . \quad . \quad (2)$$

where C, Y, Y^e and A denote respectively aggregate consumption, current non-property income, expected non-property income and assets, and β_1', β_2' and β_3' are primarily functions of the age distribution, life expectancies and earning patterns of the population.[2]

By definition, aggregate saving, S, is the difference between total income and current consumption. Total income is the sum of non-property income, Y, plus property income, denoted by R, excluding capital gains or losses. Hence, from (2) we have

$$S = (1 - \beta_1')Y + R - \beta_2' Y^e - \beta_3' A \quad . \quad . \quad . \quad (3)$$

Note that property income R appears explicitly here, but also implicitly[3] in the term $\beta_3' A$.

3.1. Although all the variables in equation (3) are conceptually measurable, it will help if we can consider two of them implicitly rather than

[1] This paper was left in draft form as a result of Richard Brumberg's untimely death in August 1954, at the threshold of what promised to be a distinguished career in economics. It is his last study, to which we have made only minor editorial changes, and we offer it for publication as the first investigation of the consumption function known to us which provides anything like a reasonable approximation to consumption levels during the war years. (J. R. N. Stone and Carl F. Christ

[2] References to the work of these authors and others mentioned below are given in a list at the end of the article.

[3] See the two papers by Modigliani and Brumberg in these connections.

[4] For an additional confirmation of the hypothesis—the fulfilment of *a priori* numerical restrictions on the coefficients by the empirical function, see the present writer's earlier study.

[5] Concerning aggregate consumption, some implications of a utility function wherein bequests enter non-homogeneously are developed in "Utility Analysis and the Consumption Function," by Modigliani and Brumberg.

[1] For a more detailed discussion of the *a priori* values of these parameters, see "Utility Analysis and Aggregate Consumption Functions," by Modigliani and Brumberg.

[2] β_3' actually contains the ratio of the age-weighted sum of assets obtained in the aggregation process to the simple sum of assets. In *ibid.* this ratio is found to be quite stable under reasonable assumptions; it appears *a priori* that it should lie between $-0{\cdot}07$ and $-0{\cdot}13$.

[3] This treatment of property income is discussed explicitly in *ibid.*, Section III.2.A. To make it clear, let us reconcile it with the more usual method of treating the dependence of consumption on assets (see, for example, equation (1.20) in Ferber's study, p. 9). In either method consumption may be regarded as a function of non-property income y, property income r and assets a (*apart* from the property income they yield). Then

$$c = \alpha_1 y + \alpha_2 r + \alpha_3 a$$

The usual approach is to assume that both kinds of income have the same effect, *i.e.*, to set $\alpha_1 = \alpha_2$ so that

$$c = \alpha_1(y + r) + \alpha_3 a$$

The approach used in this paper is to express property income in terms of assets via the rate of return i, thus:

$$c = \alpha_1 y + (\alpha_2 i + \alpha_3)a \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2')$$

Then saving is $y + r - c$, thus

$$s = (1 - \alpha_1)y + r + (\alpha_2 i + \alpha_3)a \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3')$$

If $r = ia$ as assumed, there is an unsolved identification problem involving the coefficients of r and a in equation (3'); and if $r \neq ia$, then it is illegitimate to regard $\alpha_2 i + \alpha_3$ as a constant coefficient as in (2'). This point apparently escaped Brumberg, and also Christ, who advised him on his Ph.D. thesis on this subject. (J.R.N.S. and C.F.C.)

explicitly: Y^e because there are no estimates at all available, and A because the estimates that do exist are not very satisfactory. Hamburger, Goldsmith and Melville have all expressed doubts about the accuracy of time-series estimates of wealth. In this paper we shall avoid incorporating such estimates in our analysis by the following device. Consider the first difference of (3),

$$\Delta S = (1 - \beta_1')\Delta Y + \Delta R - \beta_2'\Delta Y^e - \beta_3'\Delta A \quad . \quad . \quad (4)$$

The difference between the assets held at the beginning of this year and those held at the beginning of last year, ΔA, is identically the sum of last year's saving, S_{-1}, plus the capital gains or losses on those savings and the initial assets that have accrued between the beginning of last year and this year, G. Therefore, (4) may be rewritten as

$$\Delta S = (1 - \beta_1')\Delta Y + \Delta R - \beta_2'\Delta Y^e - \beta_3'(S_{-1} + G) \quad . \quad (5)$$

3.2. For the variable ΔY^e there are no data whatsoever; the measurement of changes in expectations has not yet been achieved. It has been argued,[1] however, that the change in aggregate average expected income of all age groups, ΔY^e, is likely to be either: (i) constant as a result of inflexible income expectations combined with a growing population, or (ii) proportional to ΔY, say $K\Delta Y$, or (iii) some combination of the two. The more general possibility (iii) asserts that $\Delta Y^e = \beta_0' + K\Delta Y$; and by placing this expression in equation (5) we are able to derive an approximation to the aggregate saving function that can readily be subjected to an empirical test.

4.1. The function to be tested, when the above substitution is made and when the coefficients are renamed, reads

$$\Delta S = b_0 + b_1\Delta Y + b_2\Delta R + b_3 S_{-1} + b_4 G \quad . \quad . \quad . \quad (6)$$

Annual estimates for all of the variables are currently available for the United States over the period 1929–49. Because the concept of saving is that of changes in personal net worth, excluding capital gains, the author has felt it advisable to make several adjustments in the series published by the United States Department of Commerce. By making use of figures compiled by Dr. Raymond Goldsmith,[2] saving has been altered by the inclusion of the net additions to the stock of consumers' durable goods and saving and property income have been revised by the substitution of depreciation of assets at replacement cost for depreciation at original cost. Furthermore, saving and non-property income have been increased by the contributions less benefits to social-insurance funds, and saving and property income have been increased by the earnings on these funds. The two income shares have been obtained first by taking the three-share breakdown suggested by Franc and Klein and then by arbitrarily imputing wages to farmers and other unincorporated entrepreneurs. Changes in an index of share prices have been used to approximate capital gains and losses. (Unfortunately, the use of this index precludes the comparison of the coefficients b_3 and b_4 to see if they are equal, as implied by equation (5).) The space-consuming derivation of the various series is to be found elsewhere[1]; the figures themselves are shown in the Appendix, columns 1 to 5.[2]

[1] See the earlier study by this writer.

[2] Dr. Goldsmith generously provided these figures in advance of the publication of his *A Study of Saving in the U.S.*

4.2. A regression of saving on the variables of equation (6) for the entire period of observation, 1929–49 (including the war years), yields

$$\Delta S = \underset{(380)}{-610} + \underset{(0{\cdot}08)}{0{\cdot}89}\Delta Y + \underset{(0{\cdot}18)}{0{\cdot}38}\Delta R - \underset{(0{\cdot}03)}{0{\cdot}14}S_{-1} - \underset{(14)}{27}G \quad . \quad (7)$$

where the figures in parentheses are the standard errors of the estimated coefficients.[3] With the exception of the constant term, which may be interpreted as displaying some inflexibility of income expectations, these standard errors reveal that all of the coefficients are significantly different from zero at the 90% level. The coefficients of ΔR and G are not significantly different from zero at the 95% level. The coefficient of multiple correlation is, as in most saving functions, high; in this instance it is 0·97. For all of the coefficients, the signs are as they should be according to equation (5). On the basis of these various considerations, it may be concluded that from a statistical point of view the coefficients derived for the function when it is fitted for the entire period do not lead to its rejection. Let us now turn to the more critical test of the function as a device for conditional forecasting.

4.3. Because the model of saving behaviour is not a part of a closed system, its predictive abilities can be tried only by assuming perfect knowledge of all variables in the equation other than saving and then comparing the levels of saving forecast, subject to this condition, with the observed levels. In this particular case we shall assume that in 1941 we knew exactly what ΔY, ΔR and S_{-1} were going to be for the next eight years. Moreover, we shall also suppose that the present theory and data for the preceding thirteen years, 1929–41, were available then and that we had fitted equation (6) for those years. We should have observed that the equation fits the period of observation very well, but that the coefficient of capital gains was hardly significant. In order to gain a degree of freedom, we might well have dropped the capital-gains variable. The estimated equation would have been:

$$\Delta S = \underset{(330)}{104} + \underset{(0{\cdot}14)}{0{\cdot}53}\Delta Y + \underset{(0{\cdot}28)}{0{\cdot}69}\Delta R - \underset{(0{\cdot}08)}{0{\cdot}14}S_{-1}$$

or

$$S = 104 + 0{\cdot}53\Delta Y + 0{\cdot}69\Delta R + 0{\cdot}86S_{-1} \quad . \quad . \quad . \quad (8)$$

From our knowledge of the 1942 values of the variables on the right side, we could then have forecast the level of saving in 1942, and the same for 1943 and succeeding years. The errors of such forecasts, *i.e.*, the observed levels of saving minus the forecasts, are shown in the Appendix, column 6.

[1] See the earlier study by this writer.

[2] The slight differences in observed values given in this paper as compared with *ibid.* are due to computing errors in the original work.

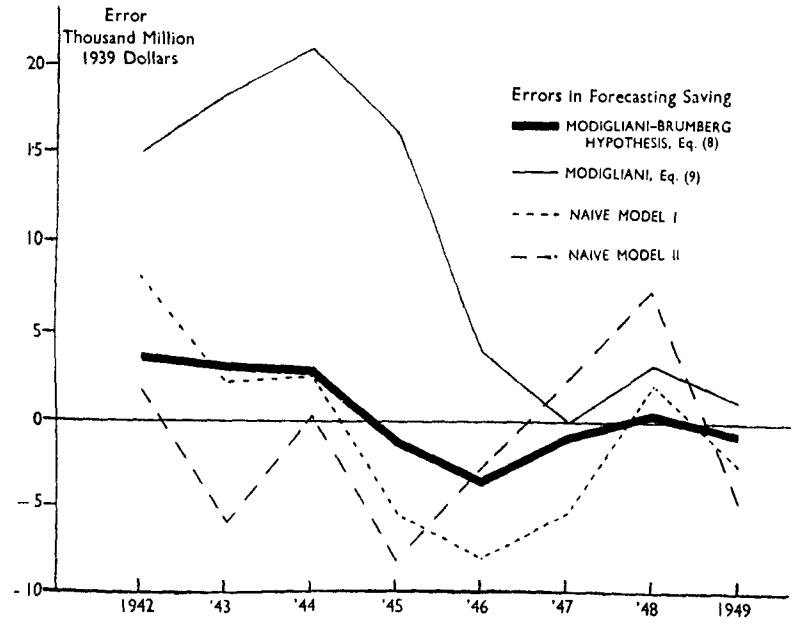
[3] The only two independent variables that show a noticeable correlation (with a value of 0·51) are ΔY and ΔR. A joint confidence region has been computed for the coefficients of these two variables and the ellipse for the 95% region is given by

$$0{\cdot}0096 \geq 0{\cdot}030(0{\cdot}89 - b_1)^2 + 2(0{\cdot}0067)(0{\cdot}89 - b_1)(0{\cdot}38 - b_2) + 0{\cdot}0057(0{\cdot}38 - b_2)^2$$

Solutions of this quadratic indicate that b_2 is not statistically significant, but also, that it may have a value of unity as implied by equation (4). See *ibid.*

Their absolute values are illustrated in the graph. It is seen that the error is never greater than 3·7 thousand million dollars (1942) and that the predictions do not appear to worsen over time.

4.4. But are these predictions good or poor ones? Merely to know the size of the errors of prediction from a conditional forecast is uninteresting; what are desired are standards for comparison. The other three lines in the figure offer such standards.



The first comparisons to be made are with what Milton Friedman calls " naïve models." These hypotheses assert that: (i) next year's saving will be the same as this year's, or (ii) the difference between next year's saving and the current year's will be the same as between this year's saving and last year's. Such simple forecasts provide what might be considered as the least rigorous kind of standard to be met by any quantitative economic forecast. The ability of the function to pass this trial is illustrated by the smaller absolute values of the forecast errors reached by (8) than by the naïve models, as shown by the Appendix, columns 7 and 8, and by the graph. The function gives better predictions than the first naïve model in six out of the eight observations and better than the second in five out of the eight observations.

It now remains for us to compare the conditional forecasts of equation (8) with those derived by a saving function that was produced by different theoretical considerations but which has been accepted by Davis and Ferber as one of the best functions tested to date. This function, due to Modigliani and independently to Duesenberry, maintains that current *per capita* real saving depends upon current *per capita* real income and the highest level of income reached in earlier years. In the Modigliani version it is written

$$\frac{S}{N} = a_1 \frac{Y+R}{N} + a_2\left[\left(\frac{Y+R}{N}\right)_0 - \frac{Y+R}{N}\right]$$

where N denotes the population; the term marked by subscript 0 contains the peak previous value of *per capita* real income, $\frac{Y+R}{N}$, and all the other variables have the same meaning as before.

Because its originators and the other workers who have tested it apparently have had no misgivings about using the definitions of saving and income adopted in most social accounts, this equation has been estimated and the errors of forecasted saving have been computed for this paper from data based on those definitions. The estimated regression for 1923–41 is [1]

$$\frac{S}{Y+R} = \underset{(0\cdot004)}{0\cdot048} + \underset{(0\cdot024)}{0\cdot176}\left[\frac{Y+R}{N} - \left(\frac{Y+R}{N}\right)_0\right] \Big/ \frac{Y+R}{N} \quad . \quad (9)$$

The errors of conditional forecasts of saving made by this function are shown in the Appendix, column 9.

It should be mentioned that, during the forecast period, the average change in the level of saving from one year to the next is larger under the customary definition than under the one suggested here, but that the average level of saving is smaller under the customary definition.

When the absolute values of this function's errors of forecast are plotted on the graph, it is seen that it gives forecasts inferior to our equation (8) for all years except 1947. In that year the difference is slight. During the war years, equation (9) is quite hopeless while our equation (8) does tolerably well.

5.1. *Summary.* A testable approximation has been developed for the aggregate saving function derived from the savings functions of similar hypothetical individuals who maximise utility by spreading their resources over their lifetimes. A test has been performed by forecasting saving in the United States for the war and post-war periods: first the approximation was fitted to pre-war data, yielding equation (8), and then perfect knowledge of the " independent " variables during the test period was assumed. The errors of the conditional forecasts derived by this means have been compared with errors produced by other forecasting devices, and the function has been found to meet this test satisfactorily.

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[1] The population data are from the United States Census' *Current Population Reports, Series P.25*, No. 71; saving and income data are from the United States Commerce Department's *National Income* (supplement to the *Survey of Current Business, 1951*); and price data are from *Statistical Abstract of the United States, 1952*, p. 278.

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Appendix

Data and Errors of Alternative Forecasts

(All figures in thousand million 1939 dollars, except the index G)

	(1) S (saving).	(2) ΔS (change in saving).	(3) ΔY (change in non-property income).	(4) ΔR (change in property income).	(5) G (capital gains index).	(6) $S - S_8$ (error of forecast of eqn. (8)).	(7) $S - S_I$ (error of forecast of naïve model I).	(8) $S - S_{II}$ (error of forecast of naïve model II).	(9) $S - S_9$ (error of forecast of eqn. (9)).
1929	4·0	—	—	—	—	—	—	—	—
1930	1·9	−2·0	−1·5	−2·6	−28	—	—	—	—
1931	0·5	−1·5	−1·0	−1·5	−39	—	—	—	—
1932	−3·5	−4·0	−4·9	−2·6	−38	—	—	—	—
1933	−2·8	0·6	−0·4	−0·2	20	—	—	—	—
1934	−1·1	1·8	3·3	0·4	6	—	—	—	—
1935	2·3	3·4	2·8	2·5	4	—	—	—	—
1936	5·5	3·2	6·7	1·0	34	—	—	—	—
1937	6·9	1·4	2·4	1·1	− 4	—	—	—	—
1938	2·0	−5·0	−2·0	−2·3	27	—	—	—	—
1939	5·1	3·1	3·7	1·7	8	—	—	—	—
1940	6·8	1·8	3·5	1·2	− 8	—	—	—	—
1941	13·2	6·4	9·0	2·0	−13	—	—	—	—
1942	21·4	8·2	10·1	1·3	−16	3·7	8·1	1·8	15·0
1943	23·7	2·3	6·9	−2·4	12	3·2	2·3	−5·9	18·3
1944	26·4	2·7	5·8	0·1	13	2·8	2·7	0·4	21·0
1945	21·0	−5·4	0·3	−1·1	12	−1·1	−5·4	−8·1	16·2
1946	13·1	−7·9	−4·3	1·1	6	−3·5	−7·9	−2·6	4·1
1947	7·7	−5·3	−0·8	−3·2	−18	−1·0	−5·3	2·6	0·0
1948	9·9	2·1	2·9	1·7	− 3	0·4	2·1	7·5	3·3
1949	7·4	−2·5	1·9	−2·0	− 1	−0·8	−2·5	−4·6	1·2

EXPORT DUTIES AND THE NATIONAL INCOME ACCOUNTS

I

Export duties have been known for a very long time. Since the Korean war boom of 1951, however, they have become much more significant than used to be the case. During this boom, the very high level of the world prices of certain primary commodities led to the imposition or increase of export duties in quite a number of primary producing countries. This was done partly because export duties formed a very useful source of revenue for the Governments of these under-developed countries and partly because they usually constituted the best anti-inflationary weapon available. In some cases the revenue obtained from such duties amounted to almost half the total revenue obtained by the Central Governments, or more than 10% of the national income of such countries. Since then, the world prices of these primary products have declined considerably, and the yield from export duties, which are usually on a sliding scale, has fallen even more steeply. In view of the fact that in such countries export duties constitute one of the most important forms of Government revenue and that their yield is liable to fluctuate very considerably, their treatment in the national-income accounts of such countries has become a matter of some importance.

The purpose of this article is to show why there is a need for some changes to be made in the present social accounting approach to export duties if their economic effects are to be more satisfactorily represented, and to suggest a suitable alternative approach. As the problem concerns primary producing countries with relatively under-developed economies, it has received comparatively little attention so far. It raises quite a number of analytical points, however, which should prove of interest to economists in under-developed and more advanced countries alike.

At present, calculations of national income in these under-developed countries are usually in the form of tables of national product, income and expenditure rather than in the form of double-entry systems of social accounts, because the information available is insufficient to calculate reasonably reliable figures for the various flows within the economy. If there were social accounts of the double-entry type in such countries, the relative importance of export duties could be more readily ascertained from them and the problem discussed in this article would become somewhat less important. Even then, however, interesting analytical questions regarding the approach to export duties would still remain.

Social accounting techniques were originally developed in the more advanced countries, where, generally speaking, there were no taxes on exports. It was convenient, though not in all respects very satisfactory, to apply the traditional division of taxation into direct and indirect taxes from

the field of public finance to that of social accounting. Where all indirect taxes consisted of taxes on some form of domestic expenditure, be it on home-produced or on imported commodities, this method was reasonable. It is not reasonable, however, when the same approach is applied to export duties, merely because they are also indirect taxes. Apart from a few minor exceptional cases, their incidence and their general economic effects are of quite a different nature.

Other indirect taxes are taxes on domestic expenditure. When such expenditure taxes are imposed, it is usually both the intention and the actual result of such a fiscal policy that they should be paid by consumers rather than by producers or importers.[1] Although this is by no means always the case, they do normally result mostly in an increase of market prices and to a much lesser extent, if at all, in a reduction of the prices net of tax which are received by the producers or importers.

Export duties, however, are taxes on commodities which do not enter into domestic consumption, and thus do not increase domestic expenditure. Their effect may be to raise the world price of the taxed exports, in which case they constitute additional receipts from abroad for the country's exports, over and above their factor cost. They should then be viewed as additional income from abroad, not as internal transfers like domestic outlay taxes. Alternatively, their effect may be not to raise the world price of the taxed commodities, but to lower the incomes of their producers, distributors and exporters. In that case they should be treated as taxes on income, certainly not as taxes on expenditure. Or, of course, their effect may be a combination of higher world prices and lower producers' incomes, so that some intermediate treatment would appear to be called for. In all these cases it is correct to say that, though they are admittedly not part of factor incomes, they are nevertheless a very real part of the national income of a country.

In practice, the type of export duties mentioned in the first paragraph, namely those imposed at times of exceptionally high world prices, will normally come into the category of taxes on income rather than the category of transfers from abroad. Since they are imposed when abnormally high profits are being made by producers, they are unlikely to reduce the relatively inelastic supply of such primary commodities. So long as they do not reduce expected profits below the profits which could be made if production were changed to alternative products, they will at the most hinder an expansion which might otherwise have taken place, but which in any case would have been a difficult and lengthy process to carry out. Furthermore, one particular country's exports of primary products will normally have to compete with similar products from other countries in the world market, a market which in many such cases comes fairly close to the theoretical concept of perfect competition. Any attempt by the exporters of one individual

[1] Professor Hicks, for instance, in the system of social accounts proposed in his *The Social Framework* (Second edition, Oxford University Press, 1952) shows indirect taxes on domestic expenditure as transfers to the public authorities from consumers and not from producers, so as to stress the fact that they are normally paid, and intended to be paid, by consumers as a result of higher market prices.

country to pass on an export duty to importers by raising their prices would most likely be defeated at once by the competition of other countries. It can be safely concluded that the imposition of such export duties is unlikely to reduce world supplies significantly, so that the world price will be left virtually unchanged and the tax will fall on producers' incomes rather than on importers' expenditure. Such export duties are, therefore, indirect taxes on income and not on expenditure, and a social accounting approach which treats them in the same way as taxes on expenditure is wrong.

Before alternative approaches to this problem are suggested, let us study our concepts of national income, national product and national expenditure at factor cost more fully and let us see exactly why the present treatment of export duties, which excludes them from these estimates at factor cost, does not give us a satisfactory picture of the national economy. This can perhaps be seen most clearly in the case of estimates of national income at factor cost. The income to a country from a taxed export industry's output is equal to the value of its output not at factor cost but at the price obtained from foreign buyers. The revenue from export duties is part of the country's export earnings, and it would be available for factor distribution were it not for the existence of these duties. Therefore it is economically more enlightening if such revenue is viewed as a part of factor incomes which has, however, been taxed away by the Government than if it is excluded altogether as at present. After all, this is not very different from the present accounting approach to P.A.Y.E. or to the deduction of income tax from dividends at source. Such income-tax payments are included in national income at factor cost, despite the fact that they have been deducted at source and have never actually become the income of the workers or shareholders concerned. They are, so to speak, available for factor distribution, but are in practice taken over by the Government before they have been distributed. The fact that such income taxes are assessed on net incomes whilst export duties are assessed on gross earnings from exports makes a difference in a number of respects, but it does not alter fundamentally the economic significance of both taxes as taxes on income.[1] A different accounting approach must therefore be found which will permit the inclusion of export taxes in estimates of national income, because although they are not part of factor incomes, they are part of the national income. Merely using national income estimates at market prices instead of at factor cost does not satisfactorily solve this problem, as will be shown below.

The need for this becomes even clearer if we consider not a stable situation but one where a substantial rise in the world prices of certain primary commodities has taken place and where export duties have been imposed in order to counteract the inflationary pressure which has been generated. With the existing approach, the resultant increase in national income is under-estimated because that part of the export receipts which goes to the Government in the form of export duties is excluded from this total.

[1] In some countries, *e.g.*, in Ceylon, export duties have been explicitly recognised as taxes on income to the extent of being deductable from income tax liability.

Although such a country is obviously better off when the prices it receives for its major exports have risen substantially, even though much of this increase has been taxed away by the Government and reserved for future needs, the national-income estimate does not reflect fully the improvement which has taken place. The more effective the Government's anti-inflationary policy is, the less will be the increase in export earnings which is shown in such an estimate. Similarly, when there is a subsequent decline in the world prices of such commodities, the reduction of the rates of export duties will diminish the impact of the lower export prices on factor incomes whilst not diminishing their impact on the national economy as a whole. A severe fall in export earnings will thus once again not be adequately reflected in the national-income total. We must conclude therefore that the exclusion of the revenue from export duties results not only in an under-estimation of national income as such, but also in an under-estimation of the fluctuations in national income which are taking place. We need a different treatment by means of which it can be shown that the national income has increased when receipts from export duties have risen, even though the income distributed to factors of production may have remained relatively stable as a result of the Government's anti-inflationary policy. Inherent instability and the effects of Government policy to counteract it will then be much more clearly depicted than they are at present.

This would have the further advantage of making international comparisons between different countries more meaningful than they are at present, particularly with regard to relatively similar economies producing as their chief export the same primary commodity. For instance, one such country may counteract inflationary pressure from unduly high export prices by means of the institution of a marketing board, similar perhaps to the West African Cocoa Marketing Boards, which at such times would pay much lower prices to domestic producers than it receives from foreign importers. The profits from the board's operations would be included in national income at factor cost in the form of profits from Government trading or as profits of public corporations. It may be held that, strictly speaking, any profits significantly above normal should be treated as Government monopoly profits and therefore as indirect taxes. But this is not being done at present, and rightly so because such profits are more similar to taxes on income than to taxes on expenditure, where such treatment might be justified. Another country may be using multiple exchange rates by means of which domestic producers could be paid less than is received from abroad, and again this gain would normally be included in national income at factor cost. It is surely undesirable that a third country's national-income estimate, merely because its stabilisation policy takes the form of an imposition or increase of export duties, should exclude this extra income which has been earned by the taxed export industry. It is this sort of divergence which makes international comparisons so difficult and unreliable. If the revenue from export duties were relatively small, such differences in accounting practices would perhaps not matter quite so much. But when it is remembered that at

times this revenue may exceed 10% of the national income of such countries, a more suitable treatment becomes obviously desirable.

With regard to the concept of national product, it may be thought that here, surely, the existing approach cannot be altered because national product at factor cost must exclude from the value of output all indirect taxes, whether on domestic consumption or on exports. However, here too, the inclusion of export duties in some form will considerably improve the picture. When it is borne in mind that in under-developed countries it is the estimate of national product at factor cost which is the most reliable (or should one say the least unreliable!) and that it is this estimate and not national income or expenditure which is mostly used for international comparisons or comparisons over time, it will be realised that it is essential to include export duties in it if under-estimation is to be averted. If one accepts the earlier argument that export duties are taxes on income, it follows that they must be included in some way in the national product total. One method by which this could be done would be to calculate national product at factor cost in the usual way and then to show export duties as additional but separate items at the bottom of the national product table, so that they can be added to obtain the final total.

This would also be a great improvement for purposes of inter-industry comparisons, as export duties could now be readily added to the value of the taxed export industries' output. At present, with export duties deducted from the value of export industries' output, such comparisons are misleading. They entail comparing industries in which incomes were considerably reduced by means of export duties, and whose real contribution to the national economy in the form of export earnings is thus seriously underestimated, with other industries in which incomes were not so reduced by any Government fiscal policy. It is true, of course, that some under-estimation in this sense will also occur when an indirect tax on domestic expenditure falls to some extent on producers' incomes. But if it is agreed that generally speaking most indirect outlay taxes fall chiefly on consumers whilst most taxes on exports fall chiefly on producers, and that this difference is sufficiently marked to necessitate a different approach to the two types of taxes, it follows that the inclusion of export duties in the national product total would be no less desirable for purposes of inter-industry comparisons than it is for comparisons over time or between countries.

Regarding the estimate of national expenditure, the present situation is also very unsatisfactory. If this estimate is to be at factor cost, indirect taxes net of subsidies have to be deducted. This ensures that national expenditure will be equal to national income or product at factor cost. But the difficulty arises here that, whereas taxes on expenditure tend to raise domestic expenditure at market prices and therefore have to be deducted for the purpose of factor cost estimates, export duties of the type discussed here do not raise domestic expenditure, nor foreign investment either. On the contrary, since they tend to reduce factor incomes, they bring about a lower domestic expenditure than would otherwise have been

the case, unless the revenue from export duties gives rise to such additional Government expenditure that it offsets this reduction. Therefore, deduction of export duties from the national expenditure estimate leads in a sense to double-deduction; explicitly because of their deduction from the market-price estimates, and implicitly because, as a result of their income-reducing effects, these duties have already reduced the figures for domestic expenditure below what they would otherwise have been. This latter reduction should, of course, be reflected in the national-expenditure estimate, unless offset by increased Government expenditure; but to deduct export duties on top of that cannot be justified analytically. Thus we are faced with the difficulty that with the present approach export duties must be deducted from national expenditure at market prices in the same way as indirect outlay taxes if we want to achieve equality between national income, product and expenditure at factor cost, whilst analytically such a procedure is objectionable.

The kind of difficulty this is liable to create can be seen, for instance, in Dr. Benham's study of the national income of Malaya.[1] In this he refrained from deducting export duties when calculating his estimates of national expenditure at factor cost, because he obviously felt that this would be analytically incorrect. Since he had, however, deducted export duties from his estimates of national product and national income, this procedure should have resulted in a divergence between his three sets of estimates. That this did not happen is no doubt due to the margin of error which is inevitable in national-income calculations in under-developed countries. Had he made similar estimates for 1951, when export duties amounted to a much more significant proportion of national income, Dr. Benham could not have failed to notice this lack of correspondence between his totals for national product, income and expenditure at factor cost. How much more satisfactory, therefore, if our definitions of these three sets of estimates were to be changed so as to permit the inclusion of export duties in all three. We could then achieve equality between them and yet deal with each one satisfactorily from the analytical point of view.

II

What, then, would be the best way of overcoming these various objections to the present accounting approach to export duties? There appear to be four possibilities. First, to use estimates of national income at market prices instead of at factor cost. Secondly, to treat export duties as direct taxes, since they are taxes on income rather than on outlay. Thirdly, to treat them as transfers or as income from abroad, since they constitute, in the purely accounting sense at any rate, an additional receipt from abroad. And fourthly, to treat them neither quite as direct taxes nor as indirect outlay taxes, but to fit them into the picture differently from both.

The first possibility is the one that comes perhaps most readily to mind. If it is important to include the revenue from export duties in estimates of national income, product or expenditure, it may be held that the obvious

[1] Cf. Frederic Benham, *The National Income of Malaya, 1947–49* (Singapore), pp. 161 and 167.

swer is to calculate these at market prices, which would then include port duties. The objection to this approach is that it does not really solve r problem in any way. The distinction between indirect taxes on expendi-re and indirect taxes on exports, and also the similarity between the latter d direct taxes on income, would still be hidden. Unless attention is awn somehow to the special position of export duties, national income imates, either at market prices or at factor cost, would probably still be ed in exactly the same way as at present, and misleading conclusions would ll be drawn. For many purposes it would be important to be able to stinguish between a rise in the national income at market prices which is e result of increased indirect taxation on domestic expenditure as compared th a rise which is the result of increased export prices. Admittedly, flating such figures of national income at market prices by appropriate ice indices would to some extent correct the situation, because higher penditure taxes would tend to cause a rise in the price index, whilst higher port duties would not, but this would not seem to be a very satisfactory lution to the difficulties. In the under-developed countries which at esent impose such export duties, suitable price indices for such purposes ould also be almost impossible to compile.

The second possibility is also unacceptable. Although it may seem sirable to consider such export duties as direct taxes because they reduce comes rather than raise prices, existing accounting definitions would be tered excessively if we included amongst direct taxes a tax which is quite early an indirect tax, and in factor cost a tax which is clearly not part of ctor cost. Export duties are not assessed in a similar manner to direct xes, and should therefore not be treated as such. Furthermore, treating port duties as direct taxes on gross profits and therefore simply including em in " profits from trading," is liable to give such a highly misleading cture of the relative income shares which go to profits and to wages spectively as to be perhaps even rather dangerous politically. It might rhaps be possible to change the present terminology and include such port duties together with direct taxes in a new group which could be called taxes not raising prices." This would raise very awkward problems, owever. As is well known, some direct taxes do raise prices in marginal ses, and the same applies to some export duties. Such a method would cessitate very careful research into the incidence of all types of taxes fore they could be suitably classified. This solution to our problem erefore does not appear to be satisfactory either.

The third alternative is more attractive. Export duties would now be nsidered either as transfers or as income from abroad, and would be cluded in national income at factor cost.[1] There are two major objections this approach. First, by treating export duties either as transfers or as

[1] Cf. J. R. Hicks, *op. cit.*, p. 246 and footnote. Professor Hicks, who recommends the transfer proach in his system of social accounts, discusses only domestic indirect taxes, which incidentally ll on exports, and can therefore be treated as being paid by foreigners. His treatment is perhaps stified in relation to the United Kingdom, which has no export duties of the kind discussed here, t it should not be applied to all export duties.

income from abroad, the impression is given that they have led to an equivalent rise in world prices and are thus paid by foreign importers. As has been explained above, this is normally not the case. From the purely accounting point of view it may be satisfactory to treat them as an additional receipt from abroad, but from the analytical point of view it is far more correct to treat most of them as payments from producers in the exporting country. Secondly, by showing export duties in the same way as other transfers from abroad, or in the same way as other income from abroad, no attention is drawn to the fundamental differences between them. Professor Meade's division of foreign transfers into either unrequited or capital transfers helps to explain the former.[1] Export duties are certainly not capital transfers, and they are not unrequited transfers either because the foreign buyer receives value for his payment. He has to pay a given world price for these exports, and the fact that in some countries part of this price may represent Government revenue from export duties instead of income of exporters is of no relevance at all to him. Therefore export duties should not be viewed as transfers but as current income resulting from current productive activity. On the other hand, they should not be treated as income from abroad either, because export receipts (inclusive of export duties) are the return for the export of domestically produced commodities, whilst income from abroad is the return for the use abroad of domestically owned factors of production. This would appear to constitute a fundamental difference. In view of these two major objections, we must conclude that the treatment of export duties as transfers or as income from abroad is unsatisfactory and gives rise to misleading results.

The fourth possibility is to show export duties in a way which falls, so to speak, midway between the usual approach to direct and indirect taxes. In other words, they are treated neither quite like direct taxes on income nor quite like indirect taxes on expenditure, but differently from both. They are simply added as separate items to the calculations of national income or national product at factor cost, and are not deducted from national expenditure at market prices when other indirect taxes are deducted. The resultant totals would then be the correct totals of national income, product and expenditure for most purposes and there would be neither double-counting nor double-deduction as far as export duties are concerned.

With regard to the national-income estimate, this would mean that we first calculate " national income at factor cost " in the usual way. To this is then added " revenue from export duties." The resultant total could simply be called " national income " without any additional qualifying phrase, since it would be quite obvious from such a table that the term " national income " stands for national income at factor cost plus export duties.

A similar method could be applied to the estimate of national product. A suitable approach would be to proceed at first as at present, so as to obtain

[1] J. E. Meade, *The Theory of International Economic Policy. Vol. I: The Balance of Payments* (Oxford University Press), p. 4 *et seq.*

the " net national product at factor cost." To this should then be added " revenue from export duties." This might be split up, if necessary, into the major types of export duties, so that they can readily be added to the value of individual export industries' output for inter-industry comparisons. The resultant total could simply be called " net national product."

As regards the estimate of national expenditure, export duties should be included here too. Therefore, only indirect taxes on expenditure, net of subsidies, should be deducted from the national expenditure at market prices. The resultant total could be called " national expenditure," but in this case it might be advisable to add a footnote to the effect that this term represents national expenditure at factor cost plus export duties.

We have so far tended to concentrate on export duties which do not raise the world price of the taxed commodities but which lower producers' incomes. In some cases, however, they may admittedly not have this effect but may fall entirely on importers' expenditure. This applies particularly to export duties which are designed to exploit monopoly advantages *vis-à-vis* importing consumer countries. It also applies to those domestic outlay taxes which incidentally fall upon exports and thus raise export prices; provided attempts can be made to identify them separately, as was done, for instance, in the last of the United Kingdom White Papers. Such types of export duties might perhaps be treated as transfers from abroad, though many of the objections raised above to such an approach would still apply. The most common case, however, would probably be the one where export duties combine both effects, *i.e.*, where they mostly reduce producers' incomes but to some extent also raise world prices. The use of different methods or terminology in dealing with export duties, depending on their precise incidence, would clearly be very undesirable, as it would make the whole procedure extremely clumsy and difficult, and would necessitate careful research into the precise incidence of such duties. In practice, if the last of the above four alternative approaches is adopted, there is no need to distinguish between these different types of export duties. If they are all added or included in the way suggested here, they are treated in an analytically suitable manner no matter whether in fact they fall on importers' expenditure or on exporters' incomes or on both. Government revenue from export duties gives rise to an addition to the national income over and above income at factor cost just as much when this revenue is received from domestic producers as when it is received from foreign importers. The only important difference is that in the former case it will have reduced factor incomes, whereas in the latter case it will not, and this effect will still be correctly shown in such national-income estimates.

Exactly the same arguments, only vice versa, can be applied to the treatment of export subsidies. All types of export subsidies can be treated in the national accounts in a similar, though opposite, fashion to the one recommended above for export duties. They should be deducted from national income at factor cost in order to obtain " national income." They should be shown as a separate item, if necessary divided into the major kinds of

export subsidies, and deducted from net national product at factor cost in order to obtain the "net national product." Finally, they should not be added to national expenditure at market prices, as other subsidies are added, when we are calculating the total for "national expenditure," which will therefore represent national expenditure at factor cost plus export duties net of export subsidies.

The chief advantages of the method which has been proposed here might perhaps be briefly summarised. First, it includes export duties in the national aggregates and excludes export subsidies from them, thus preventing under- or over-estimation. Secondly, it yields aggregate totals which are much more comparable to those of other countries with different stabilisation policies. Thirdly, it makes comparisons over time or between industries more reliable than they are at present in such countries. Fourthly, it deals with export duties and subsidies in a way which still permits the national income and product at factor cost to be clearly shown, and thus it depicts the state of the national economy in a manner which permits the investigator to get a better picture of factor incomes, on the one hand, and of national income, on the other. Finally, it does all this in a way which is analytically correct and yet does not substantially interfere with or alter present social-accounting definitions.

In conclusion, this proposed treatment of export duties and export subsidies is now illustrated by means of specimen tables of national product, income and expenditure. The figures used in these tables are fictitious. They are meant to represent an under-developed country in which there are two export duties, one on an agricultural and one on a mineral product, and one export subsidy to an agricultural product. It must be stressed, however,

TABLE I

National Product

At factor cost.	£ million.
Agriculture, forestry and fishing	170
Mining and quarrying	60
Manufacturing	45
Building and contracting	35
Transport and communications	40
Gas, electricity and water	15
Government services	45
Other services	50
Rent of all dwelling-houses	10
GROSS DOMESTIC PRODUCT AT FACTOR COST	470
Less Depreciation and capital consumption	−20
NET DOMESTIC PRODUCT AT FACTOR COST	450
Revenue from export duties on agriculture	40
Revenue from export duties on mining	15
Less Export subsidies to agriculture	−15
Less Income paid abroad	−10
NET NATIONAL PRODUCT	480

TABLE II

National Income

	£ million.
Wages and salaries, including police and military forces	180
Incomes of own account workers in primary industries	105
Incomes of other own account workers, sole traders and partnerships	55
Profits of companies	90
Profits of public enterprises	5
Rent of land and buildings	15
Less Income paid abroad	−10
NATIONAL INCOME AT FACTOR COST	440
Revenue from export duties, net of export subsidies	40
NATIONAL INCOME	480

TABLE III

National Expenditure

At market prices.	£ million.
Personal consumption	420
Public authorities' current expenditure	65
Net domestic capital formation	45
Net foreign investment	10
Less Net grants from abroad	−15
NATIONAL EXPENDITURE AT MARKET PRICES	525
Less Indirect taxes, net of subsidies, on domestic expenditure	−45
NATIONAL EXPENDITURE *	480

* The final total for national expenditure represents national expenditure at factor cost plus export duties net of export subsidies.

that in practice the national accounts could be calculated in this manner only in very few, if any, under-developed countries because the available information would be insufficient for this purpose, and many round-about methods and subterfuges would normally have to be resorted to in order to obtain the national-income totals.[1]

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[1] For an illustration of some of these difficulties, reference should perhaps be made to Dr. Benham's *The National Income of Malaya, 1947–49, op. cit.*

DEPRECIATION WITH SPECIAL REFERENCE TO TRANSPORT

In view of the relative importance of depreciation as a cost of industrial output, it is surprising how little attention has been given to the subject from the economist's point of view.[1] This would seem to justify the following somewhat rudimentary treatment of the subject, with special reference to one particular sphere of economic activity, namely transport.

The scheme of the article is as follows. First, some outstanding causes of the depreciation in value of capital equipment and other assets are distinguished and classified. Secondly, attention is drawn to alternative aims or objects which may be adopted when determining depreciation policy, one particular aim being defined and selected for the purpose of this article. Finally, the methods of providing for depreciation which seem to follow, both from the classification of its causes and the adopted aim, are set out. Unless otherwise stated, it is assumed throughout that the general level of prices is stable, and no attention will be given to the possible effects of taxation upon depreciation policy.

I. Classification of the Causes of Depreciation

The principal causes of depreciation in the value of assets may be considered under four broad headings, namely:

(i) physical wear and tear resulting from use,

(ii) physical deterioration resulting from exposure to the elements, essentially a function of time rather than use;

(iii) the expiration or running out of such legal rights as leases and licences; and

(iv) the falling away over time of the demand for particular transport services provided by the assets in question. This item is, of course, usually referred to as obsolescence.

A few comments on the precise character of these four causes seem worth making.

1. *Physical Wear and Tear Resulting from Use*

This cause consists solely of such wear and tear as results from use. By reducing an asset's future technical capacity to serve, it also reduces its future earning power, and therefore its value. Funds put aside in correspondence with the useful life or revenue-earning capacity that is taken out of such asset are in the nature of a " user " cost, in that they will vary with the amount of service provided. One example of this kind of depreciation is the actual wearing out of tyres (rubber or steel), brake-blocks or other parts of any kind of rolling stock, which results from vehicle-miles actually operated. It

[1] There is, of course, *The Depreciation of Capital*, by R. F. Fowler, to which the author is duly indebted.

should be pointed out, however, that this cause is only operative when opportunities exist for profitably using the assets to the point at which they are technically inefficient and require replacement because they are " worn out." For if, because of a rapid falling off of demand, the asset has to be scrapped before it is technically worn out, then it is irrelevant whether the asset is greatly worn or only partially so—apart from any possible second-hand or scrap value; the more powerful factor of obsolescence has rendered physical wear and tear irrelevant from the economic point of view.

2. *Physical Deterioration Resulting from Exposure to the Elements*

In contrast to the deterioration which takes place as a result of use, much transport equipment—notably station buildings, bridges and viaducts, road surfaces, important parts of the railway permanent way—being continually exposed to wind and weather, deteriorates with the passage of time. The extent of deterioration, and therefore of depreciation, is in this case essentially a function of time. From the economic point of view, the importance of distinguishing between (i), which is a user-cost, and (ii), which is a time-cost, hardly needs emphasising.[1]

3. *The Expiration of Certain Legal Rights, such as Leases, Patents and Licences*

This cause of depreciation comes into play in many branches of industry besides transport. In transport, it arises especially in the case of the expiration of various types of licences. It is essentially a function of time, and should be treated as such.

4. *Depreciation in Value due to Changes in Demand*

So far we have only considered falls in value due to changes on the side of supplying the services. There may, however, be a slackening or even cessation of demand for such services, causing corresponding falls in the value of equipment. Such falls in demand may be due to a variety of causes, which are, I think, worth distinguishing. First, there may be technical progress within the transport industry itself, leading to the provision of additional transport services which are cheaper or better than existing ones; historically, this has been a most potent cause of the depreciation in value of existing assets. Secondly, technical advance in industries other than transport, by changing relative prices, may at any time deprive transport agencies of patronage. A third cause of depreciation under this heading is when demand itself changes, quite apart from changes in relative prices. People's

[1] It is sometimes inferred that this second kind of depreciation, because it is dependent on time, can therefore be regarded as an " overhead " cost, and " independent of the volume of traffic." In a sense this is true, but only to a very limited extent and in the short run. For in the long run the magnitude of these particular time and (alleged) overhead costs depends upon the *amount of equipment exposed to the elements*, which in its turn depends for the most part upon the capacity for which provision is made. A railway may wish to maintain either large and elaborate station buildings or small and simple ones, according to the volume and character of the traffic expected. It may have much or little rolling stock, again according to the maximum amount of traffic provided for at any one time. Provision for this type of depreciation is therefore essentially in the nature of a " capacity " cost, and will remain constant only in so far as the capacity for which equipment is maintained remains so also.

tastes and habits change over time, and this may lead to a fall in the demand for transport in general or for particular kinds of transport. Yet another cause of the depreciation in the value of transport equipment is when such natural resources as mines, quarries, oil wells or forest areas are exploited to the point of exhaustion, so that the roads, canals or railways serving them become correspondingly valueless.

So much for the main causes of the depreciation in value of various types of transport equipment.

II. Alternative Aims and Objects of Depreciation Policy

Before discussing the bearing of the above classification of the causes of depreciation upon the methods of providing therefor, it is necessary to define the assumed aim or object of such provision. For there is nothing fixed or inevitable about that; it is essentially a matter of choice. One aim, for example, might be to maintain, by means of periodic replacement, the long-run *money value* of an originally acquired asset or series of assets. An alternative aim might be to greatly enhance an undertaking's money value or revenue-earning capacity over a period of years, to " plough back " profits, save and invest. It has been a conspicuous feature of many successful one-man businesses that the owner has managed to " build up " his business out of profits. A third course might be to make no attempt either to fully maintain or to enhance (out of revenue) an asset's or undertaking's value, but to allocate net earnings to profits and distribution, making little or no provision for the future. Let us assume that we select the first of these objectives—that is the maintenance, in the long run, of the value or revenue-earning prospects (in terms of money income) of a given asset, or series of assets, in the first of which a given sum of money was invested. If we keep to our assumption of a stable price level (including the rate of interest), this is tantamount to aiming at the accumulation, during the revenue-earning life of a particular asset, of the sum originally invested in it, less scrap value. Only sums earned over and above this amount would be available for distribution in the form of profits.

But that only gives us what the *total* depreciation allowance during the whole of an asset's economic life should amount to. In view of the considerable longevity (both technical and economic) of so much transport equipment, notably in the railway and shipping industries, there is the additional decision to make, that of how to spread the total depreciation allowance required over the period that elapses between the times of investment and abandonment. How much of it should be put aside after the first, second and subsequent accounting periods? It is therefore proposed to add to the first and overriding objective, that of putting aside in each accounting period a sum sufficient to compensate for the loss of value which has been sustained during that period. Thus if the capital value of the asset during an initial accounting period has fallen from £1,000 to £800, whether due to wear and tear or changed public demand, then the aim would be to put aside £200 in respect of that depreciation. So that if the aim were consistently realised,

ıe value of the asset itself plus the value of whatever had been put aside (and ossibly invested) on account of depreciation would, at the end of any given ccounting period, together amount to the original value of the investment. he problem, therefore, of deciding what amount should be put aside at the nd of each accounting period on account of depreciation is simply that of ssessing the loss of value sustained during that period, the new (lower) value f the asset in question being based on the best estimate available of its future evenue-earning capacity. What considerations, then, should determine the ctual amounts to be allocated to a depreciation fund in order to achieve hese two objectives? What follows is an attempt to answer that question.

III. Methods of Providing for Depreciation Consistent with Aims Defined above under II

Taking first as our accounting period the whole revenue-earning or conomic life of the asset concerned, whatever that may be, then the aim

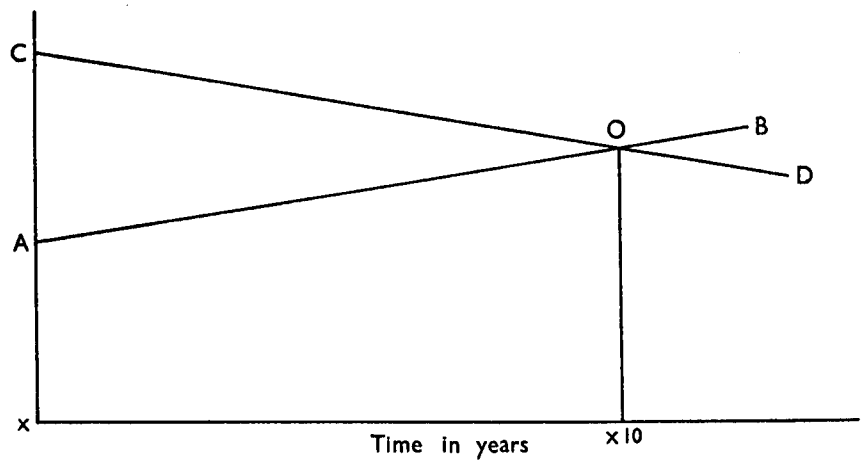


Fig. 1

would be to put aside and invest on account of depreciation a sum (less scrap value) sufficient to replace the old asset with another of no less value than the original asset. Assuming a stable price-level, an asset bought for £1,000 would require that sum to replace it. This is shown in Fig. 1, the line *AB* denoting the level of the unavoidable annual costs of operating the unit, and *CD* the level of gross earnings. Let us assume that at the time of the investment *it was hoped* that the area *CAO*, which represents the total surplus earned during the asset's life over and above inescapable working expenses, would be sufficient to meet the following items:

(i) interest on debenture or fixed-interest-bearing stocks;
(ii) full depreciation;
(iii) distributed profit on Ordinary Shares.

Let us assume, further, that in the event of failure to earn sufficient to meet all these three claims on net revenue, the order of priority for payment

would be strictly as given, profits having a lesser claim upon revenue than depreciation and interest on debenture stocks. Thus, what is allocated to Depreciation is in direct competition with profits in the sense that the more that goes to Depreciation, the less is available for Profits. Assuming our " accounting period " to be synonymous with that of the whole economic life of the asset, the decision as to how to allocate the surpluses earned arises only once. A total surplus would be available, and it either would or would not be enough to provide for debenture interest, adequate depreciation, and anticipated profit. Things being as they are, however, whereas the accounting period is usually one year only, the economic life of many important kinds of assets may be much more than this, so that there is the additional problem of how much to allocate on account of depreciation at the end of the first, second and subsequent years.

As already explained, given our assumptions as to the aims of depreciation policy, the appropriate sum to be set aside during each accounting period should as nearly as possible reflect the difference between the value, or future revenue-earning prospects, of the asset at the beginning and at the end of that period. In making this estimate it is clearly necessary to have regard both to past events, such as the wear and tear that has taken place during the period in question, and to any changes that may have taken place which would justify a revision of the assumptions originally made as regards the future course of costs (*AB*) and revenues (*CD*); indeed, to all the factors that may have affected the value of the assets in question. It is therefore proposed to take each cause of depreciation referred to above separately, and in turn, and to examine what method of depreciation is appropriate to each.

1. *Physical Wear and Tear Resulting from Use*

Let us imagine that we have an asset the sole cause of whose depreciation is wear and tear from use. The amount set aside on this account depends essentially on the amount of work (often expressed in transport in terms of vehicle-miles operated) which the asset has been called upon to do. The more work done, the less technical (and in this case also the less economic) life is left for future exploitation. So long as the technicians know just how much " life " has been taken out of the asset during the period in question, there should be little difficulty in assessing how much should be set aside on this account. On the assumption that the technical efficiency and revenue-earning capacity of the asset is not affected until it is actually worn out and demands replacement, a first approximation would be to put aside sums in proportion to the life that has been used up or taken out of the asset during the period in question. A strict adherence to this practice, however, would in fact be placing an undue burden on the early years. For the value lost in an early year represents the loss of the services which would otherwise have been rendered at the end of its life, that is the present valuation of those possibly " distant " potential services only. And the present value of a service to be given at a more distant future time is less than the value of one to be given at a not so distant future time. This factor would seem to justify putting aside somewhat less in the earlier than in the later years of an asset's life, the actual amount depending on the rate at which future earnings or benefits are presently discounted. " Pure " wear and tear due to use would seem therefore to justify an allocation which would increase, however slightly, during the life of the asset concerned.

But in most kinds of transport equipment there are two other factors which work strongly in the opposite sense, and point to the necessity, if we remain true to our objectives, of putting aside much *larger* sums in the earlier than in the later years of an asset's life. The first of these derives from the well-known fact that most power units tend to become more expensive to operate with age and as wear and tear takes its toll. In the case of most motor vehicles, for example, in the early years of their life running repairs are relatively low, and petrol and oil consumption similarly so. But as time goes on, minor repairs increase and major repairs have to be undertaken, whereas petrol and oil consumption tend to rise. Thus, even if revenues earned per vehicle-mile remained constant, " net " earnings would tend to be less in the later than in the earlier part of such asset's useful life. This case is illustrated in Fig. 2 below:

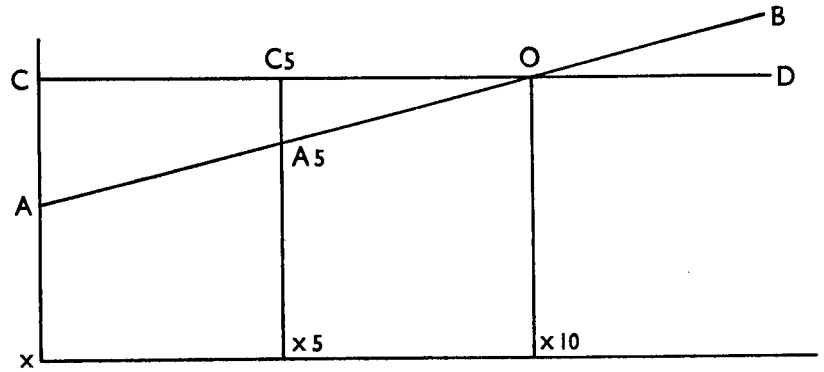


FIG. 2

As in Fig. 1, *CD* represents the level of gross earnings over time, whereas *AB* represents the level of the costs of operating the unit. It will be observed that by half-way through its useful life (at *X*5) the vehicle's prospects of earning net revenue have been reduced by far more than half. The area C_5A_5O is much less than half *CAO*, which represents the total net anticipated earnings of the asset during the whole of its life. For this reason larger sums should be set aside in the first half than in the second half of its life, and in the earlier than in the later years.

The second factor pointing in the same direction derives from the fact that the quality and reliability of the services rendered tend to deteriorate with increased wear and tear,[1] with the result that both the gross and there-

[1] This cause of a fall in value should be distinguished from obsolescence, which is dealt with below. It is neither due to technical change nor to changed demand. It derives solely from the vehicle in question giving a less good quality of service towards the end of its life than at the beginning.

fore the net revenue earned in the later part of its useful life may be definitely less than in the earlier part. This case is illustrated in Fig. 3. In this case costs are assumed to remain stable, but the level of gross revenue falls. Again, much more than half (or a quarter) of the asset's capacity to earn net revenue has disappeared by half (or a quarter) way through its life, which would seem to justify putting aside more on account of depreciation in the earlier than in the later years of the asset's life. These two factors operate with such force in the case of most kinds of road vehicles as far to outweigh the case for shifting the burden forward on account of the discounted value

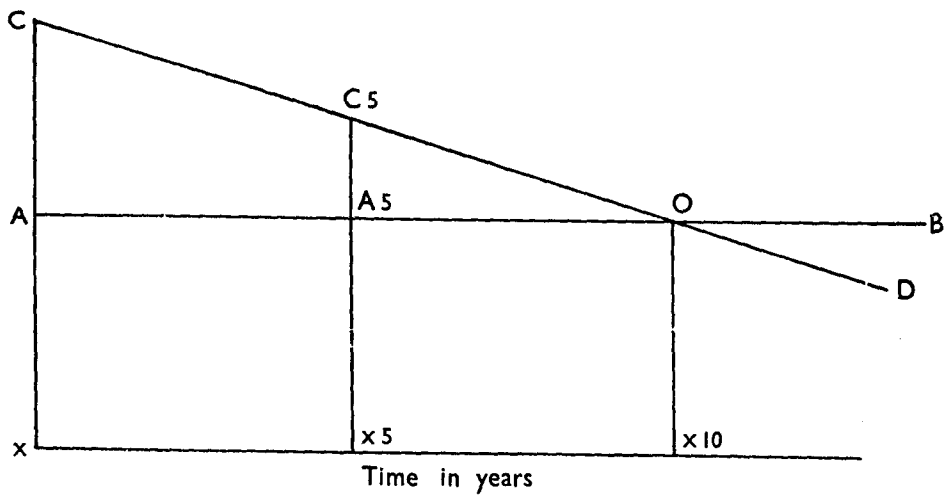


FIG. 3

of future services referred to above. So much for depreciation allowances on account of the " user-cost " or wear and tear resulting from work done.

2. *Physical Deterioration Due to Exposure to the Elements and Other Purely Time Factors*

As in the case of wear and tear from use, the need for making depreciation allowances on this account only arises if the assets concerned are going to be wanted beyond the time when replacement for these reasons becomes necessary. The amount to be set aside in any accountancy period will depend essentially on the length of that period in relation to the total time after which replacement will be required. Thus, subject to the qualification regarding the discounted value of the services to be rendered referred to in the last section, provision for depreciation is in this case essentially a function of time as opposed to " user." Here again, however, the two factors tending to reduce " net " earnings in the later part of an asset's life may come into play. As the result of the physical deterioration that takes place over time, not only may it become more expensive to operate a vehicle or maintain a roadway, but the quality of service given may also decline substantially. Here again there is a strong tendency for costs to increase and for revenue to wn, in this case with the passage of time instead of with increased use.

And its significance in relation to depreciation is the same. It provides both the means and the need for putting aside more in the earlier than in the later years of an asset's economic life.

3. *The Expiration of Legal Rights Such as Leases and Licences*

In so far as the expiration of any purchased legal rights is directly related to time, the same considerations apply to their depreciation as to other purely time factors. Although, in contrast to the last two cases, whereas regard should again be given to the discounted value of services to be rendered in a distant future, the questions of rising costs or falling revenues over time do not arise.

4. *Depreciation Due to Changes in Demand*

We now come to the problem of providing for such depreciation in value as occurs as the result of changes or anticipated changes in demand. These changes in demand may stem from at least four different sources. First, there may be technical change within " the industry " itself, *e.g.*, better buses causing existing buses or tramways to become less wanted, and therefore less profitable. Secondly, there may be technical change outside the industry, causing a change in the relative prices of transport and other competing channels of expenditure, *e.g.*, television or radio competing with other forms of entertainment which involve travel. Thirdly, changes in taste quite apart from any changes in relative prices. Finally, changes in the demand for transport due to changes in the supply and location of natural resources, *e.g.*, the exhaustion of mineral workings. Because so much in all these cases depends on *estimates* of future trends in demand, there are probably greater difficulties in making " correct " depreciation allowances here than in the cases already considered.

We are here dealing solely with such falls in value which are due to changes or prospective changes in demand. It is assumed that the quality of the services provided do not deteriorate, nor do operating costs increase.

Fig. 4 illustrates the case in point. As in the other Figures, investment takes place at *X*. The level of the costs of working the unit (indefinitely) is represented by the line *AB*. The level of revenue which was expected to be earned at the time of investment is again represented by the line *CD*. At the time of investment it was hoped to earn sufficient revenue out of the area *CAO* to meet fully this item of depreciation due to changes in demand. Given our assumption of a stable price-level, there is no difficulty as to how much the *total* allocation towards depreciation should amount to. As regards spreading such allocations between different times, assuming that eventualities take their expected course, and that revenues fall in the manner expected, *e.g.*, along *COD*, it is clear that, as in previous cases already dealt with, far larger surpluses are being earned in the earlier than in the later part of the asset's life. Also a larger proportion of the asset's total capacity to earn revenue is being lost in the earlier than in the later years of its life. At the end of the fifth year, for example, its total future revenue-earning pros-

pects (C_5A_5O) are substantially less than half what they were at the outset. This calls for much larger allocations to depreciation in the earlier than in the later years. Indeed, in the later years it would not be possible to earn anything like what it would be necessary to put aside per annum *on an average*, in order to build up the requisite and necessary amount. Of necessity, therefore, more should be put aside in the earlier than in the later part of the asset's revenue-earning life, the actual amounts per accounting period reflecting the fall in value that has taken place as the result of reduced future revenue-earning prospects.

But there is never any certainty either that demand will take the course originally forecast or indeed that the asset will earn the total net revenues originally expected of it at all. It is the effect that these *unexpected* changes in demand should, in the writer's view, have upon depreciation policy that will now be considered.

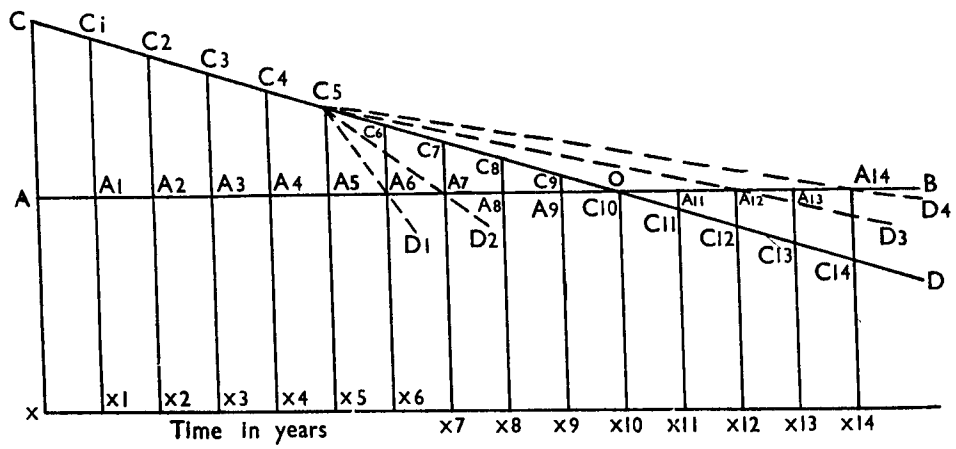


FIG. 4

Let us suppose that after the fifth year of operation the demand for the services provided by the unit unexpectedly and drastically fell off, so that by the end of the sixth year revenue had fallen below the level of working costs. This turn of events is illustrated in Fig. 4 by the level of revenue at C_5 turning downwards along the line C_5D_1. It will be seen that the results of this fall are, first, that the asset would have to be abandoned as being no longer capable of earning any surplus revenue whatever after the sixth year of operation, and secondly, that the total surplus earned by the asset during its economic life would have been reduced to the area CAA_6C_5 instead of the expected CAO. What effect should this changed demand have upon depreciation allowances? Much depends, of course, upon the time at which it became apparent that this change in demand was going to take place. Suppose, for example, at the end of the first accounting period (at $X1$) it was clearly foreseen that demand would in all probability fall off after the fifth year in the manner suggested. This changed view of the future would in itself, it is suggested,

justify larger allocations to depreciation. For during the accountancy period in question, the future revenue-earning prospects of the asset had diminished substantially and a commensurate depreciation allowance should be made. Indeed, the amount of depreciation to be paid in all subsequent years might have to be stepped up substantially above the level originally planned. Were it thought, on the other hand, that demand would fall away along C_5D_2 only, it would not have to be stepped up so much. Similarly, were future prospects to improve and net revenues larger than originally planned for were now forecast (say along C_5D_3 or even C_5D_4), there would at least be justification for reducing depreciation payments below what had been originally planned and to that extent for paying higher dividends also.

In short, if, during any one accounting period, " confidence " in the future net earnings of an asset declines, that in itself would seem to justify an increase in the depreciation allowance, whether that confidence derives from revised estimates of the future course of demand or indeed of the future supply price of working costs. Similarly, if future prospects increase, smaller allocations towards depreciation are equally justified.

It has so far been assumed that the change of view of the future course of demand took place at the end of the first accountancy period (at $X1$), so that consequential adjustments in depreciation policy could be made forthwith. But it often happens that changes in demand take place suddenly and unexpectedly. Suppose, for example, the fall of demand down C_5D_1 had not been foreseen until the end of the fourth (at $X4$) or even fifth ($X5$) accounting period, then it might be too late to find sufficient revenue to replace the loss in value sustained, even if no payment of dividends were made. An unrecovered loss in value would have been sustained, and the objective of maintaining the original value of the asset would not have been achieved. Thus, the sooner any deviation from originally expected demand can be foreseen, the greater the chance of being able to make the adjustments required by that objective.

To sum up, depreciation as a cost cannot be measured in terms of money apart from some defined objective. Given an objective, however, then it can be determined or rather estimated in the light of three quite different factors. The first of these is wear and tear, resulting from use—a " user " cost. The second, is wear and tear due to exposure to the elements—essentially a function of time, as opposed to use, though related to the maximum capacity for which equipment is provided. The expiry of legal rights, being also a function of time, requires somewhat similar treatment to the latter. Finally, anticipated changes in future demand, for whatever cause, may have drastic effects upon capital values, and therefore have a direct bearing upon what should be set aside in respect of depreciation.

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SOME NOTES ON THE "TRANSFORMATION PROBLEM"

THE debate initiated by Böhm-Bawerk on the alleged " great contradi tion " between Volume I and Volume III of Marx's *Capital* has by r means been resolved to the satisfaction of all parties. In one form (another, and with various degrees of sophistication, a number of aspects the question continue to be hotly disputed to-day. In particular, literatu on the so-called " transformation problem " has multiplied considerab since Paul Sweezy drew the attention of English-speaking readers to it 1946 in his *Theory of Capitalist Development*.[2]

The present article sets out to do three things. First, it examines Mar own discussion of the transformation of " values " into " prices of produ tion," dealing in particular with the meaning which ought properly to l ascribed to his famous statement that " total values equal total prices production." Second, it reviews two solutions of the " transformati problem " which have recently been put forward, and suggests an alternati method of solution which (it is submitted) illustrates more effectively th the others the essential point which Marx was trying to make. Third, says something about an important gap in Marx's argument which st remains after the " transformation problem " has been solved.

" Profit ", wrote Marx, " is . . . that disguise of surplus-value whi must be removed before the real nature of surplus-value can be discovere In the surplus-value, the relation between capital and labour is laid bare.' In Volume I of *Capital*, therefore, Marx presents us with an analysis surplus value stripped of its disguise. In this first stage of his argument t surplus value produced in each branch of industry is assumed to accrue the capitalists *in that branch* in the form of a net gain. Now, since the or possible source of this surplus value, according to Marx's account, is t surplus labour performed by the labourers actually employed on the jc it follows that the ratio of net gain to capital must be unequal in cases whe

[1] I acknowledge with thanks valuable criticisms of the original draft of this article made Mr. M. H. Dobb, Mr. A. L. Wright and Dr. G. A. P. Wyllie. None of these, however, must held responsible for any errors which remain.

[2] See Sweezy, *The Theory of Capitalist Development* (London, 1946), pp. 109 ff.; Ladislaus V Bortkiewicz, *Value and Price in the Marxian System* (reprinted in *International Economic Papers*, no. 1952); Bortkiewicz, *On the Correction of Marx's Fundamental Theoretical Construction in the Third Vol of "Capital"* (reprinted as an appendix to Sweezy's edn. of Böhm-Bawerk's *Karl Marx and the C of his System* and Hilferding's *Böhm-Bawerk's Criticism of Marx* (New York, 1949)); J. Wintern "Values and Prices: A Solution of the So-called Transformation Problem" (ECONOMIC JOURN June 1948, p. 276); K. May, "Value and Price of Production: A Note on Winternitz's Solutio (ECONOMIC JOURNAL, December 1948, p. 596); Joan Robinson, in a review in ECONOMIC JOURN June 1950, p. 358; Rudolf Schlesinger, *Marx: His Time and Ours* (London, 1950), pp. 139 ff.; M. H. Dobb, *A Note on the Transformation Problem*, in *On Economic Theory and Socialism* (London, 19 p. 273.

[3] *Capital*, Vol. III (Kerr edn.), p. 62.

the organic composition [1] of the capitals concerned is unequal.[2] In actual fact, however, the rates of profit in the different branches tend towards equality under developed capitalism, and the organic compositions of capital tend if anything towards greater inequality. It is evidently necessary, therefore, that the Volume I assumptions should be removed at a later stage in the proceedings, and the effect of their removal upon the Volume I conclusions duly examined.

The assumptions are removed in Parts 1 and 2 of Volume III, where the question of the relations between surplus value and profit is considered. In actual fact, Marx argues, the amount of profit which the capitalists in each branch of industry receive must be sufficient to yield them the average rate of profit on the *total* quantity of capital which they employ, so that in the majority of cases the amount of profit they receive will differ from the amount of surplus value actually generated in their own branch of industry. But this does not mean that the Volume I analysis is vitiated. On the contrary, Marx believed that without this analysis political economy would be left " without a rational basis." [3] For, according to him, the profit which the capitalists in each branch of industry receive must be conceived as accruing to them by virtue of a sort of redivision of the aggregate surplus value produced over the economy as a whole. This aggregate surplus value is, as it were, reallocated among the different branches of industry so that the capitalists in each branch share in it not in accordance with the amount of capital they have spent on wages but in accordance with the total amounts of capital they have severally employed. Without the Volume I analysis to determine the magnitude of this aggregate, Marx maintained, the average rate of profit would be, as he put it, " an average of *nothing*." [4]

In his analysis of surplus value in Volume I, Marx had assumed that the commodities in which the capitalist producers dealt were bought and sold " at their values " in the Marxian sense—*i.e.*, at equilibrium prices which were proportionate to the quantities of socially necessary simple labour required to produce them. So long as it is taken for granted that the net gain received by the capitalists in each branch of industry consists of the surplus value generated in that branch, this is a reasonable enough assumption. But the conversion of surplus value into average profit necessarily implies the transformation of values into what Marx called " prices of production." [5] It implies, in other words, that the majority of commodities do *not* tend to sell " at their values," but at " prices of production " which

[1] The organic composition of capital is the ratio between the part of capital spent on equipment, raw materials, etc., which Marx calls *constant* capital (c), and the part spent on wages, which he calls *variable* capital (v).

[2] Marx assumes here that the ratio of surplus value (s) to v is the same in all branches of industry.

[3] *Capital*, Vol. III, pp. 176–7.

[4] *Theories of Surplus Value* (*Selections*) (London, 1951), p. 231.

[5] " The price of production ", wrote Marx, " includes the average profit. We call it price of production. It is, as a matter of fact, the same thing which Adam Smith calls *natural price*, Ricardo *price of production*, or *cost of production*, and the physiocrats *prix nécessaire*, because it is in the long run a prerequisite of supply, of the reproduction of commodities in every individual sphere " (*Capital*, Vol. III, p. 233).

normally diverge to some extent from their values. The question immediately arises, therefore, whether Marx's Volume III analysis of exchange ratios in terms of prices of production can be regarded merely as a modification of his Volume I analysis in terms of values (as Marx himself argued), or whether it should be regarded as being in contradiction to it (as Böhm-Bawerk and his followers have insisted).

The basic point in Marx's answer to this question is as follows. The transformation of values into prices is brought about as a result of the conversion of surplus value into profit. Now the volume and rate of surplus value [1] are evidently determined by the ratio $\frac{\Sigma a}{\Sigma v}$ (where a is the total value, in the Marxist sense, of a given finished commodity); and the volume and rate of profit are determined by the ratio $\frac{\Sigma a_p}{\Sigma v_p}$ (where the subscript p indicates that a and v have been transformed from values into prices).[2] Marx argues, in effect, that $\frac{\Sigma a}{\Sigma v} = \frac{\Sigma a_p}{\Sigma v_p}$. (This, as we shall see, was what Marx had in mind when he said that " total values equal total prices." [3]) In other words, he argues that the ratio between the value of commodities in general and the value of the commodity labour power, upon which he had in Volume I conceived surplus value to depend,[4] remains unchanged when it is expressed in terms of prices rather than values, so that profit can be said to be determined in accordance with the Volume I analysis. If this is so, it can

[1] I am using the expression " rate of surplus value " here to mean the ratio of surplus value to *total* capital. Marx normally used it to mean the ratio of surplus value to *variable* capital.

[2] It is, of course, assumed here that the national income resolves itself only into wages and profits.

[3] Cf. M. H. Dobb, *Political Economy and Capitalism*, pp. 46 and 72–3.

[4] Marx starts in Vol. I with the fundamental exploitation ratio $\frac{s}{v}\left(=\frac{\text{Surplus labour}}{\text{Necessary labour}}\right)$; Adding unity to this ratio, we get $\frac{v+s}{v}=\frac{\text{Working day}}{\text{Necessary labour}}\Big)$. When the latter expression is applied to the totality of commodities, it becomes $\frac{\Sigma(v+s)}{\Sigma v}\left(=\frac{\text{Total labour force}}{\text{Labour required to produce wage-goods}}\right)$: and, given conditions of equilibrium between the different branches of the economy, this ratio $\frac{\text{Total labour force}}{\text{Labour required to produce wage-goods}}$ is equal to the ratio $\frac{\text{Value of finished commodities}}{\text{Value of wage-goods}}\left(=\frac{\Sigma a}{\Sigma v}\right)$. For example, in the following case Department I produces means of production and Department II consumers' goods; the ratio $\frac{s}{v}$ is the same for both Departments; and the equilibrium conditions appropriate to simple reproduction prevail between them (*i.e.*, $c_2 = v_1 + s_1$):

	c_1	v_1	s_1	a_1
I.	80	60	40	180
	c_2	v_2	s_2	a_2
II.	100	90	60	250

It will be seen that the ratios $\frac{\text{Working day}}{\text{Necessary labour}}\left(=\frac{5}{3}\right)$, $\frac{\text{Total labour force}}{\text{Labour required to produce wage-goods}}\left(=\frac{250}{150}\right)$, and $\frac{\text{Value of finished commodities}}{\text{Value of wage-goods}}\left(=\frac{250}{150}\right)$ are all equal.

e plausibly argued that the very degree to which individual prices of production diverge from values is ultimately determined according to the olume I analysis. Thus the disturbance introduced into the operation f the law of value as described in Volume I is a *calculable* disturbance, and in the exact sciences it is not the custom to regard a calculable disturbance s a refutation of a certain law." [1]

Marx's discussion of this problem is developed in two stages, the first of hich has received much more attention than the second. In the first stage e takes " five different spheres of production," deliberately assuming that one of the commodities concerned enters into the production of any of the thers. Thus capitals I to V in the accompanying table [2] can be considered

(1) Capitals.	(2) Used-up c.	(3) Cost price.	(4) Surplus value.	(5) Value.	(6) Profit.	(7) Price of production.	(8) Deviation of price from value.
I. $80c + 20v$	50	70	20	90	22	92	+ 2
II. $70c + 30v$	51	81	30	111	22	103	− 8
III. $60c + 40v$	51	91	40	131	22	113	−18
IV. $85c + 15v$	40	55	15	70	22	77	+ 7
V. $95c + 5v$	10	15	5	20	22	37	+17
			110	422	110	422	

s the component parts of one single capital of 500. Each of the constituent apitals shown in column 1 totals 100, but the cost price of each of the oututs is less than 100, since it is assumed that only a portion of the value of he constant capital is transferred to the commodity in the period we are onsidering.[3] The amount so transferred is shown in column 2, and the ost price, which is the sum of v and used-up c, is shown in column 3. It is ssumed that the working day is everywhere equally divided between necesary and surplus labour, so that surplus value (shown in column 4) is equal o v. The total *value* of each of the outputs being considered (shown in olumn 5) represents the sum of the cost price and the surplus value. Now t is evident that the sale of these commodities at their values would result in very unequal rates of profit on each of the capitals. In actual fact, however, Marx maintains, the total pool of surplus value, amounting to 110, is allotted (" by means of competition " [4]) to the individual capitals in accordance with the total size of each—in this case uniformly, so that each receives a profit of 22 (column 6). The " price of production " (column 7), then, at which each output actually tends to sell, is the sum of the cost price and the profit, and differs in each case from the value. But since the total profit is by definition equal to the total surplus value, it naturally follows that in the present case the sum of the prices of production is equal to the sum of the

[1] P. Fireman, quoted by Engels in his preface to Volume III of *Capital*, p. 25.

[2] This table is an amalgamation of those on pp. 183 and 185 of *Capital*, Vol. III, with some of the figures re-arranged.

[3] The turnover periods of v are assumed to be the same in each case.

[4] *Capital*, Vol. III, p. 186.

alues, or, to put the same thing in another way, that the deviations of prices om values (column 8) cancel one another out.[1]

Marx's statement that the sum of the prices is equal to the sum of the alues has come in for considerable criticism. From Böhm-Bawerk onwards, ritics have questioned whether this statement can be held to be meaningful, hether it embodies a tautology and so on, and have generally concluded iat Marx's " argument " is quite untenable. Some of the difficulty no oubt arises from the fact that Marx, having illustrated this equality arith-ietically in the particular case just described (the case where mutual inter-ependence is abstracted from), immediately went on, rather rashly perhaps, o say that " in the same way the sum of all the prices of production of all ommodities in society, comprising the totality of all lines of production, is qual to the sum of all their values." [2] The implication of this statement, ead in its context, might seem to be that when the assumption that none of he commodities concerned enters into the production of any of the others s dropped, so that the values of input as well as those of output have to be ransformed into prices of production, a transformation carried out on the asis of a redistribution of the pool of surplus value will bring out total prices qual to total values in the arithmetical sense. This is in fact not so. On ny plausible set of assumptions regarding the manner in which the different ranches of the economy are inter-related, it will soon be found upon experi-menting with various sets of figures that if the values of input as well as those of output are to be transformed into prices of production, it is normally impossible to effect a simultaneous transformation which will make total profit equal to total surplus value and at the same time make total prices of production equal to total values. In all but very exceptional cases, we may preserve one of these equalities, but not both.[3] If Marx's attention had been drawn to this fact, he might well have reformulated some of his expressions regarding the equality of total prices and total values, while still insisting on the essential point they were designed to express—viz., that after the trans-formation of values into prices of production the fundamental ratio upon which profit depended [4] could still be said to be determined in accordance

[1] It is evident that the only case in which price and value would coincide would be one in which the composition of the capital concerned coincided with the " social average."

[2] *Capital*, Vol. III, p. 188.

[3] For an example of one of these exceptional cases, see the transformation exhibited in Table II and IIIb on pp. 111 and 120 of Sweezy's *Theory of Capitalist Development*.

[4] There is a slight technical difficulty here. When Marx said that " total values equal total prices " it is fairly clear that what he had in mind was the equality of the ratios $\frac{\Sigma a}{\Sigma v}$ and $\frac{\Sigma a_p}{\Sigma v_p}$, each calculated over the economy as a whole. (Cf. Dobb, *loc. cit.*). Given conditions of equilibrium between the different Departments, these ratios will be equal to the basic exploitation ratio $\frac{\Sigma(v+s)}{\Sigma v}$. In the case we have just considered, however, where the information which we are given covers only a part of the economy, it is obvious that the numerical value of the ratio $\frac{\Sigma a}{\Sigma v}$ derived from this information alone (assuming that we are able to derive it at all) is likely to differ from the numerical value of $\frac{\Sigma a}{\Sigma v}$ which we could derive from complete information regarding the economy as a whole. (For example, if we assume that the table gives us complete information regarding the output of finished goods, but of no other branches of production, Σa will be the same but Σv will be under-estimated.) A similar sort of difficulty arises in the second stage of the argument (to be considered shortly), where we have full information concerning the economy, but where it is not desirable to postulate equilibrium conditions. In both these cases our calculation of $\frac{\Sigma a}{\Sigma v}$ from the information which we are given is likely to differ from that of the basic exploitation ratio $\frac{\Sigma(v+s)}{\Sigma v}$. In such cases, then, if we want to illustrate by an arithmetical example what Marx had in mind when he said that " total values equal total prices," the best we can do is to start with a ratio whose numerator is the sum of the total values of all the commodities (whether finished or otherwise) about which we are given information, and whose denominator is the sum of all the v's which we are given; and then to show that the numerical value of this ratio remains the same when those values which the particular problem requires to be transformed into prices are so transformed. The numerical value of this ratio will not normally be identical with that of $\frac{\Sigma a}{\Sigma v}$ calculated for the economy as a whole, but it will express the same underlying idea. In what follows the symbol a will be used for the total value of any commodity, whether finished or not.

with the Volume I analysis. In the special case where none of the commodities concerned enters into the production of any of the others, he might have said, the ratio remains the same for the simple reason that the relevant quantities remain the same—the denominator remains the same by hypothesis, and the numerator remains the same because *in this case* the sum of the prices necessarily equals the sum of the values. In the more difficult case where the various branches of production are mutually interdependent, he might have said, the sum of the prices does not necessarily " come out " equal to the sum of the values, but the fundamental ratio can still be said to be determined in accordance with the Volume I analysis. And it would have been possible for him to illustrate this, as I shall show below, by an arithmetical example rather similar in character to that described above.

However, it would be wrong to suggest that Marx simply ignored this more difficult case. On the contrary, his examination of it, although by no means detailed, was sufficiently well organised to be said to constitute that second stage in his argument of which I have spoken above. He begins by dropping the assumption that none of the commodities concerned enters into the production of any of the others. In actual fact, he writes, " the elements of productive capital are, as a rule, bought on the market," so that " the price of production of one line of production passes, with the profit contained in it, over into the cost-price of another line of production." At first sight it might seem as if this would mean that the profit accruing to each capitalist might be counted several times in a calculation such as that which has just been described, but Marx has little difficulty in disposing of this superficial objection. The dropping of the assumption, however, does indeed make one " essential difference," which Marx describes as follows:

> " Aside from the fact that the price of a certain product, for instance the product of capital B, differs from its value, because the surplus-value realized in B may be greater or smaller than the profit of others contained in the product of B, the same fact applies also to those commodities which form the constant part of its capital, and which indirectly, as necessities of life for the labourers, form its variable part. So far as the constant part is concerned, it is itself equal to the cost-price plus surplus-

value, which now means cost-price plus profit, and this profit may again be greater or smaller than the surplus-value in whose place it stands. And so far as the variable capital is concerned, it is true that the average daily wage is equal to the values produced by the labourers in the time which they must work in order to produce their necessities of life. But this time is in its turn modified by the deviation of the prices of production of the necessities of life from their values. However, this always amounts in the end to saying that one commodity receives too little of the surplus-value while another receives too much, so that the deviations from the value shown by the prices of production mutually compensate one another. In short, under capitalist production, the general law of value enforces itself merely as the prevailing tendency, in a very complicated and approximate manner, as a never ascertainable average of ceaseless fluctuations." [1]

Marx returned to the same point a few pages later, emphasising that the transformation process involves a modification of the Volume I assumption that " the cost-price of a commodity is equal to the value of the commodities consumed in its production." The price of production of a given commodity, he writes—

" is its cost-price for the buyer, and this price may pass into other commodities and become an element of their prices. Since the price of production may vary from the value of a commodity, it follows that the cost-price of a commodity containing this price of production may also stand above or below that portion of its total value which is formed by the value of the means of production consumed by it. It is necessary to remember this modified significance of the cost-price, and to bear in mind that there is always the possibility of an error, if we assume that the cost-price of the commodities of any particular sphere is equal to the value of the means of production consumed by it. Our present analysis does not necessitate a closer examination of this point." [2]

And in a later passage, repeating the same point once more, Marx argues that " this possibility does not alter the correctness of the rules laid down for commodities of average composition." [3]

This is where the so-called " transformation problem " comes into the picture. Marx's " method of transforming values into prices," it is said, meaning by this his original calculation outlined in the table above, contains an " error," since it does not take account of the fact that the values of elements of input as well as those of elements of output have to be transformed into prices.[4] It is then claimed that Marx can be rescued from this " error " simply by showing the *formal possibility* of a consistent derivation of prices from values in the case of mutual interdependence. When values are

[1] Quotations from *Capital*, Vol. III, pp. 188–90. There is a similar passage at the end of Marx's comments on Bailey in the *Theories of Surplus Value* (not included in the English edn.) which shows that the point had occurred to Marx several years before the publication of the first volume of *Capital*.

[2] *Capital*, Vol. III, pp. 194–5.

[3] *Ibid.*, Vol. III, pp. 241–3.

[4] As will be clear from what has been said above, it was not intended to take account of this fact, since mutual interdependence was specifically abstracted from.

transformed into prices, the ratio of price to value must be the same when a given commodity is considered as input as when it is considered as output; and after the transformation the rate of profit must come out equal in the case of each capital concerned. These ratios of price to value, and the rate of profit, are regarded as the main unknowns. The " transformation problem " then reduces itself to this: can the relations between the various branches of production, and the various conditions which are to be fulfilled as a result of the transformation, be expressed in the form of an equational system which is " determinate " in the mathematical sense—*i.e.*, in which the number of equations is equal to the number of unknowns? The assumption lying behind these researches is that if the relations and conditions can in fact be so expressed, Marx's " method of transforming values into prices " is itself transformed from an invalid to a valid one.

The best-known solution, that of Bortkiewicz, commences with the particular set of value relationships postulated by Marx as existing between the three main Departments of the economy (I = means of production; II = workers' consumption goods; III = capitalists' consumption goods) under conditions of simple reproduction. Employing the usual notation, these value relationships can be expressed in the form of three equations:

$$\begin{aligned} \text{I.} \quad & c_1 + v_1 + s_1 = c_1 + c_2 + c_3 \\ \text{II.} \quad & c_2 + v_2 + s_2 = v_1 + v_2 + v_3 \\ \text{III.} \quad & c_3 + v_3 + s_3 = s_1 + s_2 + s_3 \end{aligned}$$

If we take the ratio of price to value to be x in the case of means of production, y in the case of workers' consumption goods and z in the case of capitalists' consumption goods; if we further call the average rate of profit r; and if we state as a condition of the problem that the relations appropriate to simple reproduction should continue to obtain after the transformation of values into prices as before it, then the following equalities must hold:

$$\begin{aligned} \text{I.} \quad & c_1x + v_1y + r(c_1x + v_1y) = (c_1 + c_2 + c_3)x \\ \text{II.} \quad & c_2x + v_2y + r(c_2x + v_2y) = (v_1 + v_2 + v_3)y \\ \text{III.} \quad & c_3x + v_3y + r(c_3x + v_3y) = (s_1 + s_2 + s_3)z \end{aligned}$$

Here there are four unknowns (x, y, z and r), and only three equations. Bortkiewicz reduces the unknowns to three by the ingenious expedient of assuming: (*a*) that the value scheme was expressed in terms of money, and (*b*) that gold is the money commodity, and is produced in Department III, in which case z may reasonably be taken as = 1. The equational system thereupon becomes determinate, and solutions for x, y and r can be fairly readily derived. Upon applying these solutions to various sets of figures, it is seen that total profit comes out equal to total surplus value, but that total prices normally diverge from total values. Neither the equality nor the inequality, however, has anything more than formal significance. As Bortkiewicz says, in relation to a particular set of figures,

" That the total price exceeds the total value arises from the fact that Department III, from which the good serving as value and price

measure is taken, has a relatively low organic composition of capital. But the fact that total profit is numerically identical with total surplus value is a consequence of the fact that the good used as value and price measure belongs to Department III." [1]

It is only in the special case where the organic composition of the capital employed in Department III is equal to the social average that the sum of the prices will come out equal to the sum of the values.

Winternitz adopts the same general attitude towards the problem as Bortkiewicz, but clears the Bortkiewicz solution of certain redundancies and unnecessary artificialities. He commences with the usual value scheme in the three Departments:

$$\begin{aligned} \text{I.} \quad & c_1 + v_1 + s_1 = a_1 \\ \text{II.} \quad & c_2 + v_2 + s_2 = a_2 \\ \text{III.} \quad & c_3 + v_3 + s_3 = a_3 \end{aligned}$$

But instead of assuming the equilibrium conditions appropriate to Marx's reproduction schemes, he assumes merely that when a_1 varies by x (the price–value ratio for means of production), then c_1, c_2 and c_3 also vary by x; and that when a_2 varies by y (the price–value ratio for workers' consumption goods), then v_1, v_2 and v_3 also vary by y. Thus he arrives at the following simple equational system:

$$\begin{aligned} \text{I.} \quad & c_1x + v_1y + S_1 = a_1x \\ \text{II.} \quad & c_2x + v_2y + S_2 = a_2y \\ \text{III.} \quad & c_3x + v_3y + S_3 = a_3z \end{aligned}$$

By putting $\frac{a_1x}{c_1x + v_1y} = \frac{a_2y}{c_2x + v_2y}$ (each of these expressions being equal to $1 + r$), solutions for $x : y$ and for r are easily obtained. A further set of relationships between x, y and z must then be postulated in order to determine the price level for the system as a whole. From a purely logical point of view, it obviously does not matter what relationships are postulated, but Winternitz puts

$$a_1x + a_2y + a_3z = a_1 + a_2 + a_3$$

(*i.e.*, sum of prices = sum of values) because in his opinion this is "the obvious proposition in the spirit of the Marxian system." [2] Solutions for x, y and z are then yielded immediately without any special difficulty. When applied to various sets of figures, these solutions naturally bring out the sum of prices equal to the sum of values, but total profit normally diverges from total surplus value.

Winternitz's solution, although in essence very similar to Bortkiewicz's, is evidently simpler and therefore more acceptable from a purely mathematical point of view. Indeed, it is the special merit of Winternitz to have exposed the triviality of the whole problem as so posed—a triviality which tended to be hidden by Bortkiewicz's over-elaborate and confusing method.

[1] Bortkiewicz, in Sweezy's edn. of Böhm-Bawerk's *Karl Marx and the Close of his System*, etc., p. 205.

[2] ECONOMIC JOURNAL, June 1948, p. 279.

The Winternitz solution is an effective reply to those who said that it was not formally possible to transform values into prices when elements of input as well as output were involved. But it seems to me that something more is required before a transformation of the Bortkiewicz–Winternitz type can properly be used to *illustrate* the second stage of Marx's Volume III argument.[1] The essential point for Marx, as we have seen, was that after aggregate surplus value had been converted into profit, and values consequently transformed into prices, the ratio $\frac{\Sigma a}{\Sigma v}$ should be equal to the ratio $\frac{\Sigma a_p}{\Sigma v_p}$. Is it possible to effect a transformation which brings these ratios out equal, and if so under what conditions?

This problem can be dealt with as follows. Select three sets of quantities for c, v and s in Departments I, II and III, such that the rate of surplus value in the Marxist sense $\left(\frac{s}{v}\right)$ is equal in each case, and that the organic composition of capital in Department II is equal to the social average [2]—for example:

$$\begin{aligned} & c_1 + v_1 + s_1 = a_1 \\ \text{I.} \quad & 3 + 4 + 4 = 11 \\ & c_2 + v_2 + s_2 = a_2 \\ \text{II.} \quad & 18 + 15 + 15 = 48 \\ & c_3 + v_3 + s_3 = a_3 \\ \text{III.} \quad & 9 + 6 + 6 = 21 \end{aligned}$$

Proceed now to transform these expressions into the following:

$$\begin{aligned} \text{I.} \quad & c_1x + v_1y + S_1 = a_1x \\ \text{II.} \quad & c_2x + v_2y + S_2 = a_2y \\ \text{III.} \quad & c_3x + v_3y + S_3 = a_3z \end{aligned}$$

on the basis of the following equalities: [3]

$$\frac{S_1}{c_1x + v_1y} = \frac{S_2}{c_2x + v_2y} = \frac{S_3}{c_3x + v_3y}$$

and

$$S_1 + S_2 + S_3 = s_1 + s_2 + s_3$$

[1] The Bortkiewicz–Winternitz solutions can certainly be used to *prove* the proposition that a consistent transformation of values into prices is formally possible, but they cannot be used to do any more than *illustrate* Marx's own argument. To suggest that any argument in *Capital* stands or falls by Marx's arithmetical illustrations is to betray a serious misunderstanding of his method, and it would be equally wrong-headed, I think, to set out to "rescue" Marx from his errors with the aid of mathematical formulæ. As May has said (*op. cit.*, p. 598): "Marx . . . used calculations primarily as illustrations to accompany verbal arguments which combined process and cross-section analysis in a way which could hardly be fitted to the mathematical techniques available even to-day."

[2] *I.e.*, that $\frac{c_2}{c_2 + v_2} = \frac{\Sigma c}{\Sigma c + \Sigma v}$.

[3] These two equalities express, of course, the equality of profit rates, and the equality of the sum of profits with the sum of surplus values.

The result of this calculation in the given case is as follows:

$$\begin{array}{rrcrcrcl} & c_1x & & v_1y & & S_1 & & a_1x \\ \text{I.} & 2{\cdot}592 & + & 3{\cdot}710 & + & 3{\cdot}202 & = & 9{\cdot}504 \\ & c_2x & & v_2y & & S_2 & & a_2y \\ \text{II.} & 15{\cdot}552 & + & 13{\cdot}911 & + & 15{\cdot}052 & = & 44{\cdot}515 \\ & c_3x & & v_3y & & S_3 & & a_3z \\ \text{III.} & 7{\cdot}776 & + & 5{\cdot}564 & + & 6{\cdot}784 & = & 20{\cdot}124 \end{array}$$

This calculation, like Marx's original one in the case where mutual interdependence was abstracted from, shows the result when a fixed aggregate of surplus value is re-allocated in the form of profit at the average rate among the various capitals concerned. The sum of prices diverges from the sum of values, but the real point to which Marx wished to draw attention when he emphasised the equality between total prices and total values in the original case—*i.e.*, that after the transformation of values into prices the fundamental ratio upon which profit depended [1] could still be said to be determined in accordance with the Volume I analysis—is illustrated in this case too. It is no longer true that the numerator and the denominator of the ratio remain unchanged as a result of the transformation, but under the assumed conditions *both will always change in the same proportion*, so that $\frac{a_1x + a_2y + a_3z}{v_1y + v_2y + v_3y}$ remains equal to $\frac{a_1 + a_2 + a_3}{v_1 + v_2 + v_3}$. The achievement of this result is dependent (in the great majority of cases) upon the equality initially postulated between $\frac{c_2}{c_2 + v_2}$ and $\frac{\Sigma c}{\Sigma c + \Sigma v}$—*i.e.*, upon the assumption that the organic composition of capital in the wage-goods industries is equal to the social average.[2, 3]

Such an illustration, however, would fill only part of the gap in Marx's analysis. To fill the rest of it, one must turn to economic history rather than to mathematics. The "derivation of prices from values," according to Marx's general economic method,[4] must be regarded as a historical as well

[1] See footnote 4 above, p. 98.

[2] I am indebted to Dr. Wyllie for a mathematical proof both of this general result and of its dependence in normal cases upon the condition $\frac{c_2}{c_2 + v_2} = \frac{\Sigma c}{\Sigma c + \Sigma v}$. While the result will always be reached when this condition is satisfied, there may be a few special cases in which it could be reached without the condition being satisfied.

[3] In Marx's arithmetical illustration to the first stage of his argument, the conditions laid down do not require that the values of the elements of input should be transformed into prices. It is possible to re-interpret his figures, however, so that they illustrate a situation in which the values of v (but not of c), as well as those of a, have to be transformed into prices, and in which the organic composition of capital in the wage-goods industries is equal to the social average, so that v is the same whether expressed in price or in value terms (*i.e.*, that $y = 1$). In the present case, where c, v and a have all to be transformed into prices, the fact that the organic composition of capital in the wage-goods industries is equal to the social average no longer necessarily means that $y = 1$.

[4] The best short description of Marx's general economic method is that given by Engels in a review of Marx's *Critique of Political Economy* which appears as an appendix in the English edn. of Engels's *Ludwig Feuerbach*, pp. 98–101.

as a logical process. In "deriving prices from values" we are really reproducing in our minds, in logical and simplified form, a process which has actually happened in history. Marx began with the assumption that goods sold "at their values" under capitalism (so that profit rates in the various branches of production were often very different), not only because this appeared to be the proper starting-point from the logical point of view but also because he believed that it had "originally" [1] been so. He proceeded on this basis to transform values into prices, not only because this course appeared to be logically necessary but also because he believed that history itself had effected such a transformation. The exchange of commodities at their values, or approximately at their values, Marx wrote—

> "requires . . . a much lower stage than their exchange at their prices of production, which requires a relatively high development of capitalist production. . . .
>
> "Aside from the fact that prices and their movements are dominated by the law of value, it is quite appropriate, under these circumstances, to regard the value of commodities not only theoretically, but also historically, as existing prior to the prices of production. This applies to conditions, in which the labourer owns his means of production, and this is the condition of the land-owning farmer and of the craftsman in the old world as the new. This agrees also with the view formerly expressed by me that the development of product into commodities arises through the exchange between different communes, not through that between the members of the same commune. It applies not only to this primitive condition, but also to subsequent conditions based on slavery or serfdom, and to the guild organisation of handicrafts, so long as the means of production installed in one line of production cannot be transferred to another line except under difficulties, so that the various lines of production maintain, to a certain degree, the same mutual relations as foreign countries or communistic groups." [2]

But Marx did not pursue the historical aspects of the problem of the transformation of values into prices very much further than this, and his critics have taken full advantage of the fact that a number of problems still remain unsolved.[3] Böhm-Bawerk, for example, argued that if the derivation of prices from values had in fact proceeded in the manner which Marx's analysis suggests, "there must be traces of the actual fact that *before* the equalization of the rates of profit the branches of production with the relatively greater amounts of constant capital have won and do win the smallest rates of profit,

[1] *Capital*, Vol. III, p. 186.

[2] *Ibid.*, Vol. III, pp. 208–9. Cf. p. 212: "Competition first brings about, in a certain individual sphere, the establishment of an equal market-value and market-price by averaging the various individual values of the commodities. The competition of the capitals in the different spheres then results in the price of production which equalises the rates of profit between the different spheres. *This last process requires a higher development of capitalist production than the previous process.*" (My italics.) Cf. also pp. 207–8.

[3] Engels, referring to the passage just quoted, said that "if Marx had had an opportunity to work over the third volume once more, he would doubtless have extended this passage considerably. As it stands it gives only the sketchy outline of what is to be said on the point in question" (*Engels on "Capital,"* p. 102).

while those branches with the smaller amounts of constant capital win the largest rates of profit"; and he went on to assert (following Sombart) that there are in fact " no traces of this to be found anywhere, either in the historical past or in the present." [1] Engels attempted to deal with this and other related problems in his important " Supplement " to Volume III of *Capital*,[2] giving a suggestive account of the manner in which, in the formative years of the development of capitalism, the prices of commodities were adjusted above or below their values in order to bring the surplus value into equality with the average rate of profit. This essay is certainly the most ambitious attempt to bridge the gap in Marx's argument which we possess. But even this is really little more than a preliminary sketch, and many details still remain to be filled in.

It is, of course, quite open to the Marxist, if he wishes, to by-pass this question by characterising the view expressed by Marx in the passage just quoted as a sort of " Robinsonade." Marx, it might be argued, was really doing little more than take over the traditional Classical idea that exchange ratios were proportional to embodied labour ratios only in that " early and rude state of society " of which Adam Smith spoke. Such a characterisation would not affect the utility of the labour theory of value as a tool for the analysis of *capitalist* society—given a satisfactory solution to the logical problem of the transformation of values into prices; but on the other hand it does not seem likely that Marx himself would have been prepared to accept it. Marx and Engels always insisted very strongly that the logical method of treatment which they adopted in their work on political economy was " nothing else than the historical method, only divested of its historical form and disturbing fortuities." The chain of thought, said Engels,

> " must begin with the same thing that this history begins with and its further course will be nothing but the mirror-image of the historical course in abstract and theoretically consistent form, a corrected mirror-image but corrected according to laws furnished by the real course of history itself, in that each factor can be considered at its ripest point of development, in its classic form." [3]

Given this approach, it seems probable that Marx would have continued to take the view that his *logical* transformation of values into prices was the " corrected-image " of some actual *historical* transformation.

Engels, in the " Supplement " referred to above, tried to solve the problem by suggesting that up to the time when the capitalist form of production came upon the scene, commodity prices in actual fact normally tended to " gravitate towards the values fixed by the Marxian law and oscillate around these values." [4] This suggestion does not on the whole seem very plausible, for fairly obvious reasons connected with the prevalence

[1] *Karl Marx and the Close of his System* (Sweezy's edn.), p. 49. See also Hilferding's reply on pp. 169–72.

[2] Reprinted in *Engels on " Capital,"* pp. 94 ff.

[3] Engels, appendix to *Ludwig Feuerbach*, p. 99.

[4] *Engels on " Capital,"* p. 106.

of various forms of monopoly, the low degree of factor mobility, etc., in most pre-capitalist societies. Fortunately, however, it is not necessary to follow Engels all the way in this matter: it is quite sufficient to show that history has in fact effected a transformation of one type of *supply price* into another.[1] Broadly speaking, there are two main types of supply price to be found in the history of commodity exchange—first, that of the producer who thinks of his net receipts as a reward for his labour, and, second, that of the producer who thinks of his net receipts as a profit on his capital. What Marx did, in effect, was to assume that the first type of supply price was characteristic of all pre-capitalist forms of society (abstracting here from those specific features differentiating pre-capitalist societies from one another which in other contexts he was especially concerned to emphasise), and to concentrate on the task of showing how the coming of capitalism, with its conversion of labour power into a commodity, accomplished the actual transformation of the first type of supply price into the second.[2] This, I think, is the historical transformation of which the logical transformation considered above must be regarded as the counterpart.

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[1] The labour theory of value, like all cost theories, approaches the value problem via the supply price, and can afford a determinate explanation of actual prices only in so far as these are equal to or tend towards supply prices.

[2] See on this point *Capital*, Vol. I (Allen & Unwin edn.), pp. 148–9.

THE ECONOMIST AS A MODERN MISSIONARY[1]

ALTHOUGH economics has never divested itself fully of the stigma of " the dismal science," it is surprising how many romantic doctrines it is used to support. One of the most prominent is the widespread belief in the possibility of rapidly accelerating the development of " under-developed areas." [2] Fundamentally the article of faith which is propagated is that the economic product of most under-developed areas could be made very much higher than it is to-day by means simply of a large injection of capital plus technical and economic " know-how " of various kinds. The White Man, in general, can and should supply the capital. The White economist or technologist can and should supply the know-how.

The resemblance of this to the romantic belief in the eighteenth and nineteenth centuries in the civilising function of the White Man is too close to need much elaboration. The under-developed areas then were, of course, the areas which were under-developed spiritually rather than economically. But happily, these areas more or less coincide. In fact, it could be argued that the best way to define under-developed areas, or rather peoples, is as people who do not think that their mission in life is to show other people how to develop, on the grounds that a capacity for self-deception is the hallmark of an advanced society (witness the large number of psychiatrists required). The way in which the conception of the White Man's burden has developed is also very clear. In the nineteenth century the duty of the White Man was to carry into under-developed areas the elements of a spiritual civilisation, namely religion. If, in some cases, the increase in the natives' happiness was not obvious, this was irrelevant. The important thing was their souls. To-day the White Man's duty is commonly assumed to be to carry into under-developed areas the elements of economic civilisation and society looks to the economist to do his duty. If in some cases, the increase in the natives' happiness is still not patently obvious, this is not relevant. The important thing is " income."

The parallel between the missionary activities which have been expected of the Church, particularly in the nineteenth century, and what is expected of the economist of the twentieth is, of course, no accident. It is natural that in a society in which economic status is very widely regarded as the criterion of success in every way economic " know-how " should tend to replace spiritual holiness as a means of commanding respect. In short, the

[1] I am indebted to Professors E. Devons and S. H. Frankel and Mr. Philip Hayes for many detailed constructive criticisms of earlier drafts of sections of this article.

[2] This doctrine is mainly romantic in its presentation by left-wing parties. Among right-wing parties it is rather the reflection of a hard-headed, shrewd and calculating illusion that this provides the best defence against Communism. In fact, the reverse may often be the case (*e.g.*, where misguided attempts at rapid development merely result in the further enrichment of indigenous ruling classes or the break up of the stabilising influence of religion).

nomist is required to replace the priest. And in so far as many ministers eligion were expected (and, no doubt felt themselves impelled) to carry Gospel into backward areas, so many Ministers of Finance are expected l also, often feel themselves impelled) to carry the economic gospel into kward areas.

This link between the priest and the economist is one which spans more a a mere century or two. The parallel is, in fact, even more acute if the ction of the priest in primitive societies is examined. In such societies the t important form of crisis was usually of an economic character. The s were late, so that harvests were threatened, or big-game (meat) was in t supply (it is amazing how little progress there has been). In such a ation the tribal priest would perform various incantations and rites. In ny cases nothing would happen, though very often it would start raining ner or later. The important point about these rites, however, was that r success or failure mattered very little. One distinguished philosopher, K. Langer, has argued that " the apparently misguided efforts of savages nduce rain by dancing and drumming are not practical mistakes at all; y are rites in which the rain has a part." If rain follows, all the better—rite has been satisfactorily completed.

> " No savage tries to induce a snowstorm in midsummer, nor prays for the ripening of fruits entirely out of season, as he certainly would if he considered his dance and prayer the physical cause of such events. He dances with the rain, he invites the elements to do their part, as they are thought to be somewhere about and merely irresponsive. *This accounts for the fact that no evidence of past failure discourages this practice; for if heaven and earth do not answer him, the rite is simply unconsummated; it was not therefore a 'mistake.' Its failure can be redeemed by finding some extenuating circumstance, some 'counter-charm' that explains the miscarriage of the usual climax.*" [1] (Italics are mine.)

To-day it is the impact on his life of a variety of possible *economic* disasters ch is of greatest concern to the ordinary man. As the primitive man ded medicine-men, diviners and their repertoire of rites and symbols to uce his sense of insecurity in the face of the apparently uncontrolled ural elements, so the modern man needs economists and international nomic agencies in order to reduce his dreadful fear of insecurity in the of economic phenomena. As Langer remarks, " The driving force in nan minds is fear, which begets an imperious demand for security in the ld's confusion, a demand for a world-picture that fills all experience and s each individual a definite orientation amid the terrifying forces of ure and society." [2] It is inevitable that when, as to-day, it is the forces of ety, at least of " economic society," rather than of nature which seem to dominate, the economist should become a more powerful medicine man n the spiritual priest.

An alternative parallel has been drawn by Professor Devons, who main-s that " there seem to be striking similarities between the rôle of economic

[1] S. K. Langer, *Philosophy in a New Key*, New American Library, p. 129.
[2] *Ibid.*, p. 128.

statistics in our society and some of the functions which magic and divination play in primitive society." [1] In Professor Devons' view one of the functions of " statistical magic " is to enable society to reach decisions in a field where otherwise " wrangling would go on indefinitely with no decision ever taken." And like primitive magic, modern statistical magic can never be proved wrong—the materials or the interpretation may often be faulty, but the basic assumption that there are innumerable discoverable and measurable relationships between various economic entities is never criticised.

But before proceeding to discuss the particular way in which the economist missionary should approach his task, I must hasten to add that the above parallel between the witch-doctor in primitive societies and the economist has not been drawn in any critical spirit. Far from it; the economist can, and does, play a rôle in modern society as useful as that of the witch-doctor in much earlier societies, without economics being necessarily an infallible science. Consider, for example, the decision-making function mentioned above. An economy is somewhat like a large ship in which the passengers are the laymen and the officers and crew are the economists. The passengers calmly get on with amusing themselves or boring each other under the impression that the crew are competently handling the ship—that the meteorological officer can say what weather is coming along, the officers of the watch know what orders to give to meet any weather or follow any specified course and the navigating officer knows the best way to get to the destination, etc., etc. In actual fact, nothing of the sort is taking place. Various meteorological officers are probably in violent disagreement about the weather forecast, the officers of the watch may have very different ideas about the orders required to meet any situation (some may argue that no orders are required at all!), various navigators may be disputing the best course to take to reach the destination (assuming that there is an agreed destination, which may not be the case). Should they then all resign? Obviously not. The passengers would swarm all over the bridge and the chart-room, and in the resulting chaos the ship, which previously probably never did worse than go round in circles occasionally, would almost certainly sink.

Another line of defence, which may have a wider appeal, is that no branch of learning, even one which claims to be of practical value, need claim 100% infallibility in order to justify its existence. For example, Professor Devons points out, in connection with economic statistics, that even if the final analysis or policy for which such statistics are compiled may often be subject to a very large margin of error, the data collected may at least throw useful light on some of the important considerations involved.

This line of defence, which can be applied as much to economics as to economic statistics, could probably be equally applied to the witch-doctor in primitive societies. Even if most of his prescriptions were based on no serious foundation at all, concentration on one type of work had probably taught him a few genuine simple rules. He probably knew a little more about the weather than other members of the tribe, and possibly also a little

[1] Professor E. Devons, " Statistics as a Basis for Policy," *Lloyds Bank Review*, July 1954, p. 41–2.

more about the habits of game or the psychology of enemy tribes. Thus, even if 90% of his analyses had been seen to be bogus, it would have been worth while keeping him for the sake of the remaining 10%. The same might hold for economists. There seems to be no reason why economists should be unable to accept simultaneously that:

(*a*) economics is of very little use over most of the field that it covers;
and
(*b*) the pursuit of economics is a legitimate and serious occupation.

In fact, not only is there no need to decry the value of the economist, but the economist deserves congratulation for having responded so splendidly to the demands imposed upon him. As far as rites are concerned, what other witch-doctors or magicians have even approached the impressiveness of, for example, the annual conference of the I.M.F., at which the head economists of all the big tribes are assembled in solemn conclave? As far as mystical signs are concerned, the proliferation of mathematical economics has filled a long-lived gap in a manner, compared with which the entrails of a tiger are amateurish. And as for impressive pregnant symbols, what society has invented one superior to " Bank Rate "? (The accusation by the layman that economists speak in a " mumbo-jumbo " of their own is not one to be denied. On the contrary, it is a cause for self-congratulation.) No, the economist not only fulfils the invaluable social function of creating a sense of security and harmony with the economic elements, but fulfils it with an *élan*, an inventiveness and an array of impressive rites which is a credit to the profession. It is not for nothing that at any gathering of a serious political or social nature, such as a Cabinet meeting, the economist is always present as a sort of chief medicine-man who, after the others have presented their views, will normally have the final say.

If, then, there is no incompatibility between the view that the economist may play a rôle in society similar in some respects to that of the priest in earlier times and the view that economics may be a legitimate subject, good in parts, why should not the economist respond to the call to carry out the obviously allied function of being a missionary? The answer is that there is nothing at all against his being a missionary. What is important is that he should not let others overestimate the contribution he can make to solving the problems of backward areas. The fallibility of economic science in any field is generally admitted to be high.[1] Not only is it higher in backward

[1] Mr. R. Marris states, in connection with professional economists in government service, that " most economists are so unconfident of the accuracy of their techniques that they are tempted to abdicate not only responsibility for value-judgements, but also for final decisions as to the technical advice Ministers should receive " (p. 759) and he mentions also " those [presumably economists, but this is not made clear] who believe that all attempts to develop a successful general theory of economic policy are doomed to failure; that economic advisers should confine themselves to limited, relatively simple, micro-economic questions where there is some chance of providing answers of true scientific accuracy; that they may suggest small structural improvements in the economy, perhaps occasionally venturing so far as to make proposals for the improvements of a single industry, or interference with one particular price-relationship, but never further " (p. 773). Cf. " The Position of Economics and Economists in the Government Machine," ECONOMIC JOURNAL, December 1954, p. 759–83.

areas for reasons mentioned below, but in such areas failures and errors are relatively much more expensive. The economist must therefore discourage excess optimism among both the well-meaning members of advanced societies and the indigenous inhabitants of the backward areas, if subsequent disillusionment and frustration are to be avoided. It is better to be disillusioned in advance.

Of course, the economist can only do this if he has rid himself of any exaggerated notion of the extent to which economic science can help to accelerate the progress of the under-developed areas. And while very few economists have succumbed, the temptation to exaggerate the rôle which economics can play is very strong. Who knows whether, lurking in the collective unconscious of economists taken as a group, there is the desire to operate in economies where scarcities rule the day? When unemployment was officially admitted in academic economics the question of whether or not economics should be limited, as proposed by Professor Robbins, to the study of the allocation of scarce means among competing ends was somewhat pushed into the background, for the relevant question became one of getting rid of certain surplus means—particularly labour! In an economy, such as the United States of America, where leisure is barely moral, the problem of creating sufficient wants (*i.e.*, competing ends) to absorb productive capacity may become chronic in the not too distant future. In such a situation the economist begins to lead a furtive existence. How much happier he can be in a backward economy where scarcity of resources relative to all the wants that HE can envisage (if not the indigenous population) is paramount.

But the most serious temptation probably arises from the impression that one can solve the problem of backward economies by the simple means of projecting on to them the solutions found in the advanced economies with which the economist is already familiar. Like the attitude of many parents to the upbringing of their children, it is often assumed that emulation by under-developed economies of the characteristics of advanced economies is the surest means to rapid progress. This temptation is very insidious, because it suggests that one can become an expert on the applied economics problems of backward areas without stirring from one's armchair. For example, a certain amount of emulation-mindedness is often the cause of excessive reliance on policies such as industrialisation or income-redistribution in under-developed areas.[1]

The whole point is that if the fallibility of economics in its application to the problems of advanced areas is admitted to be large, it must be conceded that its fallibility in its application to the problems of the economic development of backward areas is immeasurably larger. In analysing problems in applied economics that may occur in advanced countries a certain amount of reasoning by analogy is at least permissible. But when we

[1] See outline of some of the objections to the implementation of these policies in certain cases in P. T. Bauer, "The United Nations Report on the Economic Development of Under-developed Countries," ECONOMIC JOURNAL, March 1953, and S. H. Frankel, "United Nations Primer for Development," *Quarterly Journal of Economics*, August 1952, reprinted in *The Economic Impact on Under-developed Societies*, 1953.

shift attention to the problems of backward areas we move on to a different plane of discourse altogether. The problems of industrialisation in, say, Norway may be basically similar to those in France or in the United Kingdom, although the experience in one case will provide only limited guidance in another. But the problems of industrialisation in an area which is "under-developed" socially as well as economically are problems on which we have incomparably less guidance. This aspect of the economist's particular fallibility in this field raises the other reason given above for the need for the economist to discourage undue optimism. This is that the harm that will result from mistakes is proportionately much greater in under-developed areas than in advanced areas. Professor Frankel has been particularly forceful in stressing the harm that may result from attempts to impose on under-developed areas a rate of economic development that exceeds the rate at which the local social structure can adapt itself. And the economist must impress upon those seeking his advice that the manner in which the differences in social conditions determine the character and the pace of economic development is a subject on which the economist, as yet, knows very little indeed.

Nor does it seem possible to overcome the obstacles to economic development caused by inadequate social development by teaching under-developed areas how to emulate, not the present state of advanced economies, but the changes which have taken place in the past, and which have since been judged to have made a major contribution to the development of the present-day advanced economies. The question of how promising this avenue of approach may be has been admirably posed by B. Hoselitz, who writes that—

> "If there are 'developed' or 'advanced' countries in the present, they must have at some time been 'underdeveloped,' and the question may properly be asked whether and to what extent the past history of the economic development of the more advanced countries can serve as a model for the present and immediate future of 'underdeveloped' countries."[1]

It would be out of place in this paper to attempt to summarise the various particular dangers, which, what may be called "historical emulation," can entail. Analytically, these dangers seem to fall under two headings. First, there are the dangers due to the lack of generality which may be attributed to the economic effects of certain historical changes so that the scope for applying knowledge of causal relationships as revealed by economic history to under-developed areas to-day is immediately limited. Furthermore, there appears to be reason to believe that certain historical causal relationships were highly variable with respect to the precise qualitative and quanti-

[1] *The Progress of Underdeveloped Areas*, 1952, edited by Hoselitz, p. v. Professor Hoselitz proceeds to demonstrate, however, that he is fully aware of the limitations—as well as the usefulness—of this method of deriving valid conclusions for accelerating progress in under-developed areas. Also A. Gerschenkron has drawn attention, in the same volume, to the fact that "A good deal of our thinking about industrialization of backward countries is dominated—consciously or unconsciously—by the grand Marxian generalization according to which it is the history of advanced or established industrial countries which traces out the road of development for the more backward countries," *ibid.*, p. 4.

tative composition of the changes that took place.[1] Second, there is an enormous difference in the problems involved between the economic development of a country at a time when no other countries are more advanced and its economic development in a world in which many other countries are already in a much more advanced state of development. Finally, there is little reason to believe that the social conditions existing in any backward area to-day correspond to the social conditions that existed, in the past, in what are now advanced countries.

Economists who work in this field are well aware of the social limits to economic development. Their problem is usually to convince others that he cannot wave away these limits with any magic economics wand. But it may be equally important to make others aware of the economic limits to social development. Otherwise there is the danger that attempts will be made to speed up the social development too rapidly. There is often a tendency to react to the information that local social structures usually slow down the rate at which economic development can take place by taking the ne " Well let's revolutionise the social structures." Not only will this often ad to claims and demands which are beyond the economic resources of the nder-developed areas to satisfy and which are based on emotional rather an rational criteria, but in particular, the actual type of social development hich is best fitted to promote the economic progress of individual under-eveloped areas, may in some cases be better served by the gradual adapta-on of existing social structure than by attempts to graft on new ones.[2]

Thus while he must modestly insist that if economic progress is desired o amount of economics " know-how " will avoid some social costs being ncurred, the economist must also be quick to point out that in so far as ocial revolution is to be the goal no amount of economics " know-how " ill prevent the economic framework from being subject to severe strains. n fact, if it is found that economic innovation (particularly of a techno-ogical character) is being pushed too fast, it may not be impossible to slow t down. But once social emulation has taken root, as it already has in nany cases, there is little that the outside world can do to moderate it. urthermore, the need to recognise the social limits to economic progress is ne which applies mainly to the advanced countries. The need to recognise he economic limits to social evolution is one which has to be put across nainly to the indigenous populations of the under-developed countries.[3]

[1] See, for example, M. H. Dobb, *Studies in the Development of Capitalism*, 1946, p. 277.

[2] See, for example, G. C. Allen, *A Short Economic History of Modern Japan*, pp. 154 and 9–10; nd Gerschenkron in (edited) B. Hoselitz, *op. cit.*, pp. 7 and 19.

[3] In many cases, of course, social or economic emulation has already taken root, or conditions ave so changed that continual spontaneous and locally inspired desires for emulation may be xpected. One interesting example of unavoidable emulation has been given by Ragnar Nurkse, who has pointed out that the conspicuous consumption of the wealthy classes in under-developed reas, which is a hindrance to the progress of these areas, is a form of undesirable emulation of dvanced countries (R. Nurkse, " Some International Aspects of the Problem of Economic Develop-nent," *American Economic Review*, May 1952). In this article Nurkse compares this emulation with Duesenberry's " demonstration effect." In the revised version of the article which appeared in *Problems of Capital Formation in Under-developed Countries*, Chap. III, Nurkse states that the same point has been made earlier by R. Prebisch.

To sum up, the rôle of the economist in modern society may be compared that of the witch-doctor in primitive societies in so far as he may be erforming a useful function while being far from infallible or even scientific. his rather religious status of the economist leads to his being expected to rry out missionary activities in less-developed countries in the sense of reaching the economic gospel to them. But the problems of such countries e problems about which the economist is even more fallible than on his me ground. Also, mistakes will be much more costly in terms of the roportionate amount of resources of the communities concerned which are asted or in terms of possible social disruption. The economist must erefore continually insist on the limitations to the degree to which he can celerate the economic progress of backward areas. To do this he must, course, make sure that despite many powerful temptations, he himself is nder no illusions about his competence to draw up blueprints for economic evelopment.

All this does not mean that the function of the economist, as far as nder-developed areas are concerned, is simply to issue warnings. There ill no doubt be some spheres in which economists will make substantial ntributions to the solution of certain problems. Above all, the economist n draw attention to the choice which will usually have to be made between conomic progress and the maintenance of existing social structures. If me societies then choose the " progress " and are prepared to face the cial upheavals, the economist can only do his best to ensure that the conomic innovations are not disastrous by insisting on " rational " economic iteria rather than emotional criteria. The former may often be wrong mis-applied, but they will be invariably better than the latter.

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REVIEWS

An Expenditure Tax. By NICHOLAS KALDOR. (London: Allen & Unwin, 1955. Pp. 249. 15*s*.)

MR. KALDOR'S book is interesting both for its contributions to pure tax theory, and for its advocacy of an expenditure tax, although it suffers from being thus written at two levels. I shall deal only with the arguments for an expenditure tax, which is advocated by Mr. Kaldor on two grounds, first that it would be more equitable than the present system, and second that it would permit capitalism to function more efficiently, and more liberally, than it is otherwise likely to do for long in a full-employment, " welfare " state.

Take the equity argument. There is no doubt that net income figures are no better than an illusion if regarded as a measure of people's relative living standards. There is also little consolation for those who believe in an approach to greater equality, in the thought that our extreme tax rates on high incomes must mean that rich people are rapidly dissipating their property if they live far beyond their incomes. The high incidence of death duties means that a millionaire can live at a rate of two or three times his net income without making a significant difference to the amount he can leave, and this without capital gains. If his estate is intelligently managed, and invested in low-yielding assets with a near certainty of capital gains—which is not difficult in a full-employment state—he should be able to spend many times his net income without getting any poorer at all. And then again, surtax is an easy tax to avoid (I know a well-known lawyer who describes it as a purely voluntary tax). Some, of course, may argue that people just do not overspend their taxable incomes like this. There are no figures either way (though on the subject of avoidance, and investment in low-yielding stocks, Mr. Kaldor shows that the surtax yield is suspiciously low), but I think one only needs to get about a bit, and keep one's eyes open, to be convinced they do.

It is widely accepted that the amount of redistribution suggested by our extremely progressive tax structure is equitable. If, then, the tax system has but a small fraction of the redistributive effect it suggests, it is a sham. The people it hits hard are those with high salaries but little property, and no opportunity for untaxed perquisites; there would certainly be a much less widespread view that it is just these, the best officials and professionals, who should be the hardest hit. (" It's not fair," a don remarked the other day, " surtax was never meant for the likes of us.") It cannot be right to maintain very high nominal rates of tax just for political appearances. The sham will be seen through, and in the meantime there is bound to be some erosion of those tax-paying standards, which have hitherto been one of the great strengths of the British economy.

I have put the point more brashly than Mr. Kaldor does, whose argument throughout, sweetly reasonable. His starting point, with which there can little disagreement, is that our notions of equity demand that tax should based on a person's ability to pay; that this must be assessed by reference his purchasing power; and that taxable income, as at present defined der English law, is, for a significant slice of the wealthier people, a very or measure of purchasing power. First, property must count for some-ing. Secondly, taxable income is a poor measure of income by any asonable definition of income. Without going into niceties (though Mr. aldor does), income should be defined as " accrued income " that is, as ual to the annual amount by which property would grow if nothing were nsumed. But taxable income falls short of accrued income by capital ins, gifts, gambling gains and various other receipts deemed to be of a pital nature (the legal concept of income has no economic or social signi-ance, being based on husbandry—" Income, it has been said, is the fruit at ripens on and can be plucked off the tree. If there is to be income there-re there must not only be fruit but also a tree " (Royal Commission Report, 27)). So far, I think, few would disagree with Mr. Kaldor. The Inland evenue and all members of the Royal Commission would seem to admit e main point.

Would a reform of the definition of income to an accrual basis be pos-le? The nearest one could get in practice would be to bring in some of e receipts at present left out, and to have a capital gains tax on a realisation sis. While Mr. Kaldor would accept that improvement is possible along ese lines (as witness not so much this book, but the Minority Report of the oyal Commission), the result would be very far short of an equitable basis assessment. First, the spending power of capital itself is untouched by a pital-gains tax. Our millionaire could still live at a great rate for a long ne. Secondly, capital gains could be assessed only on the monetary value purchases and sales. But our inflationary age would then produce urious gains. A fall in interest rates also produces gains, which are at least rtly spurious. It would be impossible to separate out these effects from ch real individual gains as result from the growth of firms through the oughing back of profits, and from the purchase of bonds below par. This not to say that a capital-gains tax would be very unjust on this account. inflationary gains, which can be regarded as monetary savings made by e individual to keep his real capital intact, are taxed, then the individual ses in real terms—but so do those people who are not so clever and put eir savings into bonds or the bank (and if anyone says that the fruits of ancial cleverness should not be taxed, let him consider what our tax system es to people who are clever enough to earn high taxable incomes). But, vertheless, leaving aside any more purely economic disadvantages of a pital-gains tax, it is easy to see that it falls well short of the high standards equity which Mr. Kaldor sets himself to satisfy.

The logic of the step from here to an expenditure tax is clear. No prac-al system could come near to the merits of an assessment on an accrued-

income basis: and even the latter leaves out of account the undeniable benefits of having capital (apart from any accrued income resulting from it). But how, anyway, could one weigh up in a common measure the spending power of capital on the one hand and income on the other? There is no objective basis. One man, for example, with no family, may feel no loss from spending all his capital during his life—but another may. The subjective basis is clear. Let spending itself be the measure of spending power, and the basis of taxation. Not only is the problem of property solved, but also the problem of capital gains. Let each decide for himself whether his gains are real, and whether he can therefore afford to spend more. Let taxation be on the basis of what one takes out of the pool in the shape of consumption, and not (partly) on the basis of what one puts into it in the shape of work.

This is the argument from equity. There is no doubt that it is, to-day, a very powerful argument. So long as Victorian attitudes to property, as something one possessed in trust for one's children, prevailed—then accrued income was a sound measure of one's command over current resources. Furthermore, until recently taxable income was a better approximation to accrued income than it has recently become. There are two reasons for this. First, there is the very height of income taxation itself, which now makes many property owners prepared to accept very low yields in return for the prospect of capital gain, and also to exploit legal loopholes in the tax structure in a manner which they would not have dreamed of twenty years ago. Secondly, excess demands on our economic resources have given rise to fiscal and other encouragement to company saving, which itself engenders the low dividend yields and good prospects of capital appreciation for which the high surtax payers were waiting.

Let us turn to the economic (and social) arguments. Under an expenditure tax, it is obvious that people can save on much better terms—the richer you are, the better the terms compared with the present situation. It is also fairly widely accepted that more private savings are desirable—though it is at this point that Mr. Kaldor's views differ from those of many, perhaps most, socialists. Savings now come pre-eminently from companies, which are encouraged to save by discriminatory taxation against dividends (though the reason for this is, of course, political as well as economic). Mr. Kaldor argues that this has undesirable effects. The dividend restraint results in high earnings yields, which, to some extent at least, set the standard for earnings on new capital: consequently profits margins are likely to rise (the argument here is *a priori* but fairly convincing—the figures to date are consistent with the argument, but can be explained in other ways). In the long run, the tax burden is therefore shifted to the consumer. But, also, these large company savings increase monopoly, and increase the concentration of economic power. If there are no good investment opportunities within the business itself, the directors no longer pay out the money, but spread into other lines of activity, and acquire other businesses—a well-attested feature of post-war capitalism. Dividend limitation undoubtedly tends towards a change in the structure of industry, away from many people's idea of a liberal and competitive capitalism. But if an expenditure tax could take the place of income and surtax, then company taxation as such could and should be abandoned altogether (though there would be a tax on investment, or company expenditure, if this were required to keep a desirable level of investment). This should result in a greater distribution of profits.

Mr. Kaldor does not deal with the effects which this radical change would have on the total required level of taxation, or on the pattern of private savings which would result. Suppose that companies distributed the whole of the reduction in tax they would enjoy. If the total amount of tax raised were unchanged, then personal disposable incomes would be unchanged, and the greater incentive to save, or not dissave, could be relied on to result in some increase in personal savings. It follows that taxation could be reduced. *Ceteris paribus*, company savings would be unchanged, while personal savings would be higher and Budget surpluses lower or negative. This might be desirable in some ways, but it would not have a very significant effect on company finance or the concentration of economic power. But, with no distributed profits tax, shareholders might induce, or compel, companies to save much less than before—though whether they would in fact is debatable. But if they did, one could no longer be sure that Budget surpluses would not have to increase: that the total of tax might not have to rise. Whether it would or not depends on the magnitude of the effect an expenditure tax would have on the total of personal savings. We know too little about motives for saving and dissaving to be able to assess this with confidence; but it must be remembered that inflation and high death duties are strong influences against saving; and it is doubtful whether an expenditure tax would be much of a help in solving the problem of wage inflation.

A reduction in company saving is, presumably, what Mr. Kaldor would hope for. With an expenditure tax, he believes that high dividends would no longer be socially undesirable, and that it would be healthier for companies to have to go more to the market for new money, while small or new companies would find it easier to get finance. Even if the total of taxation had to rise, which is by no means necessarily the case, this would not matter, for the real burden of taxation lies in the " distorting " effects it has—and an expenditure tax has no distorting effects on savings or risk-taking, and less than income tax so far as work is concerned.

Another economic effect which should be briefly noticed is that there would be considerably more power to the Chancellor's elbow if he were armed with an investment tax and an effective expenditure tax, which could be independently varied. Finally, the expenditure tax should tend to make for smaller fluctuations in consumption, so long as the spreading provisions, which Mr. Kaldor envisages for durable consumption goods, were not overdone.

All this, however, would be far in the future, even if Mr. Kaldor were given *carte blanche*. For he believes (no doubt rightly) that the proposed

changes are too radical, and the extent to which they are administratively workable is too unknown for a comprehensive change to be effected. His immediate proposal is that an expenditure tax should take the place only of surtax. Mr. Kaldor does not say what other changes he would recommend if this were done; but some reduction in the distributed profits tax would be an obvious corollary, and would be an approach towards the change in company finance he would like to see. It is a pity Mr. Kaldor does not go into this more.

Unless one believes that the level and the progressiveness of direct taxation can be, and will be, greatly reduced in the coming decades there is undeniably a powerful case in equity for an expenditure tax, and also a good case on purely economic grounds. It seems to me that essentially Mr. Kaldor is a very progressive Conservative. He does not approve of the present inequality of consumption, but he believes that capitalism does not work as efficiently as it should with the present burden of taxation, and that the devices used to promote company savings, and keep the money out of the hands of shareholders, will not only prove ineffective in the end, but will also increase the monopolisation of industry and the concentration of economic power. Essentially his tax is designed to make consumption more equal, and capitalism both more socially acceptable and more efficient.

It would, in my opinion, be foolish to dismiss the expenditure surtax, in the belief that our present tax system can continue without any radical change. It seems to me that we shall either have a capital-gains tax, like most other advanced countries, pretty soon, or Mr. Kaldor's tax; or even both, for so long as an expenditure tax took the place only of surtax, the advocates of a capital-gains tax would not be deprived of their arguments. But for practical reasons the choice may lie between the two, in which case there is little doubt to my mind that the expenditure tax could be used, if so desired, as a more effective instrument for restraining the consumption of the rich, that it would be more equitable as between individuals, and more beneficial economically, than a capital-gains tax. Moreover, a capital-gains tax would become redundant if it proved possible to extend the scope of the expenditure far enough to be able to rely only on it, and on indirect taxes.

Lastly, would it work? Unless there is an obvious "knock-down" reason why it could not work, and I do not think there is, this question is, at this juncture, the least interesting. For unless enough of the right people are convinced that it would be a very good tax if it could be made to work, no sympathetic expert assessment of its workability will be forthcoming.

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The Great Inflation 1939-1951. By A. J. BROWN. (London: Oxford University Press for the Royal Institute of International Affairs, 1955. Pp. 321. 30*s*.)

PROFESSOR BROWN's long-awaited study of inflation may best be described as a pioneering work in applied econometrics, by which term is meant the measurement of interesting things by ingeniously simple if sometimes dubious methods. This is both its strength and its weakness. On the one hand, the book abounds in highly suggestive attempts to quantify critical magnitudes at which policy-orientated economists have been content to guess—such as the critical rate of price increase beyond which inflation gets out of hand, or the critical level of unemployment below which wages increase faster than productivity. On the other hand, the author's conscious minimisation of general theoretical analysis of inflation in favour of piecemeal analysis has some unfortunate results, notably in occasional confusion of stock and flow analysis and a tendency for the quantity theory to keep slipping in by the back door after having been firmly ejected by the front; while the significance of some of the measurements is open to statistical and economic objection or at least alternative interpretation.

The central theme of the book is the predominance of the mechanism of cost inflation and the wage–price spiral, operating in an environment of cost-determined manufacturing prices, market-determined materials prices and wages determined by the cost of living, as contrasted with the mechanism of demand inflation in an environment of flexible prices. In developing this theme Professor Brown rather unfairly attributes belief in the latter mechanism to "the theorists," most of whom "have not caught up with actuality" (p. v). On the contrary, cost-inflation models in abundance have been a logical post-war extension of Keynesian theory—more so than the extension of the multiplier to prices in full employment which Professor Brown finds inadequate in Chapter 3—and Professor Brown might more fairly claim to have brought such models down from the stratosphere into the arena of statistical testing and verification. Moreover, the dependence of cost inflation on an adequately elastic supply of money, which Professor Brown fully recognises, leaves the door open to the classically-minded theorist to challenge the analytical validity (as distinct from descriptive usefulness) of the contrast between the two inflationary mechanisms.

These, however, are not matters with which Professor Brown is greatly concerned: his main interest is in description and analysis of the actual course of inflation. He begins with a brief theoretical chapter which defines inflation as an inordinate rise in prices or an inordinate increase in the money supply in a controlled system (suppressed inflation), describes the two mechanisms of price change and the process by which a plethora of money is created, shows that the common element in both open and suppressed inflation is excess demand and rejects any simple theory of causation. The shifts of emphasis between quantity of money and excess demand, here and elsewhere in the book, are rather disconcerting, and are likely to get Professor

Brown tagged, in spite of himself, as a quantity theorist. From theory, the argument moves to a survey of the course of inflation, first between 1939 and 1948, and then by stages between 1949 and 1951. Necessarily the techniques employed are crude, relying mainly on price data, and the explanations of individual national deviations condensed and rather unsatisfactory; but the survey does establish a distinction between countries grouped around the British-American norm of a price increase to 1948 of about 125%, and countries experiencing abnormal inflation or hyper-inflation, while the phase analysis reveals the predominant world-wide causal factors.

Analysis of the inflationary process begins with Chapter 3, which is concerned with the multiplier effects of war expenditure and demonstrates the inapplicability (for obvious reasons) of multiplier analysis to the main belligerents. The next four chapters, which contain Professor Brown's most important contributions, deal with the wage–price spiral. Three are concerned with the prerequisites, distributional aspects, and speed and narrowing of the spiral; all three contain extremely interesting material, the analysis of wage-level behaviour in the first being especially suggestive—the author's rather guarded argument implying that in this country 10% or more unemployment might be required to keep wages from rising faster than productivity, on the basis of inter-war experience. The fourth is an impressive analysis of the techniques and lessons of war-time price and wage control—perhaps the best chapter in the book. In all four there is a happy marriage of theoretical and statistical investigation.

The next four chapters are concerned with a variety of special subjects—hyper-inflation, interest rates, the influence of liquidity and international aspects of inflation. Here the argument is equally interesting, but the marriage of techniques tends to be less happy, and both the statistical and theoretical arguments seem faulty in important respects. The general concept of liquidity employed, for example, is such as to confuse the two vitally different notions of a more liquid composition of assets and a greater total of assets relative to income, while the devaluation analysis employs the elasticity approach, whose application to post-war conditions has been justly criticised by many writers. On the statistical side, the scatter diagram on p. 226 is open to as many interpretations as the cloud in *Hamlet*, while the " elasticity of substitution " described on p. 269 and illustrated on p. 283, suggestive as it is, is something quite different from the author's own concept.

In the concluding chapter Professor Brown ascribes the great inflation to three factors: war-time increases in demand financed by budget deficits, temporary speculative increases in demand for commodities and the bias under full employment towards the wage–price spiral. The obvious and continuing problems of controlling the latter he states very clearly, and he presents the interesting argument that, though the use of price-subsidies to restrain the spiral broke down after the War in face of a rising price trend, temporary subsidies could nevertheless be used to reduce the difficulties by preventing speculative commodity booms (such as that of 1950–51) from touching off the spiral.

Considered as a whole, the book is an impressive achievement of organisation of a vast amount of material; no review can convey adequately the range of topics discussed, the variety of examples cited, and the ingenuity applied to the quantification of economic relationships. It is not easy reading, despite its simple style, and the professional economist is likely to be irritated rather than helped by the absence of reference to statistical sources, the extreme simplification of the charts and the *ad hoc* treatment of theory. Also, while its topic is the world, its viewpoint and emphasis are decidedly Anglo-centric. But it is a major work, despite its limitations, and one which economists of widely different interests can mine with profit.

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Business Concentration and Price Policy. A Conference of the Universities-National Bureau Committee for Economic Research. (Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Geoffrey Cumberlege), 1955. Pp. 511. 72*s*.)

THE meaning of Section 1 of the Sherman Act is now fairly definitive, though marginal argumentation about it will no doubt continue to contribute to high and stable employment for American lawyers. The Courts have pronounced on the main varieties of restrictions on competition, and the economists have found most of their pronouncements good. What it is to monopolise is a much more open question, and point is lent to inquiries into it by the apprehension, lying always just below the surface of American thought on anti-trust, that the ease with which monopoly is established may vary directly, and not inversely, with the freedom of trade from restraints. The slogan of a free fight and let the best man win is simple, intelligible and appealing; but if Alexander is not to be left with no more worlds to conquer it may sometimes be necessary to tie one hand behind his back. Such might be one rationalisation of the decision in the A. & P. case.

This symposium of the Universities-National Bureau Committee for Economic Research takes stock of the help which economics can give on this issue. The collection is remarkable for the eminence of its participants (both essayists and critics), for the standard, and in some cases originality, of their contributions, and for the breadth of its coverage. American economists take their symposia with proper seriousness. The measurement of business structure is covered by Conklin and Goldstein, on definitions of industry, product, and similar basic bricks of the statistical analyst; Rosenbluth, on the measurement of concentration; and Adelman, on the measurement of vertical integration. I recommend Rosenbluth's article in particular as a lucid and balanced account of the *statistical* issues arising in connection with frequency distributions of firm size and with summarising their characteristics. The mechanics of development of concentration fall to Markham, on mergers; Lintner and Butters, on the effects of taxes; and Smith, on

economies of scale. Ruggles' essay on price flexibility is the only one which can properly be regarded as concerned with empirical investigation of the consequences of concentration. Edwards stands, in a sense, somewhat aside from the main stream of the book; his emphasis on the importance of unspecialised size (" conglomerate bigness "), even in the absence of dominance in particular markets, implies a definition of concentration more like that of Berle and Means than that, vaguely linked with oligopoly theory, employed by most of the contributors.

Finally, there are the theorists—Scitovsky and Miller. I classify them thus on the negative grounds of having to find a name for those who neither measure quantities nor test hypotheses. (Machlup, who contributes an essay on discrimination, can be classified as a neologist.) I intend no discredit to their two very competent essays, but take it rather as a disturbing reflection on the present state of economics in this field, when I say that they are also negative. In an ideal world, the theorist (even more ideally, the economist wearing his theorist's hat) would engage himself in producing hypotheses, whose concepts would guide the work of the collector of statistics and whose verification would be the daily bread of the empirical worker. Whatever else competition theorists may have done, they have not done this, and the absence from this volume of any essay except Ruggles' on the *effects* of concentration is confirmatory evidence of the failure of traditional competition theory to produce testable hypotheses. Such being the case, the work of the theorists is bound to fit somewhat uneasily into so statistical a company.

Scitovsky is loyal to tradition. He gives an admirably concise summary of the propositions on which we have all been nourished and resolutely defends them from contamination by statistical mud. There is an x, defined as a particular state of mind of an entrepreneur but called for convenience concentration, which may have important effects on the distribution of income, power and resources, and on the efficiency of the firm, at a point of time or over time. Statisticians are interested in measuring something which they also, confusingly, call concentration and propose a variety of measures, but " economic theory cannot offer much help in choosing among these and similar alternatives; and the little help it does provide is largely negative." My summary, though unfair to Scitovsky, is not to traditional theory, and it is one of the merits of Scitovsky's essay that he refuses to veil the Emperor's nakedness with the clouds of pseudo-realism with which logical consistency is so often impaired.

Miller devotes a good deal of his space to the same point as I have been making. Since the empirical irrelevance of competition theory, though widely recognised, is not, pragmatically speaking, accepted, this is all to the good. But he then, it seems to me, mistakes a mirage for the promised land, and marches stoutly off in the wrong direction. Or rather, he would have us all march off in all possible directions to gather material for " a broad statistical picture of the anatomy of industry and the processes of competition in major sectors and subsectors of the economy." It is significant

that this proposal is prefaced by the judgment that competition theory is now at the stage in which business-cycle theory stood in 1900, " before the pioneering data collection and analysis of the National Bureau of Economic Research . . . and other similar groups." It is easy to smell the heresy that, if only you collect enough data and shuffle them around on the floor for long enough, concepts and connections will somehow suggest themselves.

Nor is Miller alone in his heresy. There is, certainly, frequent obeisance to the true faith; pleas that future work should concentrate on the development of verifiable hypotheses. But this is, in a sense, logically implied in any empirical work which is not pure chronology. The real need is for hypotheses which have sufficient generality to provide an organising principle for the potential flood of Doctoral dissertations on more limited issues. It is because they lack such generality that full cost theories, of which Hefleblower provides an admirable review, have had so limited an impact. No one doubts that the gross margin is a tool of managerial thought or that margins exhibit some stability. But until we are given some hypotheses as to how the margin is determined and on what its stability depends, the theories remain limited and trivial.

I note, but cannot share, Stigler's faith that " when our knowledge of economic growth has increased, we shall not be called upon to reverse all the conclusions reached by stationary analysis," for I find it increasingly difficult to convince myself that the stationary analysis contains any conclusions. The traditional analysis, in its pure form, is essentially the definition of an equilibrium price writ large. Hence, we cannot expect to find any conclusions when it ceases to be possible to define such an equilibrium price, as in the large class of cases with which this volume is concerned. The dearth of essays on the effects of business concentration is no accident. Modern, like ancient, oligopoly theory is still in the state of saying that anything can happen, although observing that, as a matter of fact, it doesn't. Moreover, even when the imp of interdependence can be corked up in his bottle, modern exegesis is steadily refining away the more rugged prophecies of the testament of the thirties. Excess capacity was put in his place long ago; sub-optimal firms are but shadows of their former selves; and, with the welfare theorists chiselling away on the other side of the tombstone, it becomes a breach of good taste to say more than that if the initial conditions are different so will be the end result.

This is poor fare for the red-blooded trust-buster, and it is not surprising that, when passions ran high, he was told to get his teeth into " workable competition." But it is equally unsurprising that this bone proved to be a rubber one—resilient, but inorganic and unsustaining. Workable competition is, in fact, a monument of good sense in place of an analytical model; no doubt, we could not have had the good sense without abandoning the model, but in so doing, the possibilities of further developing the thought were lost also.

If we are to return to model building, as I believe we must, we ought at least to profit from Clark's excursus to dismantle the model in which, I quote

from Stigler, " the output of a competitive industry is such that price equals long-run marginal cost." I say nothing against this as a device for answering the question, " Why is the pattern of output (prices) at a particular moment what it is and not something different? " But competition theory needs to be distinguished from value theory. More specifically, our object should be to explain not " price," which, in value theory and the title of this volume, is the summary expression of all the relations between an enterprise and its environment, but rather those aspects of business performance, such as innovation and the elimination of the unfit, which command our attention as political economists. The parts are contained in the whole, but need to be selected from it before we can rebuild usefully.

Let me end, however, by emphasising that this symposium does what can be done at the present stage of thought most admirably. I am tempted to say that no one working in this field can afford to be without it. Unfortunately high concentration of talent has had its traditional effect on price, and 72*s.* may well price the product out of some of the most important markets.

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The Great Crash: 1929. By J. K. Galbraith. (Cambridge, Mass.: Houghton Mifflin (London: Hamish Hamilton), 1955. Pp. 212. 12*s.* 6*d.*)

This is both a fascinating and a topical book. It is topical because there is no more important question for the economic policy of the next few years than the question whether there is a real risk that we may sometime be again involved in another great crash similar to that of 1929. Professor Galbraith specifically disowns the intention of telling us " whether or when the misfortunes of 1929 will recur. One of the frequent lessons of that year will by now be plain: [he argues near the end of the book] it is that very specific and personal misfortune awaits those who presume to believe that the future is revealed to them." But even if we are prepared to accept that view, there remains a responsibility to consider how and why the great crash was precipitated and how far we are at all adequately armed against similar dangers to-day.

Professor Galbraith is primarily concerned with how it happened: with the boom and crash in the stock market in particular. He pictures in the upward phase the ever-widening gap between fact and expectation. The stock-exchange boom had most of the qualities of the South Sea Bubble: the wild speculation in Florida real estate, the discovery of the unlimited possibilities of " leverage " through a pyramid of holding companies, the vast opportunities for margin trading and the preparedness of apparently reputable banks to use enormous resources to facilitate it, all these superimposed on a superb confidence in the arrival of the millennium contributed to a momentum of expansion that ultimately lost all contact with reality. But what Professor Galbraith does not tell us—and I wish he did—is just

when and how far the valuation of the more solid and respectable industrial securities departed from a reasonable discounting of realistically possible future earnings if full employment had continued.

What is extraordinarily interesting is how late in the boom reasonably responsible economists, like Irving Fisher and the group of forecasters in the Harvard Economic Society, went on assuring themselves and others that nothing was seriously wrong and, in Fisher's case at least, that stock prices " had reached what looks like a permanently high plateau." The Harvard group would seem to have been thinking more of industrial activity than of stock-exchange speculation, and may have under-rated the capacity of the latter to bring down the former. But Fisher was obviously interested in the stock market. Was he taking a realistic view on an unrealistic assumption that the progress of the twenties could continue unimpaired? Was he, like others, at war with reality? The truth here seems to me of great importance and interest. For if our own generation ever repeats the absurdities of that remarkable epoch, it will, I suspect, be because infinitely precise and plausible extrapolations have been built on infinitely foolish assumptions regarding the infallibility of steady progress to the millennium.

In the downward, as in the upward phase, Professor Galbraith catalogues the catastrophes and delineates the disasters. We see the bankers attempting, like Mrs. Partington, to arrest the disaster by making brave but wholly inadequate loans. We see the stronger elements in the market each in turn persuaded that the bottom had been reached, and each in turn overwhelmed because it had not. And finally there was nothing left to arrest the downrush. And leverages and pyramids which had given power in the upsurge meant concentration of the effects of disaster on the collapse.

As a cautionary tale this is horrifying; for those of us who vaguely remember those times it re-creates and revivifies the alarms. But an economist of inquiring mind will inevitably wish that Professor Galbraith had gone farther than he has done into the relations between the stock-market crash and the subsequent economic and industrial crash. He adds relatively little to what has been well said about those events by Tom Wilson and others writing soon after. In a chapter entitled " Cause and Consequence " Professor Galbraith attributes the downturn principally to a failure of consumption to expand *pari passu* with industrial production, and a failure in consequence of incentives to invest to increase correspondingly with savings, which were vastly stimulated by the stock-market boom itself and by the concentration of the fruits of increasing productivity in the hands of those who received profits. This may be an adequate explanation of the particular case of America in 1929. But it is not obvious that a widely spread speculation, with windfall gains from capital appreciation might not increase the propensity to consume and feed an inflation in that way. In our own more recent conditions that would seem to have been happening.

But where one would most welcome a closer analysis is in regard to the propagation of the industrial downturn and collapse. Clearly the widespread margin calls must have meant that all over the country individuals

were contracting consumption in a desperate attempt to save their capital. One would like to see a close examination of the comparative timing of the stock-market disasters and of the course of consumption. It is not difficult to invent a model which would provide the necessary interconnections, but one would like to know whether it bears resemblances to the actual chain of events.

All this is—as I see it—of real and immediate importance. There has been a growing tendency among many of us to assume that if we can keep the real factors in the economic environment—consumption, government spending, fixed investment—sufficiently under control by operating on the totals of personal income after tax, on interest rates and the like, we can safely neglect the froth and scum of speculation, and to think that intense market activity is on the whole beneficial. Professor Galbraith's book forces one to ask oneself whether speculation, completely at war with realities, may not in some circumstances create a whole set of new disturbing factors, big enough to modify the environment and incapable of being left unnoticed and unregulated. It seems increasingly clear that the effects of stock-market appreciation or depreciation on consumption and investment is a subject which badly needs research, but into which—in our case at least—research is made infinitely difficult by lack of data.

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Saggi Bibliografici e Storici intorno alle Dottrine Economiche. By LUIGI EINAUDI. (Rome: Edizioni di Storia e Letteratura, 1953. Pp. 367. Lire 4,000.)

IN this volume Dr. Einaudi has given us a selection of his more important essays on the history of economic thought. The opening sections deal especially with the bibliography of the subject. Dr. Einaudi is the collector, reputedly, of the finest private library of economics in the world to-day and appears in these opening essays as a supremely eminent descendant of the line of Foxwell, Hollander, Seligman and, going back much further, of McCulloch, Morellet and Massie. How passionate a bibliographer Dr. Einaudi is, can be exemplified from his confession apropos of Higgs' massive catalogue of economic literature (1751–75) that " perhaps through some intellectual perversion I have *read*, not merely paged through, this great volume with an interest mounting more even than if it were a novel."

The opening essay, entitled " A Tour Among My Books," is in praise of that, in contemporary Britain, rapidly declining institution, the private library —in some respects, as Dr. Einaudi observes, so much more interesting than public libraries. Dr. Einaudi thinks that students and academics should spend much more on old books than on new ones—which, so far as they can spend anything on books at all, is very sound advice—though hardly encouraging to contemporary authors. Anyhow, it is clear that if students and scholars to-day, and increasingly the vast generations to come, are to have their own copies of the important [illegible] will have to be

ependent on a flow of reliable reprints. Dr. Einaudi has a section entitled How our Classics ought *Not* to be Reprinted." As examples of how *not* to o it he cites the Mixter edition of John Rae, the Levy edition of Senior and ıe *Memorials of Alfred Marshall*: " Marshal fu punito pel vizio di tagliuzzare riviste; ché gli editori dei suoi *Memorials*, a risparmio di spazio, tagliuzarono lui ". Among examples of how new editions *should* be done, Cannan's *Vealth of Nations* is mentioned. But as regards Adam Smith, Dr. Einaudi is d to exclaim, " Oh, why has no-one ever thought of publishing the whole ody of Smith's works? " and he calls for new editions of the *Theory of Ioral Sentiments* and the *Essays on Philosophical Subjects*. In these days of yper-specialisation there certainly seems to be less and less chance of any ıdividual feeling competent or audacious enough to edit the complete ritings of comprehensive authors like Smith, Hume, Locke, Bentham and S. Mill, or even Jevons, Pareto, or Sidgwick, or soon perhaps Marshall and eynes. Only narrower thinkers like Ricardo have much chance of a comlete edition, unless some sort of combined operation, difficult to organise, ın be arranged. Dr. Einaudi writes (1938) of Smith as " a great man . . . ho would justify the editorial care and almost the religious devotion which pparently has been paid only to Dante and Shakespeare," and he devotes section to a *catalogue raisonné* of his own collection of books by and on Smith.)r. Einaudi describes Smith as " a minute observer of daily life, a critic who ›unded his arguments on historical experience, and a moralist," who, owever, as a theorist was not concerned with " abstract hypotheses," but nly " to formulate the hypotheses which helped him to interpret the facts f his time." Though second to none as an admirer of Smith—and an adıirer who calls for new editions of Smith's writings—Dr. Einaudi does ot take leave of his critical faculties: " Almost certainly Petty, Cantillon nd Galiani are greater theorists than Adam Smith and the Physiocrats ırpass him as systematizers." But Dr. Einaudi's moral here seems to be not › much unfavourable to Smith as to over-abstraction and systematisation.

A short account of the Sraffa edition of Ricardo is headed " Dalla ggenda al monumento." The other writings in this volume deal mainly ith Italian economists and include the very valuable essay on Galiani. he quality and authority of these essays and their very rare interest should ıake the volume a fruitful source for study and re-study for many decades › come.

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Incertainty and Business Decisions. A Symposium edited by C. F. CARTER, G. P. MEREDITH and G. L. S. SHACKLE. (Liverpool: Liverpool University Press, 1954. Pp. 104. 10*s.* 6*d.*)

THIS small book is made up principally of the contributions to a sym›osium on business decisions under uncertainty at the 1951 meeting of the ritish Association. Professor Meredith has added a review of the sym›osium, and Professor Shackle a summary of his own theory of expectations.

It is, perhaps, not surprising that most of the contributors should have devoted themselves to a discussion of Professor Shackle's theory: it is, after all, the most notable recent contribution to the subject, and has indeed never been fully discussed. Dr. I. J. Good discusses it from a mathematical, Professor Meredith from a psychological and Dr. D. J. O'Connor and Professor W. B. Gallie from a philosophical point of view, while Professor Carter proposes an interesting generalisation of it.

What is surprising, especially in view of their preoccupation, is that they should all have adopted so uncritical an attitude. It is true that Professor Meredith and Dr. O'Connor both complain that Professor Shackle gives no explanation of how expectations are formed, but this is an immensely difficult problem, and one which one would hardly expect to yield a solution without a great deal of empirical work. Professor Carter, too, is critical of Shackle at one point. The feature that distinguishes Shackle's from the orthodox theory of decisions under uncertainty is that he supposes the business-man to base his decision purely on two " focus outcomes," ignoring the rest of the information at his disposal. This is rather implausible, and it is to remove this implausibility that Professor Carter attempts his generalisation.

However, there remain a number of obvious questions crying out for answers, which yet go unasked in this symposium. For instance, is it self-evident that a theory of expectations must regard each business decision as unique? It is true that each decision will have certain peculiarities of its own, but any business-man will make many decisions, all with a great deal in common. Even if this argument fails, so that there are *philosophical* objections to applying the orthodox theory to a business decision, is this any reason why that theory should fail to give a satisfactory explanation of how business-men *actually behave*?

Then again one would like to know whether a business-man behaving as Professor Shackle suggests would behave differently from one " obeying " the orthodox theory. If so, would the difference be a systematic one? Would it be a sizeable difference, bearing in mind the large margins of error involved? If the difference were both sizeable and systematic, would it tend to make the Shackle man more or less successful than the orthodox?

It seems a great pity that obvious questions such as these should not have been considered. However, there are many interesting things in the book. Professor Carter's generalisation involves some very tricky arguments which repay careful study and Professor B. R. Williams gives an interesting discussion of the importance of expectations in economic theory, and particularly in Keynesian theory. But perhaps the most useful paper is that of Mr. A. D Roy, who considers the various possible ways of applying empirical tests to different theories of uncertainty. After a careful discussion, he comes down heavily in favour of case studies of actual businesses, and it is interesting that Mr. W. R. Dunlop's contribution describes such a study which he made before the war.

M. J. FARRELL

Cambridge.

Outline of an Economic Theory. By B. EIRIKSSON. (Reykjavik: Helgafell Publishing Company, 1954. Pp. 493.)

IN the first seventeen chapters Dr. Eiriksson attempts to incorporate the ideas of interest and capital into the Walrasian general equilibrium theory. Any interest rate is determined with other prices in the inter-dependent system. The price of a service is a time rate—amount per unit of time: hence a rate of return is the ratio of the price of a service to the value of the agent providing the service. The special case of the rate of return called a rate of interest is the ratio of an annual premium to the amount borrowed. The agio approach of Boehm-Bawerk, Fisher and Keynes is rejected in favour of the service theory of Cassel and Schumpeter.

Dr. Eiriksson's first error would appear to be methodological. While Jevons and his followers derived the relation " rate of interest equals per-centage increase in value " as an equilibrium condition, Dr. Eiriksson tautologically finds that equilibrium is attained when the rate of interest is defined in terms of his version of the relation. Apart from this aspect of general equilibrium theory, it appears that there is another difficulty. Dr. Wold, in another connection, has suggested that an inter-dependent system is purely descriptive. It is a mistake to assume that an inter-dependent system has any causal implications at all. Causes can only be introduced from observation, and other causal theories. For any results to be obtain-able, the system must be " constrained " (as Walras made it constrained with Say's law and other forces). Dr. Eiriksson's particular constraints would seem to give rise to another error. This is the claim of generality. Wicksell pointed out that the relation of the price of service to the amount borrowed stated above assumes an evenly balanced stock of capital if the agent (capital) has finite life; if the agent has infinite life, then the relation becomes the familiar proposition about the value of a perpetual annuity. Furthermore, only in the case of an evenly balanced stock do value of agent by cost and value of agent in terms of output coincide—if this is not so, then difficulties arise from the chosen definition of the rate of return.

The issues of capital theory are further obscured by Dr. Eiriksson in a later chapter, where he assumes the lives of all capital agents to be given. Admittedly the treatment of the time dimension has been inadequate in post-Wicksellian theory, and is obscured by the aggregative index-number prob-lems which a general equilibrium approach (or a Lutzian micro-approach) may disentangle. But Dr. Eiriksson has not shown how his theory can cope with the economic determination of lifetimes and time shapes of services. Without such content, a theory of capital—such as that of Walras himself—is uninformative.

In another chapter Dr. Eiriksson attempts an excursion into mathe-matical cycle theory. He postulates a lag between the price of labour and the birth-rate. A cobweb theorem results in a system of harmonic relations. If the lag is 22 years, then waves with lengths ranging from 44 years to $3\frac{5}{13}$ years result. All known waves are produced out of a Malthusian hat. By

inspection of graphs of an American business activity series from 1857, it is argued that American business behaviour conforms with the mathematics. We may expect a depression in 1959–60 (p. 416).

Dr. Eiriksson, who is General Manager of the Iceland Bank of Development, ranges over a surprisingly wide field of economics. In two chapters he discusses interest policy—he is interesting on the subject of disparities between a controlled rate and other rates of return. In another, he generalises the savings–investment identity; in another, he considers the supply of money. In yet another, he presents a business cycle arising from a displaced Walrasian equilibrium. By his original ideas and recasting of theory he will surprise many economists. This he will also do by his comments on some of his predecessors, as for example (p. 74), that "Boehm-Bawerk overlooked the necessity of holding a machine over time."

CONRAD BLYTH

Cambridge.

The Multiplier Theory. By H. HEGELAND. (Lund: C. W. K. Gleerup, 1954. Pp. 261.)

IN this study the author traces the antecedents of the Kahn multiplier process, submits the Kahn and Keynes multiplier analyses to close scrutiny in terms of the realism of their assumptions and then proceeds to discuss more recent formulations together with extensions to other fields, such as foreign trade and to inter-sector activities via the matrix multiplier. The major conclusions of this study are that the usefulness of the multiplier theory is severely restricted, since it works in terms of broad social aggregates, disregarding the interplay of the component elements and that there is no allowance for variations in the distribution of income, expectations and institutional rearrangements, and the like, which are in practice important. For these and other reasons the concept is deemed more appropriate in micro-economic analysis.

In what sense may a theory be judged useful? If it serves to illumine some hitherto dark spots, thus aiding in exposition, or if, simple as it is, it is not refuted by observation, and therefore stands at least as an acceptable working hypothesis until some more adequate formulation, judged on similar criteria, is propounded. The reading of this book serves to convince one of the soundness of the methodological position of those who argue that an hypothesis should be tested by its predictive ability rather than by the realism of its assumptions. Dr. Hegeland's emphasis is on the latter, and one is led to speculate on the number of economic hypotheses that will be left standing under similar dissection. This reviewer considers therefore that the direction of the study is misconceived and that the effect of such an approach is to inhibit rather than to promote economic inquiry. The lessons of the multiplier have, in general, been absorbed and integrated in fruitful ways into the corpus of economic thinking, as the recent cycle models of Kalecki, Goodwin and Hicks bear witness.

Dr. Hegeland might have been wiser to concentrate his attention on the consumption and investment functions, examine their predictive ability and their consistency with micro-economic theories upon aggregation. In the course of tidying up in these fields some of his criticisms have already been met.

One further point. Dr. Hegeland leaves one in considerable doubt as to whether the multiplier is a hypothesis capable of contradiction or a truism. In fact, on p. 126 he states that in static equilibrium economics it is a truism. Now it is the consumption function and an income identity that provide the interrelation between income and investment summarised in simple systems as a multiplier. Since the former of these components is a behaviour relationship, and therefore subject to refutation, how can the derived equation be a truism?

MALCOLM R. FISHER

Cambridge.

Centralization and Decentralization in Economic Policy. By J. TINBERGEN. Contributions to Economic Analysis, VI. (Amsterdam: North-Holland Publishing Company, 1954. Pp. 80. 13*s.*)

IN this latest contribution, Professor Tinbergen teaches us how to formulate consistent and generally logical economic policy. His theory deals with the choice of instrument variables to guide an economy towards targets within a system containing these and other variables, both endogenous and exogenous. Although the instruments are exogenous variables, his problem is turned about, compared with the conventional problems of economic analysis, so that these variables are *unknowns*. With fixed targets, the number of relations must equal the sum of the number of instruments and targets. Customarily we think of the number of relations as being equal to the number of endogenous variables. If this latter condition also holds, we find that the number of instruments equals the number of targets.

The analysis is extended to the case of flexible targets, in which a social-utility function of target and instrument variables is maximised with respect to the instruments and subject to the structural relations of the system. The structural relations show how targets, instruments and other variables are interrelated. This type of extension is interesting because it gives an added dimension to the system, allowing the number of relations to adapt itself to the number of unknowns.

Many examples are discussed in terms of Professor Tinbergen's own experience as a policy maker in the Netherlands Central Planning Bureau. In some of these he assumes a linear utility function and inequalities as boundary conditions. Then the maximisation problem reduces to the type of analysis pursued in the theory of linear programming.

The next extension of his previous work in the field is to the case of decentralised policy. He drops the assumption of one policy maker and allows central bankers, trade-union leaders and similar representatives of sectors of the economy to have their say simultaneously with central government officials. The solution of problems of this type resembles the treatment

of oligopoly and similar bargaining problems familiar in economic analysis. It would seem that some useful results could have been based on game theory, but unfortunately Professor Tinbergen did not veer in that direction.

Types of structural relations and types of instrument variables are classified in useful patterns according to their place in the network of decentralised decisions. For example, instruments are listed as supporting (affecting each utility function in the same way), conflicting (affecting other policy maker's utility functions in the opposite way from the effect on one's own), neutral (having different effects on other policy makers' utility functions). Professor Tinbergen is able to show how supporting, conflicting or neutral instruments will be treated in centralised as compared with decentralised regimes. Examples are given of the various types of instruments, and finally criteria are given for choosing between centralisation and decentralisation of instruments in terms of the above classification.

The beauty of Professor Tinbergen's approach to planning is its neatness, its internal consistency, its logic. We may find room to disagree with the actual set-up of some of his problems, the choice of targets or the structure of utility functions, but we must admire his methods and wish that other policy makers would adopt a similar approach and thus avoid the common pitfall of using too many or too few degrees of freedom.

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The Role of the Economist as Official Adviser. By W. A. JÖHR and H. W. SINGER. Translated from the German by J. DEGRAS and S. FROWEIN. (London: Allen & Unwin, 1955. Pp. v + 150. 15*s*.)

THIS book is to be welcomed as a first effort to write a book about the role of economic advisers. When a considerable profession establishes itself as rapidly as this one has, some reflection on its role, its methods and standards is, no doubt, desirable. It originated in a review by Dr. H. W. Singer of Professor W. A. Jöhr's *Die Beurteilung konkreter Wirtschaftspolitiker Probleme.* Professor E. A. G. Robinson induced publisher, author and reviewer to collaborate, the last interspersing remarks on the role of the economist in international organisations into Professor Jöhr's treatment of the economist as adviser of national governments. This makes up seventy-eight pages on the subject of economic advice and how to give it. To this is added a somewhat naïve and unoriginal discussion of basic aims, and the relative merits of liberalism and socialism, which is entirely out of place.

Confining myself to the central topic, and mainly to Professor Jöhr's contribution, I think he should have drawn more distinctions than he does, and should have made up his mind more clearly as to his likely readers. The first distinction he might have made is between economists and non-economists who advise on economic policy: the latter being still, of course, well in the lead. Some of his examples of mistaken analysis are ones which I find it difficult to believe could be made by any economist. For example, he

says (p. 43) that " if the present indebtedness of a country is compared with that of 1914 or 1870 . . . then its financial situation may appear to be very serious indeed. But in this instance the economist is the victim of misleading comparisons." Economist, indeed!

The next distinction is between the economist in the public service and the economic adviser. They may be the same man, and even the humblest analyst probably sometimes advises. But their roles are different. Thus much of what Professor Jöhr says is concerned with how to do applied economic analysis, and is not specifically related to economic advice. When the analysis has been done as best it can, the adviser has the responsibility of advising how much weight should be attached to it. This is, it seems to me, primarily what distinguishes him from the analyst more pure and simple.

As a result of not drawing these distinctions the book falls between two stools. It is too elementary for the economist in so far as it deals with how to analyse economic problems. It gives the non-economist little or no idea of how the way that the economist sets about things might differ from how he would set about them. Where it deals with the *savoir-faire* of political advice in general, it will appear very obvious to anyone used to giving advice, and at the same time does not go deep enough to give much help to the economist first entering public service. Moreover, some of the remarks made about the obligations of the official economist are, to say the least, peculiar. For instance, we are told (p. 35) that a British follower of neo-liberalism who gave advice on the most suitable form of nationalisation would certainly be considered unprincipled. Dr. Jöhr must think Whitehall a very immoral place. Or, perhaps, the title of the book is wrong, and he had in mind the unofficial " expert ": this is perhaps another distinction which should have been drawn.

It seems to me that in falling between these stools the book fails to bring out both what is peculiar about the role of the official economist advising on economic policy, and the actual problems which beset him. For instance, the professional economist alone among a minister's or government's advisers on economic and social matters has a systematic method of analysis which is more or less common to all members of his profession. This gives rise to a problem peculiar to himself, the assessment of how trustworthy the analysis on economic and social matters is in a particular case. Its results are, of course, available to other advisers, but, generally, he alone is capable of assessing its worth—and indicating whether, if it points to action which is unappetising on other grounds, it is really perilous to ignore it, or minimise its relevance. How far is he justified in pushing a view which is always based on more or less shaky foundations? To know how far to go, one needs to assess the strength of feeling among other advisers, among ministers and even the public (not that the economic adviser wants to usurp the politician's political judgment—but he must often anticipate it or assist it). He needs, in fact, all the merits of an experienced Civil Servant, as well as good economic judgment and a wide knowledge of economic analysis (though there is little need to be good at it himself).

He also differs from other advisers on economic policy in that neither the

analysis nor the policies which may come to mind are likely to be influenced by any particular institutional interest, as, for example, economising is identified with the Treasury or the use of monetary policy with the Central Bank. This lack of sectional interest should be a strength; but it can also give rise to problems and conflict, for the economist is usually attached to some executive institution; or, if he is not so attached, he may be left high and dry, lose influence and be unable to be in touch with immediate political realities.

Then, again, the economic adviser is something of an upstart, who is probably convinced that professional standards of reasoning should play a wider role in affairs than they as yet do. This presents him with ever-recurrent problems of tact, tactics and strategy.

These, it seems to me, are some of the things which distinguish the role of the official economist, and which give rise to questions which I would have expected to see discussed. But perhaps I am merely saying that a quite different book is needed, and would have been more interesting. In fact, the book is much more about the formal methodology of applying economics to the solution of problems than it is about the role of official economic adviser. Dr. Singer's remarks on the position of an economist in international institutions have a greater flavour of reality—but it would have been better to give them a separate chapter than let them be scattered about the book with insufficient relation to what precedes and follows them.

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Economics. By F. Benham. Fifth edition. (London: Pitman, 1955. Pp. 568. 18*s.*)

A First Approach to Economics. By E. V. Morgan. (London: Pitman, 1955. Pp. 456. 20*s.*)

The Price System and Resource Allocation. By R. H. Leftwich. (New York: Rinehart (London: Macmillan), 1955. Pp. 372. 32*s.*)

Modern Economics. By A. E. Burns, A. C. Neal and D. S. Watson. Second edition. (New York: Harcourt, Brace and Co., 1954. Pp. 790. 40*s.*)

A Key to Modern Economics. By D. McCord Wright. (New York: The Macmillan Co., 1954. Pp. vii + 520.)

Our Expanding Economy: An Introduction. By R. H. Blodgett. (New York: Rinehart, 1955. Pp. 973. $6.00.)

Introduction to Economics. By W. Birmingham. Penguin West African Series. (Harmondsworth: Penguin Books, 1955. Pp. 124. 2*s.*)

Economic Theory. By A. Johnson. (London: Frederick Muller, 1954. Pp. 144. 8*s.* 6*d.*)

The Essentials of Economics. By D. C. Hague and A. W. Stonier. (London: Longmans, 1955. Pp. ix + 173. 12*s.* 6*d.*)

This group of recent introductory text-books contains a number which are of much more than ordinary interest. The most important, I think, is the new edition of Benham's *Economics.* This has long had a special reputation and place of its own, and it needs no introduction from me. The new edition does, however, need to be drawn to the attention of all teachers. It represents an almost complete re-writing, and both those who already use the earlier edition and those who, for some reason, have preferred alternatives ought to examine it with care. In some way that is difficult either to define or to illustrate from detailed examples, the book has acquired a maturity and wisdom to be added to the qualities of accuracy and precision that it has long possessed. I would myself now regard it as the best available text-book of its kind.

The structure of the book has been significantly changed, and it has grown from thirty-one to forty chapters with little or no sign of the middle-aged *embonpoint* from which many of our older friends among text-books seem to suffer. Indeed, the growth represents only about twenty-five pages, and the additional coverage means in effect that at all possible points the treatment has been slimmed, and to that extent marches faster. Some of the greatest changes affect the beginning of the book. There is a really valuable introductory section which starts with a general survey, goes on to the aims of economic policy and to the social framework and then introduces the student to the national income, national accounting and the problems of comparison. Production then precedes instead of following demand, as it did previously, and the discussion of demand itself is integrated with that of price formation in a variety of different market conditions. Indifference curves are in an appendix, and are neither required reading nor a *pons asinorum* obstructing further progress by those who may fail to comprehend. Next follow sections on the price system under capitalism, and on distribution, and thereafter the framework, but not the content, is nearer to that of the earlier editions.

I cannot in a brief review hope to draw attention to all the improvements. They are many. I like the new group of chapters which lead up to a careful, responsible and in no sense *ex parte* discussion of the merits and defects of capitalism: the problems both of monopoly and of unemployment are fairly and independently stated, and while many of us would individually put more stress on some aspects and less on others, there can be no question here of a burking of issues.

In the section on "Money and Banking" there is a useful discussion of the problems of inflation and of the causes of changes in the value of money. The quantity theory, in the Fisher form, is set out, but so also are the defects and limitations of the theory, and Professor Benham concludes that "the quantity theory is not very helpful in showing how to stop inflation." He goes on to discuss the effects of budget deficits and surpluses, of export surpluses, of fluctuations in investment and so on.

I think I have said enough to show that Professor Benham's new edition deserves very careful attention. I would put second in this list Professor Victor Morgan's new book, *A First Approach to Economics.* The book is divided into three parts. The first discusses the Development of the Industrial Economy; the second the Economic Organisation of Modern

Britain; the third the Theory of Economic Organisation. Like everything that Professor Morgan writes, it flows well, reads easily and has an accuracy and lucidity that is a pleasure. The first two parts represent a comfortable amalgam of relevant factor and relevant theory, and the British economy emerges, as it surely should, as the combined result of past history and of past and present economic forces. A student who reads this will come out with a substantial knowledge of the history of British trade development, of the banking system, of economic policies over the past three centuries, of the company acts and of the present pattern of employment and activity.

It was to me something of a surprise to move forward from this very happy mixture of theory and practice to the treatment of the theory of economic organisation. Here the treatment follows the equally valid, but not for all students equally palatable method of rigid analytical argument from firm hypotheses to firm consequences. The argument is supported by a multiplicity of diagrams, and a certain degree of mathematical understanding is demanded. The presentation is not unlike that of the earlier book by Stonier and Hague (not that reviewed below), but is a little easier, and substantially more inclined to look behind the diagrams to the real forces. It is a very competent exposition, and in these days probably represents the minimum effort that must be demanded of a serious student. But I retain my surprise that Professor Morgan, who himself so excellently bestrides the two techniques of history and description on the one hand and of rigid argument on the other, should have stood in this part of the book almost exclusively on one leg.

Professor Leftwich has written a text which perfectly conforms to familiar American standards. This is a strict parade-ground drill in the precisions of profit-maximisation, consumer-satisfaction-maximisation and input-minimisation in all their possible variations. The squad presents curves exactly as required at each instant. I cannot fault it: its isoquants and isocosts are beautifully polished. But somehow I could wish that the sergeant-major could occasionally stand the squad at ease and admit that all this drill is no more than disciplining and limbering up for action in rough country, where parade-ground evolutions are impracticable. On its own level the book is excellent, and its very character makes it easier to use outside America by anyone who may want a text of this kind.

The Burns, Neal and Watson book is the antithesis of the last. It is much more aware of the uncertainties of the rough world, and of the inability of the entrepreneur to draw up reasonably precise schedules in advance. It mixes analysis with description—naturally American. It starts with the scope of economics, and goes on immediately to national income and the use of resources, and returns very logically from that to the determination of prices, the allocation of resources and the institutions for the control of resources. It ends with public finance and banking, international economics and a brief look at various economic systems and at economic progress. This is obviously a good and useful American text, but not, I think, one with very special claims to be used outside America.

Professor McCord Wright has written a book of a very different sort. He specifically abandons the attempt " to cover the whole economic museum on roller skates." He equally eschews the ramifications of advanced pure theory. His main purpose is to provide a clear basic explanation of the fundamental concepts. But in doing so he puts the emphasis on growth and the causes of growth rather than on choice and the problems of adjustment to changes of choice: " Somehow a number of people who begin with adjustment and choice seldom seem to get any further." He begins with the requirements for social growth, and then goes on to economic organisation and to the relation of growth to changes of inputs and of money flows. He next discusses the functions and place of money and the problems of inflation and its control. That leads on to economic activity, business cycles and the theory of employment. From this he proceeds to decision-making, including price-making, and to the consequent problems of distribution. Next come discussions of market power. Finally, international economics, public finance and economic stabilisation. A reader accustomed to reviewing barrack-square troops engaged in ceremonial drill may feel that he is trying to find the Brigade of Guards in a Malayan jungle. But this is lively, original, interesting stuff which is well worth consideration.

Professor Blodgett has this much in common with the last book, that the author has made economic growth its central theme. But this is mimic warfare on Camberley Common rather than real war in the Malayan jungles. It is diagrammatic—though that is no fault—following the more or less normal presentation of an American text, but with the order of presentation so reversed that there is rather more emphasis on the elements that contribute to growth. Rather curiously, in a book so oriented, the national income receives more than cursory mention only at p. 500. The external world—perhaps inevitably—does not impinge before p. 777. It is a good American text, but not I think an equally good text outside America.

Mr. Birmingham's book is designed on a much shorter and more modest scale. It was written primarily for West African readers (he lectures in the Gold Coast). The book is a simple presentation of the elements of theory with West African illustrations where apposite; Dr. Prest's estimates of Nigerian national income and expenditure are given, for example. The argument is, on the whole, rigid and formal, with a modest apparatus of appropriate diagrams; the standard of mathematical knowledge assumed is not excessive, and the book would seem to be well designed for its market. It is, however, primarily concerned with the theoretical structure of a basically capitalist system, with implied assumptions of profit-maximisation and cost-minimisation. One wonders whether a rather fuller treatment of the problems of self-subsistence and of trade *versus* self-sufficiency might not usefully have found a place, and possibly also some fuller discussion of motives and incentives in practice in an African economy.

Mr. Johnson's book is addressed to the layman and the member of Tutorial Class. It is designedly simple and straightforward. It assumes sustained interest and attention, but not severe mathematical or other

intellectual effort. It comes, in my view, rather dangerously near the level where an already simplified economics has been re-simplified to the point where it is in danger of being misleading. If this sort of thing is to be done at all, Mr. Johnson does it competently and with reasonable accuracy. But it confirms my scepticism as to whether a book at this level should aim to be lucidly simple and accurate on drastically over-simplified assumptions rather than to impart a feeling of the complexities of the real world at the expense of achieving simple solutions of fundamentally unsimple problems.

I have left the new Hague and Stonier (to be distinguished from their *Text-book of Economic Theory*) to the last. Its purpose, like that of the last book, is to be simple: " to explain the main generalisations of present-day economics in simple and straight forward language, using only those few technical terms which are essential for accurate expression." It has many of the qualities that are needed for this. It does not talk down to the reader. One has a sense all the time of more serious discussion available for those who want it. It is a book that I would gladly put in the hands of anyone who was thinking of taking up serious economics to give him a first canter over the whole field.

For all that I am led to wonder whether the authors have found the perfect solution of the age-long problem of simple economics. The book is in effect an introduction to adult economics, with the same basic skeleton. Its progress is the familiar one: the consumer; the firm, competition, monopoly; wages, profit and rent, money and interest; the level of activity, fluctuations; public finance; international trade, foreign-exchange rates, the balance of payments; economic policy. It is, basically, the economics of choice—and none the worse for it. But somehow I feel that I want to make the criticism of David McCord Wright that I quoted above. To the intelligent reader the problems that are causing him concern are surely the problems caused by progress, and the problems of the constant difficulties and setbacks of a country struggling to live in a very open economy. The traditional skeleton leaves these disturbances and the adjustments they require very much to the end of the story, and adjustment to growth and to other nations' growth hardly appears at all. Perhaps I am wrong in feeling that the best first approach is to use the analytical tools of economics on some of the economic problems of the real world. But surely in the end the purpose of economics is not tool making but tool using, and if one wants to convey an elementary impression of what economics is about, one ought to demonstrate, at an elementary level, the use of economic reasoning on a suitable selection of real problems, so chosen as to exhibit a wide range of methods over a wide range of problems.

Be that as it may, Messrs. Hague and Stonier have written a first-rate book which will have a useful function, and one which should have an appeal both to the beginner and to the layman.

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›pulation. By I. BOWEN. Cambridge Economic Handbooks, under the general editorship of C. W. GUILLEBAUD. (London: James Nisbet and Cambridge University Press, 1954. Pp. v + 256. 10*s.* 6*d.*)

ONE of the merits of the Malthusian theory of population from the point 'view of exposition was its simplicity. Given the subsistence minimum and ıe production function of the economy, then the equilibrium level of ›pulation was determined. The demographers' attack on the influence of ıe exclusively economic factors governing population growth, and the imulus given to the study of the effects of population structure on aggregate :mand by " depression economics " have introduced complexities into the ıbject which have made the expositor's problem a very difficult one. Pro- ssor Bowen's book, which replaces the earlier volume on population in the ıme series by Harold Wright, contains a brave attempt to overcome these ›mplexities.

Part I, an introductory survey, sets out the facts about world population, s growth and distribution, and has a special chapter on Great Britain. he student will find here a most useful résumé of the main population trends ıd just enough anticipation of the analytical problems to be considered ıter to preserve interest. Two specific criticisms can be made of this :ction. It seems right to discuss in some detail the problems encountered ı forecasting population trends, but wrong to use mathematical terms with nly occasional explanation of their meaning. Perhaps the solution here 'ould have been an appendix to this Part on the simpler mathematics of opulation growth. While questions of population quality are important, a nowledge of the theory of genetics sufficient to understand pp. 75–6 unlikely to be part of the intellectual equipment of economics under- raduates.

It is in Part II, the section on analysis, that the problems of exposition rise. Professor Bowen has introduced the economics of population by a ›rty-page chapter on the history of the Malthusian controversy taking up ne-sixth of the book, and he sides, unlike Mr. Wright, with the anti-Mal- ıusians. He then deals separately with such problems as the idea of an ptimum population, the effects of population structure on economic growth, nd with international migration. There is much to stimulate the reader, ut this stimulus is bought at the cost of lack of cohesion. The reader is not ›ld at the beginning what exactly a population theory is designed to explain, nd in consequence it may be difficult for the reader to see the population ontroversy in perspective. It seems to the reviewer that Professor Bowen 'ould have been better to have begun with the static equilibrium analysis xplained in Chapter V and then to have relaxed some of the assumptions in he simple model, such as the assumption of a one-commodity economy with o foreign trade. In this way the reader would be brought nearer the conomic theory which he may be learning concurrently.

The concluding part contains a chapter on the future population problem ı Britain which recommends European immigration as a possible solution.

A final chapter discusses in broad terms the world population problems and population growth in less-developed countries. There is no index to the work, but there is a comprehensive bibliography.

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Population Statistics and their Compilation. By H. H. WOLFENDEN. Revised Edition. (Chicago: University of Chicago Press, for the Society of Actuaries (London: Cambridge University Press), 1954. Pp. xxiv + 258. 56*s.* 6*d.*)

THIS is a revised and greatly enlarged edition of Mr. Wolfenden's earlier book with the same title, which was originally published in 1925 and has been out of print for some time. It is addressed primarily to an actuarial audience, but covers a large part of the subject matter of formal demography. The topics dealt with include the history of census and vital registration statistics, together with notes on their adjustment, the construction of mortality tables and the analysis of mortality, nuptiality and fertility.

Mr. Wolfenden is a distinguished actuary, and it is obvious that a great deal of erudition as well as a lifetime's experience have gone into the writing of the book. The British and American literature are very thoroughly covered, though there is a surprising paucity of reference to the work of foreign writers. But a text-book cannot be judged on coverage and content alone: presentation and arrangement are equally important. From this point of view it is difficult to regard the book as successful. Mr. Wolfenden states in his preface that he has based his book on "needs . . . revealed during a long experience of lecturing on this subject to students," and, indeed, the book bears signs of having originated as a set of lecturer's notes. Its argument is extremely concise and compressed, and it is not self-contained: the student who has not access to a well-stocked library in which he may consult actuarial or statistical journals would have to be very exceptional indeed to benefit from the exposition.

The second and more important criticism, however, relates to the balance of contents. Mr. Wolfenden devotes 110 pages to the study of life-table construction, and deals with nuptiality, fertility and reproductivity in a mere twenty-four! Historically the study of mortality preceded the analysis of fertility and nuptiality and the life table is admittedly the basic tool of demographic analysis, but even so, it is difficult to see the reason for the allocation of so disproportionate an amount of space to it. Moreover, the section on life-table construction contains references to such a bewildering variety of different methods, some of which would seem to belong to the actuarial museum rather than a text-book. The preoccupation with graduation, smoothing and different kinds of interpolation, osculatory, tangential and others sometimes obscures rather than clarifies the issue. The idea of a life table is, after all, a very simple one, and one cannot help wondering whether the actuaries do not make too much of a mystery of it. Indeed, in some places Mr. Wolfenden's book reads a little like a book of recipes, each

earing the name of the cook who first created the dish, but without any ndication whether it is entrée, sweet or savoury.

On the other hand, there are some surprising omissions. The construc- ion of double-decrement tables, such as net nuptiality tables, receives scant .ttention, and the section on fertility and reproductivity is far too concise to e of much use to the student.

It would, however, be ungracious as well as unfair, to keep this review n an entirely critical note. Mr. Wolfenden has certainly not produced a sable text-book for the student. But he has produced a work of reference or those concerned with life-table construction and the adjustment of vital tatistics in English-speaking countries. The student's loss is the teacher's ain. He and the practitioner will be able to refer to Wolfenden in the our of need, and the prayer for help will not go unanswered, a reference to nd summary of most methods likely to be in demand will be found in the ook. But even here, an index would have helped: a table of contents, owever extended, is no substitute.

E. GREBENIK

University of Leeds.

The Redistribution of Income in Postwar Britain. A Study of the Effects of the Central Government Fiscal Program in 1948–49. By A. M. CARTTER. (New Haven, Connecticut: Yale University Press (London: Geoffrey Cumberlege), 1955. Pp. 242. 40*s.*)

A LARGE public social expenditure, financed out of taxation which alls most heavily on the rich, has become an established British institution. Since the war this system has so grown in size and complexity as to prohibit a simple statistical description. But while native statisticians have steered lear of the subject, Mr. Cartter is the second American to have been attracted to it in recent years. In 1950 Mr. Findlay Weaver, then of the United States Embassy in London, published in the *Review of Economics and Statistics* a straightforward statistical exercise on income redistribution in Britain, and now Mr. Cartter follows with a more ambitious attempt at interpreting to an American audience this aspect of British public finance.

Mr. Cartter adopts, in the main, the methods followed in a similar study for 1937. The essence of this approach is to take all items of public revenue and expenditure (*plus* the surplus) and allocate them as deductions from or additions to the factor income of classes differentiated by income size. It is assumed that the incidence of income taxes is on the payer, of indirect taxes on the consumer, and similar assumptions are made on the expenditure side. Indivisible benefits from public expenditure (such as defence) are allocated according to alternative hypotheses.

The three alternative assumptions for the allocation of indivisible benefits made by Mr. Cartter allow a wider range of results than did those that I made in my study of *Redistribution of Incomes through Public Finance in 1937*. One of his assumptions implies that it is reasonable to levy a poll tax to pay for

defence; this quite ignores the fundamental reasoning of Professor Pigou in favour of a tax system which is progressive, or at least not regressive. Moreover, Mr. Cartter enlarges the uncertainty attached to the estimates by including too much under the heading of indivisible benefits. He adds to them interest on the national debt and subtracts indirect taxes on production in general, instead of treating these on their merit. It should be possible, even though empirically difficult, to allocate indirect taxes on production without recourse to political or ethical assumptions. Expenditure on roads or grants to universities could have been regarded as yielding divisible rather than indivisible benefits, and altogether a finer classification of public expenditure would have thrown up more divisible items.

The study takes account of receipts and expenditures legislated in 1948, and avoidable statistical complications are caused by examining the effects of a given year's legislation on incomes earned in different years instead of tax liability on a given year's income. The exclusion of Northern Ireland is also the source of a number of adjustments, but the omission of local authorities is more disturbing in view of the change in the relationship between central and local finances. Mr. Cartter regards Exchequer grants to local authorities as within the scope of his inquiry, but, of course, he is unable to trace the destination of the block grant.

Although the income data in the national income white papers are based on Inland Revenue sources, Mr. Cartter fails to produce a satisfactory reconciliation between the two. Apart from minor pitfalls, he omits to discuss evasion which must have been an element in the discrepancy. The degree of inequality shown would also have been less had adjustments been made for substantial inventory profits and for depreciation in excess of the statutory allowance.

On the statistical side great ingenuity is exhibited in dealing, for example, with purchase tax and the National Health Service, but one often feels uneasy about the insufficiency of the basic information available to Mr. Cartter. In particular, taxes on alcohol and tobacco are heavy, but little is known about the consumption of these commodities; margins of error are likely to be greater than suggested, for instance, on p. 173. Elsewhere, it is apparently assumed that all passenger cars are in personal ownership, but, in fact, a high proportion are run on business account. Subsidies on cereals and potatoes, £136 million, are distributed in proportion to estimated expenditure on unrationed food; available evidence suggests that an equal amount per head would be a better assumption. It would have been wiser, perhaps, to ignore post-war credit repayments and demobilisation leave pay rather than regard them as transfers. It would have been also more realistic to spread the amount of the special contribution, which was similar to a capital levy, over the income of several years.

The discussion of incidence, which precedes the statistical exercise, is insufficiently related to place and time and, in particular, there is an insufficient discussion of the changed post-war conditions and of taxes and expenditures introduced during the War and since. Certain extra-budgetary

measures, such as rent control, may also be considered as relevant to the subject.

Nevertheless, it is to the merit of the book that it is reasonably comprehensive. In spite of the qualifications, it is probably true that the amount redistributed from rich to poor was, in real terms, substantially greater than before the War, and that the dividing line between gainers and losers has moved to a lower level of real income. The inequality of income distribution probably also declined, though not as much as shown by Mr. Cartter's figures illustrating a long-term decline; surely the data up to 1928 are on a different basis from those since 1937.

Lastly, the reader who is not familiar with the British scene must be warned against the book's concluding argument that Conservatives and "Labourites" see eye to eye on redistributive policy. It is true that Conservatives have introduced or continued to operate social legislation, but seldom were they its intellectual authors. It is precisely on measures which aim at redistribution, as against those which may redistribute income as an incidental effect, that the major parties clearly disagree.

T. BARNA

London.

The Budgetary Process in the United States. By A. SMITHIES. A research study for the Committee for Economic Development. (New York and London: McGraw Hill, 1955. Pp. xxii + 486. $6.50.)

PROFESSOR SMITHIES' book is in the words of the accompanying press release of the Committee for Economic Development, "a comprehensive analysis of the problems involved in the determination and control of government expenditure."

Part I of the book sets out the background and describes the nature and objectives of the budgetary process in some detail. Part II is the historical section showing the development of the system from the days of Hamilton to modern times. This brings out very clearly the reforms which have failed as well as those which have succeeded. Part III outlines the weaknesses in present Congressional and Executive procedures, and many detailed suggestions are thrown out for their improvement. These cover a variety of topics, such as the separation of the determination of government programmes from the problem of reviewing them, suggestions for greater co-ordination of Congressional discussion and the possibilities of relating such discussion to the more general effects on the economy.

Part IV deals with the formulation and programming of a defence budget. This is perhaps of rather less interest to non-American readers than the rest. Part V discusses miscellaneous problems of, for example, water-resource and agricultural programmes. This again is of less interest than the earlier Parts, but nevertheless does include a chapter which deals with the great problem of all Federations—the financial relations between the Federal and State governments. Part VI consists of only one chapter, but

his is probably the most interesting of all to the general economist, as its itle, " The Economic Impact of the Budget," implies.

This bare outline may perhaps give some idea of the great range of this ook. An authoritative review of the present American budgetary system vas long overdue and must be of the greatest value to British, as well as American, specialists on public finance and government. Whether, however, the greater part of the book is likely to appeal strongly to the general eader is more doubtful. The two chapters on federal grants-in-aid and the conomic impact of the budget are the most interesting. The former might ıave gained in effectiveness by a study and appraisal of the British block-;rant system; for this is one of the points at which the problems of unitary ınd federal governments do overlap. The latter chapter suffers from being oo compressed. It simply is *not* possible to deal properly with the principles ıf balancing the budget, the prevention of inflation, Colin Clark's 25% atio, economic growth, capital budgeting and the like all in one chapter of hirty-two pages!

These minor criticisms, however, do not impair the great advantages of ıaving an up-to-date description and appraisal of the Federal Government's ıudgetary procedure and practice, all contained in one volume.

A. R. Prest

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The Twentieth-century Capitalist Revolution. By A. A. Berle. (London: Macmillan, 1955. Pp. 157. 8*s.* 6*d.*)

Adolf Berle was in 1933 co-author with Gardiner Means of the *Modern Corporation and Private Property* which, in a review in the Economic Journal or September 1935, was welcomed as " at last . . . a book that analyses he actual practice and the implications of the joint stock method of organization." Dr. Berle has continued his interest in the legal implications of American Corporations and the present little book attempts to " study them ıow as quasi-political institutions " (p. v). " The Twentieth-century Capitalist Revolution " is the development in very large corporations (Dr. Berle, pp. 15 and 36, quotes Adelman's estimate that 135 corporations own 45% of the United States' industrial assets) and in the independence of these corporations from the capital market. Of the $150 billion spent between 946 and 1953 in capital expenditures, " only 6% was raised by issue of tock " (p. 26). What, asks Dr. Berle (p. 25), has become of the judgment ıf the market-place assumed by Adam Smith and still relied upon, apparently, by American business apologists in the financial pages of many ıewspapers. Economic events are no longer the consequences of the demand ınd supply of industrial atoms in a market, but the consequences of the ıuasi-political decisions and planning of the men of power—" the tiny self-ıerpetuating oligarchies " as he puts it (p. 146)—at the top of a few dozen ompanies.

Dr. Berle finds this (p. 4) " a far more appealing organization of affairs

than ever was described under the ægis of *laissez-faire*," and his later chapters compare the conduct of corporations with the Norman courts of equity and the conscience of the King, and with Saint Augustine's conception of the " City of God." He instances the sums given by large corporations in the course of education, thus withholding " from their shareholders a portion of their profits " (p. 137), and the diplomacy exercised in international affairs by corporation representatives; but otherwise nothing very definite is adduced apart from the great progress in material standards of living in twentieth-century America. The reader is left somewhat uncertain whether he is claiming some achievement on the part of the corporation, or merely sees ground for hope. What certainly is clear is the author's great fear of " statism." Though he does not find classical *laissez-faire* appealing, this book shows him a very zealot for keeping the state out of industry, even when he has no belief in the hidden hand. Things are apparently to be left to the undisguised, visible hands of the large corporations.

" Augustine christened ' The City of God ' " (p. 145) the philosophical content which " alone gave permanence to institutions." Dr. Berle hopes the corporations' philosophy will keep up with public opinion and that some agreed procedure, in consonance with the public conception of due process of law, will regulate the corporations' policy and its relations with employees and agents. Failing this, and he honestly admits the chance of failure, reliance must be placed on the countervailing powers of other large corporations as competitors, suppliers or customers, or on large trade unions. Only if all these fail is the State's powers considered, and even then, Dr. Berle hopes that the threat of State competition will be enough. He tells how the T.V.A. under the New Deal first brought substantial rural electrification:

> " Whereupon the light and power companies discovered unsuspected ability to serve this market, and proceeded to do it. In the ensuing fifteen years the number of American farms to which electric power was made available jumped from 30 to 90%, of which more than half obtained service from private enterprise under the spur of possible government-financed competition " (p. 41).

The short case-histories which Dr. Berle introduces are most interesting and illuminating; but what they illuminate, at least to a European, is not always what the author intended. America is the land of reactions. Will there not soon be a reaction from this reaction from the State and Federal intervention of Roosevelt's New Deal?

P. Sargant Florence

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Free Trade and Protection in the Netherlands, 1816-1830. By H. R. C. Wright. Cambridge Studies in Economic History. (London: Cambridge University Press, 1955. Pp. ix + 251. 31*s.* 6*d.*)

Dr. Wright's book is not concerned with theoretical discussions on free trade or protection in the Netherlands during the years 1816–30, so much as with practical problems of tariff policy in the new kingdom. A change of

economic policy was unquestionably needed, not only because of the annexation of the Belgian provinces but for many other reasons also.

During the Napoleonic Wars the country had lost almost the whole of its shipping as well as its trade connections with overseas territories; after the wars economic revival was delayed as the result of imports of low-priced British goods and the revival of protectionism in countries like France and Prussia. King William I, a very active and energetic ruler, had the difficult task of promoting certain interests without damaging others; he wished to protect industry and agriculture without commerce being hampered or consumers' prices being raised. It is interesting to note—and Dr. Wright does not fail to emphasise—that there were no differences of Dutch and Belgian views on these controversial issues. The Dutch and Belgian clothiers were united in demanding duties on woollen cloth of at least 15%. The commercial interests of Antwerp did not differ from those of Amsterdam and Rotterdam. Agitation for restrictive corn laws made considerable headway in the agricultural provinces both of the North and of the South.

Because there were so many conflicting interests to be safeguarded, King William I had to act by trial and error, abandoning failures and following up successes. The result was satisfactory in so far that the Dutch–Belgian quarrels towards the end of the twenties were not economic. The king saw his work ruined by failure on the political side, especially in regard to language and education. This conclusion, which the author does not fail to draw, is not wholly new, but it is supported by new material. Dr. Wright has not only studied the existing literature on this period, including many little-known pamphlets from the Royal Library in The Hague; he also has made detailed inquiries in the Public Record Office of the Netherlands. In addition, he has found statistical data in the British Parliamentary Papers and elsewhere, which have not previously been used by Dutch scholars.

There is, however, a danger connected with such research in archives which the author has not completely avoided. The scale of each chapter of his book has been determined less by the importance of the subject than by the abundance of the documents. The result is, for example, that much attention is being given to the tariff commission of 1820, which, in his own words, " decided nothing and served merely for the rehearsal of familiar arguments," whereas the tariff laws of 1818 and 1819 are hardly mentioned, probably because they have already received elaborate study by Dr. Groeneveld Meyer.

The chapter on the tariff policy in the Netherlands Indies (Dr. Wright does not mention his earlier publication on this topic in the *Economic History Review*) offers another example of lack of balance through failure to emphasise the important decree of 1819, which established a sort of tariff union between the Netherlands and the East Indian archipelago by exempting Netherlands products from import duty in Java.

Impartiality is a virtue which no genuine historian can dispense with. Dr. Wright treats his subject most impartially; he is neither a protectionist nor a free-trader, and he has no predilection for the Belgians or the Netherlanders. It is my opinion, however, that the author carries impartiality too far in not expressing any opinion on the many controversial issues which aroused public opinion at that time. The Hollanders and the Belgians, for instance, disagreed on the possibility of restoring Holland's general trade, the so-called staple market. Dr. Wright presents to the reader the arguments from both sides, but he fails to indicate where truth ended and fallacy started. His book would have been easier reading if he had been more prepared to draw conclusions. The historian, after all, should be a judge who, after having listened to both parties, pronounces an impartial sentence.

Notwithstanding this minor criticism, Dr. Wright has made a valuable contribution to the economic history of the Netherlands, which brings new points of view even to the expert. His study has at the same time practical and topical value, since the governments of the Netherlands and Belgium after the Second World War have been aiming at the same goal as King William I: the economic integration of North and South, of the Netherlands and Belgium.

I. J. BRUGMANS

Amsterdam.

The Economic Development of Mexico. Report of the Mexican Working Party of the International Bank for Reconstruction and Development. (Baltimore, Maryland: Johns Hopkins Press (London: Geoffrey Cumberlege), 1953. Pp. vii + 392. 80*s.*)

Industrialisation and Labor. By W. E. MOORE. (New York: Cornell University Press for the Institute of World Affairs, 1951 (London: Geoffrey Cumberlege, 1952). Pp. xx + 410. 32*s.* 6*d.*)

THE report by the Combined Mexican Working Party, set up jointly by the Nacional Financera of Mexico D.F. and the International Bank for Reconstruction and Development in Washington, D.C., on the prospects for the economic development of Mexico over the long term, is claimed on the dust cover as the most complete financial study to be published on the economy of Mexico in recent times. The reviewer can well believe it, though he might have preferred to substitute " statistical " for " financial." Of the 387 pages, over half is devoted to 153 tables. The text, well embellished with figures and percentages, occupies 152 pages. These are large, each of two columns of 300 words. There are five brief appendices, fifteen pages in all, twenty-three charts in the text, three maps and a short but useful index.

The Combined Working Party considers the recent economic history and outlook for Mexico under the heads of national income, agriculture, mining, petroleum, electric power, industry, transport and communications and education, public health and welfare. The report then passes to an examination of the public finances and the balance of payments, and concludes with a short summary chapter on the general outlook.

Mexico, at the beginning of the war, was suffering, as indeed most

countries were, from surplus of capacity. Output rose after 1939. The foundations of industrial development were firmly laid by capital goods imported and paid for by the growing volume of exports at favourable prices. The growth of wealth was assisted over the twelve years from 1939 to 1950 by rising foreign demand, by the high rate of domestic saving and the lessened home consumption which is one result of inflation; and by the quick and substantial returns to investment which then opened out. Population has since increased by reduction in the death-rate. The birth-rate has remained unaltered and high. Whether the rise in output can now be continued appears from the Report to depend chiefly upon the success with which resources can be raised, principally from domestic sources, and turned to the less spectacular business of maintaining the existing stock of capital and financing investments, many of which do not provide the quick returns heretofor expected but without which production cannot but decline and social welfare fail to be improved.

Professor Moore selects for intensive study "a small area of central Mexico." Two small villages of the Zone of Atlizco, a few miles south and west of Puebla and two textile factories were included. The method adopted was personal interview and about 1,200 persons were reached, one-half from villages and one-half from factories. The questionnaire is printed in the Appendix. It occupies twenty-five pages. It is something of an anti-climax to learn after all this that the inhabitants of the traditional but more impoverished village are more likely to be coerced into the factories by their poverty than the relatively more affluent residents of the more modern and more prosperous village; and that it is from the landless, the hungry, the politically powerless and the socially disaffected that the first industrial recruits are most likely to be found. But neither the poverty-stricken nor the more affluent, as Professor Moore so properly points out, are suited as the source to supply the managers and technicians who are needed if capital, whether foreign or domestic, is to be properly employed in the furthering of industrial development.

This inquiry occupies three chapters (less than 100 pages) out of the twelve chapters which fill the 300 pages of text in the book. In the first six, Professor Moore reviews the literature for an account "of the types and conditions or attitudes that induce or impede transition to industrial labour wherever they may be found." He rejects as naïve the view that men in an undeveloped country move from agriculture and other customary occupations into industrial employment just because the rewards are greater, pointing out what surely should have been obvious, that money is no incentive where there is nothing to buy. Professor Moore (or at least his assistants, for this is a co-operative venture) quotes from and support their argument by 382 references in the first 200 pages of text. These are taken, but without indication of relative worth, from popular magazines and from the tomes of the gravest amongst us. Professor Moore provides an index both to his pages and to the "Indianness" of several provinces of Mexico. He reproduces a number of tables from the Census of Mexican population in 1940 and

lies the language with some choice additions. The reviewer was lated by two such gems, "familial" production and the theory of ulturation."

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g *in Industry*. By F. LE GROS CLARK and A. C. DUNNE. (London: The Nuffield Foundation, 1955. Pp. 146. 6*s*.)

HE authors took the Census of Population for three years, 1921, 1931 and as the basis of an investigation of retirement either into complete idle- or into another occupation. Because of difficulties of classification they ntrated on thirty-two occupations, covering a quarter of the occupied population, which they then examined in the light of detailed knowledge them by specialists in those trades. These statistics were used to er the question, how far can men in their mid-sixties remain in their mary jobs? The authors' answer is complex. Old-time craftsmen, lock-makers, often remain until they are very old; bus-conductors and rs, coal-miners and signalmen usually retire; skilled men like farm- ers and bricklayers tend to carry on in some way until they are nearly ty. The key factor is the ability to adjust your working pace, which is for the craftsman or the man on piece work than for other people. industries arrange for their workers to change grades; in a coal-mine move away from the coal-face to the surface. About 20% of men ge their occupations to lighter work, becoming, for example, porters or ng gardeners. Some retire under superannuation schemes, even in the ly working-class occupations studied in the report, particularly tobacco ers, and the occupations in which this tends to happen are those where uction methods have recently changed and made personal adaptation difficult. The report ends with an appeal for an organised manner of fer of the ageing into suitably adapted jobs. It considers this a matter gency with our ageing population.

his research throws important light on to an obscure and emotional lem of industry, although the light it throws is different from that given e social survey on reasons for retirement, or in geriatric studies, because Nuffield report is concentrated on part of the working population rather on the aged as a whole. There are two assumptions implicitly made: s that as a matter of social health elderly people should be able to work if want; the other is that these people's productive capacity is necessary to national economy. The first is more important, although propaganda entrates on the second. This report concentrates, implicitly, on the l problem.

he report's methods are interesting. The Census material is broken into identifiable occupations which have changed little, where the age- ps are identifiable because they can be presumed to remain in the same pation for most of their lives. Thus if all carpenters became carpenters

before they were thirty-five, and either remained carpenters all their lives or retired, the 1951 Census would show in comparison with the 1921 Census how many had retired and how many were left. The occupational mortality factor can remove the dead from the figures, but the doubtful categories are those who have migrated and (to relax our assumptions) carpenters who have changed their occupation. For the occupations selected the data are not subject to too wide a margin of error. In combination with a second method of research (the age-group ratios) the figures in this report are as reliable a picture of retirement as anything short of several thousand case-histories. Indeed, the case-histories would be relatively worthless without this broad statistical background.

The elucidation of the occupational material is of more doubtful value than the statistical work. For example, in farming, over half of one crucial age-group cannot be accounted for by the figures; it is alleged that large numbers of apparently retired men continue to work part-time or seasonally. The basis for this is a Ministry of Agriculture sample survey. Many jobbing gardeners are over fifty-five, and these are probably lapsed farm-workers. It would have been useful had the scope of the investigation included at least one detailed study of one occupation, because these inferences seem too casual to support the conclusions one is tempted to draw from the material. This is particularly the case in another large industry, coal-mining, where the exhortation is made on little evidence (admittedly guardedly) to adapt coal-face work to the elderly men. On the other hand, the section on brickworking is thorough, and the Pilkington material is excellent.

But this is carping criticism when so much has been done with what might at first sight appear so little. This report develops a new method of investigation and indicates the lines of future work. Briefly, it is clear that if the elderly need jobs, and socially this is probably so, then a large number will continue to leave their life's work for something lighter and slower. The traditional light jobs are limited in number and in scope. What one would like to know now is how much adaptation within industry is taking place and is possible. If research on this question could be linked to the problems of white-collar retirement and superannuation, then a major social problem would be well on the way to solution.

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America, Britain and Russia, Their Co-operation and Conflict, 1941–1946. By W. H. MCNEILL. (London: Oxford University Press, for the Royal Institute of International Affairs, 1953. Pp. 819. 63*s.*)

IN this volume of the Survey for International Affairs, Mr. McNeill has written a history, not of the War itself, nor simply of the diplomatic relations among the Powers of the Allied coalition, but of a much wider and more penetrating range of relationships, as far as the United States and Britain are concerned. It was unprecedented and indeed revolutionary, and, as

the author hints in his conclusion, may, however transitory, embody the most promising clue to constructive change in international relations. In the tradition of Chatham House the book takes the form of a detailed and dispassionate chronicle of events. It is, of course, compiled from such sources as happen to have been published, and depends heavily on memoirs; but the author has performed an invaluable service both for statesmen in marking the path to the present and for historians in providing an authoritative and meaningful framework within which they may in time find answers to the more searching questions of historical analysis. Indeed, the book is far more than a chronicle; in its scale, in the organisation which preserves unity of theme without sacrificing complexity of detail, in its skilful handling of narrative to show the new developing out of the old, and above all in the author's capacity to convey, without rhetoric, the unfolding of great and tragic events, the book is a signal achievement of the historian's art.

In this story of co-operation and conflict, the co-operation is largely to be found in the relations of Great Britain and the United States, the conflict largely in those of the two Western Powers with the Soviet Union. The book has especial value in pursuing its theme, not merely to the victory of the coalition, but to its break-up and the onset of the Cold War, when Russia, as well as Germany and Japan, comes to provide a catalyst for Anglo-American co-operation. Because of the limited nature of Russian co-operation, as well as the lack of evidence which would provide an equivalent depth to the Russian side of the story, the book's chief value lies in its elucidation of the nature of Anglo-American co-operation.

Owing to the spectacular achievement of SHAEF, the aspect of Anglo-American co-operation which has hitherto received most attention has been military; this is the first general work to give proper emphasis to the underlying economic relationships which made that military achievement possible. Even on the military side economic factors induced global co-operation, if not, as in the European theatre, true integration. The Combined Chiefs of Staff became the arbiter of Allied strategy because of their power to allocate supply, and the Combined Boards, whatever their limitations, provided machinery not merely for allocating raw materials and munitions, but for integrating the two economies, in a measure, so that the entire resources of Britain could be mobilised for the decisive stroke in 1944. The story of this integration was revolutionary in the history of nation states, and administrative historians will find much to ponder over in Mr. McNeill's account, which is admirably accurate and fair. Here and there the memory of a participant may be at odds with his judgment over details: he perhaps over-emphasises the extent to which the Foreign Office co-ordinated British supply policy in Washington, and Mr. Duncan Hall's more recently published history of the British supply missions might have shown him how, by means of a miniature War Cabinet Office secretariat in Washington, the day-to-day work of co-operation was carried on outside the realm of foreign policy altogether. The limits of the " Combined " idea were in practice, as Mr. McNeill shows, severe, and the Combined Production and Resources Board

never even remotely approached the authority of the Combined Chiefs of Staff, whose civilian twin it was designed to be. It may be that if the President and the Prime Minister had been as personally interested in the logistics of supply as they were in military strategy, the Combined idea might have had more authority. But military combination for a specific end was one thing; the integration of economies, impinging on the basic stuff of national societies, was another; and those concerned with the practical limits of the abrogation of sovereignty would do well to study the history of the Combined Boards.

The American attitude to the Combined Idea was ambivalent. Alongside the genuine desire for a combined effort was the knowledge that the British were in Washington as claimants for American supplies. Those Boards worked best where, like the Combined Raw Materials Board, the British representatives came to the table with goods to offer, and therefore more nearly on equal terms with the Americans. Where this was not the case the British, like Churchill himself on the broader issues of strategy, could argue and plead, sometimes with good effect, but in the end had to acquiesce in American decisions. For beneath and supporting, not merely the Combined Boards but the entire Allied war effort, was a second novel, and separate, principle.

The power of Lend-Lease in determining the character of the Allied war effort emerges ever more strongly as one contemplates the facts of Mr. McNeill's narrative; and it is a pity that so little has been published which would give body to official statements (Sir David Waley's account, in an appendix, is, inevitably, as flat as a White Paper). The " philosophy " of Lend-Lease was kept deliberately vague by a President who understood better than anyone the conflicting popular attitudes towards the support of Allies with American resources. Enlightened self-interest, philanthropy to suffering peoples, a loan in kind, all competed with the Combined Principle expressed in terms of " Mutual Aid "; and opposition in Congress and the press led Roosevelt to repudiate the principle expressed in his covering letter to the annual Lend-Lease report of 1943 that " each is contributing in accordance with its ability and its resources." Thenceforward although Lend-Lease appropriations were helped by publicity for British Reciprocal Aid to American Forces in Britain, the Combined Principle never became established in the public mind in the United States, and a growing set of problems beset the administration of Lend-Lease as the European War drew to a conclusion and as both countries set about reconversion and the British restoring the export trade. This lack of clarity about the nature and purpose of the vast American subsidy overseas lies at the centre of the problem of American foreign policy. It was responsible for the abrupt cessation of Lend-Lease with the end of the Japanese War, bedevilled the negotiations for the British Loan in 1946, which was launched as economic succour but, like the Marshall Aid programme, passed Congress as aid in the " fight against Communism," and still confuses and inhibits American economic policy, especially towards Asia. The key nature of the Lend-Lease idea as

an historical subject is illustrated by the unsuccessful attempt of the United States Government to use it as an instrument for re-establishing a liberal structure of international trade, and its success as a political instrument.

The collapse of the whole structure of Anglo-American co-operation after the war is an important element in the tragedy of the Peace. It is not British complacency to believe that this collapse was the result of the decision of the overwhelmingly stronger of the two Powers to withdraw from it. Mr. McNeill brings out clearly the limitations of American foreign policy of which Lend-Lease was only a part. The American military tradition, which eschews politics and tried to fight the European campaign in a political vacuum; the aboriginal hostility of Americans in general and their President in particular to imperial authority and to " power politics " and spheres of influence, especially when British; the Wilsonian yearning for an international rule of law, expressed again by President Roosevelt; the American desire for a return to normalcy in a world which had ceased to recognise a norm; all combined to obscure the realities of power and the vital importance of a special relationship between the United States and the British Commonwealth, a relationship which had to be painfully re-established, in a disguised form, in NATO and ECA.

Yet there is an obverse to the coin. Mr. McNeill's book reads, to an European, like a tragedy in the grand scale. But, true to his American birthright, the author by no means shuts the door to progress. In his concluding chapter he surveys the change in scale of international politics, the development of supra-national administration, the universal promotion, in various guises including the Russian, of social revolution and, above all, the continuing robustness of American idealism expressed most recently in Roosevelt's " myth " of peace on earth through human planning, and comes to the conclusion that the experience of war may have pushed international relationships on to a higher and more stable plane. In this American hopes are important.

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NOTES AND MEMORANDA

A NOTE ON INCOME DISTRIBUTION IN DEVELOPED AND UNDERDEVELOPED COUNTRIES

THESE comments relate to Professor Theodore Morgan's article, "Distribution of Income in Ceylon, Puerto Rico, the United States and the United Kingdom," appearing in the December 1953 issue of the ECONOMIC JOURNAL, pp. 821–34. In this article two inferences are drawn by the author: first, that despite various caveats regarding the data presented for Ceylon and Puerto Rico, the inequality in size distribution of income in these countries is greater than in the United States and the United Kingdom, and second, this conclusion is boldly extended to underdeveloped and developed countries in general.

The first conclusion is based mainly on the comparison of concentration ratios (p. 828), which are (for before-tax distribution) 53% for Puerto Rico, 43% for Ceylon, 40% for the United States and 35% for the United Kingdom. The author states: "There are qualms about the accuracy of the Puerto Rico data, given above." Tax evasion and avoidance, inadequate samples and failure to report miscellaneous and imputed incomes (mentioned by the author) all amount to a considerable sum. How large this under-reporting may be can be seen by comparing the aggregate income from the size distribution with aggregates from national-income statistics. The total in the income distribution (which is for 1946/7) is $423 million. (See the original source, H. Perloff, *Puerto Rico's Economic Future*, p. 166.) This total, presumably personal income, may be compared with a recent estimate of personal income —derived from fairly good income statistics—of $658 million for 1946/7 (see Economic Planning Board, *Economic Development of Puerto Rico 1940–1950, 1951–1960*, p. 158). The coverage of personal income in the former is only 64% of aggregate personal income derived from national-income statistics. It may be noted that H. Perloff uses the Puerto Rican distribution to indicate "approximate magnitudes" without any comparisons with United States distribution.

The data for Ceylon appear to be no better. The most questionable aspect of the data is the fact that these figures cover only the month of December 1950. They appear to be converted into annual incomes by multiplying by twelve months. In countries which are predominantly agricultural there is apt to be a pronounced seasonal pattern of economic activities. For example, in Ceylon the winter paddy-growing season is harvested in January or February, at which time peasant income may be high and in preceding months low. On the basis of the data given by Professor Morgan (p. 823), *per capita* annual income works out to be 220 rupees in 1950. This figure multiplied by a total population of 7,544,000

gives an aggregate income of 1,660 million rupees. Personal-income data are not available for Ceylon, but its national income for 1950 is 3,840 million and for 1951 4,507 million rupees. (These together with the population figures, are from the U.N. *Monthly Bulletin of Statistics*, April 1953, pp. 1 and 142). Thus, the total income from the size distribution is only 43% of the 1950 national income. It would seem to me that these figures, both for Puerto Rico and Ceylon, are too rough for the kind of comparisons in the article and that the few percentage differences shown in the concentration ratios are not significant.

As to the larger ratio of highest to the lowest average incomes of various occupations in Ceylon as compared to the United States (see pp. 830–1), this depends on the number and composition of occupations in the highest and the lowest brackets in Ceylon and the extent to which these are matched in the corresponding brackets in the United States. The information given in the article is too brief to permit one to pass judgment on many of the comparisons intended. This type of income distribution is extremely difficult to execute successfully.

In addition to the concentration ratios, Professor Morgan supports his conclusion by appealing to impressions of Westerners which are "more emphatic than our data bear out." But on complex quantitative matters, such as the comparison of total income distributions in various countries, impressions (especially the first ones) can be most misleading. Interestingly enough, the two impressions he cites are taken from the U.N. *Economic Bulletin for Asia and the Far East*, January–June 1952, pp. 24–5, according to his footnote, p. 829. Now (as I understand this passage in the *Bulletin*), these are cited by the *Bulletin* only to show that impressions of Westerners may be misleading and that they tend to exaggerate the actual state of inequality in the Orient. The authors of the *Bulletin* (looking, incidentally, at the same Lorenz curves and concentration ratios for Ceylon and the United States as those of Professor Morgan) conclude that "the relative uniformity in the degrees of income inequality in such different economies is indeed surprising, and suggests some generalization having the character of a statistical-economic law" (*op. cit.*). The *Bulletin* argues that the extreme riches the Westerner sees are confined to a very small group, say, those in the "topmost one, two, or five percent," while the extreme poverty he sees in the rest of the population is due to his inability to distinguish the gradations in the standard of living which actually exist.

I understand these passages in the *Bulletin* to mean that the proportion in the lowest and highest income brackets in the Orient is smaller than first impressions lead the Westerner to believe. I would agree with the *Bulletin* and further argue that the income range represented by the extremes of poverty and riches that the Westerner sees in the Orient is probably small in comparison to that in a country such as the United States. The wealth of the Oriental potentate is in full display (jewels, castles, cars, etc.), but the wealth of the rich in the West is in portfolio, in the form of stocks and bonds. In the main, the consumer durables (non-income-yielding wealth)

of the former do not represent either current income expended or future income to be yielded.

The first conclusion is generalised and is extended to underdeveloped and developed countries in general. " Income distribution in 'underdeveloped' economies, by size, by occupations, and by national groups, is more unequal than in developed countries. The persisting cause is immobility in the widest sense " (p. 833). By the latter is meant, monopolies, high interest rates, concentration of land ownership, in addition to factor and commodity immobilities. This conclusion with respect to size distribution is of great interest, and it may be worthwhile to discuss this a bit more than the author does. We focus our arguments on the problem of " persisting cause of immobility, even though the conclusion is an empirical one. For the empirical evidence is very inadequate and in all probability will continue for a long time to be of a dubious kind due to various technical reasons." [1]

In effect, the author makes greater inequality the function of greater immobility. Even when immobility is taken in a broad sense, this view of the matter is too simplified. For example, the number of income earners within each household is a factor to be considered, and probably the average number in the lower-income households is larger in underdeveloped than in developed countries (due partly to longer educational periods in the latter countries). More important, perhaps, is the size of total output of the economy or national income relative to the bare subsistence output. If the total output is no larger than the subsistence output required by the inhabitants, there can be very little inequality of income persisting over very long periods, excepting for such differences as may occur owing to regional price and income differentials, varying size of households, etc.[2] That is to say, the smaller the difference of total output from subsistence output, the smaller is the maximum possible degree of variation from equality. (Eskimos, American Indians, nomadic tribes and other groups whose study is the central interest of anthropology may be examples of underdeveloped societies in which total output is not very much larger than bare subsistence. Large parts of Asia, Africa and Latin America are still inhabited by such subsistence groups.) It is largely upon this margin of difference that Professor Morgan's immobilities operate to produce inequalities.

Now, for a number of the underdeveloped countries, it would seem that total output is not very much greater than subsistence needs. And where

[1] Morgan's thesis is not supported by some of the existing data. See, for example, W. Abraham's study in the U.N. Technical Assistance report, *The National Income of the Philippines and Its Distribution* (New York, 1952), p. 20, and the U.N. *Economic Bulletin for Asia and the Far East*, January–June 1952, Bangkok, November 1952. The Philippine data, which show a concentration ratio equal to that of the United States, appear somewhat better than those of Ceylon or Puerto Rico, although not enough details of the data are available to permit a conclusive judgment.

[2] One may note that, if we confine the term geographic mobility to factor and commodities as it is customary, greater mobility tends more to equalise the real incomes rather than the money incomes of the same factor or commodity. Due to various reasons (*e.g.*, foreign trade, transport costs, etc.) differences in money incomes will remain even after real incomes are equalised.

The annual wage per person employed in the underdeveloped economy is taken to represent very approximately the subsistence income or output per person in the labor force.

the latter is from 85 to 95% of total output it does not seem possible for very much inequality to persist for these poor countries regardless of immobilities. That is, even with high interest rates, if the total volume of money loaned out by a given group of moneylenders is small, the influence of interest rates on inequality is small.

Another important consideration is the distribution of ownership of income-yielding assets. (This is, in part, included in the author's " immobility " as concentration of land ownership. It seems preferable to treat such concentration separately from immobility, *per se*.) Income-yielding assets may be divided into natural resources and man-made assets. First, the *per capita* value of man-made assets (relative to rates of earned incomes) is small in underdeveloped countries, compared to developed countries, so that even if the concentration of their ownership were the same, this factor would contribute to equality. The volume of industrial, mercantile and financial capital is probably very small, since capitalistic production and commerce are only partially developed. It is not possible to make a similar statement for natural resources, but the statement probably holds true if both types of assets are considered together. Secondly, there is one major reason for the presumption that the distribution of asset ownership is less unequal in the underdeveloped countries. Except for countries like Cuba, the size of the class of working proprietors and other entrepreneurs in the labor force is relatively large. This means that, if the *per capita* value of all income-yielding assets (relative to earned income) is the same in both types of economies, this total of assets is probably distributed more equally in the underdeveloped countries.

These considerations would lead me to a view quite the opposite of Professor Morgan's, although with certain qualifications. Generalisations with respect to size distribution of incomes in underdeveloped relative to developed countries are possible only for countries whose *per capita* output is so low that it does not exceed by very much the *per capita* subsistence, and where the concentration of land ownership is not marked.[1] The lower the level of real income and land concentration, the greater the confidence of such generalisations. For other countries (which we may refer to as " semi-developed " countries) whose output is considerably larger and where land concentration is marked, it is hazardous to assume that income inequality in the distribution of assets varies considerably from one semi-developed country to another. (For example, compare land concentration in Japan and in Cuba.) Similarly, variation in *per capita* output is considerable.

In other words, a blanket generalisation covering developed and " semi-developed " countries is risky, since there is no clear-cut distinction between, or designation of, developed and " semi-developed " countries. Even for those underdeveloped countries (with very low incomes), the generalisation

[1] Offhand, these countries may be those occupying the lowest *per capita* income bracket in the U.N. *National and Per Capita Incomes in 70 Countries—1949* (New York, October 1950), p. 28; perhaps not all these countries, since these estimates are very approximate. For 1949, these countries may be Ethiopia, Liberia, Haiti, Ecuador, Burma, China, Indonesia, Korea, Ceylon, Saudi Arabia, Thailand, Yemen, Afghanistan, India, etc., to name a few.

stated above must be taken in a very approximate and loose sense. For, to a certain extent, the outcome of the comparison will depend on the definition of income and recipient unit employed in the construction of the distribution. But assuming a broad definition of income (*at least* as broad as the definition adopted in the U.N. *A System of National Accounts with Supporting Tables* (New York, 1953)) and the recipient unit to be the household, our guess is that income (before tax) is distributed more equally in most countries of Latin America, Africa, Asia and the Middle East than in the United States or the United Kingdom.

NOTE. In an article in the *American Economic Review*, March 1955, " Economic Growth and Income Inequality," Professor Kuznets arrives at conclusions similar to Professor Morgan's. In addition to the data cited by the latter, Professor Kuznets uses data for India which are admitted to be very approximate (and in the view of this writer, too rough for the uses to which the data are put). But Professor Kuznets rests his case not only on the empirical data but also on the discussion of certain causal factors, *i.e.*, greater inequality in the ownership of assets and the shift from agriculture to urban industries. One would think that these and other factors are relevant for countries which have passed from the underdeveloped stage and are in the semi-developed period; for example England in most of the nineteenth century rather than the eighteenth century, and would hardly apply to India to-day.

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INCOME DISTRIBUTION IN DEVELOPED AND UNDER-DEVELOPED COUNTRIES: A REJOINDER[1]

MR. OSHIMA'S note is based on a misapprehension. It is not with a conclusion of my article that he disagrees, since no conclusion was given, but with a hypothesis (Article, p. 833). Though the difference is a matter of emphasis, it is still appreciable. But data available to me since I first wrote suggest a stronger case for the hypothesis than I then supposed. Mr. Oshima's arguments relate, first, to the statistics on concentration of income, and second, to general reasoning on what concentration comparisons ought to show.

Statistics from under-developed areas are no doubt less trustworthy than those from the most developed countries. The issues are then, how modestly the former are to be used, or whether they are to be disregarded altogether. There was, we know (p. 824), under-reporting in the Puerto Rico data, and as a later Ceylon survey indicates, probably also in Ceylon. The U.S. Federal Reserve consumer surveys have been troubled by the same problem. Nevertheless, an exaggerated impression of inequality does not arise from under-reporting in itself, but only from greater under-reporting in low than in high income groups. Mr. Oshima does not present evidence

[1] I am indebted to Jacqueline L. Hodgson for assistance in preparing the statistics in this note.

why this should be so. The original article suggests (p. 824) that the problem exists for both groups.

Mr. Oshima assumed that a foolish way of estimating annual agricultural income was followed, that is, multiplying the income of one month by twelve. The method was indicated (p. 823); perhaps it should have been given more plainly: the typical or normal income of those sampled was sought, not the income of the month of the Survey.

Nor are national income data necessarily a good benchmark for accuracy. Mr. Oshima quotes Ceylon gross national income figures as rising by 16% between 1950 and 1951. The rise proves neither swift economic development nor swift inflation. The 1951 figure is based on calculations that we at the Central Bank of Ceylon worked out: it included estimates for items previously omitted for lack of data. National income figures are also uncertain! Also in under-developed countries with heavy reliance on indirect as compared with direct taxes (in Ceylon the former have recently been nearly five times the latter), personal income naturally falls far below gross national income. On the other hand, the gap between the two estimates of Puerto Rico personal income cited by Mr. Oshima does seem wide, though no proof of distortion of the sampling evidence on distribution.

The best recent statistical comparisons I have been able to find are the following:

(1) The United Nations has calculated[1] comparable data for three under-developed and five developed countries (using these terms in a conventional sense):

	Percentage of total income received by richest $\frac{1}{10}$.		Percentage of total income received by poorest half.	
	Before income taxes.	After income taxes.	Before income taxes.	After income taxes.
Under-developed:				
Ceylon (1950)	33	—	21	—
El Salvador (1946)	44	—	26	—
Puerto Rico (1946–47)	41	—	16	—
Developed:				
Denmark (1949)	—	29	—	23
United Kingdom (1947–48)	32	26	26	30
Sweden (1949)	29	—	27	—
Canada (1949)	28	26	26	27
United States (1949)	30	28	23	24

The contrast is unmistakable. Usually rich are relatively richer, and the poor relatively poorer in under-developed than in developed areas. (But if we use figures from the 1930s, depression years, the comparisons are ambiguous. The United Nations table gives such estimates for the Netherlands, the United Kingdom and the United States.)

[1] United Nations: *Preliminary Report on the World Social Situation*, New York, 1952, p. 133. The Ceylon data are from our own basic figures. Italy is included in the U.N. table but omitted above as being neither clearly developed nor under-developed. Percentages are rounded to the nearest whole figure.

(2) Professor Kuznets includes India in a comparison [1] of post-war income distributions:

	Percentage of total income received by richest 20%.	Percentage of total income received by poorest 60%.
Under-developed :		
India	55	28
Ceylon	50	30
Puerto Rico	56	24
Developed :		
United States	44	34
United Kingdom	45	35

India here fits into the normal pattern. The rich are richer and the poor are poorer than in the developed countries.

(3) Ceylon carried out in 1953 a careful country-wide sample survey of consumer income and outlay. There was some under-reporting, but again the presumption is that it existed both in low (through forgetting items of real income) and high (past or future evasion of income taxes) income brackets.[2] A United Nations Mission surveyed the 1951 incomes of the urban population of El Salvador by a large and careful sample.[3] In 1951–52 a sample survey of incomes in Barbados was carried out by the Dominion Bureau of Statistics of Ottawa, Canada. The Survey attempted to get average weekly incomes for two periods, the crop season and " hard-times." [4] The income distribution results of all these can be summarised as Lorenz concentration ratios, where 100 means complete inequality of income distribution and 0 complete equality (Article, p. 827). We compare these with our previous results for the United Kingdom and the United States:

	Concentration ratios (before taxes).
Under-developed : *	
Ceylon (1953)	49
El Salvador, urban (1951)	59
Barbados (1951–52)—	
Crop season	46
Hard times	47
Developed :	
United States	40
United Kingdom	35

* A Philippine study is referred to by Mr. Oshima. It is based on data from the 1948 census, which included questions on income. The allocation by income brackets omits, however, 31% of estimated personal income as "unreported," "other" or consisting of transfers (United Nations Technical Assistance Programme, *The National Income of the Philippines and its Distribution* (New York, 1952), pp. 20, 35). The portion of personal income that is allocated gives a concentration ratio of 40, equal to that of the United States in our data. I have not included the Philippine figure in the table, since it seemed to me the omissions were too large to leave the remainder trustworthy.

[1] " Economic Growth and Income Inequality," Presidential Address, *American Economic Review*, March 1955, pp. 20–1.

[2] Central Bank of Ceylon, *Survey of Ceylon's Consumer Finances* (Colombo, 1954), p. 16; table 10.

[3] United Nations Technical Assistance Programme, *Proposals for the Further Economic Development of El Salvador* (New York, 1954), p. 11, Appendix II (pp. 101 ff.).

[4] K. H. Straw: "A Survey of Income and Consumption Patterns in Barbados," *Social and Economic Studies*, Vol. I, No. 4, August 1953, pp. 29, 30.

The data from El Salvador appear to be the least significant, in this series, use of the sampling of the urban population only. The general comson once again suggests greater inequality in under-developed areas.

Comparisons between occupational incomes (Article, pp. 830–1) ously do turn, to a considerable degree, on the occupations chosen. I l to choose occupational groupings that would make fair comparisons. ently I have also compared the range of salaries within a United States a Ceylon university, and within a United States and a Ceylon bank of size, with the same contrast as was found in the article. The point is , in my opinion, the inequality difference is so large that no room for onable doubt is left.

The United Nations study cited above considers the greater income inality it finds in under-developed areas to be consistent with frequently erved conditions: " concentration of land ownership . . . high rents, shares of crops to landowners, and high interest rates; a large surplus heap, unskilled labor . . . competing for work; extreme educational cultural differences." It sees the spread of industrialisation resulting in masses of low-paid unskilled workers, but " more opportunities for ier paid types of work, such as professional, technical, or commercial k." [1] Kuznets comments on the lack of middle classes in undereloped countries.[2] An influence working toward immediate greater quality of after-tax income in under-developed areas, and eventual greater ore-tax inequality, is the relative ineffectiveness of the income tax there. n where it seems to be sharply progressive, as in Asia, it may be only erficially so. " There are many ways in which the wealthy tax payers legally avoid the tax through 'loopholes' and also through relatively fective—or at least uneven—administration of the law." [3]

Mr. Oshima's subsistence argument runs that in under-developed coun- output is usually not much greater than subsistence needs, that people sume no less than their subsistence needs, therefore that there is very e surplus that can give rise to inequality. The fallacy, it seems to me, his interesting reasoning lies in assuming that subsistence needs are a d thing, below which income does not fall. But subsistence needs are as iable as any other cultural-physical phenomenon of societies, and income and does fall far below subsistence. Even though we define subsistence ds very moderately, income in most under-developed areas is regularly ow " subsistence." Chronic malnutrition, frequent disease, and early th are evidence. To assume that output cannot be less than subsistence confuse " ought " with " is."

The argument that income-yielding assets must be relatively equally ributed in under-developed areas is in part based on the same fallacy, t each entrepreneur must have no less than some minimum of assets,

Op. cit., p. 133.

Op. cit., p. 22.

Economic Commission for Asia and the Far East, *Bulletin*, Vol. IV, No. 3 (Bangkok, 1953), 0.

that the total of assets is small, therefore no one can have very much over the minimum. But if the minimum, as a fixed thing, does not exist? And even if income-yielding assets were distributed completely equally, the effect would at most be no separate cause of inequality, to be added to the other causes existing in the society.

Summing up, I conclude that in 1955 general reasoning supports no less strongly, and the statistics support more strongly, than when I was writing in 1953, the hypothesis that income is currently distributed more unequally in under-developed than in developed areas. The U.N. data [1] do suggest, however, that that might not have been true in the depression years of the 1930s.

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STOCKS AND THE SHARE OF WAGES

IN his article, "Inventory Investment and the Share of Wages in Manufacturing Income," Mr. G. C. Archibald [2] aims at establishing a relationship between the share of wages in total manufacturing income and changes in stocks, that is, in inventory investment. By this is meant not the well-known statistical effects on income, and therefore, on the share of wages in income, of monetary changes in stocks which are the same in volume, but the effects of physical changes in stocks on the share of wages. He applies the disequilibrium method to the analysis of distribution and assumes [3] that a firm:

(*a*) keeps prices constant during the planning period so that incorrect plans, in the sense of inaccurate forecasts of sales, result in the accumulation of stocks, that is, in unintentional investment in inventories;

(*b*) maintains a constant profit margin and that although entrepreneurs believed at the beginning of the period that their planned ouput would maximise their profits, they prefer price stability to profit maximisation in the event of overestimates of demand;

(*c*) is confronted with constant average prime costs so that total wages, which are equated with total costs in the first instance, are constant—output being assumed constant in (*a*).

The conclusions suggested at the end of the article are:

(1) in the short run, when sales fall, entrepreneurs prefer the accumulation of stocks to the reduction of output or margins, and this results in an increase in the share of wages (caused by changes in the output: sales ratio and in the raw-material-prices : wage-rates ratio);

(2) when sales continue to fall entrepreneurs reduce the burden of

[1] *Op. cit.*, p. 133.

[2] G. C. Archibald, "Inventory Investment and the Share of Wages in Manufacturing Income," ECONOMIC JOURNAL, Vol. LXV, No. 258, June 1955, pp. 257–70.

[3] *Ibid.*, pp. 257–8.

stocks and accept smaller margins, thus continuing the redistribution in favour of labour, even when the output : sales ratio turns back against it.

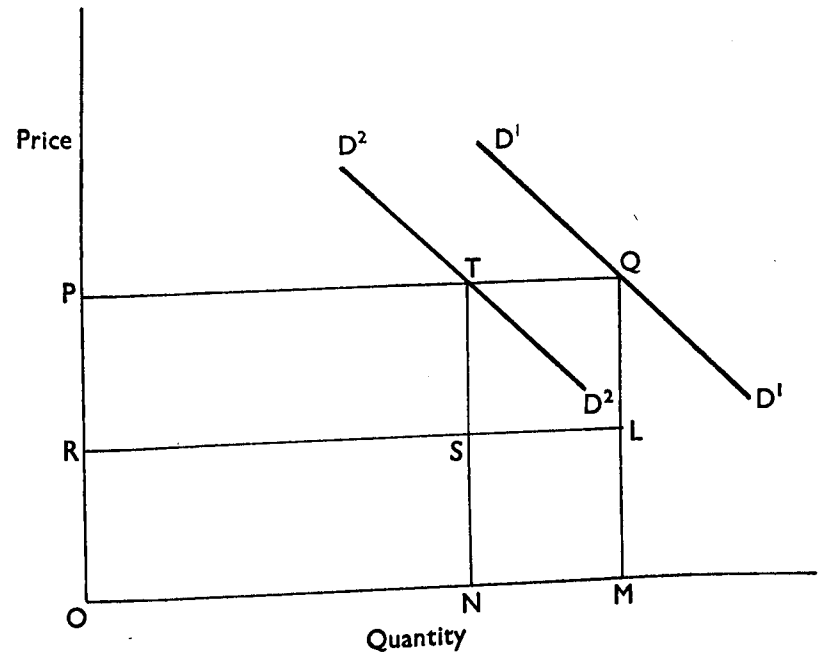


FIG. 1

In the model of the behaviour of a firm, as shown in Fig. 1, demand in period one was D^1D^1 and in period two was D^2D^2. Because changes in prices, margins and costs are ruled out by assumptions (*a*), (*b*) and (*c*), sales contract from OM to ON. But on assumption (*a*) output is maintained at OM, so there is accumulation of stocks by quantity NM. The value of the increase in stocks is $NMLS$ if they are valued at cost, or $NMQT$ if they are valued at market prices. The method of valuation is important because cost-valuation results in a fall in total income by $SLQT$, and price-valuation results in the same total income $OMQP$. Since total wages are assumed constant in (*a*), and since it is also assumed that total income consists of wages plus profits (including stock changes), it follows that the variation of the share of wages also depends on the method of valuation; if cost-valuation is chosen, the share of wages rises because profits (including stock changes) fall; if price-valuation of stocks is adopted, the share of wages is constant.

The tautological nature of this approach is even more clearly brought out if stock changes are treated—as they are in the accounting sense—as part of the profits of a firm, for the theory amounts to this: assuming that total income consists of profits plus wages, and assuming that the wages bill is constant, the share of wages in total income depends on what happens to profits.

Of course, it is no criticism to describe a theory as tautological, for not all tautologies are trivial. Indeed, tautologies such as the equation of national income and national expenditure can become useful tools of analysis. Unfortunately, it is very difficult, as Mr. Archibald points out, to assess the pragmatic value of his theory. But the assumptions of his theory can be examined, and this can give an indication of whether or not the tautology is likely to be useful.

First, it is very dangerous to generalise from the theory of the firm to the total of all manufacturing income, and this danger is present in all micro-economic analysis, including the disequilibrium analysis. Different firms have different planning periods, and at any time t there will be a large number of firms arriving at the end of their planning periods. If the aggregate demand for goods and services is declining, these firms will tend to reduce prices and/or output, and such actions will influence the share of wages in total manufacturing income. The decision to reduce prices and/or output will also be taken by another set of firms at time $t + 1$ with similar effects on the share of wages. For the manufacturing sector as a whole the continuous variation of prices and/or output—even with the assumptions of disequilibrium analysis—will affect the share of wages in total manufacturing income. Assumption (a) cannot be applied to the total manufacturing sector.

Again, if the aggregate demand for goods is increasing, assumption (c) becomes untenable: the wages bill will tend to increase as a result of trade-union pressure and/or the competitive bidding for labour by entrepreneurs. Similarly, in certain types of depression it may be possible for entrepreneurs to enforce wage-cuts and so reduce the wages bill. The effects of trade-union pressure and the strategy of management have been discussed in a previous article in this JOURNAL.[1] However, this type of influence on the share of wages must be distinguished from the sort of relationship between changes in stocks, isolated from profits, and the share of wages; the latter is a *definitional* relationship, whereas the former are *functional* relationships and are capable of being refuted or not refuted by an examination of the facts. The functional relationships which were considered seemed to apply to British experience,

[1] E. H. Phelps Brown and P. E. Hart, "The Share of Wages in National Income," ECONOMIC JOURNAL, Vol. LXII, No. 246, June 1952, pp. 253–77. In this article, the rigid sector of salaries and rent was regarded as stable, but there was no assumption that the share of profits in national income was stable. The relationship between wages and profits (including stock changes) "though far from constant does draw a fairly stable pattern of cyclical variation" (p. 267). This regularity of variation was attributed to a stable pattern of adjustment of firms which could not "be reduced to any simple form, such as that . . . price is set at a certain gross margin over direct cost" (p. 268). For this reason, among others, any constancy in the share of wages in total income (wages + profits + salaries + rent) was not explained in terms of a constant mark-up. The short-run stability of the share of wages, when corrected for changes in the working population, was partly accidental in the sense that the absolute size of the rigid sector was large enough to be able to compensate, for example, any losses by wages relatively to profits in the upswing. In other economies, where rents and salaries are smaller relatively to the flexible sector, this compensation would not happen. These points, together with a careful reading of the whole article, should remove the misunderstanding on pp. 268–9 of Mr. Archibald's paper.

but there may well be others which were not considered (for example, the terms of trade), and it may also be true that the same functional relationships do not exist in other economies.

To establish a functional relationship between changes in stocks and the share of wages, one would have to estimate the part played by monetary and physical changes in stocks in entrepreneurial strategy; how stock changes influence the prices entrepreneurs would like to charge and how these are related to actual prices. The effects of changes in stocks on entrepreneurial policy are likely to depend on the causes of the change; if stocks are being accumulated because of declining sales, entrepreneurs may lower their prices; if the increase in stocks is a result of rapid improvement in productive techniques or due to sudden fear of war and future shortage, with distribution lagging behind, they may not lower their prices, indeed, if their expectations are very optimistic, they may try to raise them. Similarly, the monetary valuation of stocks may depend on why stocks change; in the case of production expanding ahead of distribution it would be reasonable for entrepreneurs to value stocks at current prices, while in the case of declining sales, entrepreneurs may value stocks at direct cost or even less.[1]

Clearly, business-men's valuation of profit actually made in the past will vary in different circumstances, even if stock changes are the same, and if their future policy (for example, price and wages policy) partly depends on past profits, it will in turn depend upon the method of stock valuation. It is also probable that entrepreneurial attitudes to stock changes will vary between different economies: in those economies with long experience of inflation, entrepreneurs may tend to value stocks at current prices, whereas in those economies with a tradition of stability, business-men may favour stock valuation at historical cost.

Enough has been said to show that the establishment of a functional relationship between stock changes and the share of wages would be a difficult task. The definitional relationship is obvious; stock changes, both real and monetary, form part of reported profits, and thereby part of total income, and affect the denominator of the share of wages. But attempts to explain variations in the share of wages must be concerned with the establishment of functional relationships; the interesting questions are: how is this share affected by trade-union activity, by entrepreneurial strategy, by changes in the terms of trade, etc., etc.?

Estimates of the value of physical changes in stocks in this country 1870/1954 will be available,[2] and perhaps Mr. Archibald can be persuaded

[1] The stock valuation being discussed here is the value which business-men take into consideration when deciding policy. This valuation need not be identical with their accountants' figures. For example, business-men, especially if they are accountants themselves, regard stock appreciation in times of inflation as a nominal part of their profits when deciding policy on dividend distribution or on appropriation to reserves.

[2] J. B. Jefferys and D. Walters: "National Income and Expenditure of the United Kingdom 1870/1952," *Income and Wealth*, Series V, to be published for the International Association for Research in *Income and Wealth* by Bowes & Bowes, London. For recent years the Blue Book on National Income gives estimates of the value of physical changes in stocks and stock appreciation.

to relax his assumptions of constant wages, constant prices, and to assess the influence of stock changes on entrepreneurial policy, and therefore on one factor influencing the share of wages.

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STOCKS AND THE SHARE OF WAGES: A REJOINDER

1. THE chief of Mr. Hart's interesting criticisms of my paper is that the relationships I set out to explore were "definitional," and hence less interesting, and less important, than what he calls "functional" relationships. The obvious methodological reply is that, in matters of this sort, definitional relationships have to be cleared up, whether they are exciting or not. But either Mr. Hart's categories are imperfectly defined or his allocation of relationships to those categories uncertain. Among the questions he poses as interesting, and functional rather than definitional, is: how is the share of wages affected by entrepreneurial strategy? It was a very small part of the answer to this question that my paper was intended to supply. The argument is: *if* firms characteristically change output less rapidly than sales, and *if* stocks of finished goods are characteristically valued nearer to direct cost than to market price, then the share of wages in reported income will increase in the downswing, and vice versa. These movements in the share of wages will then be the consequence of entrepreneurial policy—or the lack of it—in adjusting output to sales, as well as of tax law and accounting practice. There is some evidence to suggest that firms do lag in adjusting output, and do value stocks of finished goods nearer to cost than market price. Mr. Hart's charge, however, that my argument is purely definitional, and his implied charge, that it is a trivial tautology, are surely met by the fact that, if entrepreneurs pursued a different policy in adjusting output to sales, if, for example, they were quicker off the mark, then the result on the share of wages would be different, or, at least, would be achieved by the manipulation of some other of the variables within the entrepreneurs' control.

Mr. Hart also points out that, at different times, and in different places, stocks may accumulate for different reasons, and business-men react differently to the accumulation. This is indisputable; but its relevance to my argument, that a certain pattern of accumulation and reaction will have a certain effect on the share of wages, and that this was the pattern displayed by the American manufacturing sector between the wars, is not obvious.

2. Mr. Hart's other criticisms are concerned with the method and with the assumptions.[1] He objects, first, that different firms have different

[1] There is also the dispute over whether or not the statement that the relative constancy of the share of wages was partly the consequence of compensation in the opposite movement of the ratios (wages : wages plus profits) and (wages plus profits : home-produced national income) is inconsistent with the rest of the Phelps Brown–Hart argument. It is inconsistent with the view that constancy of margins was the main cause of the steadiness of the share of wages. The dispute therefore turns c whether or not Professor Phelps Brown and Mr. Hart advanced the latter view. That they d might appear from their statements that "it does seem that we must invoke some stability of poli in the firm to explain the facts" (p. 267), that "firms' 'patterns of adjustment' generally we malleable, in the sense that a level of margins once imposed by force of circumstances came to accepted as normal" (p. 273), and, in the conclusion, that "the comparative regularity [of t cyclical variation in wages and profits] and also the narrowness of its movements in comparison wi those in prices and money income, we attribute to the stability of *the pattern of adjustment* by whi firms regulate the relations between costs, output and prices" (p. 274). Mr. Hart argues that th did not, reminding us of their statement that the regularity of variation could not "be reduced any simple form, such as that . . . price is set at a certain gross margin over direct cost" [p. 26 Perhaps it will be admitted that there was room for some misunderstanding here. What was doubt was whether or not Professor Phelps Brown and Mr. Hart did consider constancy of margi (or the relations between costs and prices) as a prime cause of the relative steadiness of the share wages. If they did, then the compensatory movement of the other ratios follows from this (and t stability of rents and salaries) and cannot be made the cause of the steadiness of the share of wag Mr. Hart, however, is clear that they did not.

[1] See A. T. Peacock and W. J. L. Ryan, "Wage Claims and the Pace of Inflation," ECONOMIC JOURNAL, Vol. LXIII, No. 250, June 1953, pp. 385–92.

planning periods, so that, for the manufacturing sector as a whole, changes i output and prices are continuous. He concludes from this that my assump tion of constant prices during the planning period cannot be applied to th total manufacturing sector. The difficulties for analysis caused by the fac that planning periods are not synchronous and co-terminous, and th difficulties of aggregation, are well known, but are not relevant to this dis cussion. All that is necessary to my argument is that individual firms fi price and output for a period during which unexpected things may happe and the level of stocks change. It is only the result, in the shape of wages an profits, of the actions of the individual firms, that need be (statistically aggregated.

Mr. Hart objects, second, that trade-union pressure and entrepreneuria activity will increase the wages bill in the upswing, and that money wage may be cut in the downswing, so that my assumption of constant averag prime costs is untenable. There seems to be a confusion of periods here. I is only necessary to my argument that wage rates be known for the period— presumably much shorter than the wage adjustment period[1]—for which pric and output are determined. When negotiations lead to a new wage rate, i may reasonably be supposed that each firm affected revises its plans for a perio at any rate not longer than the period for which the new rate is expected t last. If, in an inflationary period, the competitive bidding of employers producing a continuous wage increase, the wage rate to be offered migh well be included with price and output as one of the variables to be fixed a regular intervals. In any case it is not necessary to my argument, as M Hart seems to imply, that average prime costs be constant throughout th cycle.

G. C. ARCHIBALD

London.

INSTABILITY OF PRIMARY PRODUCT PRICES: A FURTHER COMMENT

Absence from my headquarters has prevented any earlier rejoinder t the reply by Professor Klaus Knorr and the comment by Mr. S. G. Sturme which appeared in the Economic Journal of June 1955. Nor do I now pr pose to enter into any long controversy with either contributor. I shoul however, like to make three comments on Professor Knorr's reply and or general remark on Mr. Sturmey's comment.

My comments on Professor Knorr's submissions are:

(*a*) My original note referred to two United Nations publications- *Instability in Export Markets of Underdeveloped Countries* (1951) and *A Report of Committee on Commodity Trade and Economic Development* (1953). Not all th views I criticised are expressed in both reports, and I readily agree that son of my criticisms are not applicable to the second, which Professor Knorr concerned to defend.

(*b*) The point about the primary producers suffering a deterioratir balance of trade during periods of falling prices (whereas industrial countri tend to have an improving balance of trade in such periods) is made clear in the second document, the report of the Committee. I quote from paragrap 26 of that Report (the remainder of the paragraph consists of statistic illustration):

> "There is also an important technical reason for the severity of th difficulties produced in primary producing countries by instability i prices. Economically developed manufacturing countries tend to hav a more favourable balance of payments in depression and a less favou able one in boom years; primary producers have the opposite patter Thus for the manufacturing countries internal and external problen alternate; for the primary producers they arrive at the same time."

My criticism of this was not that it was not a new discovery but that was put forward as an additional disadvantage suffered by primary pr ducing countries, without recognising that it is commonly an automat result of their own very sensible efforts to even out the expenditure of the external incomes over the years (*i.e.*, they have payments deficits in depre sions because they are then using the reserves they accumulated in the boon to maintain some degree of steadiness in their patterns of consumption an investment). Nothing that Professor Knorr has said bears on that criticisn

(*c*) Professor Knorr's comment on my reference to the experience British dependencies suggests that we are much nearer agreement tha appears at first sight. In effect, it is a re-statement of one of my princip points, *i.e.*, that many of the difficulties of underdeveloped countries are th result of bad or inexperienced financial management rather than being th inevitable consequences of price instability. I imagine that Professor Kno would agree that in practice such countries would be wise to try to achie better internal management (which is worth while whether prices fluctua

or not) and not to depend exclusively on hopes that they will be saved the trouble by some external power.

My comment on what Mr. Sturmey has said is that this is just the kind of concrete examination of specific, as opposed to general, results of price instability which I was appealing for. Once we are clearer what the specific problems are it may be possible to find answers to them one by one without waiting for a general and comprehensive solution.

Sydney Caine

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Singapore.

IMPERFECT COMPETITION AND THE ELASTICITY OF DEMAND FOR IMPORTS: A NOTE

In the Economic Journal of June 1953 Professor Brems advanced the proposition that the theory of imperfect competition established the presumption of a lower limit for the elasticity of demand for imports at a point numerically higher than unity, and, hence, provided an *a priori* proof of the effectiveness of devaluation as an instrument for the improvement of the trade balance.[1]

The argument was simple. A firm maximises its profits at the point of equality between marginal revenue and marginal cost. Since marginal cost is inevitably positive, marginal revenue must be positive too. But marginal revenue cannot be positive unless the elasticity of demand is numerically greater than unity.

Mr. Harrod, in a "Comment" on Professor Brems' article,[2] produced a very damaging criticism of this argument when applied to the case of devaluation. He pointed out that the concept of a fixed demand curve for the individual firm depends on competitors' prices being taken as given; should competitors' prices alter, the firm's demand curve will shift. Now, devaluation is precisely the event which will enable all competing exporters to lower their foreign prices. Thus, the foreign-demand curve of each of these firms will shift to the left. The observed foreign elasticity of demand will therefore be, for each one of them, a compound of the initial elasticity of the curve *plus* the effect of its shift, and this may well be numerically less than unity.

But, as Mr. Harrod himself indicated,[3] the effectiveness of his criticism depends on the proportion of each group of competitive products supplied by the devaluing country. Should that be small, the shift to the left of the foreign-demand curves of the individual firms of the devaluing country will be small and possibly insufficient to bring the observed elasticity of foreign demand below unity. There is, however, a criticism of Professor Brems'

[1] H. Brems, "Foreign Exchange Rates and Monopolistic Competition," Economic Journal, Vol. LXVIII (1953), pp. 289–94.
[2] Economic Journal, Vol. LXVIII (1953), pp. 294–8.
[3] *Ibid.*, p. 296.

argument which holds even if the shift in the foreign-demand curve of each individual firm is zero. In that sense it may be said to have logical precedence over Mr. Harrod's criticism.

Professor Brems bases his case on the equality of marginal cost with the marginal revenue *obtained from the foreign market.* But it is no way fundamental to the theory of imperfect competition that this should happen. If it does happen it implies price discrimination between the home and foreign markets (unless elasticities of demand are the same in both),[1] and discrimination, whilst capable of being elegantly analysed in terms of the theoretical apparatus associated with the theories of imperfect competition, has never been thought of as having such universal application as to be elevated to the status of a basic hypothesis in the theory of the firm.

If discrimination is not practised, the elasticity of an individual firm's foreign-demand curve, in the neighbourhood of the firm's current volume of exports, can be numerically less than unity (yield, that is, a negative marginal revenue from the foreign market) quite consistently with the hypotheses of the theory of imperfect competition. The hypothesis of profit maximisation requires the equation of marginal revenue to marginal cost, but, in the absence of price discrimination, the marginal revenue in question is that which corresponds to the aggregate demand curve and not to the demand curves for the separate markets. The volume of exports determined in such an event might easily be such that the firm is in fact operating at a very inelastic range of its foreign-demand curve.

Since Professor Brems did not refer explicitly to price discrimination, one does not know whether he was aware that it is implicit in his reasoning, but judged it unnecessary to defend it because he was satisfied that price discrimination between home and foreign markets is so extensively practised that it can be taken for granted.

The classical case of international price discrimination is that of " dumping," which was practised at some scale before the war by national cartels. A higher price at home than abroad, which is the essence of dumping, implies, according to the theory of discrimination, a foreign-demand elasticity higher than that obtaining at home.[2] But this, beyond confirming that there are some commodities with quite high foreign elasticities of demand, is of little relevance. The crucial question for the Brems case is whether price discrimination is practised in the wide range of traded goods whose foreign-demand elasticity is, rightly or wrongly, thought to be low. Theoretically it would be expected that, in the event of low foreign elasticities, discrimination would take the form of higher prices abroad than at home. (Admittedly this would only indicate that the foreign elasticities are low relatively to the corresponding home elasticities, and not low absolutely; but the latter may be fairly presumed.) Of this there have been several instances in the post-war years. For example, in the United Kingdom the Coal Board has been charging more for exported coal, and in India there have been export restrictions in order to ensure a home price for certain home-produced raw materials lower that that obtaining in the world market. A mere enumeration of such leading instances, however, shows that they are exceptional and irrelevant. Irrelevant because in these instances the lower home price was not dictated by considerations of profit maximisation; exceptional because the discrimination was operated under a shield of statutory export monopoly, than which nothing less is adequate for the maintenance of an export premium. (The shield of import tariffs behind which a higher home price can be maintained has no equivalent to protect an export premium.)

Nothing in the arguments advanced here purports to establish that the foreign demand for individual firms' products *must* be inelastic. The aim has simply been to refute the claim that by virtue of the hypotheses of imperfect competition theory they *cannot* be inelastic. The naïve application of simple theory to complicated facts of life has been dictated by this objective.

JOHN SPRAOS

University of Sheffield.

[1] See, for example, J. Robinson, *The Economics of Imperfect Competition* (London: Macmillan, 1933), p. 181.

[2] J. Robinson, *ibid.*

CURRENT TOPICS

WE offer our very best congratulations to Professor R. G. Hawtrey, for many years a member of our Council, and during the years 1946–48 President of the Society, on the conferment of the honour of Knight Bachelor in the New Year Honours List.

THE *Premio Internazionale Antonio Feltrinelli per le Scienze Economiche e Sociali*, of 5 million lire, for the year 1955, has been awarded to Professor A. C. Pigou of Cambridge University, in recognition of his great contributions to the development of economic thought. May we offer our best congratulations and good wishes to Professor Pigou on this very well deserved honour.

MR. T. W. HUTCHISON, Reader in Economics at the London School of Economics and Political Science, has been elected to the Chair of Economics in the University of Birmingham. Professor Gilbert Walker, who had held this Chair, has been transferred to the Chair of Commerce, vacant through the retirement of Professor Sargant Florence.

MR. H. G. JOHNSON, Fellow of King's College, Cambridge, has been elected to the Chair of Economic Theory in the University of Manchester.

MR. C. W. GUILLEBAUD, Fellow of St. John's College, Cambridge, has been appointed to a Readership in the University of Cambridge.

THE Israel Political Sciences Association is anxious to get in touch with all economists working in Israel. The Association would be grateful if any Fellows of the Royal Economic Society resident in the country would write to Dr. E. Alexander, President of the Israel Political Sciences Association, 24 Shmarjahu Street, Haifa.

The following have been admitted to life fellowship of the Society:

Daniell, P. A.
Henderson, J. M.
Jones, G. T.
Murphy, H. C.
Nerlove, M. L.

The following have been admitted to fellowship of the Society:

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Velupillay, S.
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Woolgar, M. R.
Yeh, Kung Chia.
Yip, Y. P.
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VOL. 118, PART 4, 1955. *A Unified Derivation of some Well-known Frequency Distributions of Interest in Biometry and Statistics:* J. O. IRWIN. *Colliery Statistics:* F. D. K. LIDDELL. *An Analysis of 162,332 Lottery Numbers:* J. H. WEST. *Statistical Assessment of the Need for Clinical Services. National Income and Related Statistics:* J. E. G. UTTING. *Population and Vital Statistics:* E. GREBENIK.

Applied Statistics

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Economica

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The Review of Economic Studies

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Oxford Economic Papers

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Bulletin of the Oxford University Institute of Statistics

VOL. 17, NO. 4, NOVEMBER 1955. *Some Problems Raised by the Report of the Royal Commission on the Taxation of Profits and Income:* P. P. STREETEN. *Output, Employment, and Productivity in British Manufacturing in the Last Half Century:* A. MADDISON. *Major Consumer Expenditures and Ownership of Durable Goods:* L. R. KLEIN.

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The Economic History Review

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No. 8, 1955. *In Every Way Activate the Further Upsurge of Socialist Industry. The New Planning and Financing Regulations for the Economies of Union-Republics and the Tasks of Finance Organs:* V. SOSNOVSKY. *For a Better Level of Work in Drawing Up the Draft 1956 Budget:* N. KISMAN. *The Establishment of Expenditure Limits for Institutions Carried on the State Budget:* N. POMANSKY. *Reserves for Lowering Administrative Expenditures in Industry:* N. VASILEV. *Important Tasks for the Finance Organs of Kazakhstan:* U. ATAMBAEV. *For a Successful Completion of the State Revenue Plan:* G. RAMBAM, V. BLYASHOV and G. BOTSUL. *The Decentralised Account System for Budget Deductions from Profits:* V. PAEVSKY. *The Computation of Requirements in Fixing the Circulating Capital of Industrial Enterprises:* L. ROTSHTEIN. *The Definition of Planned Profits in Industrial Ministries and Administrations:* YU. MARGULIS. *The Role of Finance in the Industrial Development of Bulgaria:* I. SEMENOV. *The Decentralised Account*

No. 9, 1955. *The Resolutions of the July Plenum of the Central Committee and the Work of Financial Agencies:* A. ZVEREV. *Control by the Rouble—An Important Function of Financial Agencies:* I. SLAVNY. *Improve the Use of Repair Funds:* A. SIDOROV. *Reserves for Lowering the Cost of Tractor Work in M.T.S.:* N. DVORETSKOVA. *The Rôle of Finance in the Execution of the First Five-year Plan of the Chinese People's Republic:* N. ANDREYCHENKO.

Dengi i Kredit (Russian text)

No. 7, 1955. *Activate the Further Progress of Industry. The Organisation of Clearing Accounts in the Light and Food Industries:* A. KAZANTSEV. *Ways to a Further Improvement of Accounting in the Economy:* I. DOLGIN. *Strengthen the Links Between the Divisions of the State Bank:* M. GROZOVSKY. *Forms of Accounting Between the U.S.S.R. and the Countries of Popular Democracy:* A. ALTSHULER. *Some Results of the Activity of the European Payments Union:* A. EVREISKOY. *The Analysis of the Profit Plan Fulfilment of an Industrial Enterprise:* V. KOPNYAEV and G. SHTUKMEISTER.

No. 8, 1955. *A Fighting Programme of Action. Plans for Organisational and Technical Measures and Bank Control:* P. PARFANYAK. *The Effectiveness of Credit for Mechanization in Industry:* N. BARKOVSKY. *Credit-accounting Relations Between the U.S.S.R. and Finland:* V. TRUBENKOV. *The Hungarian National Bank in the Service of Building Socialism:* J. VERES. *The Activity of Bank Control:* YA. MASLYUKOV. *The Proper Discount of Bills of Lading for Autonomously Financed Organisations:* A. KOSOY. *Bank Control of the Observance of Contracts:* T. CHERNYSHEVA.

No. 9, 1955. *Improve the Efficiency of Bank Control. Widen the Rights of the Director of an Enterprise. Accounts in the Metallurgical Industry:* M. KOTKOV. *The Training of Specialists for the State Bank:* M. IVANOV. *The Control System for Inter-branch Turnover:* M. GROZOVSKY. *Shortcomings in Economic Operation:* S. KHOTETOVSKY. *Perfect Credit and Accounting Methods:* V. RYLKOV.

Vestnik Statistiki (Russian text)

No. 3, 1955. *For a Further Improvement in Agricultural Statistics:* V. MANYAKIN. *Methodological Problems in Accounting the Consumption Fund of the Population for Livestock Products:* S. PARTIGUL. *On the Problem of Revealing the Influence of Alterations in Product-mix on the Level of Production Costs:* G. GROMYKO. *Computing the Influence of Changes in Product-mix on the Dynamics of Production Costs:* YA. KABACHNIK. *P. P. Semenov Tyan-Shansky (1827–1914) as a Statistician:* M. KUZNETSOVA. *On Computing the Actual Crop of Agricultural Produce in 1955:* N. ZHIVILIN. *Statistical Problems at the Eighth Session of the U.N. Commission on Censuses of Population:* T. RYABUSHKIN.

No. 4, 1955. *A Programme for the Struggle to Develop Socialist Industry Still Further. For Continued Improvement in Statistical Work. Problems in the Use of Wholesale Prices for Computing the Volume of Gross and Saleable Output of Industry:* N. LYUBIMOV. *Methods of Computing Labour Productivity in Agriculture:* A. BRYANSKY and D. DUMNOV. *The Employment of Harmonic Means in Statistics:* D. OPARIN. *On the Harmonic Mean:* M. ILEVSKY. *New Procedure in Planning, Accounting and Calculating the Cost of Production of Industrial Goods:* D. VAINSHENKER.

No. 5, 1955. *Some Problems in the Analysis of the Efficiency of Introducing New Technique:* A. KONSON. *Methods of Studying Labour Productivity in Collective Farms:* A. LIBKIND. *Poll Counts in Russian Statistics (1710–1859):* N. DRYZHININ. *Chinese Censuses of Population, 2205* B.C. *to* A.D. *1953:* S. KROTEVICH. *The Organisation of Industrial Statistics in Capitalist Countries:* N. IVANOV. *Checking Workers' Household Budget Enquiries:* I. KLYUCHANSKY. *Shortcomings in Measuring Labour Productivity in Flour Milling:* G. BAVIL. *On the Improvement of the Annual Accounts of Collective Farms:* M. MOROZOV. *Some Problems in Analysing Plan Fulfilment for Production Costs:* V. SHLYAPENTOKH.

Plánované Hospodářstvi (Czech text)

No. 6, 1955. *A Better Organization of the Even Fulfilment of the Economic Plan:* V. LUKEŠ and B. REHÁK. *For the Development of International Trade:* J. VLČEK. *Economic Problems in the Development of Livestock Breeding:* V. NEMCHINOV. *Further Decentralisation of Planning Material. Technical Supply:* L. MATĚJKA and M. KULICH. *The 1956 Plan for Production Expenses and Circulation:* B. KLIČKA.

No. 7, 1955. *The Improvement of Planning and Executing Capital Construction in Industry:* V. KOMÁREK. *The Use of Reserves in Engineering:* L. ŠMID. *Some Problems in the Economic Development of Isolated Agricultural Co-operatives:* J. KOŘALKA. *Planning the Gross and Net Output of Industry:* O. GERSHANOVSKY and M. POLIKARPOV.

No. 8, 1955. *For a Greater Use of Chemical Processing in the National Economy:* J. PELC. *A Better Use of Reserves for Increasing Output and Labour Productivity in Metallurgy:* J. GOLDMANN.

Speed the Introduction of New Technology into Engineering: R. PLATZER. *Improve Plan Fulfilment in Light Industry:* J. MATOUŠEK. *The Use of Material Incentives to Workers for the Fulfilment and Overfulfilment of Industrial Plans:* F. KUTTA. *A Proper Determination of the Need to Electrify Czechoslovak Railways:* B. TOMEK.

No. 9, 1955. *The Main Tasks for Developing Energy Supplies in the Second Five-year Plan:* F. HOMOLA. *For the Further Mechanisation of the Timber Industry:* J. JINDRA. *U.S. Imperialism in South America:* A. NUOŠKA. *The New Planning System in Agriculture and Problems of Regional Livestock Distribution:* L. ZALTSMAN. *Improve the Price System for Domestic Materials:* O. FIALA and J. TYPOLT.

Gospodarka Planowa (Polish text)

No. 9, 1955. *On the Methods of Investigating and the Criteria of Selecting the Most Efficient Technological Solution:* J. PAJESTKA. *Let us Intensify the Fight for a More Rapid Increase in the Efficiency of Labour in Industry:* M. SZAPIRO. *The Problem of Maize Cultivation in Poland:* W. KOWNACKI. *The Footwear Industry in the Five-year Plan:* J. POZNAŃSKI. *Changes in the Organisation of the Local Economic Planning Commissions:* CZ. BIELECKI and E. SZKLARCZYK. *Employment Policy and the Proportions of the Manpower Balance:* M. CHARKIEWICZ. *Some Problems in the Struggle for Lowering Material Costs in Industry:* L. ZĘBKOWICZ. *"The Dirty War" in Algeria:* J. DUCLOS. *After the Discussion on Calculating the Value of Gross Production in Engineering Enterprises. A Measure of Daily Fluctuation in Output:* A. ROTMIL.

No. 10, 1955. *Some Problems Connected with the Elaboration of the 1956 National Economic Plan:* A. WANG. *The Part to be Played by Construction Offices in Technological Progress:* J. KOPIŃSKI. *Let us Make Wider Use of Synthetic Materials in the Construction of Machines and Apparatus:* A. MARKOWSKI. *Remarks on the Present Stage in Agricultural Mechanisation:* Z. KUNCZYŃSKI. *On the Simplification in the Programme of Reporting and Statistical Research for 1956:* M. RYBKOWSKI. *The Investigation of the Effectiveness of Investments as a Component Factor of the Planning System:* A. BRZESKI. *Symposium on the Five-year Plan for Agriculture.*

No. 11, 1956. *The Elaboration of Factory Drafts for the Five-year Plan is an Important Task of Today. The Effect of Producer Goods Prices on Output:* Z. AUGUSTOWSKI. *The Problem of Building Prices and Cost Accounting:* S. KUROWSKI. *Some Pro'lems of the Economic Effectiveness of Technical Progress in Industry:* C. NIEWADZI. *The Subject Matter of Economic Dissertations:* M. RADOWSKI. *The Organisation of State Statistics and the Needs of Planning. Symposium on Agricultural Problems in the Five-year Plan:* Z. WEGRYK, Z. KARST, I. REJDUCH, H. SMACZNY, R. FROMER and E. WIĘCKO.

Planovo Stopanstvo (Bulgarian text)

No. 5, 1955. *For a Complete Utilization of Reserves for Expanding Labour Productivity. Socialist Emulation and Labour Productivity in the Coal Industry:* B. MECHKOV. *The Voroshilov Works and the Sofia Appeal:* A. MARINOV and I. GELEV. *For a Wide Introduction into Industry of Labour-norm Fixing on a Technological Basis:* L. PETROV. *Forms of Economic Links between Town and Country in Bulgaria:* P. MASTIKOV. *How to Solve the Fodder Problem on Collective Farms:* S. NESHEV. *Methods of Calculating Productive Capacity in Industry:* D. DAVIDOV. *Planning Stocks of Materials in Industry:* I. OLOVANOV. *The Economic Development of China:* I. PANAIOTOV.

Probleme Economice (Rumanian text)

No. 8, 1955. *The Unity of Party, Government and People Guarantees the Construction of Socialism in Rumania. Soviet Aid in the Industrialization of Our Country:* S. PETRESCU. *Aspects of the Problem of Present Day Market Prices:* I. ANGHEL. *For an Improvement in the Teaching of the Social Sciences in Higher Education:* Ş. CRUCERU and V. RAUSSER. *The Development of Ferrous Metallurgy in Rumania:* A. SINESCU and T. NICOLESCU. *Certain Problems of Cost Prices and Profitability in Machine-tractor Stations:* V. TOPOR and G. VÎLCEANU. *Agrarian Problems in the Works of N. Bălcescu:* V. IONESCU. *A Consideration of the Methodology of Calculating Labour Productivity in Industry:* M. FLORESCU. *The Reproduction of Social Capital:* Z. BRINCU.

No. 9, 1955. *Speeches of G. Gheorghiu Dej and N. Khrushchev at the 11th Commemoration of Rumanian Liberation. On Volume III of* Capital*:* S. EMIL. *Some Aspects of Operation of the Law of Value in the Rumanian Economy:* H. KOHN. *The Present System of Industrial Wholesale Pricing in Our Country:* R. MANESCU. *The Tasks of Transport in Servicing Agriculture:* P. LUPŞE. *The Foreign Trade of China:* P. ANTIM. *Neomalthusian Theories of Population:* E. MESAROŞ. *On the Methodology of Calculating Gross Production and Labour Productivity in Industry:* L. BEKE. *The Economic Role of the Socialist State:* G. MARIANOVICI. *Engineering in China:* E. ANGHEL.

Ekonomist (*Croat text, English or French summaries*)

No. 2, 1955. *Some Problems in the Theory of the Development of Underdeveloped Areas:* G. GRDIĆ. *Demographic and Sociological Factors in Yugoslav Agriculture:* M. MACURA. *Is the Value of Used-up Means of Production Transferred to the Commodity Produced?:* R. RADOVANOVIĆ. *Internal Migration in Yugoslavia from 1948 to 1953:* S. OBRADOVIĆ. *A Discussion on the Problems of Agriculture* (*Eleventh Meeting of the Association of Economists of Serbia*): V. STIPETIĆ.

NEW BOOKS

British

The Accountability of Government Departments. A Course of Studies Paper. Henley on Thames: The Administrative Staff College, 1955. 9″. Pp. 34. 3*s.* 6*d.*

[This contains an account of the constitutional practice in this country regarding the responsibility of Ministers, individually and collectively, to Parliament.]

The Accountability of Public Companies. A Course of Studies Paper. Henley on Thames: The Administrative Staff College, 1955. 9″. Pp. 31. 3*s.* 6*d.*

[A summary of the development and present state of company law, with special reference to the rights of shareholders and creditors.]

Black's Rocky Mountain Journal, 1824. Publications of the Hudson's Bay Record Society, XVIII. Edited by E. E. Rich. London: Hudson's Bay Record Society, 1955. 10″. Pp. 260.

[The subject of the journal here reproduced is an exploratory expedition up the Finlay River in the north of British Columbia. This piece of country is still at the present day an untouched wilderness. Much of the interest of the journal comes from Black's detailed record of the way of life of the Indian tribes of the district. The long introduction by R. M. Patterson describes Black's career and his colourful personality.]

Estate Incomes. Cambridge: University of Cambridge Department of Estate Management, 1955. 8½″. Pp. 24.

[This is the third of a series of papers on aspects of the taxation of agricultural estates. It is based on an inquiry into net and gross incomes and tax liabilities of a sample of estates. It is argued that the taxation of agricultural estates involves two injustices: in the first place, taxable income is arrived at by deduction of actual expenditure on maintenance instead of by deduction of depreciation, which may be greater; and in the second place, in a period of rising prices, actual maintenance expenditure in any year tends to exceed the deductable expenditure, since the latter is computed on the average of the last five years. Gross income on the estates in the sample was only 3·62% of capital value, and the net income is actually found to be negative. This is taken as further evidence of the tax difficulties besetting the agricultural landlord. Unfortunately the presentation of the argument throughout the pamphlet is not a model of lucidity, and it is not easy to see just what the negative net income means. Nor is it made clear how the estates in the sample were selected and what grounds there are for supposing them to be representative. While it will be generally conceded that agricultural landlords have a certain grievance in the low level of *rents*, the author does not establish an entirely convincing case for supposing that they are also unjustly treated in the matter of taxation. One cannot help suspecting that the low level of net income found in the sample was influenced by the important privilege of being allowed to offset against the other income of the estate owner any excess of maintenance expenditure over estate revenue.]

EVELY (R.). The Future of Retailing. Fabian Research Series, No. 177. London: The Fabian Society, 1955. 8½″. Pp. 40. 2*s.* 6*d.*

[The author describes the present structure of distribution in this country and makes proposals for increasing its efficiency. He favours the abolition of resale price maintenance and other restrictions on competition, and he proposes that the state should take a more active part by laying down stricter standards of hygiene, establishing an advisory service and possibly entering into certain branches of wholesaling. He recognises that the freeing of competition is likely to make things more difficult for small shop-keepers, and he suggests that some degree of co-operation between them in buying might help them to overcome their difficulties without prejudice to the public interest.]

FEDERATION OF BRITISH INDUSTRIES. Taxation of Profits and Income. A digest of the Reports of the Royal Commission. London: Federation of British Industries, 1955. 8½″. Pp. 92. 5*s.*

[This contains a digest of the three reports of the Royal Commission on the Taxation of Income and Profits and of the reports of the two Departmental Committees presided over by Sir James Millard Tucker on the Taxation of Trading Profits and on the Taxation Treatment of Provisions for Retirement. An index is provided containing references to the original reports as well as to the digest. On a good many points the digest is able to state only the conclusions arrived at in the reports without giving the grounds on which they are based, so it is not a substitute for the original documents; it is, however, a very useful guide to them. It has been prepared by Mr. Frank Bower.]

FORD (P.), THOMAS (C. J.) and ASHTON (E. T.). Problem Families. The fourth report of the Southampton Survey. Oxford: Basil Blackwell, 1955. 8½″. Pp. 49. 4*s.*

[Like the earlier reports in the Southampton Survey, this is a competent piece of work with more than merely local interest. It is based on material made available by the Social Rehabilitation Committee of the County Borough of Southampton. The first chapter contains a lucid survey of past work in the field, and describes how the growth of national income per head has caused the phenomenon of the problem family to emerge as something distinct from the general problem of poverty. The statistical analysis of the Southampton material none the less leads the authors to emphasise that there is no single cause that makes a family into a problem family. Indeed, the concept of a problem family is itself far from perfectly clear. A combination of below average intelligence and ill-health is held to underlie a large proportion of the cases studied. It is clear also that many of the married couples concerned would not have come to the attention of the authorities had it not been for the large number of children born to them, since a mother who would have been able to cope more or less adequately with one or two children finds the management of a large family too much for her, and her health is, moreover, undermined by recurring pregnancies.]

Freedom for Coal. London: The British Coal Exporters Federation, 1955. 9½″. Pp. 24.

[A statement of the case for measures aimed at increasing the export of coal. The chief proposal is that the National Coal Board should be free to charge full economic prices, so discouraging wasteful consumption at home, and should then allocate coal between home and export markets on normal commercial principles.]

GIFFORD (C.) and STEVENS (J. A.). Making Money on the Stock Exchange. A beginner's guide to investment policy. London: Macgibbon & Kee, 1955. 7½″. Pp. 255. 15*s.*

[To be reviewed.]

GREGORY (SIR THEODORE). The Present Position of Central Banks. The Stamp Memorial Lecture, 1955. London: The Athlone Press, University of London, 1955. 8½″. Pp. 25. 2*s.* 6*d.*

[Most of this lecture is devoted to a survey of recent developments in opinion on the proper functions and status of a central bank. The author traces the reasons why the prestige of central banks declined in the nineteen-thirties and has recovered in the last few years. On the basic constitutional question whether there is any adequate reason why a central bank should enjoy more independence than an ordinary government department, Sir Theodore Gregory has two points to make: in the first place, the control of fiscal and monetary policy is too big a job for a single minister to handle successfully; and in the second place, "such a concentration of power in the hands of an individual, the nominee, under democratic conditions, of a political party, would be, and would be felt to be, intolerable" (p. 16). He concludes with a brief discussion of the instruments of central banking policy. He suggests that if the Federal Reserve System has perhaps gone too far in precise formulation of its attitude towards the alternative techniques at its disposal, in this country we have not gone far enough in that direction and would benefit from some clarification of official policy.]

LE GROS CLARK (F.) and DUNNE (A. C.). Ageing in Industry. An inquiry based on figures derived from census reports into the problem of ageing under the conditions of modern industry. London: The Nuffield Foundation, 1955. 8½″. Pp. 146. 6*s.*

[Reviewed in this issue.]

HEILBRONER (R. L.). The Great Economists. Their lives and their conceptions of the world. Revised for publication in England with two supplementary chapters by P. STREETEN. London: Eyre & Spottiswoode, 1955. 9″. Pp. 320. 28*s.*

[To be reviewed.]

HOOPER (S. G.). The Finance of Farming in Great Britain. London: Europa Publications, 1956. 8½″. Pp. 247. 25*s*.

[To be reviewed.]

INTERNATIONAL BANKING SUMMER SCHOOL. The Post War Functioning of Banking. Return to Normal? A series of lectures delivered to the Seventh Session, Madrid–Granada, September 1954. Madrid: Consejo Superior Bancario, 1955. 9″. Pp. 245.

INTERNATIONAL BANKING SUMMER SCHOOL. International Banking and Foreign Trade. A series of lectures delivered at the Eighth Session, Christ Church, Oxford, September 1955. London: Europa Publications, for the Institute of Bankers, 1955. 9″. Pp. 226. 20*s*.

[These two volumes contain numbers of lectures by economists, bankers and others on current monetary problems. Notable contributions include, in the proceedings of 1954, a lecture by Sir Dennis Robertson on "Convertibility," and, in the proceedings of 1955, a lecture by W. F. Crick on "The International Flow of Capital" and a group of three papers by prominent bankers on "Post-war Monetary Policy in its Effect on Foreign Trade" in Western Germany, the Benelux countries, France, Italy and Switzerland.]

INTERNATIONAL ECONOMIC ASSOCIATION. International Economic Papers, No. 5. Edited by A. T. Peacock, R. Turvey, W. Stolper and E. Henderson. London: Macmillan (New York: The Macmillan Co.), 1955. 10″. Pp. 199. 15*s*.

[To be reviewed.]

KALDOR (N.). An Expenditure Tax. London: Allen & Unwin, 1955. 9″. Pp. 249. 18*s*.

[Reviewed in this issue.]

KUZNETS (S.). (Ed.) for the International Association for Research in Income and Wealth. Income and Wealth, Series V. Cambridge: Bowes & Bowes, 1956. 9″. Pp. 242. 42*s*.

[To be reviewed.]

LANGLEY (J. A.), LUXTON (H. W. B.) and MORRIS (S. T.). Farm Organisation in Dorset. Dairy Research Study, 1953/55, Part I. Newton Abbot: Department of Economics, University of Bristol, 1955. 9″. Pp. 69. 4*s*.

LANGLEY (J. A.) and LUXTON (H. W. B.). Milk Production in Dorset. Dairy Research Study, 1953/55, Part II. Newton Abbot: Department of Economics, University of Bristol, 1955. 9″. Pp. 64. 4*s*.

[These two reports represent the first results of a comprehensive research project on the economics of milk production in the South-West. The importance of milk production to the farms of the region is analysed in the first report, while the second one deals more specifically with some aspects of milk production on the farms in question.]

LITTLE (L. T.). A Handbook for Economics Students. London: Jordan & Sons, 1955. 7½″. Pp. 181. 7*s*. 6*d*.

[This is the desperate examinee's *vade mecum*. A few years ago Mr. Little re-wrote the elementary *Economics for Commercial Students and Businessmen*, long familiar to candidates for certain examinations as "Crew." This little book, which will tell you the answer to almost any major problem of economics in fifty words, is described as based on that major work. It probably has uses for a half-educated student during the frantic process of revision. As one might expect from so competent an economist as Mr. Little, it is accurate within its limits. But an adult reviewer can hardly be expected to recommend it seriously.]

LUDWIG (M.). (Ed.). The Cotton Industry—Today and Tomorrow. Official Report on the Jubilee Cotton Congress held at Buxton, England in May, 1954. Manchester: International Federation of Cotton and Allied Textile Industries (567 Royal Exchange, Manchester 2), 1955. 10″. Pp. 288.

[The proceedings of the Congress include a long statistical paper by W. T. Kroese on the history of the cotton industry during the last fifty years and its future prospects and also a paper by Prof. L. Dupriez on the relevance of international monetary problems for the cotton industry at the present time. Most of the other contributions are of a more technical character.]

LUNDBERG (E.). (Ed.). The Business Cycle in the Post-war World. Proceedings of a Conference held by the International Economic Association. London: Macmillan, 1955. 9″. Pp. ix + 367. 30*s*.

[To be reviewed.]

MEADE (J. E.). The Theory of International Economic Policy, Volume II. Trade and Welfare. 9″. Pp. v + 618. 45*s*. Mathematical Supplement. 9″. Pp. vii + 128. 25*s*. London: Oxford University Press, for the Royal Institute of International Affairs, 1955.

[To be reviewed.]

MILNE (A. M.). The Economics of Inland Transport. London: Sir Isaac Pitman, 1955. 9″. Pp. 292. 25*s*.

[To be reviewed.]

MORTIMER (R. G.). Farming Types and Financial Results, 1954–55. Nottingham: Department of Agricultural Economics University of Nottingham, 1955. 8″. Pp. 24 + tables. 2*s*.

[This statistical report by the Provincial Agricultural Economist on financial results on East Midland farms in 1954/55 is designed chiefly to enable farmers in the region to compare their own results with those of the average in the sample and the average of the six most profitable farms in the sample.]

NEALE (E. P.). Guide to New Zealand Official Statistics. Third edition. Auckland: Whitcombe & Tombs for Auckland University College, 1955. 8½″. Pp. 195. 16*s*.

[This contains a guide to sources and extensive discussion of scope, methods of calculation, reliability, interpretation, etc.]

NEVIN (E. T.). The Mechanism of Cheap Money. A study of British monetary policy, 1931–1939. Cardiff: University of Wales Press, 1955. 9″. Pp. xi + 350. 25*s*.

[To be reviewed.]

NEVIN (E. T.). The Problem of the National Debt. Cardiff: The University of Wales Press, 1954. 7½″. Pp. 115. 6*s*.

[The public debt of almost all countries has been growing astronomically. That of the United Kingdom represented half of one year's income in 1914, two years' income in 1930 and, suprisingly, about the same in 1950. Of the eighteen largest countries of the world our proportion is highest. It is twice that of the United States, five times that of France, ten times that of Germany. Mr. Nevin draws our attention to the economic consequences of this debt: to the recurring problems of repayment and conversion, to its effects on our public finances, to its effects on the assets of the banking system and the control of inflation and its effects on the power to use a flexible monetary policy. Mr. Nevin considers the ways in which reform might be possible, first in relation to government debt held by government departments (about one-fifth of the whole), and then in relation to debt held by the banks, by institutions and by private holders. He suggests the creation of a variety of types of debt certificates, to be held respectively by banks, institutions and persons, and subject to different conditions and degrees of liquidity.]

THE NUFFIELD FOUNDATION. Report for the year ended 31 March 1955. London: The Nuffield Foundation, 1955. 9″. Pp. 125.

[The total amount of grants allocated in the first year of the Foundation's third quinquennium was £681,397. The major part of the year's allocation for social research was a grant to increase the permanent endowment of Nuffield College. An interesting addition to the Foundation's activities is the grant of a sum of £43,750 to be spent over the next five years in support of learned journals, with initially some preference for journals devoted to the humanities. The grant will be administered by two special committees, one for journals in the humanities appointed by the British Academy, and the other, appointed by the Foundation in consultation with the Royal Society, for scientific journals.]

THE NUFFIELD PROVINCIAL HOSPITALS TRUST. Third Report, 1951–1955. London: Nuffield Provincial Hospitals Trust, 1955. 8½″. Pp. 60.

[An account of the research and experimental projects carried out or supported by the Trust during the past quinquennium.]

POOL (A. G.) and LLEWELLYN (G.). The British Hosiery Industry. A study in competition. First report. Leicester: University College, Leicester, 1955. 10″. Pp. 34. 4*s*. 6*d*.

[This lucid and interesting report describes the first stage of an inquiry into the hosiery industry, financed from Conditional Aid funds. The authors examine the extent to which the hosiery industry satisfies the two text-book criteria of competitiveness: the existence of many firms producing

similar products, and ease of entry. Evidence on the size structure of the industry is taken from the Census of Production and from material made available by the National Hosiery Manufacturers' Federation. It is found that in general the degree of concentration in the industry is low. The firms vary greatly in size, the large ones being mostly old-established undertakings which produce a particularly wide range of products. With the partial exception of the section of the industry engaged in manufacturing fully-fashioned stockings, the economies of scale are not great. The structure of the industry is thus highly competitive, and there is no collusion or restriction of competition between firms. The industry also satisfies well the criterion of ease of entry. Detailed information was collected from all the firms that could be traced to have entered the industry in the North Midlands since the war. Most of these businesses started on a very small scale and have grown rapidly, although there are also a fair number of firms that have closed down during the period, especially in the last few years. Most of the new firms mentioned lack of capital as the chief factor restricting their rate of growth. The great majority of them started up with second-hand machinery, this being much cheaper than new equipment. The authors suggest that the availability of second-hand machinery contributes substantially to ease of entry to the industry.]

REDDISH (H.). This is Industrial Partnership. London: Staples, 1955. 7″. Pp. 34. 2*s*.

[The Chairman of the Rugby Portland Cement Company here describes the schemes in operation in his company by which the worker is given a financial interest in the success of the undertaking. These consist of a profit-sharing scheme, which was established twenty years ago, and the more recently instituted "A" Share scheme. The effect of the latter is something similar to an endowment-assurance policy, in which the sum payable on death or retirement depends on the current fortunes of the company as reflected in the market price of its shares. Mr. Reddish emphasises that no scheme of profit-sharing is likely to succeed unless it is based on an already existing foundation of goodwill and *esprit de corps* in the business.]

ROTWEIN (E.). (Ed.). David Hume. Writings on Economics. Edinburgh: Thomas Nelson, 1955. 9″. Pp. 224. 30*s*.

[To be reviewed.]

SHANNON (I.). Rural Industries in the Australian Economy. Melbourne: F. W. Cheshire (London: Angus & Robertson), 1955. 8½″. Pp. 150. 22*s*. 6*d*.

["Rural industries" in the title in effect means agriculture. About half of the book is devoted to describing the evolution and present condition of the different branches of Australian agriculture —wool, wheat, meat and dairying—in their context of world markets. Most of the rest of the book concerns the effects of Australia's policy of protection on her agriculture and on her economy generally. The author draws on a wide range of sources, including econometric work on world supply and demand for primary products, and his argument is pursued with ingenuity and considerable theoretical refinement. It is interesting to learn, for example, that the general policy of favouring manufacturing at the expense of agriculture tends to encourage wool production relatively to other forms of agriculture, because wool production is particularly land-intensive, and therefore benefits from the relative cheapening of land that is brought about by the shift away from agriculture as a whole. The author is strongly hostile to the policy of protection, and he traces out in much detail the dire consequences that must result from it. He would favour a retreat from the policy of encouraging manufactures, and he suggests various ways in which the balance might be shifted back to primary production. The weakest link in his argument appears to lie in his more or less unquestioning assumption that a unit of resources will yield a larger real social output in primary production than in manufacturing. Once this is granted, the rest of his conclusions naturally follow. The argument in favour of the basic assumption, however, is stated almost entirely in *a priori* terms ("otherwise protection would not be necessary"). The author might have strengthened his case by a more explicit discussion of the evidence on this aspect of the question.]

Shops and Shopping. L.P.E. Papers, No. 2. London: London Press Exchange (110 St. Martin's Lane, W.C.2), 1955. 9½″. Pp. 34.

[This is the second of a series of papers "on subjects having general significance for the community," published by a firm of advertising agents. It contains four papers on retailing: "Resale Price Maintenance," by Margaret Hall; "Shifts in the Distributive Pattern and the Department Store," by James B. Jefferys; "Self-service," by John Baxter; and "Instalment Selling," by C. McNeil Greig. In addition, there are two brief editorial notes on "The Consumer and Resale Price Maintenance" and "Present Shopping Habits." These notes report the results of sample inquiries among housewives. It is interesting to find that most of the housewives expressed themselves in favour of resale price maintenance, although, as the authors explain, it was difficult to present to them such a complicated question without introducing bias.]

SMELLIE (K. B.). The British Way of Life. London: Heinemann, 1955. 9″. Pp. 195. 15*s*.

[The chapter headings of Professor Smellie's contribution to this series of volumes on national "ways of life" are: Land and People; The Family; Education; Economic Life; Political Institutions; and Britain and the World. This might suggest a collection of essays, but the book has in fact a unity which belies first impressions. Naturally no two authors could be expected to agree on the best way to handle such a daunting topic as the British Way of Life, and the prominence given by Professor Smellie at a number of points to institutions and legislation may be criticised as rather the line of least resistance. Certainly, although the author is a shrewd observer of the contemporary scene, his work does not indicate the close first-hand acquaintance with social realities to be found, for example, in F. Zweig's *The British Worker*. But his aim is a different one, and it has been well achieved. The book's distinctive feature lies in its historical approach—in the emphasis laid throughout on the part played by Britain's past in determining the present structure of British life. This theme is traced out with much subtlety and learning. The author is particularly good on the evolution of opinion.]

Social and Economic Progress in the Northern Region of Nigeria. Kaduna, Northern Nigeria: Director of Information Services, 1955. 10″. Pp. 97.

[The various chapters survey the progress made since 1946 in agriculture, industry, co-operation, community development, education, health, public works and a number of other spheres.]

TEW (B.). Wealth and Income. An analysis of the economic and financial systems of Australia and Great Britain. Second edition. Melbourne: Melbourne University Press (London: Cambridge University Press), 1955. 8½″. Pp. vii + 265. 30*s*.

[The first edition of this unusually original text-book was reviewed by Mr. Alan T. Peacock in the ECONOMIC JOURNAL, June 1951, p. 393. In this revision the author has re-arranged and strengthened the argument at a number of points.]

TIPPETT (L. H. C.). Statistics. Second edition. Home University Library. London: Oxford University Press, 1956. 7″. Pp. 224. 7*s*. 6*d*.

[This lucid introduction to the concepts and methods of statistics (not only economic statistics) was first published in 1943. The present edition takes account of developments in technique made since that time and of the much more extensive statistical material now available.]

WEISSKOPF (W. A.). The Psychology of Economics. London: Routledge & Kegan Paul, 1955. 8½″. Pp. 266. 25*s*.

[To be reviewed.]

WIENER (N.). Time and Organization. The second Fawley Foundation Lecture. Southampton: University of Southampton, 1955. 8½″. Pp. 16. 2*s*. 6*d*.

[The distinguished author of *Cybernetics* takes as the starting point for this lecture his own recent work on the electric activity of the brain. Application of the technique of autocorrelation has revealed a periodic rhythm in brain waves which was difficult to discern in the original data. As now revealed, the oscillation is extremely clear and persistent. In order to cast light on the possible functions of this "clock" in the brain, Professor Wiener turns to the analogy of physical control mechanisms in which accurate timing measures are necessary (or at least very useful) to ensure the efficient co-ordination of different impulses. He suggests that in the human brain and nervous system likewise the "clock" may be an essential part of the mechanism of communication and control. Finally, the author takes a social analogy, and points out the importance of measures of time in the effective co-ordination of the activities of individuals in a group. Examples of this range from the clocking-in of workers in a factory to the institution of the week and the calendar, which is common in some form or other to all civilisations. Professor Wiener emphasises that much of what he has to say is highly tentative and conjectural, and to many readers his analogies—especially the social analogy—may seem a little strained. We should none the less be grateful to him for such a lucid sketch of some of the possibilities in an unmapped and fascinating field of study.]

WILLIAMS (D.). The Rebecca Riots. A study in agrarian discontent. Cardiff: University of Wales Press, 1955. 9″. Pp. 377. 25*s*.

[To be reviewed.]

WILSON (T.). (Ed.). Ulster under Home Rule. A study of the political and economic problems of Northern Ireland. London: Oxford University Press, 1955. 9″. Pp. ix + 229. 21*s*.

[To be reviewed.]

World Population and Resources. A report by P.E.P. London: Political and Economic Planning, 1955. (Distributed by Allen & Unwin.) 9″. Pp. ix + 339. 30*s*.

[To be reviewed.]

ZEUTHEN (F.). Economic Theory and Method. London: Longmans, 1955. 9″. Pp. 364. 30*s*.

[To be reviewed.]

Indian

BAJPAI (R. G.). A Few Aspects of Indian Economy. Kapurthala: published by the author at Randhir College, 1955. 9½″. Pp. 117. Rs. 1/8.

[These are seven lectures given by Professor Bajpai of Randhir College, Kapurthala. They cover the freedom of the market economy, the problems of a backward economy, population, rationalisation, unemployment, the welfare state, the new economic policy, all seen in relation to India.]

BALAKRISHNA (R.). Recent Trends in Indian Finance. Madras: University of Madras, 1955. 10″. Pp. 176. Rs. 8/-.

[This book prints the six Sir William Meyer lectures delivered by Professor Balakrishna in 1953–54. His main theme is the re-orientation of fiscal policy as an instrument for the maintenance of full employment, on the one hand, and for the avoidance of inflation, on the other. He looks at tax policy in relation both to this and to the wider use of fiscal policy to contribute to economic development and in relation to India's economic plans.]

DEY (S.). Industrial Development: a new approach. Calcutta: Thacker, Spink & Company, 1955. 9″. Pp. 82. Rs. 5/-.

[This is an amusing and fascinating little book. The reader is transported to Kulkuri, an Indian village in process of "development." He finds underemployed workers, discovering for themselves that by barter and enterprise they can add to their own and other people's real income. To any economist, brought up on Say's Law, even with the limitations that Keynes set upon it, it will be a stimulating exercise to ask whether and in what conditions a wide market economy with a monetary basis may frustrate the simpler processes of almost direct exchange that might raise real production while reducing underemployment. The book goes on to discuss the possible escape and a scheme for multilateral expansion of output for mutual exchange, which recalls in some ways the Upholland Scheme devised by Peter Scott for a group of long-term unemployed during the years of depression.]

GADGIL (D. R.). Economic Policy and Development. A collection of writings. Poona: Gokhale Institute of Politics and Economics, 1955. 10″. Pp. 248. 12*s*.

[This reprints a number of recent writings by Dr. Gadgil. The volume begins with his Presidential Address to the Indian Economic Conference of 1940, in which he surveyed the principles that he then thought should govern Indian economic policy. It ends with a similar address in 1954 to the Indian Society of Agricultural Economics on the place of agriculture in the Indian Five Year Plan. In between he deals with other aspects of that plan and with various other problems of economic and social development. The whole makes an interesting and coherent commentary on recent economic policies and events in India.]

HENNESSY (J.). India, Democracy and Education. A study of the work of the Birla Education Trust. Calcutta: Orient Longmans, 1955. 10″. Pp. 338. Rs. 15/-.

[This is a detailed and well-illustrated account of the work of the Birla Education Trust, of the institutions maintained by it at Pilani and of the educational ideals that have inspired the experiments for which it has been responsible.]

JOSHI (N. S.) and DHEKNEY (B. R.). Irrigation and Agriculture in the First Five Year Plan: An Appraisal. Volume II. Poona: Deccan Book Stall, 1954. 10″. Pp. 170. Rs. 3/-.

[This is an *addendum* to a report by the same authors that was noted in the ECONOMIC JOURNAL of June 1955, p. 378.]

Madhya Pradesh in Indian Economy. Brochure prepared by the Department of Economics and Statistics. Nagpur: Government Press, 1955. 10″. Pp. 63. Rs. 3/-.

[An official handbook which contains useful information and statistics regarding the State of Madhya Pradesh—formerly the Central Provinces of India.]

MANN (H. H.). Rainfall and Famine. A study of rainfall in the Bombay Deccan, 1865–1938. Bombay: Indian Society of Agricultural Economics 1955. 8½″. Pp. 47. Rs. 2/-.

[The author was formerly Director of Agriculture, Bombay State. He here carries out an elaborate analysis of the relation between crop yields and the amount and timing within the year of rainfall in four stations in or near the belt in the Bombay Deccan most liable to famines. The conclusions reached are not sufficiently clear to be immediately useful for forecasting, but they should none the less be of value both in themselves and as indicating a technique of analysis capable of being carried further.]

NAMBUDIRIPAD (K. N. S.). A Short History of Indian Currency. Poona: Continental Prakashan, 1955. 7½″. Pp. 380. Rs. 7/8.

[Dr. Nambudiripad, who is Lecturer in the University of Poona, has written a workman-like small introduction to the history of Indian currency. He begins, after a brief review of earlier periods, with the establishment of a uniform currency in 1835, and the events which led up to it. Subsequent chapters cover the period of the silver standard, the difficulties of the eighties and nineties, the appointment of the Herschell Committee and the closing of the mints, and the subsequent emergence of the gold exchange standard. There follow, in a series of chapters, the problems of the inter-war years, the rupee ratio dispute, the development of Central Banking, and then the difficulties first of the depression years and then of the war, and finally the problems of the control of inflation and of India's currency after independence. This is a useful addition both to the available text-books and to the more general literature of the subject.]

RAO (V. K. R. V.). An Economic Review of Refugee Rehabilitation in India. Monograph 1, A Study of Nilokheri Township, pp. 56; 3, A Study of Faridabad Township, pp. 76; 5, A Study of Kingsway Camp, pp. 70; 6, A Study of Rajpura Township, pp. 78; 7, A Study of Tripuri Township, pp. 68. Delhi: University Press for the Delhi School of Economics, 1955. 9½″. Rs. 2/8 each.

[After the partition of India and Pakistan numerous refugees fled from one country to the other. In India a series of new townships were built to accommodate the refugees, and the problem of finding work for the potential wage-earners and retraining them as necessary was tackled. Professor Rao, at the request of the Government of India, has made a sample study of seven of these camps or townships, with the assistance of some of his staff at the Delhi School of Economics. These monographs present his findings. Up to a point they reveal heroic achievements in creating accommodation, the minimum of facilities and of the essentials for a new life. But they reveal also the extraordinary difficulties of absorbing and fitting into the Indian economy large numbers of persons lacking capital or capital equipment, and in several of the townships the end of the story shows a substantial residue of remaining unemployment. It is difficult not to compare in one's mind these heroic attempts and limited successes with the similar attempts of some of the Quaker and other organisations to create employment in South Wales during the thirties and their limited success in an environment where effective demand was in total deficient, and to wonder how far the general economic policies of India have contributed to the difficulties.]

RESERVE BANK OF INDIA. Trend and Progress of Banking in India during the year 1954. Bombay: Reserve Bank of India, 1955. 9½″. Pp. 127. 6*s*.

[This report, which provides full statistical information regarding Indian banking, describes the year 1954 in India as a year of orderly economic expansion, with credit policy broadly unchanged, but with an increasing *tempo* of development.]

SOVANI (N. V.) and DANDEKAR (KUMUDINI). Fertility Survey of Nasik, Kolaba and Satara (North) Districts. Poona: Gokhale Institute of Politics and Economics, 1955. 10″. Pp. 167. 9*s*.

[This is a continuation of an earlier study of *Fertility and Mortality in Poona District*. This study was extended to record the fertility history of all women in the sample and to throw light on attitudes to family planning. The proportion of male heads of families who had knowledge of contraception was probably less than 5% (many were uncertain of their knowledge), while less than 2% were probably practising it. Some interesting case studies are appended.]

American

BALDWIN (G. B.). Beyond Nationalization. The labor problems of British coal. Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 1955. 9½″. Pp. 324. 35*s*.

[To be reviewed.]

BERGEL (E. E.). Urban Sociology. New York and London: McGraw Hill, 1955. 9″. Pp. vii + 558. 49*s*.

[This text-book treats in turn the history of cities, problems of location and morphology, demography (including migration), the urban forms of basic institutions (family, religion, recreation), government, crime, and housing and town planning. A great deal of illustrative material is provided, chosen chiefly but by no means exclusively from the United States. It is primarily a text-book on cities, rather than on sociology, but the author has endeavoured wherever possible to relate what he has to say to general sociological theories.]

Can we Depression-Proof our Economy? Report of the Committee on Economic Policy. Washington, D.C.: Chamber of Commerce of the United States, 1955. 9″. Pp. 28.

[A brief survey of the means available in the United States to-day for preventing the onset of depressions or lessening their severity. The authors attach importance to the responsibility of business leaders in this regard. It is suggested that the pursuit of sound but enterprising business policies, based on a long-range view, may make an important contribution to stabilising the economy.]

CARLTON (R. K.). (Ed.). Forced Labor in the "People's Democracies." New York: Frederick A. Praeger for the Mid-European Studies Center, 1955. 8″. Pp. 248.

[This survey is based on evidence derived from legislation and official decrees, newspaper publications, the testimony of refugees, etc. It sets out to supplement and bring up to date the findings of a U.N. *Ad Hoc* Committee on Forced Labour, published in 1953. It includes material relating to changes in the position since the death of Stalin.]

CLARK (J. M.). The Ethical Basis of Economic Freedom. The Kazanjian Foundation Lectures. Westport, Connecticut: The Calvin K. Kazanjian Economics Foundation (P.O. Box 431), 1955. 9″. Pp. 38.

[The central theme of these two lectures is that capitalism cannot lead to satisfactory results unless certain ethical standards are observed. Unrestrained individualism is not an effective alternative to communism, since economic actions have such a variety of by-products that private and public interest cannot be expected to coincide. Nor can legislation always provide an adequate corrective, since divergence between private and social interest can occur in such an enormous variety of ways; moreover, legislation will not be effective unless it has the sanction of public opinion. Professor Clark enumerates a whole host of spheres where ethical issues are unavoidable: in the relation between directors and shareholders ("corporate ethics"), in the provision of entertainment (which is bound to influence public taste and individuals' characters), in the pursuit of sectoral interests by trade unions and other bodies, to quote a few examples. He is reasonably optimistic about the prospects of a sufficient degree of ethical responsibility being forthcoming. He points out that the concept of pure self-seeking is not very meaningful and certainly does not describe representative human behaviour. It is not natural for people to disregard entirely the interests of others, at least of those in their immediate environment (here Professor Clark comes close to David Hume's doctrine of "sympathy"). Ethical standards may be observed by individuals, and they may also operate through institutional agencies such as business corporations, trade unions, professional organisations and the law. Professor Clark's wide-ranging and subtle analysis exposes most effectively the jejune psychological and ethical basis of much contemporary writing about economics. These lectures deserve to be widely read.]

DAVIDSON (R. K.). Price Discrimination in Selling Gas and Electricity. Baltimore, Maryland: The Johns Hopkins Press, 1955. 9″. Pp. 254. $4.00.

[To be reviewed.]

FREEMAN (R. A.). Federal Aid to Education—Boon or Bane? National Economic Problems, No. 458. Washington, D.C.: American Enterprise Association, 1955. 8½″. Pp. 50.

[A statement of the case against extending federal aid to education. The author takes his stand on the general principle that centralisation of authority is undesirable and is an inevitable concomitant of even partial centralisation of finance.]

GALBRAITH (J. K.). The Great Crash: 1929. Boston, Mass.: Houghton Mifflin (London: Hamish Hamilton), 1955. 8½″. Pp. 212. 12*s*. 6*d*.

[Reviewed in this issue.]

HAYNES (W. W.). Present and Prospective Markets for West Kentucky Coal. Lexington, Kentucky: University of Kentucky, for the Bureau of Business Research, 1955. 11″. Pp. 124.

[The author analyses the present sales of West Kentucky coal by region and by use. He then proceeds to make estimates of likely sales in 1960.]

HIDY (R.W.) and (M.E.) Pioneering in Big Business. History of Standard Oil Company (New Jersey) 1882–1911. Prepared under the auspices of the Business History Foundation. New York: Harper & Brothers, 1955. 9½″. Pp. xix + 839. $7.50.

[To be reviewed.]

Input–Output Analysis: an Appraisal. Studies in Income and Wealth, Vol. 18, by the Conference on Research in Income and Wealth. Princeton, New Jersey: Princeton University Press, for the National Bureau of Economic Research (London: Geoffrey Cumberlege), 1955. 9½″. Pp. 381. 60*s*.

[To be reviewed.]

ISARD (W.) and SCHOOLER (E. W.). Location Factors in the Petrochemical Industry, with special reference to future expansion in the Arkansas–White–Red River basins. Washington, D.C.: U.S. Department of Commerce, 1955. 10½″. Pp. 45 and appendices. $3.00.

[The petrochemical industry is defined as that engaged in the production of chemical elements and compounds derived in whole or in part from petroleum or natural gas. The report examines the forces affecting the future geographical pattern of the industry in the United States. The chief issue is between sites where the raw materials are available and sites close to markets. The forces affecting the decision are broken down into three groups: transport costs on raw material and fuel gas; transport costs on finished products; economies and diseconomies of scale. Statistical estimates of these are worked out systematically for each of the chief petrochemical products.]

KEYNES (J. N.). The Scope and Method of Political Economy. A reprint of the Fourth Edition. Reprints of Economic Classics. New York: Kelley & Millman, 1955. 7″. Pp. 382. $6.00.

[This volume, which is a reprint of J. N. Keynes' classic treatise on the methodology of economics, is a copy of the fourth edition which appeared in 1917. The first edition (1890) of this penetrating and humane inquiry was reviewed in the first volume of this JOURNAL (pp. 420–23) by Professor Edgeworth. On the substance of the book, with its clear distinction between positive science, normative science and art, there is nothing that need be added to the review of the first edition. It is, as Professor Milton Friedman has recently reminded us, a work that should be read even to-day by all interested in serious economics. The publishers are to be congratulated on making it once again available even though the price seems formidable.]

KNOWLES (W. H.). Personnel Management: a human relations approach. New York: American Book Company, 1955. 8½″. Pp. 488. $4.50.

[The first half of this text-book deals with the functions of personnel management in a broad psychological and social setting. The remainder is concerned with the more specific problems of union–management relations, wage administration and government intervention. Underlying the author's approach is his belief that ethical judgments are inseparable from personnel management: "Scientific management attempted to eliminate value judgments by approaching personnel management purely as a science, and in doing so overlooked the fact that it was making value judgments in the name of science" (p. 478). He takes his own stand squarely on the principles of industrial democracy, and a major purpose of the book is to work out what this involves in practice.]

LAMBIE (J. T.). From Mine to Market. The history of coal transportation on the Norfolk and Western Railway. New York: New York University Press, 1954. 9½″. Pp. vii + 380. $6.

[This is an excellent, straightforward account of the relationship first, between the Norfolk and Western and the coal-producing companies along its lines, and second, between the Norfolk and Western and the four other big bituminous-carrying roads, both in the early days of pooling, when regulation of rates and production was being attempted by agreement between the roads, and since the inauguration of the Interstate Commerce Commission. It also includes a history of the expansion and vicissitudes of the Norfolk and Western from the beginning in 1881 until the present. Mr. Lambie's work is of particular interest because of the position of the Norfolk and Western as the envy of railroad men and "the outstanding investment among railroad common stocks."]

LESTER (R. A.). Adjustments to Labor Shortages. Management practices and institutional controls in an area of expanding employment. Princeton, New Jersey: Industrial Relations Section, Princeton University, 1955. 9″. Pp. 89. $2.00.

[This is the third and last of a series of studies of the labour market in Trenton, New Jersey. It is based on intensive interviews with employers, union officials and Employment Service staff. Its subject is the impact on firms' labour-hiring policies of the expansion of employment in the area brought about in the last few years by the setting-up of a number of new plants. The establishment of new plants made labour recruitment more difficult for the existing firms, many of whom had to lower their quality standards for new employees. In no case, however, did labour recruitment difficulties lead firms to alter their basic methods of production. Losses of existing employees to the expanding firms are found not to have presented too serious a difficulty to the others, for several reasons. Seniority premiums and other ties in general discouraged long-service employees from leaving, and most of the expanding firms adhered to an agreed anti-pirating code which had the effect of preventing a drain of labour from being concentrated unduly on particular undertakings. In addition, the two firms that were expanding most rapidly recruited a large proportion of their labour from outside the area.]

MORGENSTERN (O.). The Validity of International Gold Movement Statistics. Special Papers in International Economics, No. 2. Princeton, New Jersey: International Finance Section, Princeton University, 1955. 9″. Pp. 42.

[Most of this paper is occupied with a painstaking analysis of the reliability of statistics relating to gold movements by means of a simple technique developed by C. F. Ferraris in 1885. This technique consists of comparing country A's gold exports to country B according to A's export statistics and B's import statistics, and conversely for movements of gold in the opposite direction. The result of this comparison is to suggest that the figures are too unreliable for use except for very broad and long-range purposes. Professor Morgenstern also discusses briefly the main reasons that may have caused the statistics to be so unsatisfactory.]

MORTON (W. A.). Housing Taxation. Madison, Wisconsin: University of Wisconsin Press, 1955. 9″. Pp. 262. $4.75.

[To be reviewed.]

PETERSEN (W.). Planned Migration. The social determinants of the Dutch–Canadian movement. University of California Publications in Sociology and Social Institutions, Volume 2. Berkeley and Los Angeles: University of California Press (London: Cambridge University Press), 1955. 9½″. Pp. 273. $3.50.

[This is a study of migration from Holland to Canada since the war. This migration has been much influenced in extent and character by conscious policy in the two countries concerned. The author is chiefly interested in the effects of currently held social views on the formation of policy and hence on events. His findings are very unfavourable. " Planned migration . . . has ordinarily meant the institutionalisation of irrational sentiments behind a façade of scientific terminology." There are serious doubts whether emigration is capable of solving the problems created by Holland's unusually high rate of natural increase, but the development of more fundamental solutions has been inhibited by various more or less irrational resistances. Irrationality has also been present on the Canadian side, notably in the preference given to agricultural immigrants at a time when the relative and even the absolute importance of agriculture as a source of employment is diminishing.]

PHELPS (C. W.). Using Instalment Credit. Studies in Consumer Credit, No. 4. Baltimore, Maryland: Commercial Credit Company, 1955. 9½″. Pp. 80.

[This is addressed to " senior high school students and the general reader." Its purpose is to assist the consumer to make intelligent use of the instalment credit facilities made available to him by such firms as the Commercial Credit Company, which sponsors the publication.]

ROBINSON (L. R.). Operating Results of Limited Price Variety Chains in 1954. Boston, Mass.: Harvard University Graduate School of Business Administration (London: Bailey Bros. & Swinfen), 1955. 11″. Pp. 38. 16*s*.

[This is the twenty-fourth annual report in its series. Sales of the chains furnishing data were slightly higher in 1954 than in 1953, despite the recession. Profit margins, however, were reduced and the rate of stock turn was comparatively slow.]

SAMUELSON (P. A.), BISHOP (R. L.) and COLEMAN (J. R.). (Eds.). Readings in Economics. New second edition. New York and London: McGraw Hill, 1955. 9″. Pp. 488. 34*s*.

[This is designed for courses in elementary economics in American universities, to supplement whatever general text-book is used to provide the backbone of the course. It contains fifty-five passages, mostly abridged somewhat from their original form, with brief introductory remarks by

the editors to help place each extract in its context. The passages come partly from the writings of economists of varying dates, and partly from modern business leaders, government publications, newspapers, etc.]

SCHELLING (T. C.). International Cost-sharing Agreements. Essays in International Finance, No. 24. Princeton, New Jersey: International Finance Section, Princeton University, 1955. 9″. Pp. 25.

[The subject of this pamphlet is the criteria that have been and may be used for allocating between the participating countries the cost of joint undertakings like U.N.R.R.A. and N.A.T.O. In particular, the author is concerned with the attempts that have been made to apply principles of progression similar to those used in most income-tax systems. His conclusion is that it is scarcely possible to establish logical criteria that are both simple (as they have to be for political reasons) and universally applicable. But the substitution of " relevant considerations " for strict criteria makes it possible as a rule to arrive at acceptable results, and the statement and weighing of these considerations " are not necessarily ineffectual just because the final outcome is a negotiated compromise."]

SPIEGEL (H. W.). Current Economic Problems. Revised edition. Homewood, Illinois: Richard D. Irwin, 1955. 9″. Pp. 682. $6.00.

[The first edition of this book was published in 1949. The author's purpose is to provide a reasonably thorough and rigorous survey of the leading economic problems of the day, grouped under the four headings of progress, security, freedom and peace. The unusually full and up-to-date bibliographies at the end of each chapter are a useful feature.]

TAYLOR (O. H.). Economics and Liberalism. Collected Papers. Harvard Economic Studies. Vol. XCVI. Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 1955. 8½″. Pp. 321. 40*s*.

[To be reviewed.]

A Trade Union Library, 1955. Prepared by M. Horowitz and H. C. Benjamin. Sixth Edition. Princeton, New Jersey: Industrial Relations Section, Princeton University, 1955. 9″. Pp. 58.

[This is a classified and annotated list of the books which might be taken to comprise a " balanced working library " for a trade union.]

TROXEL (E.). Economics of Transport. New York: Rinehart, 1955. 9½″. Pp. 837. $7.00.

[To be reviewed.]

VATTER (H. G.). Small Enterprise and Oligopoly. A study of the butter, flour, automobile and glass container industries. Corvallis, Oregon: Oregon State College, 1955. 10½″. Pp. 116. $1.00.

[The subject of this monograph, which is a condensation of a doctoral dissertation, is the position of small firms in industries dominated by large oligopolistic concerns. Much interesting material is presented, which is not easily summarised. The author discusses the chief functions exercised by small firms in such industries and the factors that help them to survive. One of his chief theses is that small firms are generally a source of potential disturbance to the competitive *status quo*, because they are trying to expand their share of the market. The oligopolistic firms, at least in industries that have passed the earlier stages of development, are by contrast more concerned with maintaining their share of sales.]

WALLICH (H. C.). Mainsprings of the German Revival. Yale Studies in Economics, No. 5. New Haven, Connecticut: Yale University Press (London: Geoffrey Cumberlege), 1956. 9″. Pp. 401. 36*s*.

[To be reviewed.]

WHEELER (R. G.) and BLACK (J. D.). Planning for Successful Dairying in New England. Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 1955. 9½″. Pp. 321. 40*s*.

[This book is based on information made available by 241 dairy farmers in New England. It contains a detailed analysis of ways in which farming practice may be improved, illustrated by extensive reference to the situation in specific individual farms. Brief treatment is also given to the more general problems of New England dairying in its context in the national economy.]

WICKSTEED (P. H.). The Alphabet of Economic Science. Reprints of Economic Classics. New York: Kelley & Millman, 1955. 7″. Pp. 142. $4.50.

[This introduction to mathematical economics for the non-mathematician was originally published in 1888. In addition to its considerable expositional merits, the book is notable as being the first place in which the term " marginal utility " was used.]

WILLIAMS (J. D.). The Compleat Strategyst. Being a primer on the theory of games of strategy. A RAND Corporation research study. New York and London: McGraw Hill, 1954. 9½″. Pp. xii + 234. 38*s*.

[This book is the first genuinely elementary introduction to von Neumann's theory of games. It uses no algebraic symbols whatever: instead of simultaneous equations and inequalities, simple arithmetical devices and graphical methods are used to yield solutions of the many examples of zero-sum two-person games, which are taken from a wide variety of situations. Mr. Williams' ingenuity in avoiding algebra has enabled him to expound very clearly the logic of the theory so that it can be understood by a reader whose mathematics is limited to addition, subtraction, multiplication and division. But his treatment is never superficial: no difficulties are slurred over, and experts will delight in references to such sophisticated matters as games with ordinal utilities, the Brown–Robinson method of approximation, the symmetrisation of a game, the relation of Games Theory to that of linear programming. The occasional flippancy of the style, and the consistent facetiousness of the illustrations (which include an admirable picture of a " saddle-point ") may not be to the taste of all readers. But the book as a whole is a masterpiece of popularisation of a novel and widely applicable way of reasoning.]

French

ÅKERMAN (J.). Structures et Cycles Economiques. Vol. I. Translated from the Swedish by B. Marchal and G. Augot. Paris: Presses Universitaires de France, 1955. 9″. Pp. 234. 1,200 frs.

[This is a translation into French of Part II of Professor Åkerman's *Ekonomisk Teori*, published in 1944. The original Swedish edition was reviewed by Professor Brinley Thomas in the ECONOMIC JOURNAL, September 1946, p. 455.]

BOURIEZ-GREGG (F.). Les Classes Sociales aux États-Unis. Paris: Armand Colin, 1954. 9½″. Pp. 234.

[This valuable study considers the United States historically and then analyses the present social structure, using mainly economic criteria but also making use of the other indicators common in American sociology. It is refreshingly free from jargon and abounds in erudition.]

DAUPHIN-MEUNIER (L.). La Cité de Londres et les Grands Marchés Internationaux. Paris: Nouvelles Éditions Latines, 1954. 9″. Pp. 358.

[This study considers the historical development of the City, its reaction to the War, its present structure and the implications of its changes for France. The emphasis is on the pragmatic approach of those in charge of British institutions and the merits of this in a rapidly changing world. The pragmatic approach tends to be identified with free competition.]

DIETERLEN (P.). Quelques Enseignements de l'Évolution Monétaire Française de 1948 à 1952. Paris: Armand Colin, 1954. 9½″. Pp. 230. 750 fr.

[M. Dieterlen is concerned to give a theoretical analysis of monetary problems and to set within this the observable data of French policy in the period 1948–52. The book contains commentaries on M. Dieterlen's theses by five other writers.]

JEANNENEY (J. M.). Les Commerces de Détail en Europe Occidentale. Paris: Armand Colin, 1954. 9½″. Pp. 71. 300 fr.

[This well-documented study analyses the reason for the low productivity of retailing in Western Europe and suggests that prosperity is itself a means of raising productivity in contrast to the possible elimination of small shops as a means of increasing productivity by driving their owners into more productive occupations. It also emphasises the importance of numerous shops in the satisfaction of consumers' wants.]

MAGAUD (C.). L'Économie Mondiale et la Nation. Paris: Société d'Édition d'Enseignement Superieur, 1954. 10″. Pp. 334. 1300 fr.

[In an ambitious work, M. Magaud combines international-trade theory (in particular the international-trade multiplier) with location theory in an attempt to describe and analyse the transmission of economic structures. These structures are related to the importance of certain centres where decisions are taken; the rise and fall of these centres is related to changing factor endowments.]

MILLERON (J.). Étude sur l'Économie Espagnole. Rabat: Société d'Études économiques, Sociales et Statistiques du Maroc, 1955. 9″. Pp. 185.

[This is a comparatively short and factual study of the Spanish economy dealing with its main sectors; among them agriculture, industry, transport and communications. As such it offers a preliminary treatment of some salient features of an economy, further study of which would be of great interest.]

NEF (J. U.). La Naissance de la Civilisation Industrielle et le Monde Contemporain. Paris: Armand Colin, 1954. 9″. Pp. 250. 680 fr.

[This book is based on the visiting lectures delivered by Professor Nef of Chicago at the Collège de France in the Spring of 1953. The problem which prompts it is that of the relationship between the " quantitative aspect " of a civilisation based on mass production of goods, and the " qualitative " values of human life. In these may be included the expression of beauty in the domain of industry itself. In the context of the general relationship between " quantitative " civilisation and moral values, Professor Nef discusses the development of the industrial civilisation of modern Europe.]

PERROT (M.). La Monnaie et l'Opinion Publique en France et en Angleterre 1924–1936. Paris: Armand Colin, 1955. 9½″. Pp. 252. 800 fr.

[This book consists of a selection of quotations from the press and journals in France and Britain, relating to major matters of monetary history in the period 1924–36. A limited amount of comment by the author surrounds the quotations. By the method adopted in this study, the author hopes to convey a sense of the public opinion of the times and the specific attitudes of bankers and industrialists. Of all these, it is easiest to express the views of the bankers as they were shown in speeches by chairmen of banks. For the others, it is perhaps questionable how much can be learned from a digest of the daily Press. In so far as they reflect differences in psychological approach between the two countries in matters in which psychology is of acute importance, the quotations serve a useful purpose. Furthermore, it is a sobering reflection to note how ill-informed was much of the near-unanimity of opinion which urged the return of Britain to the gold standard in 1925 and how strikingly it had altered in 1931.]

PONSARD (C.). Économie et Espace. Essai d'intégration du facteur spatial dans l'analyse économique. Paris: Sedes, 1955. 10″. Pp. 467.

[To be reviewed.]

REYNAUD (P. L.). La Psychologie Économique. Paris: Marcel Rivière, 1954. 8½″. Pp. 260. 700 fr.

[Psychology and economics are allied disciplines, and this book essays an historical survey of the development of both of them and the use of psychological assumptions in economic theory. The psychology seems synthetic, and the economic theory is too simplified to make the book more than an interesting study of a large and difficult field.]

STAUB (H.). Le Profit des Grandes Entreprises Américaines. Paris: Armand Colin, 1954. 9½″. Pp. 150.

[This well-documented study relates American profit levels to size, capital structure, market conditions, technical change and government contracts. It is of considerable interest and would be useful in translation.]

Belgian

COPPIETERS (E.). English Bank Note Circulation 1694–1954. Louvain: Institute of Economic and Social Research; The Hague: Martinus Nijhoff, 1955. 9″. Pp. 171. 125 fr. B.

[This well-informed and well-documented monograph traces movements in the relative importance of bank-notes as means of transaction in this country compared with coin, bills of exchange and cheques. The period covered is from the foundation of the Bank of England until the present day. The author is particularly interested in the relationship between actual developments in this sphere and the policy recommended by the writers of the day and adopted by Parliament. He finds that many of the most important changes affecting the means of transaction have been entirely unforeseen and unrelated to conscious policy.]

INTERNATIONAL ECONOMIC ASSOCIATION. Economic Progress. Papers and proceedings of a conference held in September 1953, edited by L. H. Dupriez with the assistance of D. C. Hague. Louvain: Institut de Recherches Économiques et Sociales, 1955. 9½″. Pp. 574. 43*s*.

[This volume, issued in near-print from Professor Dupriez's Institute in Louvain, reproduces the full text of the papers written for the Conference of the International Economic Association,

held at Santa Margherita in September 1953, on the subject of Economic Progress. The papers are all either in English or in French, and the French papers are accompanied by an English translation. The Conference found itself concerned with two slightly different issues: first, the factors determining the rate of material progress; second, the relation of material progress to economic welfare more broadly interpreted. Among the authors of papers primarily concerned with the measurement of economic progress, and its relation to such factors as investment, technology, managerial capacity, are Professor Kuznets, Professor Fourastié, Professor Cairncross, Professor Domar, Professor Vakil, Professor Dahmen and Professor Sauvy. The historical and environmental setting is analysed in valuable papers by Professor Habakkuk, Professor Giersch, Professor Gerschenkron and Professor Rostow. The economic policies that may contribute to development are discussed by Professor Howard Ellis and M. Duquesne de la Vinelle. The more philosophic aspects of the meaning of progress are considered by Professor Guitton, Professor Gini and Professor Dalmulder. Finally, the underlying principles of a theory of development were discussed by Professor A. Marchal and by Professor Dupriez himself, who also contributes a general appraisal of the work of the Conference. A brief summary of the discussions is included.]

German

HENSEN (H.). Die Finanzen der Sozialen Sicherung im Kreislauf der Wirtschaft. Kiel: Institut für Weltwirtschaft, 1955. 9″. Pp. 204. DM. 16.

[This is an exposition of the economic aspects of the German social-security system based on a social-accounting approach. It includes detailed statistics of money flows for the years 1950–53.]

KAHLE (O.). Die frachtkostenmässige Lage der schleswig-holsteinischen Land- und Ernährungswirtschaft im übergebietlichen Versand ihrer Produktionsüberschüsse. Kiel: Institut für Weltwirtschaft, 1955. 9″. Pp. 131. DM. 12.

[This study of agriculture in Schleswig-Holstein shows that despite the post-war increase in population this region is still a considerable supplier of foodstuffs to other parts of Germany. The study is in the form of a commentary on a set of tables showing the destination and sources of various agricultural products and the costs of transport from alternative sources.]

LEHBERT (B.). Entwicklungstendenzen in der westeuropäischen Energiewirtschaft. Kiel: Institut für Weltwirtschaft, 1955. 9″. Pp. 84. DM. 10.

[This is a commentary on a hitherto unpublished set of statistics of the production and consumption of fuel and power (including petrol) in Western Europe as a whole for the period 1920–53.]

LUTZ (F. A.). Der Konsumentenkredit. Cologne and Berlin: Carl Heymanns, 1954. 9″. Pp. 123.

[In this first of a new series of studies dealing with marketing problems, Professor Lutz has given an attractive outline of the economics of consumer credits. The major forms of consumer credit are dealt with in the first part, with supporting statistics for the United States and Germany. The second and third parts deal respectively with economic and social consequences and end with certain recommendations for the legal control of such credit. Among these are the suggestions that all contracts should state the implied rate of interest charged *per annum* on the average outstanding balance; that all contracts may be unilaterally repudiated by the customer within three days; and that the central bank should have authority to lay down minimum deposit requirements and the maximum period of repayment in accordance with general credit policy.]

Die Neuordnung der Eisen- und Stahl-Industrie im Gebiet der Bundesrepublik Deutschland. Ein Bericht der Stahltreuhändervereinigung. Munich and Berlin: C. H. Beck, 1954. 12″. Pp. vi + 870.

[This massive publication is a documentary account by the German Steel Trustee Association of the post-war reorganisation of the iron and steel industry under the supervision of the military government. About half of the volume consists of appendices reproducing the laws, exchanges of correspondence, forms of permissible agreement and other material relevant to the reorganisation procedure.]

Swiss

SUCHESTOW (M.). Die Unvollkommenheit des Geldmarktes. Winterthur: Keller, 1955. 8″. Pp. 179.

[Whether there exist market forces which determine the rate of interest, or at any rate determine it within a certain range, is a question which many economists have been re-examining in recent years. This thesis collates the opinions expressed on this subject by both English and continental writers.]

Dutch

MEADE (J. E.). The Theory of Customs Unions. Professor F. de Vries Lectures, Volume I. Amsterdam: North Holland Publishing Company, 1955. 7½″. Pp. 121. 15*s*.

[To be reviewed.]

Swedish

HISTORISK STATISTIK FÖR SVERIGE. I. Befolkning. Stockholm: Statistiska Centralbyran, 1955. 9½″. Pp. 78.

[This is the first of a series of half a dozen volumes that will cover the historical statistics of Sweden. The publication results from a recent decision to present only current data in the Swedish Statistical Abstract and to make the historical material available separately. In consequence it has been possible to give the historical statistics in much greater detail than could be done within the confines of the Statistical Abstract. The present volume presents in convenient form the population statistics, which are available from an earlier date and in more detail for Sweden than for almost any other country. Table headings and introduction are given in English as well as Swedish. The publication of this admirable piece of work—which may be compared with the well-known *Historical Statistics of the United States*—prompts the question how long we shall have to wait before we are provided with a similar compilation of historical statistics for Great Britain.]

HÖÖK (E.). Salaried Employees and the Industrial Transformation. Stockholm: Industriens Utredningsinstitut, 1955. 8½″. Pp. 15.

[This is a summary in English of a book published in Swedish in 1953. Its purpose is to explain the rapid increase in the proportion of salary-earners to total occupied population in Sweden since 1930. It is based on detailed particulars made available by a small sample of firms. The greater part of the increase is attributed to what the author calls " the industrial transformation "—the changes in industrial organisation which have increased the importance of administration, intelligence work and salesmanship.]

Norwegian

GERHARDSEN (G. M.). Fifty Years of Norwegian Fisheries, 1905–1955. Bergen Institute of Economics, Paper 1. Bergen: Norwegian School of Economics and Business Administration, 1955. 12″. Pp. 20.

SVENDSEN (A. S.). Changes in the Size of Ships in the Inter-War Period. Bergen Institute of Economics, Paper 2. Bergen: Norwegian School of Economics and Business Administration, 1955. 12″. Pp. 27.

SVENDSEN (A. S.). . A Note on Port Statistics. Bergen Institute of Economics, Paper 3. Bergen: Norwegian School of Economics and Business Administration, 1955. 12″. Pp. 12.

[These are the first three of a new series of duplicated monographs in English published by the Institute of Economics in Bergen. Professor Gerhardsen's is a general history of the Norwegian fishing industry and was previously published in a Norwegian newspaper. The second monograph in the series is based on analysis of statistics relating to the average size of ships during the period 1920–38. This size is found to have had an upward trend but to have fluctuated cyclically. Mr. Svendsen's other monograph surveys world statistics on shipping entered and cleared at ports.

Spanish

DIAZ-LLANOS (R.). Sintesis de la Economia de Canarias. La Coruna: Editorial Litografia e Imprenta Roel, 1953. 10″. Pp. 460 of text and 360 of statistics.

[A detailed gazeteer and commentary on the economic structure and potentialities of the Canary Islands, profusely illustrated.]

Ceylonese

CENTRAL BANK OF CEYLON. Annual Report of the Monetary Board to the Minister of Finance, for the year 1954. Colombo: Central Bank of Ceylon. 1955. 10″. Pp. 97.

[A useful source of statistical and other information relating to most aspects of the economy of Ceylon.]

Chinese

TANG (HUI-SUN). Land Reform in Free China. Taipei, Taiwan: Chinese–American Joint Commission on Rural Reconstruction, 1954. 10″. Pp. 336.

[A detailed account of the reforms carried out by the Chinese Nationalist Government in Formosa. Some of these reforms had already been initiated on the mainland of China at the time when it passed under the control of the Communists. The programme, which is now largely completed, consisted of three stages: an all-round reduction in rents by one-quarter; the sale of public land; and the compulsory purchase of rented land from landlords and its sale to the cultivators by means of instalments over ten years.]

Japanese

THE SUMITOMO BANK. History of Sixty Years, 1895–1955. Osaka: The Sumitomo Bank, 1955. 10″. Pp. 35.

[A brief illustrated history of one of the six leading banking institutions in Japan. The bank was founded in 1895, but it had its origins in a large family mining and commercial enterprise going back to the seventeenth century.]

Indonesian

BANK INDONESIA. Report for the Year 1954–1955. Djakarta: Bank Indonesia, 1955. 11″. Pp. 203.

[This report gives, in addition to the relevant information about recent trends in banking and in public finance in Indonesia, a great deal of valuable statistical information about the trends of agricultural and mining production, about wages and prices and about recent trends in foreign trade.]

Official

BRITISH

BEHRENS (C. B. A.). Merchant Shipping and the Demands of War. History of the Second World War, United Kingdom Civil Series, edited by Sir Keith Hancock. London: H.M. Stationery Office and Longmans, 1955. 10″. Pp. xv + 494. 35*s*.

[To be reviewed.]

MURRAY (K. A. H.). Agriculture. History of the Second World War, United Kingdom Civil Series, edited by Sir Keith Hancock. London: H.M. Stationery Office and Longmans, 1956. 10″. Pp. xii + 422. 30*s*.

[To be reviewed.]

SCOTT (J. D.) and HUGHES (R.). Administration of War Production. History of the Second World War, United Kingdom Civil Series, edited by Sir Keith Hancock. London: H.M. Stationery Office and Longmans, 1956. 10″. Pp. 544. 37*s*. 6*d*.

[To be reviewed.]

CANADIAN

RESTRICTIVE TRADE PRACTICES COMMISSION, DEPARTMENT OF JUSTICE, OTTAWA. Report Concerning an Alleged Combine in the Manufacture, Distribution and Sale of Asphalt and Tar Roofings and Related Products in Canada. Ottawa: Department of Justice, 1955. 9½″. Pp. 282.

RESTRICTIVE TRADE PRACTICES COMMISSION, DEPARTMENT OF JUSTICE, OTTAWA. Report Concerning a Manufacturer's Advertising Plan alleged to constitute Resale Price Maintenance in the Distribution and Sale of certain Household Appliances. Ottawa: Department of Justice, 1955. 9½″. Pp. 93.

[The first of these reports relates to the arrangements responsible for the establishment of a uniform price structure in the supply of asphalt roofings. The second illustrates some of the implications of the prohibition of resale price maintenance. In the case under review, the manufacturer agreed to share a proportion of retailers' advertising costs on condition that the advertisements stated a price approved by the manufacturer. This is held to be an attempt to enforce resale prices.]

AMERICAN

FEDERAL RESERVE SYSTEM. Flow of Funds in the United States, 1939–1953. Washington, D.C.: Board of Governors, Federal Reserve System, 1955. 10″. Pp. 390.

[This publication makes a major addition to the available social-accounting data of the United States. The material is organised into two groups of chapters. The first group deals with the monetary transactions of the ten major sectors that are distinguished, and sets forth sources of funds and use of funds for each of them. The second group of chapters recapitulates these data in terms of receipts and disbursements in each principal type of transaction (including the various classes of purely financial transaction). Summary flow-of-funds accounts are also given. An introductory chapter surveys the general methods adopted, and the statistical tables in each of the subsequent chapters are preceded by full description of scope, sources, etc. Supplementary tables show the relationship between the flow-of-funds data and those appearing in other forms of social accounts. Sufficient evidence was not available to carry the work back before 1939.]

CEYLONESE

GOVERNMENT OF CEYLON. Six-Year Programme of Investment 1954/55 to 1959/60. Colombo: Planning Secretariat, Government of Ceylon, 1955. 9½″. Pp. 510.

[The Government of Ceylon's six-year investment programme is interesting not only in relation to the future development of the economy of Ceylon, but also in relation to the techniques of economic development. The greater part of the volume deals with particular plans for expansion of different sectors of the economy. Both the Prime Minister and the Minister of Finance emphasise in a foreword and introduction that this programme is designed as a framework for an economic development in which the private sector of the economy has an important role. The last forty pages set out the methods of analysis, the assumptions that have been made regarding such essential factors as the terms of trade, the determinants of output, the components of capital formation, the real sources of savings, dependence on foreign capital and the like.]

INTERNATIONAL

BANK FOR INTERNATIONAL SETTLEMENTS. Twenty-fifth Annual Report. Basle: Bank for International Settlements, 1955. 12″. Pp. 207, and appendices.

[This year's report follows the normal pattern. In addition to the usual chapters on prices, foreign trade, foreign-exchange markets, gold production and reserves, credit policies, and the European Payments Union, a special chapter is provided surveying the relation between financial policy and the growth of trade in each of the principal countries of Europe. The report also contains as an annex a paper by the Bank's General Manager, Roger Auboin, on the Bank's history during the first twenty-five years of its existence. This paper was first published as No. 22 in the series of "Essays in International Finance" issued by Princeton University.]

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT. Tenth Annual Report, 1954–1955. Washington, D.C.: International Bank for Reconstruction and Development, 1955. 11″. Pp. 39. Appendices, pp. 57.

[This contains a retrospective chapter on the work of the Bank in the nine years of its life, as well as a more detailed description of its activities during the past year. Of its total loans of more than $2,300 million, the distribution between continents has been as follows: Europe, $929 million; Latin America, $579 million; Asia, $275 million; Australia, $258 million; Africa, $232 million.]

INTERNATIONAL LABOUR OFFICE. Unemployment Insurance Schemes. Geneva: International Labour Office, 1955. 9½″. Pp. 254. 9*s*.

[A comparative survey of schemes in force in different countries. Aspects dealt with include scope of unemployment insurance, eligibility for benefits, methods of financing and administrative organisation. The book is chiefly one for reference, but issues of principle are briefly discussed as they arise.]

INTERNATIONAL MONETARY FUND. Summary Proceedings of the Tenth Annual Meeting of the Board of Governors, September 1955. Washington, D.C.: International Monetary Fund, 1955. 9″. Pp. 116.

[The 1955 meeting of the Bank's Board of Governors was held in Istanbul. In presenting the annual report, Mr. Ivar Rooth reviews the ways in which general economic progress since the end of the War has facilitated the resumption of more normal international monetary arrangements.]

INTERNATIONAL TIN STUDY GROUP. Tin 1954. A review of the world tin industry. The Hague: International Tin Study Group, 1955. 8″. Pp. 51. 7*s*. 6*d*.

[A factual survey of production, consumption, trade and prices of tin during 1954, illustrated with numerous charts and maps.]

International Trade 1954. Geneva: GATT, 1955. 9½″. Pp. 169. $1.50.

[This is very much more than a mere report of the progress of GATT itself during 1954. It starts with a very useful study of the general trends of world trade and world production, and

provides tables showing, for example, the development over the past five years of trade in manufactures and primary products, of trade between industrial and primary producing areas, and the trade flowing in sheltered as distinct from normally competitive channels. It is perhaps symptomatic of the rapid oscillation of world conditions that one section is headed "The Reduced Significance of Western Europe's Dollar Problems." For anyone concerned with the changing structure of world trade and the growing discrepancies between the expansion of primary production and industrial production, this is an invaluable source of information. It also, as its special obligation, records the recent changes in the barriers and controls in international trade. During 1954 there were signs, *inter alia*, of customs duties being raised as quantitative restrictions were removed. It remains extraordinarily difficult from a reading even of the extensive detail of this report to judge whether progress exceeded retrogression during the year. One wishes that the ingenuity of statisticians could solve satisfactorily the problems of measuring the obstacles to trade and the changes resulting from the progress of negotiations and the whittling away of specific duties by inflation.]

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANISATION. The Positive Contribution by Immigrants. A symposium prepared for Unesco by the International Sociological Association and the International Economic Association. Paris: Unesco, 1955. 8½". Pp. 202. 12*s*. 6*d*.

[This contains five papers by different authors on the "positive contribution" made by immigrants to the social and cultural life of the United States, the United Kingdom, Australia, Brazil and Argentina. The economic effects of immigration are only briefly treated in these papers, and this aspect is discussed in a separate paper by Professor Brinley Thomas. The assessment of "positive contribution" was evidently not an easy assignment and at some points the treatment tends to lapse into recital of the achievement of individual distinguished immigrants. None the less, much interesting and valuable material is included. The findings are skilfully brought together in a concluding paper by the general rapporteur, Professor Oscar Handlin.]

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANISATION. The University Teaching of Social Sciences: Economics. A report prepared by C. W. Guillebaud on behalf of the International Economic Association. Paris: Unesco, 1954. 8½". Pp. 300. 11*s*. 6*d*.

[The International Economic Association was asked by Unesco to contribute to a general study that was being made of the methods of teaching at the university level in the different social sciences. A small conference was held at Talloires under the chairmanship of Mr. C. W. Guillebaud, and a number of experienced teachers in different countries were invited to contribute reports on course, syllabuses and methods of teaching in their respective countries. Mr. Guillebaud himself writes about the teaching of economics in the United Kingdom; Professor Horace Taylor for the United States; Professor Emile James for France; Professor Palander for Sweden; Professor Vakil for India. Other countries covered include Belgium, Egypt, Germany, Italy, Mexico and Yugoslavia. There is a special section on the teaching of econometrics by Professor Tintner. Mr. Guillebaud, besides his study of the United Kingdom, has contributed a general survey, based on the very interesting discussion of the papers which took place at the conference and in which a number of others besides the authors took part. It would not be easy to summarise the wide range of issues discussed. It was made clear from an early stage that teaching methods depended not only on traditions but also on the character of the university institutions in which they took place, with the State universities of the continent at one extreme and the collegiate system of some British universities at the other. There was wide difference also as to the emphasis on undergraduate and post-graduate studies respectively. But inevitably the central part of the discussion was concerned with the extent to which economics should or should not be a self-sufficient discipline of its own, or should or should not be attached to a general training in the broad principles of administration, looked at from all angles, such as is represented by the ideal of the *Faculté de Droit*. Professor James' frank discussion of the development of ideas relating to this in the universities of France is especially interesting. This book, which is at the same time a valuable work of reference regarding actual courses in different universities, is obtainable on special terms by Fellows of the Royal Economic Society at a price of 7*s*. on application (enclosing a remittance for that amount) to the Secretary, The Marshall Library, Downing Street, Cambridge.]

UNITED NATIONS FOOD AND AGRICULTURE ORGANISATION. Uses of Agricultural Surpluses to Finance Economic Development in Under-developed Countries. Commodity Policy Studies, No. 6. Rome: F.A.O., 1955. 11½". Pp. 65. 5*s*.

[This report is based on an inquiry carried out under the leadership of Dr. Mordecai Ezekiel. It is in two parts. The first part discusses the general economic principles involved in various types of schemes under which agricultural surpluses are used to make possible development projects by meeting part or all of the extra effective demand created by them. The second part applies these principles to certain concrete proposals for development projects in India, chosen as a case study. The report is lucid and well arranged, and it has interest not only on its own account but also as an example of how general principles may usefully be applied in the assessment of particular proposals.]

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EXPECTATION AND CARDINALITY

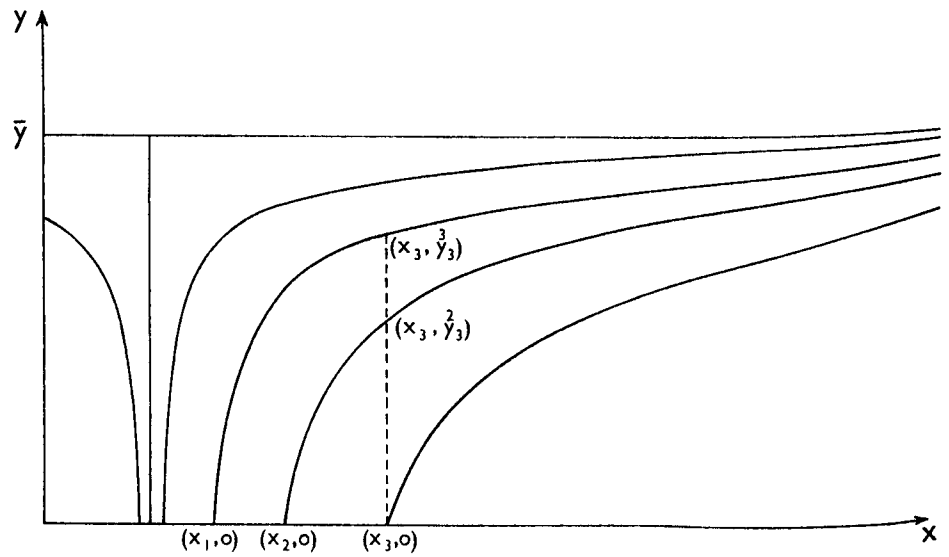
I BELIEVE it is sometimes said that if we are to be able to claim that a given variable is cardinal, we must provide it with a unit interval and a zero point. If, by the nature of what we seek to measure, only one possible unit and only one possible zero point offer themselves, cardinality is complete. For some purposes, however, we shall be content, on a certain condition, with a lesser cardinality in which those two elements can be arbitrarily chosen; this condition is that the expression of a given magnitude in terms of one pair of these elements can always be re-expressed in terms of any other pair merely by a linear transformation. In the context with which I am specially concerned, the matter has presented itself to me from a somewhat different angle; for it seems to me that when the variable is *potential surprise* we are presented with not only a natural and inevitable zero point, the meaning of which will be the same for everybody, but also with another magnitude which satisfies this same condition of *absoluteness of meaning*, viz., the absolute maximum of potential surprise which I have habitually denoted $\bar{y}$. Now if $y = 0$ and $y = \bar{y}$ have fixed and universally constant meanings, and are distinct from each other, then if we can regard this distinctness as implying that they are separated by an interval, is not this a natural interval of fixed meaning which could meet the second of the two requirements of full cardinality? Plainly it cannot, for the entire range of the variable, to which we assign any meaning, is encompassed by and is identical with this interval. Thus it seems to me that, at any rate in my own context, the problem is to find some principle or method of *subdividing* the natural interval with which the context provides us. It is not appropriate or sufficient, as in some other contexts perhaps it may be, to assume that if the meanings of any two integers, taken to represent values of our variable, are fixed, then all other rational numbers will thus directly and automatically have their appropriate meanings assigned to them.

Our logical first step is to decide what conditions our principle of subdivision must satisfy, and to decide this we must consider what is our purpose in seeking to render cardinal, in some sense, the variable I have called "potential surprise." This purpose is analytical and descriptive. If an enterpriser chooses one rather than another of several technically specified investments that are open to him, we wish to be able to see this act as the consequence of several distinct elements, viz., some characteristics of his own

temperament and some judgments that he makes about the range of different consequences which might follow from his committing his resources to this investment or that. Again, let us suppose him to have in mind three hypothetical outcomes, of respective face value x_1, x_2 and x_3, with degrees of potential surprise respectively y_1, y_2 and y_3 (see Fig.). Let us suppose that $x_1 < x_2 < x_3$, and that initially $\overset{1}{y}_1 = \overset{1}{y}_2 = \overset{1}{y}_3 = 0$, so that [1]

$$\phi(x_1, 0) < \phi(x_2, 0) < \phi(x_3, 0)$$

Then let us imagine his knowledge and inferences to change so that the outcome x_3 comes to be associated with such a degree $\overset{2}{y}_3$ of potential surprise that



$\phi(x_3, \overset{2}{y}_3) = \phi(x_2, 0)$. Suppose, further, that his knowledge and his interpretation of it again change so that now x_3 is assigned $\overset{3}{y}_3$ such that $\phi(x_3, \overset{3}{y}_3) = \phi(x_1, 0)$. Finally, let us suppose that the change of information which assigns to outcome x_3 the degree of potential surprise $\overset{3}{y}_3$ occurs as it were in one movement, without the intervention of any stage where x_3 is associated with $\overset{2}{y}_3$. In the whole set of events that we have now imagined there are involved three distinct *differences* of degree of potential surprise, viz.,

$$\overset{3}{y}_3 - \overset{2}{y}_3 \quad . \quad . \quad . \quad . \quad . \quad \text{(i)}$$
$$\overset{2}{y}_3 - \overset{1}{y}_3 = \overset{2}{y}_3 \quad . \quad . \quad . \quad . \quad \text{(ii)}$$
$$\overset{3}{y}_3 - \overset{1}{y}_3 = \overset{3}{y}_3 \quad . \quad . \quad . \quad . \quad \text{(iii)}$$

Then we wish to find some principle or method of subdivision of the range of definition of potential surprise, such that the sum of (i) and (ii) is equal to

[1] ϕ here stands, as in my *Expectation in Economics*, for the " attention-arresting power " of various " elements " (x, y).

(iii). It is in this sense that we must, I think, seek a *consistently additive* cardinality for potential surprise.

This introduction of the word " additive " in connection with potential surprise compels me to digress for a few moments, for there is another, and an essential, sense in which, as I have taken pains elsewhere to emphasise, potential surprise is non-additive.

If it is possible, *a priori* or empirically, to establish a table of the relative frequencies with which we obtain each distinct result out of an exhaustive set of possible results when some defined class of trial or performance is indefinitely repeated, and if some valuation is put on each distinct result, the so-called " mathematical expectation " is reckoned, in a way which is familiar to all of us, by multiplying the valuation of each contingency by its relative frequency, the latter being expressed as a proper fraction such that all the relative frequencies together sum to unity, and adding the products so obtained. The idea of the frequency-table has often been transferred from its proper use as a statement of " objective " knowledge about the outcome of an experiment consisting in the totality of some " large " number of trials, to an entirely different use for which it seems to me to be in several respects quite unsuitable, namely the description of a person's uncertain state of mind about the question what will come of a single unique or isolated act of his own. However, when our formal basis of discussion of uncertainty is the frequency-table, our process of thought involves *addition*, the summing and averaging of items each corresponding to a distinct contingency. It is addition for this sort of purpose which is entirely absent from my own construction based on potential surprise. My own construction recognises the different possible or conceivable results of a unique or isolated experiment (what I have elsewhere called a *non-divisible non-seriable* experiment) as mutually exclusive rivals the attempt to add which is a contradiction of their essential meaning.

Let us return to the problem of how to subdivide the range within which potential surprise is defined, the closed interval $0 \leq y \leq \bar{y}$. A proposal which introspection has strongly recommended to me is one which was made by Mr. W. E. Armstrong in 1939 in the context of utility theory.[1] Mr. Armstrong's idea as I understand it could be expressed as follows. In a given set of circumstances, I find that I prefer a cup of tea to a cup of coffee, and also that I prefer a cup of coffee to a cup of cocoa. But I also have a definite feeling which I can best express by saying that the difference between what the cup of tea does for me and what the cup of coffee does for me is less than the difference between the subjective benefit I get from the cup of coffee and that which I get from the cup of cocoa. The utility of the coffee can thus be said to be in some real sense *nearer* to that of the tea than that of the cocoa, there is an *interval* between the utility of the tea and that of the cocoa which is unequally divided by the utility of the coffee. Now if (Mr. Armstrong's argument proceeds) I can find some other object of consumption

[1] " The Determinateness of the Utility Function," by W. E. Armstrong, ECONOMIC JOURNAL, September 1939. I believe a similar suggestion had been made by Professor Frisch at an earlier date. Mr. Armstrong, however, arrived at his ideas quite independently.

concerning which I cannot decide whether its utility is nearer to that of the tea or that of the coffee, it can be claimed that this new utility exactly halves the interval. Each half of the interval can be similarly halved, and so on until, perhaps, a limit is set by my reaching the smallest difference between utilities which I can discriminate.

Does this method of subdivision furnish what I have called a consistently additive cardinality? We must notice that this question is not the same as the question whether the sub-intervals obtained by Mr. Armstrong's method are all equal in the same sense that the centimetre divisions on a scale of length are equal. The latter can be proved equal by being each compared with one and the same marked centimetre interval on a separate object which can be moved from one part of the length-scale to another. In our context and in that of utility no such procedure is possible. Yet by the nature of Mr. Armstrong's method it follows that, so long as my own subjective criteria, the correspondence in my own temperamental make-up between certain material states of affairs and certain feelings, remain stable, the additive test we have proposed is always met. For suppose I have in mind four objects of respective utilities $u_1 < u_2 < u_3 < u_4$ and that for the purpose of constructing a scale on Mr. Armstrong's principle I take the interval between u_1 and u_4 as my unit interval. Suppose also that u_2 and u_3 occupy the points obtained by the second halving operation in Mr. Armstrong's process of repeated halving, so that u_2 is " one-quarter " of the way from u_1 to u_4 and that u_3 is " three-quarters " of the distance from u_1 to u_4. Is it now necessarily true that the " distance " from u_1 to u_3 is the sum of the distances from u_1 to u_2 and from u_2 to u_3? Yes, for both u_2 and u_3 were determined or fixed with reference to the mid-point (in Mr. Armstrong's sense) of the unit interval separating u_1 and u_4. Let us call this mid-point u_M. Then if we start, as it were, from u_M and traverse a certain distance in one sense we reach u_2, while if we traverse a certain distance from u_M in the opposite sense we reach u_3. Having reached u_3, we can plainly reverse the sense of the movement and go right back through u_M to u_2 and on to u_1. It follows, I think, that we have in Mr. Armstrong's principle a means of obtaining a consistently additive cardinality in the sense which I have tried to give these words above.

We have *a* cardinality. But, according to Professor Carter,[1] whose criticism was the main cause of my attempting this exploration of the subject, it is not sufficient for my purpose to show that potential surprise can be cardinalised, I must show that there is one and only one cardinal scale. For let us assume that the function, according to which ϕ depends on gain or loss, x, and on potential surprise, y, is simply the product $x.\frac{1}{y}$. Then if, for example, two amounts of gain, $x_1 = 16$ and $x_2 = 27$, are respectively associated with degrees of potential surprise represented, on one scale, by

[1] " A Revised Theory of Expectations," by C. F. Carter, ECONOMIC JOURNAL, Vol. LXIII, No. 252, December 1953, reprinted in *Uncertainty and Business Decisions*, ed. Carter, Meredith and Shackle (Liverpool University Press, 1954).

nd 9, the corresponding values of ϕ will be $\phi_1 = 16 \times \frac{1}{4} = 4$, and $\phi_2 = \times \frac{1}{9} = 3$. But if we regard the particular scale by which we have igned numerical values to particular degrees of potential surprise as ıply *one* scale out of many, and if, for example, we assume that any notonic increasing or decreasing function of that first scale will serve ıally well, we might instead have $\phi_1 = 16 \times \frac{1}{2} = 8$ and $\phi_2 = 27 \times \frac{1}{3} = 9$. us by choosing a different scale for y we should have reversed the size-ıking of ϕ_1 and ϕ_2.

The fact that several different methods have been proposed for demonıating the measurability of utility, or the " determinateness (that is to say, : uniqueness) of the utility function," may well set up in our minds a preıption against such uniqueness, not merely in regard to utility, the only ıtext in which there has been any general discussion of the matter, but in ' similar context, such as that of potential surprise. For is there any son *a priori* why different methods should lead to the same result? In a ninous article [1] Mr. D. Ellsberg has indeed pointed out that if two concepts : defined by two different operational procedures they are in strictness two ferent concepts, and the onus of proving them to be effectively identical, in ' context or argument, lies on the person who wishes to treat them so. '. Ellsberg's article is admirably lucid, exact and thorough, but its subject .tter is inherently so difficult that perhaps I may be excused for having still mind, after several readings, a number of points on which I do not feel ite clear or satisfied. His main concern is with two possible operations in rticular, by which some concept of cardinal utility might be defined, mely that of von Neumann and Morgenstern consisting in the observation a person's choices in so-called " risk situations," and that which the neossical economists such as Jevons had in mind, consisting in the subjective veighing " by the person himself of the amounts of satisfaction associated th different events. I must confess myself here still puzzled by what is ant by a " risk-situation." What precisely is it that the person has to do? : is offered the choice between, for example, the certainty of receiving a ted sum of money B, on the one hand, and a lottery ticket which will give n " with a probability " p a sum $A > B$ or " with a probability " $(1 - p)$;um $C < B$. Does this mean that if he chooses the lottery ticket the tery will be drawn *just once* and he will in fact receive either A or C? If s is indeed the meaning, whatever can be meant by saying that he will :eive A " with a probability " p? The interpretation he puts on this tement must be entirely subjective, something evolved in his own mind d different, in general, from the interpretation which would be put on it by other person. There seems to me to be no ground on which we could say ıt if, for example, $p = \frac{1}{2}$ and $\frac{1}{2}A + \frac{1}{2}C = B$, he " ought " or " it would be ional " to be indifferent between the sure outcome B and the lottery ticket , p; C). We simply do not and cannot know, without further informan, what a lottery ticket in this sense of a *unique* drawing means to him,

[1] " Classic and Current Notions of 'Measurable Utility,'" by D. Ellsberg, ECONOMIC JOURNAL, . LXIV, No. 255, September 1954.

what its essential quality or significance in his mind is. The idea " *A* with a probability *p* " involves *two* subjective elements and not one, the so-called probability cannot play the role of something objective that will enable us to pin down a single remaining element of " satisfaction," this probability is no more, *at most*, than the objective base or correlate of a dimension or aspect or element of *feeling*, that very strand of feeling to which I have sought to give precise definition under the name of potential surprise. Thus to me Mr. Ellsberg's insistence that we cannot treat the " utility " arrived at by von Neumann and Morgenstern's procedure as being identical with that resulting from Jevonsian introspection, is rather like an insistence that we cannot discover the altitude of a mountain peak by manipulating its latitude and longitude.

Suppose, however, that the meaning of the lottery ticket is quite different, and that instead of being drawn just once the lottery is going to be drawn, say, 10,000 times, so that the probability *p* means a statistical frequency which will be approximately realised in fact. In this case if the lottery ticket offers, for example, £1,000 with a probability of $\frac{1}{4}$ and £200 with a probability of $\frac{3}{4}$, the actuarial valuation of the lottery ticket is £250 + £150 = £400, and this is what, to a quite good approximation, the person can look forward with virtual certainty to receiving. But on what ground, in this case, can we speak of a risk situation?

How fallacy can flow from this ambiguity of the expression " a risk-situation " is most strikingly illustrated by Professor Wold in his note on " Ordinal Preferences or Cardinal Utility? " in *Econometrica*, Vol. 20, No. 4. This Note Mr. Ellsberg dismisses without any reasoning or discussion whatever, with an *ipse dixit* which seems something of a blemish on his otherwise fine article. The assertion " The argument . . . by H. Wold . . . is definitely invalid " ought surely not to have been made without a demonstration that would have rendered the word " definitely " superfluous.

My contention is, then, that if von Neumann and Morgenstern's operation, by which they seek to define utility, refers to a *unique* lottery drawing, the resulting observed behaviour will spring from the *combined* effect of two subjective judgments, one concerned with degrees of belief in outcomes and the other concerned with degrees of satisfaction arising from given face-values of outcomes, and that it will be impossible, by observation alone of the kind Mr. Ellsberg and others have in mind, to disentangle the effects of these two elements. If, on the other hand, von Neumann and Morgenstern have in mind an indefinitely long series of drawings of the same lottery, then risk and uncertainty are eliminated and the proposed method breaks down in the way that I think is implied in Professor Wold's note.[1]

However, even if we claim that, whatever is distilled by von Neumann and Morgenstern's operation, this distillate is not pure utility or satisfaction and that their procedure cannot be included in the list of methods of cardinalising utility, still this elimination of one suggested method does not imply that there are no others. Mr. Armstrong himself has in fact suggested an alternative to his first method. He proposes to use as the cardinal unit of utility the *smallest discriminable difference* between utilities. This method would indeed eliminate altogether the difficulty, if it be one, that even when we have established a unit for measuring the intensity of some mental phenomenon such as satisfaction or potential surprise, we may need, and be unable, to propose a method of sub-dividing it. Plainly, we can attach no meaning to the idea of sub-dividing the least discriminable difference. If Mr. Armstrong's second method can be validly applied to certain psychic variables, it follows that these variables are in fact discontinuous, and only a discontinuous cardinality can be established for them. It is not evident that such variables would entail any greater strain on our consciences, when we apply to them the methods of the differential calculus, than such things as population or money value do already.

[1] Uncertainty enters only in regard to the *temporal sequence* in which the various outcomes will occur, a matter which, as Professor Wold has pointed out in his Note in *Econometrica*, is quite inadmissible when we are considering a static model.

But the real question I have to face is whether Mr. Armstrong's two methods are bound to give us concepts of cardinal utility, or in my own context, of cardinal potential surprise, which it will be legitimate for us to treat as identical. I feel bound to ask whether, in supposing it to be possible that there are many different cardinal utilities, we are not losing sight of psychic reality, the character and essential processes of the human mind, and allowing ourselves to be led astray by considerations of technical mathematical or logical procedure. It is true that, for example, the " distance " between two points in any space can be measured, if we will, along any number of different paths, and we are quite at liberty, in the abstract, to postulate any space. But the physical space of nature, whether it be Euclidean or of some non-Euclidean variety, is surely of a *unique* character, and gravity or whatever we care to call the principle which manifests itself in the apparent behaviour of massive objects operates in just one and only one way, and it operates in just one and only one kind of space, whatever that kind may be. Can we suppose that the structure of human thought, feeling and consciousness is any more capricious and " multi-principled " in its essential nature than the physical universe?

I have one suggestion to make, in regard to the particular question whether Mr. Armstrong's two methods will lead us to one and the same or to two different cardinal utilities. I wish to suggest what may seem to you a rather far-fetched analogy, and I wish to ask whether in this matter we could not usefully pay some attention to the difference between the methods open to us for measuring, say, length or mass and those open to us for measuring *time*. In measuring length in practice we are absolved from any need to resort to methods essentially involving *integration*, but when we measure time by means of clocks, candles or sand glasses we are, it seems to me, using a principle closely bound up with integration, and even if we measure time by observing the different positions of the sun, or of its shadow on the sun-dial, we are in effect assuming that the sun moved from one position to the other by traversing (as it were) the distance between those positions " a bit at a

time," at a speed corresponding, of course, to that of the earth's rotation. Now can we not imagine a person who is contemplating the degree of utility, or of potential surprise, associated with some event or state of affairs allowing himself to traverse in his own mind the distance separating that degree from some other definite degree, such, let us say, as zero potential surprise, by a series of steps each of the smallest size he can discriminate? If so, we can imagine him to make the following experiment: Having selected two particular levels of utility or of potential surprise, he first selects by a direct and immediate judgment the mid-point, in Mr. Armstrong's sense, between them. He then proceeds to move, as it were, from one of the initial levels towards the mid-point, reckoning the distance by some process rather like that by which we subjectively reckon *duration* in time, or even, if you like, by counting the number of the *minima sensibilia* he needs to carry him to the mid-point. Lastly, he moves from the mid-point to the other of the two initially selected levels and again reckons the distance by this process of quasi-integration. Will the two distances thus reckoned, between the two initial levels and the mid-point selected by direct judgment, turn out equal? I do not assert that they will, I scarcely venture to assert that the experiment that I have described has a clear meaning, but if it has I see no reason why the two distances should not be equal.

However, my real answer to Professor Carter's objections is not along the lines of technical analysis. The solution appears to me to lie in a radically different argument concerned with the essence of the matter rather than with formal analysis of it, and this argument can perhaps be best introduced by means of a brief anecdote. In a certain village the grocer and the baker lived just opposite one another. One day the baker entered the grocer's shop in a state of high indignation, and charged his neighbour with repeatedly selling him bags of sugar that were several ounces short in weight. " I am really very sorry," replied the grocer, " but the fact is that I always weigh out my sugar by putting one of your loaves in the other pan of the scales." In assigning numerical values to certain intensities of feeling we are at most making explicit a cardinality which may already reside in these intensities. The cardinality itself, if it exists, is a psychological reality. If cardinality inheres in the intensities of one kind of feeling, in one emotion, it must surely inhere in all. But if we admit this, can we then suppose that any kind or aspect whatever of reality can be reflected by the practice, which Professor Carter's argument would by implication make legitimate, of adopting one unchanging method of conferring explicit cardinality upon one variable, representing one emotion, while holding ourselves free to use in combination with it any one of several methods of making explicit the cardinality of another variable representing some other feeling? The two feelings must surely in the nature of things be linked with each other like the measures used by the grocer and the baker in my story. Or perhaps we can say, they are linked in the same way as the measures of length we use in reckoning the volume of a cuboid. If we decide to measure the length of the cuboid in centimetres, we shall not feel free to measure its breadth and height

in centimetres or in inches as the fancy takes us, and then express the volume as the product of the resulting three numbers without any explanation.

Surely we must believe, if we are to make sense of life at all, that nature guarantees us against making a *practical* mistake of the kind that would be possible if the human mind itself were free to use, as it were, one method of " measuring " one kind of feeling and some other method of " measuring " another kind of feeling in such a way that its judgment, which is the greater of two values of some variable depending on both these feelings, could be made *inconsistently* at different times. In saying " inconsistently " I mean, of course, *differently* without any justifying change in the person's knowledge, inferences or tastes. And this brings me back to my statement that my purpose, in seeking to show that potential surprise can be treated as a cardinal variable, is analytical. The task we are charged with is not that of *designing* the human mind but of *describing* and understanding how, overtly, it proceeds.

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FOREIGN INVESTMENT AND THE GROWTH OF THE FIRM [1]

I

SUCH is the desire for an accelerated rate of capital formation in most of the less-industrialised countries to-day, that fears about the ultimate problem of servicing foreign capital invested in the country are often pushed, rather uneasily, into the background, while inducements are held out to attract such capital, in particular to attract private direct investment. In Australia, however, a recent event has emphasised once again the controversial aspect of foreign investment when the investment takes the form of the successful establishment of a foreign subsidiary enterprise in which the ordinary capital, or common stock, is largely held abroad. Most successful firms grow, and if a firm grows by virtue of its own earnings, that is to say, if the rate of new investment in the firm does not exceed the rate of earnings on its past investment, then the foreign equity in the firm grows without any net import of new foreign exchange—*i.e.*, foreign investment in the firm is increasing while there may be a net outflow of foreign funds.

Thus, a relatively small initial dollar investment, for example, may establish a firm whose earnings are sufficient to permit extensive expansion through ploughed-back profits, each increment of expansion increasing the foreign liabilities of the country. It is therefore likely that dividend remittances, when they become an important proportion of profits, will be enormously high in relation to the original dollar investment, although not necessarily high in relation to the total foreign investment in the firm. This paper is concerned with the economic implications of this form of foreign investment for the economic policies of some of the less-industrialised countries to-day.

We shall consider first the particular case of General Motors-Holden's Ltd. in Australia, secondly, the general question whether it makes any difference if foreign investment takes place through the expansion of existing foreign-controlled firms rather than in some other form, and finally what solutions, if any, there are to the problems raised.

General Motors–Holden's in Australia

With the publication of its Annual Report for 1954, General Motors-Holden's Ltd., the Australian wholly-owned subsidiary of General Motors Corporation in the United States, raised a hornet's nest of controversy about its corporate ears, and became more firmly than ever committed to the

[1] I want to acknowledge here the criticism of the staff of the Economics Department of the Australian National University, and in particular that of Professor T. W. Swan, who saved me from some serious errors in the latter part of the paper. I am also indebted to Professor Fritz Machlup and to Professor E. F. Penrose for much helpful criticism, and to the John Simon Guggenheim Memorial Foundation for granting me a Fellowship for research in Australia.

necessity of convincing the Australian public that "What's good for General Motors is good for the country." The storm arose over the revelation that: (*a*) GMH made a profit A£9,830,000 after taxes in 1953–54, which is variously portrayed as 560% on ordinary capital (the ordinary capital representing in this case the original dollar investment of GMH), 39% on shareholders' funds (net worth), 24% on funds employed or 14% on sales, depending on how the speaker feels about the size of the profit; and (*b*) that a dividend was declared to the parent company of A£4,550,000, which again is 260% on ordinary capital, 18% on shareholders' funds or 11% on funds employed.[1] The dividend declared is about 8% of the dollar export receipts in the Australian balance of payments for 1954–55.[2]

Newspaper stories and editorials critical of the profit (the highest ever declared by a firm in Australia) and of the dividend payment were followed by an attack by Dr. H. V. Evatt, Leader of the Labor Party (the Government Opposition) on the GMH "Colossus," and letters pro and con appeared in the correspondence columns of the Sydney and Melbourne Press. Economists immediately began debating the issues raised for the Australian economy, and H. W. Arndt, Professor of Economics of Canberra University College, stated on the air " As far as policy towards future overseas investment in this country is concerned, the Holden case may induce some caution in giving indiscriminate encouragement." He suggested that Australia might do well to " concentrate less on attracting American capital and more on hiring American technical and managerial know-how."

The background of the General Motors situation is as follows: The firm began in Australia in 1926 with chassis-assembly plants in various States, and in 1931 bought out the Australian-owned Holden's Motor Body Builders Ltd. with an issue of Preference Shares. Until 1945 the combined firm was engaged in building bodies and assembling imported chassis units, but in that year began planning the manufacture in Australia of the Holden car. This car appeared in 1948, and has steadily gained a larger and larger share of the automobile market in Australia.[3] All Australian produced, it is the cheapest and most popular car in its class (medium weight—by Australian standards—and in the middle price range). GMH has been unable to produce enough cars to meet demand at existing prices, and the waiting list was announced as being equal to twelve months production. In 1953–54 the retail price of the car was reduced by A£84, or 7%. Further reductions in price would only intensify the shortage and put profits in the hands of " grey-market " dealers. (It is alleged that at present prices many people buy new Holdens and immediately resell them at A£100 profit.)

Along with the release of the Annual Report, expansion plans were

[1] The par value of the ordinary shares is A£1,750,000; there are in addition A£561,600 of Preference Shares owned by Australians. The net worth of the company (or shareholders' funds) is A£25 million; total funds employed are A£41 million.

[2] There is a 15% tax on dividends, and hence the actual dollar remittance was less by this amount.

[3] From 1953 to 1954, however, the Holden share of the market actually declined from 36·5 to 35·1% as a result of the inability of the company to keep up with the demand in an expanding market.

announced involving a 50% increase in production of the Holden (from the present 65,000 a year to 100,000), expansion of the household and commercial refrigeration business and entry into the production of central-heating units and other household appliances. The planned expansion is estimated to cost A£21,622,000, bringing the Company's post-war expenditure on new plants and facilities to A£47,750,000 and the funds employed in the business to more than A£61 million. (The total assets of the largest firm in Australia, a firm which comprehends the entire steel industry, were A£76·4 million in 1954.)

GMH has successfully established a completely Australian automobile,[1] thus reducing import requirements for automobiles and promoting efficient industrialisation. In other words, it has done "just what the doctor ordered"; for the promotion of industrial development by "import replacement" through efficient home production is established national policy. But if the post-war rate of expansion continues for long GMH will not only be far more important in the automobile market than all other producers combined,[2] but will also be reaching out into more and more industries. This continued expansion will not involve any further import of dollars; on the contrary, it will be accompanied by an ever-increasing stream of dollar dividends paid out as the equity increases on which the dividends are paid. Taking the ten-year period 1945–54, total profit of GMH was about 10% on sales and 27% on the average capital over the period, but 72·4% of the profit was retained in the business.[3] And there is little reason for believing that either smaller increments of expansion or lower earning rates are going to mark the reasonably foreseeable future.

At first sight it might seem that the problem is basically one of monopolistic profits; the task, accordingly, being to increase the amount of effective competition in the automobile industry. In general, and in spite of the periodic pronouncements of the Labor Party against "monopolies," neither the Australian Government nor the Australian public tend to be much concerned about monopoly as such. There is a very high degree of "concentration" in the economy—the largest seventy-five firms owning nearly 45% of the total fixed assets in manufacturing.[4] The steel industry

[1] As the saying goes, "Australian except for the key"—which is made in Wisconsin.

[2] The three largest producers are GMH, Ford and British Motors Corporation. Since 1949 the GMH share of the market has risen from 23 to 35½%, that of Ford from 14 to 21%, while that of BMC has fallen from 31 to 20%. Thus the "Big Three" have 76% of the market, and Ford and GMH together have risen from 37 to 54%. Of these only GMH publishes a balance sheet in Australia; nothing is known about the profits of the other two.

[3] Consequently, the actual dividends paid out have not until this year been appreciable, only some 7·4% on the average capital employed in the ten years. But this, of course, means that the equity upon which profits are expected to be earned and eventually realised in significant amounts s so much the greater. From now on it may be expected that the GMH dividend will remain high.

[4] This figure is subject to a fair margin of error because some of the largest companies in Australia are subsidiaries of foreign firms and do not publish balance sheets. Hence we have no nformation about their fixed assets. The figure was obtained by taking the largest manufacturing firms listed on the stock exchanges and comparing their fixed assets net of depreciation (because the gross figure is not usually available) with the net fixed assets in manufacturing as given by the Commonwealth Statistician.

and the glass industry are each in the hands of a single firm, 70% of the paper industry in the hands of another, 50% of the rubber industry is in the hands of still another and so on for many important industries. For one firm to gain a dominant position in the automobile industry would not be contrary to the general development of the structure of industry in Australia, and would not be expected to raise many eyebrows, especially since the industry is already highly concentrated. In addition, efficiency in meeting market demand seems to be the chief reason for the predominance of GMH—it is hard to trace the failure of competition to reduce its profits to any significant monopolistic practices on the part of GMH itself. Other companies have not produced a car as popular as the Holden (Ford is the only company significantly close to GMH in the market). The tariff on cars not wholly manufactured in Australia is of some importance, but not so much as is generally assumed. To encourage manufacturing in Australia there is a duty on automobile parts of around A£87 on a car equivalent to the Holden when imported from Britain already assembled, and A£38 on a vehicle to be assembled in Australia. Since automobiles other than the Holden are assembled in Australia partly from imported and partly from domestically manufactured parts, the duty naturally raises their cost, depending on the extent to which parts are imported.[1] Import restrictions imposed for balance-of-payments purposes are much more important and at present are very severe.

One simple and obvious step to take would seem to be a reduction in the tariff and of import restrictions. But this might have two unwanted effects. First, it is very probable that it would hurt other local manufacturers of component parts more than it would GMH. There is a large scope for the reduction of the price of the Holden in the face of competition, and there is strong reason to believe that while GMH would stand up well to increased competition, especially after the new expansion program is well under way, the others would not. In view of the Government's attitude towards the motor-car industry up to the present, it seems unlikely that it would be prepared at this point to risk a discouragement of further local manufacture. Second, and even more compelling from the Government's point of view, is the possible effect on the balance of payments. Any increase in imports is considered highly undesirable under present circumstances. Because of a current deterioration in the balance of payments, import restrictions have recently been severely increased. Since it is not at all certain that increased competition from imports would in fact go far to reduce GMH profits but might involve a partial destruction of the rest of the automobile manufacturing industry, a reduction of the tariff, or of restrictions might have little effect on GMH and merely cause a further deterioration in the balance of payments.

Nevertheless, the tariff is one of the factors in the situation, and a full-scale inquiry into the state of the automobile industry, which has been scheduled by the Tariff Board for some time, is now in process. It is possible

[1] However, several companies are well forward with plans to produce in Australia.

that tariff revision may to some extent increase competition and reduce the monopolistic element in the GMH profit rate. But competition in this sense will not eliminate the fundamental difficulty—the continued profitable expansion of the firm—unless it eliminates the differentials in expected profit rates which are the very basis for international direct investment.[1]

Various other approaches to the GMH problem have been offered. A favorite of some of the financial commentators is the suggestion that GMH should forthwith accept Australian equity capital. Even apart from the fact that this implies a repatriation of capital for which special permission is required from the Government, the proposal is highly impractical if it is expected to be on more than a token scale designed primarily for its psychological effect. To reduce significantly the foreign-exchange payments if profits and dividends near the present scale are continued, the Australian-held proportion of the total equity in the company would have to be substantial. Let us assume that the parent company would have no objection to 49% of the equity being transferred to Australian hands. Given the present net worth of the company, this might involve a diversion of Australian investable funds to GMH of something like A£90 million. The total investment funds raised in Australia on the capital market by Australian companies and semi-government authorities was not over A£200 million in 1954. Clearly it would take many years before a transfer of funds, including the repatriation of the capital, on this scale could be absorbed by the Australian economy without serious complications.

Finally, it is possible for the Government to limit the remittance of dividends either by direct limitation of the amount that can be exported or by very heavy progressive taxation. Some of the problems raised by this are discussed below; it is sufficient at this point to note that in order to attract foreign capital the Government has made it more or less clear that this type of action would not be taken; hence it would inevitably be viewed as a repudiation of previously incurred obligations and would create bad feeling all around. As is suggested below, once a foreign firm is established, it is not, from an economic point of view, desirable to limit its growth or to buy it out at its market value, in whole or in part, although from a political point of view a case can be made for acquiring it.

II

Let us now examine the problem in more general terms. It will be argued that the growth of foreign investment through the reinvestment of retained earnings by firms is subject to different influences from those determining the inflow of foreign investment from other sources. Once a foreign firm is established its continued growth is an increase in foreign investment, but an increase which is more appropriately analysed in the light of a theory of the growth of firms rather than a theory of foreign investment. The issues raised for the receiving economy will then be discussed.

[1] See Section II below for discussion of this point.

The Growth of the Firm

In the absence of markedly unfavorable environmental conditions, there is a strong tendency for a business enterprise possessing extensive and versatile internal managerial resources continually to expand, not only in its existing fields but also into new products and new markets as opportunity offers. The expansion is not usually a continuous straight-line process; rather it fluctuates with external conditions, and may be retarded by internal difficulties. But for the successful firms over the long haul—and there always are such firms—there seems to be no reason to assume that the process cannot continue indefinitely, or at least for any relevant future. The "productive opportunity" which invites expansion is not exclusively an external one. It is largely determined by the internal resources of the firm: the products the firm can successfully produce, the new areas in which it can successfully set up plants, the innovations it can successfully launch, the very ideas of its executives and the opportunities they see, depend as much on the kind of experience, managerial ability and technological know-how already existing within the firm as they do upon external opportunities open to all.[1]

Direct foreign investment—and by this I mean the ownership and operation of business organisations in a foreign country [2]—can, in its origin, be of several types. Here we are interested only in direct investment in manufacturing activity which takes the form of the establishment of branches or subsidiaries in foreign countries. In the realm of manufacturing this kind of investment is probably more effective in expanding productivity and promoting industrial efficiency than any other kind of foreign investment.[3] Its advantages derive largely from the fact that behind the new foreign firm are the resources and experience of the parent concern, including not only managerial and technical personnel but also that indefinable advantage in its internal operations which an efficient going concern usually has over a new one. Consequently the receiving country, in addition to foreign capital, foreign technicians and management, also obtains an unlimited drawing account, as it were, on the intangible resources of the investing company. The establishment of foreign subsidiaries or branches is, for the parent company, not essentially different from the establishment of subsidiaries or branches in its own country. To be sure, greater allowance for risk must be made, and greater profits are expected if the venture succeeds according to plan. But the new expansion is still part of the process of growth of the parent company.

Once established, however, a new subsidiary has a life of its own, and its growth will continue in response to the development of its own internal

[1] For a fuller, though still incomplete, discussion of the theory of the growth of the firm upon which part of the argument in this paper is based see my "Limits to the Growth and Size of Firms," *American Economic Review*, XLV, No. 2 (May 1955), Papers and Proceedings, pp. 531–43.

[2] This begs the question of what constitutes ownership or, more precisely, a controlling interest. For the purposes of this paper we need not worry about the kind of precise definition necessary for statistical analyses.

[3] By the emphasis on manufacturing I want to exclude from consideration the development of public utilities, railroads and similar industries basic to manufacturing through inter-governmental loans or through international financial intermediaries. Obviously such investment may be equally effective in promoting development.

resources and the opportunities presented in its new environment. This means, in the first instance, expansion in the production of the products contemplated when the subsidiary was originally established, an expansion which may well continue for a considerable period if, as is usually the case, the firm is introducing a new product or was established in an industry with the prospect of rapid growth. In time, however, the possibilities of expanding in other fields will appear attractive, either because expansion in the original lines at the same rates as before is no longer profitable, because new market opportunities have appeared, or because the firm has itself developed, or can draw on the parent company for productive services suitable for other types of products (*e.g.*, by-products, innovations related in production or consumption to the original product, a market standing facilitating the sale of other products, etc.). One of the notable characteristics of the growth of large modern corporations is the extent to which they change the range and nature of the product they produce as they grow. They introduce entirely new products, they improve and alter existing products, they enter into a wide range of industries, continually adding to their product lines. In other words, firms are not limited to their original fields; they tend to branch out in many directions. The extent to which this process of diversification can continue depends upon the flexibility of management and upon the resources of the firm—no clear limit is as yet discernible, even in the largest United States corporations. GMH in Australia illustrates the principle: even if the profitability of automobile production declines as competition develops, GMH can in principle, and very likely will in practice, continue to expand by going into other activities where a higher rate of return is still available. As noted above, the firm is already making provision for expanding production into a wide range of fields. In short, so long as there are openings in industry in which the firm expects a rate of return on investment sufficient to justify entering it, there is nothing in principle to limit its continued expansion. And if foreign firms have any advantage in management, technology, capital or other resources, foreign firms may be expected to grow somewhat faster than domestic firms, even in the absence of any exorbitant degree of monopoly power. This conclusion is reinforced by the fact that foreign firms tend to enter the newer, and therefore faster-growing and more profitable, industries.

On the whole, foreign subsidiaries have, for a variety of reasons, a greater degree of independence of the parent than have domestic subsidiaries. Where they are in a distant country the distance itself tends to restrict the mobility of personnel; where the subsidiaries operate in a radically different political, economic and social environment more weight is often given to the judgment of their executives, who are likely to possess an understanding of conditions that is not easily available to the parent company; where foreign subsidiaries are concerned, the area over which a close co-ordination of policy is considered necessary is often smaller than it is with respect to domestic subsidiaries operating in a more closely connected national market. For these and similar reasons, a foreign subsidiary, once it is established, is, with important exceptions, more appropriately treated in many ways as a separate firm. The most important of these exceptions relates to finance.

Foreign subsidiaries can obtain additional capital from their parent companies or, like local firms, from the local capital market. If funds for expansion are obtained from local equity sources the firm will represent foreign investment to a progressively smaller degree as it grows, and the problems discussed in this paper will not arise.[1] But a preference for expansion through retained earnings is becoming increasingly characteristic of the modern corporation, and of particular interest from the point of view of foreign investment is the situation, especially favored by American firms, in which the parent company holds all, or nearly all, of the equity and permits the subsidiary to expand with its own earnings.

Internally Financed Foreign Investment

The preference of American firms for nearly complete ownership of their foreign subsidiaries contrasts sharply with British practice.[2] Several reasons for the contrast have been put forward by business-men and economists—on the part of the Americans, a desire for freedom from interference from minority stockholders, a desire to avoid shareholder criticism of a ruthless dividend limitation in the early stages of growth even when profits are high, a desire to avoid precise inter-company book-keeping (such as charging part of the overhead of the parent concern to the subsidiary, charging it for managerial and technical advice, service and " know-how "), a desire for secrecy;[3] and on the part of the British, an appreciation of the political importance of a shared ownership. Whatever the reasons may be, the preference is clear. The result is that virtually the entire growth of most American-owned subsidiaries is properly classed as a growth in foreign investment. And a very large proportion of the total increment in United States investment abroad in recent years has taken the form of re-investment of retained earnings of such subsidiaries.[4]

[1] There are a variety of ways in which foreign concerns can co-operate with local firms and financial interests in establishing and developing manufacturing activity and without creating the kind of problem typified by the GMH case. See, for example, the methods discussed in *Processes and Problems of Industrialization in Under-developed Countries* (New York: United Nations, Department of Economic and Social Affairs, 1955), pp. 85–6.

[2] It has been estimated that on the average American companies hold 85% and British companies 40% of the Ordinary Shares of their subsidiaries in Australia.

[3] Foreign subsidiaries in Australia, for example, do not have to publish balance sheets unless they are " public companies " (some shares being publicly held); GMH issued Preference Shares in order to acquire the Holden company, and for this reason has to publish a balance sheet.

[4] " Between 1946 and 1951, for example, no less than three-quarters of all United States new direct foreign investment in manufacturing industry was the result of the ploughing back of profits earned in foreign branches and subsidiaries." United Nations, *op. cit.*, p. 84. According to a very interesting paper on the contribution of overseas companies to Australian post-war industrial development presented to the 1955 meeting of the Australian and New Zealand Association for the Advancement of Science by D. M. Hocking, which was based upon figures developed by the Australian Department of National Development, direct investment in secondary industry in Australia from the United States increased by A£80·1 million between 1945 and 1953. The United States Department of Commerce (*Survey of Current Business*, December 1954) estimates that the undistributed profits of Australian subsidiaries of United States firms amounted to A£65·2 million in the period from January 1946 to December 1953.

Because of the potentialities for expansion inherent in the modern corporation with its extensive techniques of decentralised management, its emphasis on developing new markets, on innovations and on research, and its power to generate internal funds for expansion, there are several reasons for believing that the flow of direct foreign investment when it is the result of the growth of foreign firms through retained earnings will proceed at a faster rate, in larger amounts and for a longer period than was characteristic of direct investment of the past. Furthermore, a decision by the parent firm to embark on a new foreign venture is taken under substantially different circumstances from those surrounding a decision to permit an already existing (and profitable) venture to expand.

Although it is true that foreign investment is undertaken because a rate of return on capital that is higher than alternative rates obtainable elsewhere is expected (although not necessarily in the short run), it should not be forgotten that a very considerable input of the managerial and technical resources of the investing firm may be required to ascertain what foreign opportunities exist and how they may best be taken advantage of. Indeed, the original investment of many a foreign firm has been little more than an exploratory venture which can be classed essentially as part of the cost of discovering whether or not investment is desirable. The cost of investigation, together with the cost of planning, organising and actually establishing the new firm must, other things being equal, obviously limit the number and extent of such ventures undertaken. When, however, a profitable foreign subsidiary presents a request that it be permitted to retain some or all of its profits for further investment, the case is different. The parent firm is presented with a program for expansion which has already been evaluated by the management of the subsidiary. It has to consider this program, to be sure, and it may modify it, but the exploratory work has already been done, and been done by men who know local conditions and (presumably) are trusted and responsible officials of the firm. In other words, an interested group in the firm itself presents a case and makes a plea. The degree of uncertainty surrounding such investment, and the cost of making it, is surely much lower than that associated with a new venture, and the investment, therefore, much easier to make.

Secondly, the very operations of the subsidiary in the foreign country, its knowledge of the market and of the conditions of production, the experience gained by its officials and the position it may have established for itself with its own customers and in the country generally all tend to create new opportunities for further investment, opportunities that did not exist at the time the firm was established. These, since they are new opportunities for the growth of the foreign firm, are by definition, new opportunities for the growth of foreign investment.

Finally, there is the fact that it is often easier not to go into an activity than it is to abandon it once it has been firmly established. In the modern corporate world, maintaining an established position often requires net new investment to keep up with the innovation of products, production techniques and marketing methods of competitors. Thus new investment may be required indefinitely to enable the foreign subsidiary even to maintain its position in the foreign market. And here enters, in a sense, a non-economic factor. More is involved in a going concern than an investment of funds. An organisation has been created, men and women have vested interests in the concern, a publicly recognised entity exists. It seems highly probable, and the suggestion has been confirmed in various conversations with businessmen, that there will be a strong tendency for the parent company to take its " cut " of the profits and to permit the subsidiary to retain a part long after a comparison of rates of return on capital would attract new investments in the absence of the existing subsidiaries.[1] In other words, even if increasing investment reduces, or even eliminates, the original differential between foreign and domestic rates of return on capital, foreign investment will still increase because foreign-owned firms will continue to grow through their own earnings. There is very little information available to enable us to evaluate the importance of this aspect of the matter. But from what we do know of the general processes of growth of business firms, there seems no good reason for expecting that the growth of the successful foreign firms will cease at any time, and the only important question relating to the growth of foreign investment is whether finance will be obtained from retained earnings or whether the parent company will gradually permit a dilution of the equity with domestically raised capital.

In effect, the profitable operation of foreign companies means, in the first place, that there are likely to be more funds available for foreign investment than there would otherwise have been, and in the second place, that the opportunities for foreign investment are enlarged. More funds are likely to be available because of the general bias in favor of permitting a successful subsidiary to retain some of its earnings for expansion, and because of the reduction in uncertainty and risk associated with foreign investment of this kind in comparison with the launching of entirely new ventures. New opportunities are created in the same way in which any growing and aggressive firm creates its own opportunities; it just happens that opportunities for expansion created by foreign firms are at the same time new opportunities for foreign investment.

Such are the reasons for expecting that the flow of foreign investment will increase at a more rapid rate and continue longer when it depends on the expansion of existing firms than it would if it depended on fresh imports of capital for new firms. And I suggest that the increasing importance of direct foreign investment in manufacturing in recent years is partly explained by these factors—some investment that would not otherwise have been made is being made for the reasons outlined above. It is direct investment, but of a much less speculative and risky kind than is usually assumed.

[1] This is particularly true if capital repatriation is not permitted and the foreign firm has no alternative but to continue to invest to protect its existing investment.

The Balance-of-payments Problem

Such investment, though ardently desired by the less-industrialised countries, is not accepted without misgivings. The misgivings relate to two potential difficulties: the political implication of foreign control and the economic problem of paying for the investment. Both are greatest in the case of direct investment; here we are concerned only with the economic problem. There can be little doubt that in order to provide the means of paying for foreign investment, an economy may, in the absence of expanding exports, be faced with the difficult task of inducing an unpalatable reduction in domestic consumption and investment.

This task may be especially difficult when incomes are expanding rapidly in response to a high rate of investment pursuant to government industrial-development and full-employment policies. Under such circumstances, with consumption and investment at high levels, import demand is likely to be very high, not only for consumers' goods, but especially for capital goods. The problem of maintaining economic stability—sustained full employment without inflation—becomes crucial, and is particularly difficult in countries whose export proceeds are subject to wide and unpredictable fluctuations from season to season. The goal of governments is to keep inflationary pressures under some sort of control without precipitating deflation, or if deflation threatens, to counteract the recession quickly and thus prevent depression. In pursuance of this goal there is often little hesitation in applying direct exchange and import restrictions or in using Central Bank credit to maintain financial liquidity in order to ensure that unfavorable movements of the foreign balance do not interfere with domestic policy. Yet the foreign balance is likely to be a continual source of trouble because of an excessive demand for imports consequent upon the difficulty of controlling " excess demand " within the economy without creating unacceptable unemployment. At the same time depreciation as a remedy is looked on with great suspicion, to be used only rarely and *in extremis*.

Such policies have several effects on the problem under discussion. High levels of activity mean high business profits, which not only attract foreign firms but also furnish an easy source of funds for the expansion of already established firms. In a raw-material-exporting economy, where industrial development does not contribute substantially to exports, large amounts of foreign lending may well be necessary to sustain the development program unless demand for the country's raw-material exports is also expanding rapidly. The high levels of activity attract the foreign investment required in the form of direct private investment, and particularly, after foreign firms have become well established, in the form of the growth of foreign firms through retained earnings. We have already shown that direct private investment will tend to grow rapidly and without practical limits as foreign firms grow. So long as these firms retain the greater part of their earnings for re-investment the effect on the balance of payments of servicing the investment is masked, for the re-investment of profits is equivalent to an import of

foreign funds. In not exercising their right to export their profits, the firms leave foreign exchange available to the country that would otherwise have gone into dividend remittances.[1] The effect is similar to the familiar process by which old loans are serviced partly out of the proceeds of new ones. No problem is apparent until the new lending stops. When profits are not paid out it is as if new loans were being made, but when this new " lending " slows down and dividends are paid on the existing investment the country may find that some difficult readjustments in the economy are required. It has been traditionally held that loans with fixed interest payments are likely to be more of a burden on the economy than equity investment, because in the former case the payments have to be made at the same rate in periods of depressed economic activity, while in the latter dividend payments fall when profits are low. This appraisal of the two forms of investment must be revised if, as seems likely, the more severe depressions can be prevented by appropriate internal government policy.

When the readjustments in the economy required to service foreign investment are difficult to make they create what is called a " balance-of-payments problem." And they will be the more difficult to make the greater the pressure of domestic demand on imports and the larger the foreign payments required. Rapidly developing economies attempting to maintain consistently high levels of employment will have continually to struggle to control excess domestic demand. Under the circumstances assumed in this paper dividend remittances from direct private investment will tend to involve larger transfers of foreign funds than would have been the case if only loans had been received. Consequently, a real " balance-of-payments problem " in this sense may arise. But it is, in essence, a " technical " problem, a problem of how best to reduce domestic consumption and investment—whether to use import restrictions, tariffs, exchange rates, taxation, monetary policy or some combination of these, and how to mitigate, if desired, the effects on the distribution of income and on the direction of domestic investment. However, in so far as foreign investment goes into industries producing for the domestic market, total dividend payments are likely to move slowly upward without much fluctuation. If export proceeds fluctuate widely from season to season the dividend payments may cause severe strains on the country's reserves from time to time. In so far as foreign investment takes place in export industries, the profits, and hence the dividends, of foreign firms are more likely to fluctuate with export proceeds and less likely to cause temporary strains. Economic authorities have an understandable reluctance to force far-reaching economic adjustment because of temporary difficulties. In the absence of sufficient flexibility in exchange rates the only alternative lies in the creation of adequate inter-

[1] We are not, of course, taking into account here the effect on the demand for imports (or supply of exports) of the investment which is itself the alternative to the building up of cash balances for the purpose of paying dividends. This is part of the whole question of how industrialisation in a primarily raw-material-exporting country affects the demand for imported goods—a question we cannot explore in this paper.

national reserves to maintain service on investment in periods when export proceeds are low.

Australia is an excellent illustration. Exports are only a little influenced by its industrial development.[1] Import demand is continually straining the country's foreign resources. Foreign investment, in particular direct dollar investment through the growth of American firms, is increasing rapidly. The balance-of-payments problem that this investment may create is masked so long as substantial proportions of the profits of foreign firms are retained. But as the total profits of foreign firms grow and the firms become more solidly established, the tendency to pay out a goodly portion of their profits to the parent companies will increase, particularly if foreign firms become nervous about the balance-of-payments position. It is highly probable that in time this portion paid out of a growing total will become large enough to make an appreciable contribution to the already existing difficulties of keeping the demand for foreign exchange within bounds, for the profit of the foreign firms, and the firms themselves, will continue to grow so long as the efforts of the Government to maintain domestic incomes at a full-employment level are successful. The adjustments required, together with the foreign payments made, are indeed a " cost " to the economy, and the basic question is whether the foreign investment is worth the cost. Is there anything in the nature of the type of foreign investment considered here—the growth of foreign firms—that makes the high cost of this investment " too high "?

Cost vs. *Benefits*

In principle, the growth of foreign indebtedness, like the growth of domestic indebtedness, need not be of particular concern in a growing economy, providing that the net income out of which the indebtedness can be serviced also grows correspondingly. If the increments of investment involved in the growth of foreign firms are of such high productivity that domestic real income is raised to an extent equal to, or greater than, the return on the investment to the owners of the capital it will pay the economy to accept them. There may be " technical " problems associated with the remittance of dividends, but in principle if the increase in the economy's productivity is not less than the cost, it will pay the economy to make the required adjustments, provided that the same increase in productivity could not have been obtained at a cheaper price.

There are two types of benefits realised from foreign investment: additional supplies of capital, on the one hand, and, on the other, new techniques of production and management, entrepreneurial skill, new products, new ideas. We have suggested that loan capital is in general cheaper than equity capital, but that probably less foreign investment would take place if loans alone were relied on. But it is primarily in the second category of benefits that the special advantages of direct investment lie. The benefits

[1] However, we should not overlook the fact that industrialisation may have *reduced* exports by diverting exportable products to domestic consumption and by attracting factors of production away from the export industries.

of direct foreign investment, when it takes the form of the establishment of new foreign firms, the introduction of new technology and the provision of experienced managerial and technical services can hardly be exaggerated.[1] In addition, the development of subsidiary industries and the improved productivity of other resources which the entry of a progressive foreign firm into a major industry may stimulate is of great importance in increasing the total productivity of the economy. The importance of the opportunities afforded for training not only the domestic labor supply but also domestic managerial and technical personnel is attested to by the lengths to which many countries go in insisting that foreign firms make special efforts in these directions. If the benefits of direct investment can be obtained in some cheaper way it will, of course, pay to do so. The intrinsic difficulties of controlling direct private investment once it gets established, the problem of paying for it, together with the political fear of foreign " exploitation " and domination, have led many countries to explore ways of hiring foreign management and technical personnel and purchasing access to foreign technology.[2] Such efforts have met with considerable success in some of the Latin American countries, but from an economic point of view it seems doubtful that they would obtain for the country the full set of advantages which are brought in by new foreign firms, although this will vary appreciably between industries. Nevertheless, a great deal can be gained in these ways which benefits the economy. Furthermore, it must be conceded that from a political point of view there is much to be said for this approach.

Even if a great many of the advantages of foreign investment can be obtained by these cheaper methods, it is still true that so long as still more capital and still further " intangible " benefits can be acquired by permitting the establishment of foreign firms whose contribution to the domestic product is greater than the cost of the investment, it will pay the economy to accept them. And so long as this condition holds true for further increments of expansion of foreign firms, it will pay the economy to permit the indefinite expansion of these firms.[3] If a point is reached where it does not hold true, *i.e.*, where the profits of the foreign firms contain a strong element of private monopoly gain, the situation is changed and the increase in foreign liabilities may be, to the extent of this gain, a net loss to the economy. This brings us up against the moot question whether the monopoly elements almost inevitably associated with the position of the very large firms are almost necessary conditions for further research, innovation and progress, as has been powerfully argued by many, Schumpeter in particular. In some cases

[1] For a survey of the enormous contributions made to the Australian economy by foreign firms see D. M. Hocking, " New Products, New Skills Follow Overseas Capital," *The Australian Financial Review*, September 29, 1955, p. 2. John H. Dunning has discussed a significant aspect of the importance of the contribution of American firms to the British economy in an article " United States Manufacturing Subsidiaries and Britain's Trade Balance," *District Bank Review*, September 1955, pp. 20–30.

[2] See United Nations, *op. cit.*, pp. 85–7.

[3] This is, of course, apart from the political question of whether large and powerful firms—foreign or domestic—should be countenanced.

this may be true; in others it plainly is not true. In any event, this is the element in the growth of foreign firms that will cause the increments of foreign investment it represents to take place at " too high " a cost to the economy, and it is this element, consequently, that receiving countries should pay especial attention to. It is obvious that this particular type of foreign investment is more likely than most others to contain an appreciable amount of unproductive monopoly profit.

Now all of this bears on the proposition, so often put forward, that there is some gain to the economy if arrangements are made after a point to buy out the foreign investor. It is probably true that the contributions of direct foreign investment are of greatest importance in the early stages of the growth of the foreign firms and of industrial development. It seems very likely that as the firm grows the point is reached where the specifically foreign contribution to the operation of the firm becomes less important in relation to the contribution of the locally recruited staff who have grown up with and have been trained in the firm. But if the firm is still paying its way—if the contribution to the productivity of the economy is greater than the return to the owners—it will not be to the domestic economy's advantage to divert scarce domestic capital to replace the foreign capital so long as there are opportunities for the profitable use of domestic capital. On the other hand, if the firm is making monopoly profits it would even less pay the economy to buy the firm at its market value, which would inevitably include the capitalisation of prospective monopoly profits. If there is no other way of eliminating the monopoly profit, then the purchase of the firm at a price which did not reflect prospective monopoly profits may be the only economic solution to the problem—this is usually referred to as " expropriation."

Thus it is clear that if it is economic to accept direct private foreign investment at all and to permit the establishment of foreign firms, that is to say, if the benefits of foreign investment cannot be obtained in cheaper ways (perhaps over a longer period of time), then it is desirable to permit the continued growth of foreign firms so long as they pay their way.[1] Furthermore, once they are established, under no circumstances does it pay to buy them out at their market value if domestic capital can be more profitably used elsewhere.

The fact still remains, however, that if extensive amounts of direct foreign investment are obtained, the balance-of-payments problem of the type discussed earlier may require adjustments which create awkward difficulties for many established government policies. If, therefore, there is not a reasonably large gain to be had from direct foreign investment, the country may well consider that the investment is not worth the cost of the adjustments required to pay for it. Furthermore, the political repercussions of policies designed to

[1] It has been implicitly assumed in this entire argument, of course, that industrialisation itself is, in the long run, a profitable use of the country's resources, or rather that the rate of industrial development implied in the investment program is not excessive. If this is not true and if real income would be increased if more resources were devoted to the raw-material-exporting industries and less to domestic industry, then further foreign investment, just as further domestic investment, in industry will be unprofitable to the economy as a whole.

restrict domestic expenditure when it is realised that the restrictions are partly for the sake of paying foreign " capitalists," may make such adjustments virtually impossible. By calling the balance-of-payments problem a " technical " one I do not mean to minimise its difficulties. Policies designed to force the rate of industrialisation, coupled with the potentialities for almost indefinite growth inherent in the modern corporation, the modern trend for increasing reliance on internal financing of expansion and the preference, particularly of United States firms, for nearly complete ownership of foreign subsidiaries, raises the possibility that much larger amounts of direct foreign investment may take place in a much shorter period of time when political conditions are favorable than was generally the case in the past. When and if the foreign payments become significant, the countries accepting the investment must also be willing to accept the adjustments in domestic consumption and investment required to service it. One suspects that for some countries there may be a basic incompatibility between the economic objectives of fostering very rapid industrial development and at the same time promoting domestic full employment at all times regardless of the state of the foreign balance, and the acceptance of an unlimited, unknown and uncontrollable foreign liability.

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THE DISAGGREGATION OF INVESTMENT IN THE STUDY OF ECONOMIC GROWTH

THE purpose of this article is to explore means of clarifying discussion of investment, particularly in relation to economic growth. After a brief survey of some possibilities in the field of investment analysis, two methods of disaggregating total investment are suggested. These two methods are: (1) division of total investment into supply investment and demand investment; (2) division of total investment into initiatory investment and complementary investment. The relationship between this latter classification and Mr. Harrod's concept of long-range investment is briefly discussed. Inventory investment is throughout excluded from consideration. No attempt is made to "explain" either investment or economic growth, and there is no suggestion that there exists one correct method of disaggregation.

I

Investment can be conceived as a process not only of creating capital but also of imparting specificity to resources. This is another way of saying that capital, once created, is not homogenous; although it may be true that some capital instruments can be switched from one use to another, possessing, so to speak, a certain elasticity of transference between uses.

The non-homogeneity of created capital is the basis of two well-known methods of disaggregating total investment. These are:

(1) according to sphere of use (*e.g.*, industry or sector);
(2) according to the estimated income-earning life of the asset.

To these might be added:

(3) disaggregation according to physical composition (*e.g.*, proportion of imported goods contained in the asset).

Each of these methods has its appropriate function. But for the study of economic growth, it is especially useful to differentiate according to the nature of the decisions which give rise to capital creation rather than to the nature of the capital created, because this helps to clarify the nature of the circumstances in which decisions to invest are, or are likely to be, or can be taken. The remainder of this article is concerned solely with this kind of analysis.

II

In one sense, all decisions to invest are homogeneous, because all assets are created in the expectation of profit. But disaggregation is possible by reference not to expectations as such, but to the nature of the connection between the current market situation and the decision to invest. It does no violence to language to describe this as expectational analysis, because,

although it does not deal with expectations in the customary way, expectations about the future are involved in all investment decisions for the simple reason that all investment decisions relate future output to some hypothetical projection of the current market situation.

Many varieties of expectation leading to investment have been suggested.[1] At present, the popular distinction is that between induced and autonomous investment. A distinction of this sort appeared first in trade-cycle analysis as a result of the revival by several authors of interest in the so-called acceleration principle.[2] To begin with, what is now called induced investment was called derived demand, while as a rule very little was said about the remainder of investment activity. This unbalanced treatment of the subject was not challenged until, in his review of Mr. Harrod's *The Trade Cycle* published in 1937, Sir Dennis Robertson wrote as follows:

> "I find myself in agreement with Mr. Harrod that the principle of acceleration deserves pride of place in any analysis of the trade cycle. But the next most important thing to be said is perhaps that some of the principal forms of investment in the modern world—the instruments of power production, of transport, of office activity—are, after all, very loosely geared to the visible demand for particular types of consumption goods and depend rather on fairly vague estimates of the future progress of whole areas and populations." [3]

Again there was a lapse of years, until finally Mr. Harrod, in his pioneering "Essay in Dynamic Theory," reached out to include non-induced as well as induced investment in a fairly systematic if regrettably brief analysis. It is significant that this step was taken in a treatment which emphasised the connections between the trade cycle and economic growth. Mr. Harrod distinguished between induced investment and long-range investment, and he divided the latter into two parts, one varying with the current level of income, the other "quite independent both of the current level of income and its current rate of growth," involving outlays "related to a prospective long-period increase of activity" or "induced by new inventions." [4] Later, Professor Hicks devised the slightly different distinction, which has become more prominent in discussion, between induced and autonomous investment.

By emphasising that the more remarkable changes in investment activity take place alongside much investment activity which is of a fairly stable nature, Hicks performed a valuable service to trade-cycle analysis. In the

[1] The earliest and still one of the best analyses of the problem is to be found in D. H. Robertson, *A Study of Industrial Fluctuation*, especially Chapters III and IV. See also R. F. Harrod, "An Essay in Dynamic Theory," ECONOMIC JOURNAL, March 1939; J. R. Hicks, *A Contribution to the Theory of the Trade Cycle*; T. Wilson, "Cyclical and Autonomous Inducements to Invest," *Oxford Economic Papers*, New Series, Vol. V, No. 1; and W. W. Rostow, "Some Notes on Mr. Hicks and History," *American Economic Review*, Vol. XLI.

[2] The article by J. M. Clark, "Business Acceleration and the Law of Demand," *The Journal of Political Economy*, March 1917, was itself something of a revival. For earlier statements see T. N. Carver, "A Suggestion for a Theory of Industrial Depressions," *The Quarterly Journal of Economics*, May 1903; A. Aftalion, "La Réalité des Surproductions Générales," *Revue d'économie politique*, 1909.

[3] Robertson, *Essays in Monetary Theory*, p. 179.

[4] *Loc. cit.*, pp. 26–7.

study of economic growth, however, the more stable element deserves greater attention than it has usually received; and difficulties appear as soon as autonomous investment is examined at all closely. Leaving aside the functional objection, so to speak, that within Hicks' model autonomous investment results in no addition to capacity, there is the definitional difficulty that the distinction between autonomous and induced investment " is not, in practice, a sharp one." [1] A boundary of vagueness must always surround any category of investment, and there must always be doubtful cases; this is especially true where we are classifying by motive, because motives, in the economic no less than in the moral world, are mixed. But there are reasons for regarding the category of autonomous investment as peculiarly unsatisfactory. The meaning given to " autonomous " in *The Trade Cycle* is " not induced by changes in output." This means that autonomous investment is classified according to a negative characteristic; and it is therefore not, like induced investment, a category itself defined by motive. The definition of autonomous investment is held to cover all cases of: " Public investment, investment which occurs in direct response to inventions, and much of the ' long-range ' investment . . . which is only expected to pay for itself over the long period." [2] It is further suggested [3] that bulges and dips in autonomous investment might be amenable to control *via* " a large movement in the rate of interest." At this point, doubts even of the reasonableness of the original idea begin to arise. Is it true, for example, that past changes in the level of output have an effect on the willingness of entrepreneurs to pioneer innovations " so small as to be insignificant "? [4] Waiving this difficulty, if autonomous investment is responsive to substantial movements in the rate of interest, is it not the same as investment with a long earning life? But if it is the same, then the complementary category to this should be not induced investment but short-range investment, *i.e.*, investment with a short earning life. But this means that we are back—or at least half back, for Hicks acknowledges only " much " long-lived investment to be involved—in the world of classification according to the expected income-earning life of the asset.

In other words, the distinction between induced and autonomous investment seems to be not only as vague as all such distinctions must be, but unnecessarily and disturbingly vague, and autonomous investment seems something of a rag-bag category. Hicks' classification has been severely handled for other reasons, and a fresh start is required. This can be made by means of a form of supply-and-demand analysis.

Demand Investment. By demand investment is meant investment undertaken in response to the known trend of demand for consumers' or for producers' goods. This category provides two subdivisions:

(*a*) Normal replacement investment.

(*b*) Investment which makes an addition to capacity, undertaken either because of a rise in the demand price of the consumption goods

[1] Hicks, *op. cit.*, p. 59.
[2] *Ibid.*, p. 59.
[3] *Ibid.*, p. 105.
[4] *Ibid.*, p. 59.

concerned, or because of a fall in the ratio of capacity to average outp or because of both these influences together; or because of the expec tion of such changes.[1]

Supply Investment. By supply investment is meant investment undertal in response to changes in the conditions of supply. This category provi three subdivisions:

(*a*) Investment designed to place a new commodity on the mark
(*b*) Investment designed to place an improved commodity on market.
(*c*) Investment designed to provide a cheapened and increa supply of an existing commodity.

It is to be noted that each of these kinds of investment may be carried either by an entrepreneur who seeks to enhance his profits by stealin march on his rivals or by one who is merely attempting to keep his h above water.

These five subdivisions of investment according to the nature of connection between the current market situation and the decision to in leave no investment unaccounted for. Many acts of investment, of cou will fit into more than one of these subdivisions. Nevertheless, this cla fication is systematic in a way in which the well-known two-division cla fications of investment—the induced/autonomous distinction and the lo range/short-range distinction—are not, and it is also neutral in the se that its validity does not depend upon prior acceptance of a theory ab the nature of cyclical movements nor upon some grasp (even if only intuit of the general dynamic characteristics of the economy to which it relates is the case with long-range investment). The composition of investment be studied within this framework with respect both to long- and to sh period movements, and the study of changes in the relative importance of suggested subdivisions could prove helpful in explaining changes in the ove level of investment.

At the same time, it must be recognised that the neutral character of classification is a drawback as well as an asset. For it is only within an un stood economic framework that any classification of investment decisions be useful, and it may well be that the most suggestive classifications c with them some assumptions or implications about the nature of the ec mic world to which they relate. The difficulty is to make entrepreneu decisions understandable without becoming involved in a far-reaching cussion of social and institutional circumstances. There exists one lin disaggregative analysis, however, which, although leaving a great deal accounted for, does both imply and to a small extent explain the operatio

[1] From the standpoint here adopted, it does not matter whether the addition made to cap prove profitable or unprofitable. Viewed *ex-post*, some of the investment may be seen to been undertaken because of a miscalculation of the relation between existing capacity and demand.

certain not unlikely economic forces, while at the same time lending itself to at least a limited theoretical development. This line of analysis is set out in the next section.

III

It is sometimes argued that the accumulation of capital must cause a fall in the rate of return on capital, and hence on the rate of growth of the capital stock. Something like this was argued by Marshall, who was careful, however, to restrict his argument to the secular long-period; and this may be very long indeed. For the important fact is that some forms of capital creation stimulate rather than depress further capital creation. If it were true that all innovations are capital saving,[1] and if an appropriate assumption were then made about the elasticities of demand, the argument that accumulation exercises a depressive effect on the rate of growth of capital would hold good without qualification. But not all innovations are capital saving. Some innovations are both labour and capital saving, and it would seem that as a rule they have been labour saving. This does not of itself determine the effect on the aggregate demand for factors, and it ignores the fact that many innovations introduce completely (or as near completely as can be) new products. But it suggests that realistic assumptions about the nature of innovations and about the relevant elasticities of demand would greatly weaken the argument for a decline in the rate of return on capital. Above all, attention is thus focused on the vital role of new product innovation. Investment for this purpose may well give rise to a chain of further investments whereby the initial investment is sustained, elaborated and supplemented. A classic case is the introduction of the motor car. Investment in plant to build cars gave rise to consequential investment in rubber plantations, steel presses, oil refineries, road-making equipment, petrol stations and so on. We can thus form another distinction: that between what can be called initiatory and complementary investment.[2]

This distinction does not come within the family of those already discussed, because it relates in no way to the nature of the decision to undertake investment but solely to how the investment, once it is undertaken, is connected, in terms of supply and demand, with the rest of the economy. It is not, moreover, a clear-cut distinction. Investment in A is the cause of investment in B, but investment in B, in its turn, is the cause of investment in C and so on. Investment in B is therefore both initiatory and complementary. Nevertheless, the flow of activity can more reasonably be interrupted at some points than at others; not all forms of investment require to an equal extent the co-operation of investment in other trades. A more serious difficulty is that the sequence may be upset, and investment in C be

[1] A capital-saving innovation is here taken to mean one which reduces capital input per unit of output; a labour-saving innovation one which reduces labour input per unit of output.

[2] This distinction is not new to economic analysis. It can be found in the work of both Wicksell and Robertson.

undertaken, justifiably, *in anticipation* of investment in the two logically preceding categories. The logical and the temporal sequence may not be the same. Investment in power supply or in the provision of raw materials, for example, may be not a response to demand, but an anticipation of demand, an anticipation which helps to create the anticipated demand. Certainly it is true that some forms of investment are peculiarly initiatory in their operation. They set the economic scene for further investment. Much of this initiatory investment is likely to be cost-reducing in character—transport improvement is the obvious case—rendering it, in Marshall's words, " worth while to do a great many things which it was not worth while to do before." [1]

Is this initiatory investment the same kind of activity as Robertson's investment related to " vague estimates of the future progress of whole areas," [2] and is it the same as that investment which, in Harrod's analysis, is motivated by faith in the long-period growing power of the economy? Not necessarily. The two forms—let us call them initiatory investment and long-period-growth investment—are distinct, especially in motivation. If a piece of initiatory investment opens up fresh investment opportunities in other spheres, and does not merely encourage (or compel) investment in industries selling their products to the initiating industry, then it resembles long-period-growth investment; the more extensive the opportunities opened up, the greater the resemblance. But for initiatory investment to be undertaken, the entrepreneur requires only to be convinced that the product will sell. He need not be aware of the initiatory character of his investment, and its power to give rise to complementary investment and hence, perhaps, to economic growth is of no immediate importance to him. Long-period-growth investment, on the other hand, is undertaken chiefly on the strength of the entrepreneur's assessment of future developments external to his own business. It is rarely, if ever, undertaken on a small scale, and the financial return to which it looks is usually of a temporally remote character. An example can make the distinction clear. An outstanding instance of long-period-growth investment is railroad construction in the United States in the nineteenth century. This was usually a large-scale undertaking, carried out with consciousness of the need for a more developed economy than already existed if the lines were to pay. Investment of this sort generally included extensive efforts to bring about the required economic development. The obvious example of initiatory investment is the automobile. Here, Ford and his contemporaries could begin in a small way, and they depended for large-scale success (which they did not *have* to envisage) on the existence of a latent demand for cheap automobiles, *not* on extensive future growth of the economy as a whole. In both cases entrepreneurs did a great deal to create their own demand, although in the first case this is true chiefly in a " physical " and in the second case chiefly in a " psychological " sense. But the significant point is that initiatory investment may, but need not, result in generalised economic expansion; long-period-growth investment, on the

[1] Evidence before the Gold and Silver Commission, Q.9831.

[2] Robertson, *loc. cit.*

other hand, must have an initiatory character if it is to prove profitable to those undertaking it.

IV

It has already been emphasised that it is only within an understood economic framework that any classification of investment decisions can be useful. This is markedly true with respect to initiatory investment and to long-period-growth investment; for while we may believe that there are acts of investment which fit into these categories and into no others, we cannot understand these acts of investment unless we also understand a good deal of the economic setting, including the mentalities of entrepreneurs, in which they are possible. Unfortunately, little that is significant can be said on general grounds about this setting, although notable attempts have been made to do so, especially in terms of population growth [1] and crop variations.[2] Discussion of these matters leads away from theoretical analysis to the whole problem of the socio-economic milieu in which investment decisions are taken. This is a topic of the highest importance. It has recently been touched upon by several writers,[3] and no one not a slave to *a priori* argument can doubt that the volume of investment is likely to be significantly influenced by other factors besides those susceptible of economic measurement and straightforward definition. It may well be true, for example, that the evidently rapid accumulation of capital in several countries in the 1850s and 1860s and early 1870s was the result of exceptional entrepreneurial optimism, enterprise and boldness, possibly associated with the dominant Liberal ideas of the period, one characteristic of which was faith in a kind of automatic and accelerating progress.[4] This feeling may have been decisive in some instances. But, of course, it remains true that entrepreneurs set their targets high when notable successes have been achieved in the recent past—successes which may well be the consequence of a fortunate conjuncture of circumstances strictly economic.

The nature of these successes and the way in which they may be translated into further business enterprise is a problem which requires discussion in concrete and institutional and not merely in abstract terms. It is for this reason that long-period-growth investment cannot be discussed briefly, or be made to fit conveniently into a theoretical scheme. Despite Mr. Harrod's efforts, it has remained outside the theoretical pale. The idea of initiatory investment, perhaps for similar reasons, has never attracted very much attention. Nevertheless, the study of acts of investment possessing a strong

[1] J. M. Keynes, "Some Economic Consequences of a Declining Population," *The Eugenics Review*, Vol. 39, No. 1.

[2] D. H. Robertson, *op. cit.*, Chapters V, VI and VII. It must be added that Sir Dennis Robertson's discussion is to a large degree factual as well as theoretical.

[3] For example, W. Fellner, *Monetary Policies and Full Employment*, Chapter III, and E. H. Phelps Brown and P. E. Hart, "The Share of Wages in National Income," THE ECONOMIC JOURNAL, June 1952.

[4] For a discussion of the origins, development and ultimate pervasiveness of this idea, see Morris Ginsberg, *The Idea of Progress*, *passim*.

initiatory character may prove to be the key to an understanding of the processes of economic growth.

V

It is not the purpose of this article to press the claims of any one method of disaggregating total investment. Two internally consistent methods have been suggested, one tidy, the other not so tidy. The Robertson–Harrod notion of long-period-growth investment, which has been in danger of being lost sight of in discussion of the induced-autonomous distinction, has also been reviewed. The essential point is that total investment should not be divided into pairs of categories which are inconsistent with one another; into induced investment, for example, which is a vaguely defined market-relationship category, and investment having a long earning life, which is a temporal category. Internal consistency is essential for any classificatory system, and in its absence there is always the risk that classification will increase and not reduce confusion. But completeness and absence of overlapping are other matters, and perhaps it is true that along the most suggestive lines, hard-and-fast distinctions are not to be found.

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GROWTH VERSUS CHOICE [1]

1. Political Introduction

Economic growth is beginning to reoccupy a central position in economics —in theory though not yet in practice—that it has not had since Adam Smith. This re-instatement is very right, since growth is obviously the "best" thing that can happen in economics—better than Free Trade or the attainment of the optimum allocation of resources between competing ends or even full employment. This can be very simply shown: the prime end of economic man is material plenty, he wants to have as much of everything as possible. But in order that this state of affairs should be achieved the economy must grow, *i.e.*, production per head must be increased. Growth is then, by definition, the *sine qua non* for the attainment of the supreme end, and therefore itself supreme. It is, and should be, a cuckoo in the nest of economic topics. This article will survey its relation to one other topic only: that of choice or scarcity economics.

We must inquire first as to the optimum rate of growth. At the present time, in the cold war, the purposes of propaganda, foreign policy and military strategy require that the rate of economic growth in NATO countries should not fall below that in the Communist countries: say 5% per annum in the real net national income. Actually Soviet growth is at 6% per annum,[2] but doubtless Chinese is slower than that, and it would suffice to double the $2\frac{1}{2}\%$ characteristic of a healthy average non-Communist economy. Are such hardships really necessary, it may be asked? Is not our present economic superiority enough? Out of our superfluity we are to-day in fact spending more than the Communists on re-armament, and investing much more than they in the neutralist backward areas. But although we can beat the Communists at that to-day, they are growing twice as fast as we and will be able to beat us to-morrow. The cold war will last a very long time. Only by outgrowing the enemy can we keep on winning it. Nor does it suffice that backward areas only should achieve such rates of growth. For so long as they remain free they can only grow by importing capital, and the

[1] Parts of this article were read as a paper to the British Association in September 1954. I am indebted for criticisms and corrections to Miss P. Ady and Messrs. N. H. Leyland and G. B. Richardson.

[2] The pre-war rate (1928–37). Cf. Grossman in *Soviet Economic Growth* (ed. A. Bergson), pp. 5–12. In 1948–50 the rate of growth was much greater: Jasny, *Social Research*, Spring 1954, pp. 37–8. The current United States rate (1948/9 to 1952/53) is a mere 3% per annum. The British rate is about 2%. All these figures are, of course, lower if taken per head: by 1% in Britain, 1·5% in the U.S.S.R. and the United States. Such a comparison, relating to economies in entirely different states of maturity, is not, of course, to be taken as ranging them in any order of merit. For that purpose it would be necessary so far as possible to compare the three economic systems at the same stage of maturity. This I have done very briefly in *Foreign Affairs* (U.S.A.), July 1953. In fact, the same order of merit emerges. In its youth the Soviet economy has grown faster than any other young economy recorded; must we not suppose, then, the same of its middle age?

capital required is so enormous that the advanced countries cannot provide it without themselves growing, especially as they must be able *easily* to provide it, in the face of Communist competition to do so. Moreover, to argue only in terms of backward-area growth is to forget the need for superiority in armaments.

2. Indefinite Growth

So much for politics. On pure welfare grounds, however, the question is much more complicated, and we shall not discuss it here, except to stress that the *maximisation* of growth would be very unpleasant indeed for the generation then alive. The ideal rate is less than that,[1] though there is little reason on the demand side to suppose that growth should begin to fall off in any foreseeable future. That is to say, we need not here consider the possibility of an "exhaustion of consumption opportunities," of a near approach to what the Communists call full Communism. This is when productivity is so great that all consumer needs can be satisfied, even if not clothed in effective demand. Leisure increases to almost intolerable proportions, money falls out of use, and we all go and help ourselves in the shops. Choice and scarcity cease to be a problem, and economics to be a worthwhile study. Such a state of affairs, if possible at all, is obviously very far off indeed. We deal here with the intervening period.

In dismissing this interesting problem as beyond our purview, and in insisting that mature capitalist economies can and must grow as fast as immature Communist ones, I imply that on the supply side economic growth curves are not S-shaped but exponential or at any rate linear. Population growth curves may—and do—have almost any shape. Growth should, however, be defined for most purposes as growth in productivity. This in turn depends, so long as there is unemployment of any sort, on capital widening (which increases production per head, of course, but not per worker); and on technical progress (the lowering of the real cost of output), whether or not there is unemployment. Now so long as mere capital widening can take up unemployed or under-employed workers—for instance the flow of Soviet peasants into an ill-organised and inefficient industry during the first Five Year Plan—or so long as there remains great technical leeway to make up, growth can be very rapid indeed. These initial advantages of immaturity exhausted, the rate falls, as it now depends solely on new technical progress. But the fall occurs once for all, and there is no reason at all why the new moderate rate of growth should further taper off. This is not only evident from the actual history of growth in mature countries (neglecting periods of war and slump), but also from the nature of technical progress. For in so far as "inventions" or "innovations" can be made into statistically comparable units, research shows that their growth curve is exponential.[2] Whether this will always be so, whether the sum of eco-

[1] Cf. F. P. Ramsey, Economic Journal, 1928.

[2] Ogburn and Nimkoff, *Handbook of Sociology*, p. 525. Compare Ffrangcon Roberts, *The Cost of Health*, pp. 55–6.

nomically applicable scientific knowledge hitherto undiscovered is finite, is another question. Enough that there is no sign whatsoever of this.[1] *A priori*, it is difficult to see why an exponential curve in the acquisition of cost-reducing or product-innovating knowledge should lead to an S-shaped curve in the rise of productivity. Yet in a mature economy productivity depends in the long run almost solely on knowledge.

3. Growth and Investment

Another proposition must also be laid down at the start: *the prime cause of growth of output per head is investment.* This is not obvious and may not be, as it so often is, simply assumed. Clearly of course capital widening—the mere accumulation [2] of durable assets similar to those already in existence—is by definition an increase in the quantity of resources available for production; it is like the discovery of new land. Its usefulness is severely limited, as we have seen, by the quantity of the labour force—not, of course, by that of the total consuming population. There *is no use*—quite the reverse, indeed—in capital widening if there are no un- or under-employed to man the new machines. So when the labour force is fully used, growth of output per head is very largely due to the discovery *and application* of new techniques, new minerals, new plants, etc.

Now some writers [3] set technical progress over against, not only capital widening in particular, but investment in general, as a superior cause of growth. Superior maybe, but not separate. For investment is the ugly but indispensable handmaiden of nearly all technical progress. First both the discovery and the application of new techniques and materials require a great deal of money, *i.e.*, of savings. In other words, though quite different from the multiplication, improvement or renewal of capital assets, research is investment.[4] And as research goes on we find that all the easiest discoveries have already been made. Though the remaining field of knowledge is surely infinite, and for all we know that of economically useful knowledge too (see above), new discoveries become more costly. More and more equipment, and ever less intelligent assistants with ever longer and more specialised training, are drawn in.

[1] I am also unable to say *a priori* whether finiteness is more probable than infinity here. It is difficult to see how to begin to reason on such a question.

[2] How much more revealing, incidentally, is the Communist phrase, "capital accumulation," than the Keynesian "investment"—which is to be sure, more general. "Investment" connotes getting rid of surplus savings, keeping up full employment somehow or other. It leads one to think of the allocation of income, and of the short run generally. It deflects one's attention from the ensuing increase in productivity and/or production. "Capital accumulation" has none of these associations. It simply connotes growth.

[3] Principally Professor Cairncross, in his important "The Place of Capital in Economic Progress" (*International Social Science Bulletin*, UNESCO, 2/1954; this number also contains an admirable bibliography on economic growth).

[4] In 1947–52 in the United States 0·8% of the G.N.P. was spent on research, or from 6 to 8% of business expenditure on new plant (National Science Foundation, *Federal Funds for Research and Development 1952* (Washington, 1953)).

Technical education is a too often forgotten corollary of research; forgotten, no doubt, in part because it is foolishly entered as consumption in the national income accounts. Whatever we may think of elementary education and of arts degrees, which benefit citizenship and culture quite as much as productivity, technical education is surely a kind of investment. The fragmentation of knowledge, as we have seen, demands ever longer courses from more and more, and therefore less intelligent, students.[1] Research and technical education, then, will surely claim an ever larger share of the national income.[2]

Thirdly, there is always an immense lag in the application of new techniques between the best and the worst firms. This is not to be cured by a once for all spurt in investment, since a backward firm changes its technique not only later but also less often than a progressive one. The more technical progress there is, the more obsolescence there is. This, too, increases the need for capital.

Even the mere rationalisation of an industry or the re-deployment of labour within a factory requires some saving to finance it. There are, perhaps, only two serious causes of economic growth that are free of investment costs. The first is the supposed capital-saving trend of modern, as opposed to Victorian, technical progress. Taking years of full employment only, the ratio of national capital to income in the United States has fallen by about 40% since the all-time high of 1911–14.[3] But we have no good ground for extrapolating the course of this ratio in any particular direction. Moreover, the fall is exaggerated by, and may even wholly result from, the omission of consumers' durables from the national capital. Finally, comparable figures for Britain show no such trend.[4]

The second possible cause of growth without capital costs is an increase in the worker's will to work or the adoption by the manager of the American attitude to costs, innovation and output, both so constantly recommended by the Anglo-American productivity teams. But this is clearly the least hopeful of all solutions to the whole problem, since it cannot be applied administratively at all, but is purely a matter of sociology and propaganda—the cost of which would also be an investment! It is fair to claim that investment solutions are quicker and easier. We must therefore increase the *absolute total* of investment, though not necessarily, perhaps, its proportion to the national income for very long.

Naturally all solutions must be applied together. A country that applies both the sociological and the investment solutions (U.S.S.R.) will outgrow

[1] Cf. Ffrangcon Roberts, *op. cit.*, pp. 71–4.

[2] Neglecting, as we must for lack of adequate research, questions of quality, we must note that Britain lags behind many advanced countries in the number of her technical students. And these in turn, as is so depressingly usual, lag behind the Communist countries (Benjamin Fine, *New York Times*, November 7, 1954).

[3] Domar, source as for Cairncross.

[4] Phelps-Brown, Economic Journal, 1953. Mr. Redfern's figures for Britain do show a slight downward trend, but they, too, omit technical education and consumers' durables (*Economist*, January, 22, 1955).

one that applies only the sociological (United States), just as that country will outgrow us, who apply neither.[1]

We shall not broach here the question of the direction of investment: should it be, for instance, in industry, where owing to the low capital coefficient a little investment leads to much growth, or in public utilities, where the capital coefficient is high and growth correspondingly slow? Or, more significant, should it be in capital goods making consumer goods (*e.g.*, looms) or in capital goods making capital goods (*e.g.*, machine tools)? The latter naturally leads to far higher rates of growth; indeed, without it no sustained growth is possible at all. We use here the word "investment" as a catch-all, neglecting this extremely important distinction. It is no part of my argument, then, that investment is the sole determinant of growth or that its rate stands in any definite relationship to the rate of growth. Enough merely that, if defined to include expenditure on the acquisition of knowledge, it is a—indeed the only—necessary condition of growth: that it is also sometimes a sufficient condition, and that in any case the more investment there is, the more growth there is.

4. Scarcity Economics and Hesitancy

In this and the following sections we discuss the effect of growth-consciousness upon scarcity economics. Too delicate a comprehension of "scarcity" problems, a determination never to violate Professor Lerner's welfare equations for however short a period or in however unimportant a connection, slows up the rate of growth. For it leads to hesitation, whether on the part of the government or of the individual entrepreneur, before investing, even sometimes before beginning current production. It creates an atmosphere hostile to rationalisation, standardisation and mass production, and thus interferes with the technical efficiency of whatever is, despite all hesitation, produced.

This applies more especially to underdeveloped countries. Thus Professor Nurkse has emphasised the need for balanced growth:[2]

> "the difficulty caused by the small size of the market relates to individual investment incentives in any single line of production taken by itself. At least in principle, the difficulty vanishes in the case of a more or less synchronised application of capital to a wide range of different industries. Here is an escape from the deadlock; here the result is an overall enlargement of the market. . . . Experience has certainly shown that large-scale public investment plans, in their practical execution if not in their conception, often have a tendency to develop a marked lack of balance."

[1] *Saving* (defined to cover productive net investment, armaments and the personal consumption of the armed forces, but not depreciation) was the following percentages of net national income at factor cost: U.K., 18% in 1948, 21% in 1951; U.S.A. 20% in 1950; U.S.S.R., 31% in 1937, 41% in 1948. Cf. A. Bergson and H. Heymann, *Soviet National Income and Product*, 1940-1948, pp. 24–5, 70–1. The Soviet figures are exceedingly speculative and controversial.

[2] *Problems of Capital Formation in Underdeveloped Countries*, pp. 11–17.

True, but balance means investing at the pace of the slowest: either of the slowest entrepreneur, which means a snail's pace, or of the slowest-spending government department, which is not quick enough. The balance problem is but a special case of the scarcity problem,[1] and we have here again the dichotomy: good resource allocation versus rapid growth. There can be too much worry about balance. Moderate inflation would tide over many of these temporary difficulties.

All this has been hinted at by Professor Kindleberger,[2] who complains that colonial developers tend to compare their client country with a fully developed one, and noting all the differences "subtract the former from the latter. The difference is a program." The desire for balanced development bogs them down in all sorts of pettifogging detail. It also bogs down the execution of the programme. The conclusion is clearly that Soviet development technique is more effective: choose a few "leading branches" and concentrate on them. The details and the secondary industries can catch up later. The fact that such a programme is unbalanced and violates "scarcity" rules matters less than its superior speed.

5. Scarcity Economics and the Measurement of Growth

All this is by no means to say that we must not consider "scarcity" when investing in new projects or undertaking technical research, for without *some* consideration of the due proportion between one article and another growth may not be growth at all. Thus in a starving community a 10% per annum rise in industrial production combined with a 1% fall in agricultural production—the two being of roughly equal value to start with—may truly be called on grounds of "scarcity" not growth at all but diminution. That is, the Laspeyres index of production, which weights industrial and agricultural products by the scarcity relationships of the initial year, is wholly misleading, and for welfare purposes only the Paasche index applies; and with a suitable choice of the present-year weights this index can easily be arranged to show a fall. This indeed is what might fairly be claimed on welfare grounds for the planned economy in Stalin's life-time, although on strategic grounds we have only too good a reason to know that Laspeyres' index, which gives a heavy weight to the increase in military production, is correct enough.

6. Growth and Consumer Sovereignty

"Scarcity," however, is not the same thing as consumer sovereignty. Wherever "the man in Whitehall (or the Kremlin) knows best" consumer sovereignty is, of course, in abeyance, although resources continue to be scarce *vis-à-vis* competing ends—the manifold, even when properly co-

[1] It is not, as presented by Professor Nurske, a matter of physical bottlenecks, which would be more serious (if there were no foreign exchange), but of markets, *i.e.*, of choice.

[2] *Review of Economics and Statistics*, November 1952, p. 391.

ordinated, ends of Whitehall. There is, of course, no reason why the man in Whitehall should not on occasion know best, and it is mere demagoguery to suggest the opposite. In particular, the voluntary decision of the consumer to save, without which there can under *laissez faire* be neither investment to promote economic growth nor personal security for the individual, is by any reasonable standards always too low in the modern world; except of course when decisions to invest are even lower, causing unemployment. But the talk should always be of under-investment, not over-saving. The latter phrase has the most harmful anti-growth connotations. The "expansionary way out," beloved of Keynesians, is not at all to save less but to invest more. Even when there is deflation, savings are still in an important sense too small: they are smaller than the volume of investment that there ought to be. Though this is not, of course, to deny that in such circumstances an attempt to save less would actually increase investment, up to the level of full employment.

To this irrationality must be added one which follows from competition among consumers, or among producers. This is that the technical specifications laid down by the unco-ordinated purchasers of final or intermediate goods, each thinking only of himself, usually pay too little attention to the economies of rationalisation and standardisation; while the producers, engaged in a struggle for goodwill under imperfect competition, may be aware of these economies but cannot individually enforce them. Here too, then, the man in Whitehall—or the promoter of the merger—knows best. Only by excluding this latter aspect of consumer sovereignty is it possible to satisfy the consumer to the fullest extent out of any given quantity of resources. Only, perhaps, by forced saving can resources be increased, to the consumer's still greater ultimate good. For it is consumer *satisfaction* not sovereignty that is the essence of welfare economics. The substitution of the word sovereignty for "satisfaction" is a piece of unconscious political bias. The sovereignty must in the above cases be violated in order to achieve the satisfaction.

Perfect competition, again, as every undergraduate knows, is the organisation of industry that best ensures consumer sovereignty. Hence many lyrical passages in the text-books, ending in an almost theological *O Altitudo*. And the accepted case against monopoly is that it restricts output below the competitive level. Now empirically this case is quite unproven since the Managerial Revolution. And even if it were proven it would be unimportant, since it would be only a violation of the welfare equations. The real criterion for judging the organisation of an industry is whether it promotes investment and technical progress: and the Managerial Revolution has clearly brought monopoly from the lowest place in this order of merit to the highest—which it shares, let us hasten to add, with any oligopoly of sufficiently large firms.

It is useless to protest that perfect competition is supposed to be the most efficient form. For in this context the word efficient takes on an entirely new and indeed bogus meaning: "responsive to changes in consumer

demand" (not necessarily to changes in long-run scarcity relationships—a monopoly might perceive these better). This has little to do with technical progress or with growth, nay even directly hinders them. Extreme responsiveness of this kind is a disadvantage, leading to low investment and low profitability, and therefore stifling technical research. Also it can hardly exist in conjunction with large scale, which is, of course, a condition of efficiency *proprement dit*. Efficiency—meaning low real cost—is the micro-economic duty of man; given that, growth follows, either spontaneously or through planning that uses up the resources set free. It is characteristic of our growth-blind economics that we blur this vital concept by making the word do duty in the field of "scarcity" too.

7. The Relative Importance of Growth and Choice

Growth conflicts, then, at certain points with consumers' sovereignty and even with "scarcity" itself.[1] It is quite wrong to throw either wholly overboard, however. The advantages of each must as far as possible be quantified, and a balance struck. Thus to correct an important and permanent misallocation of resources is in itself economic growth; for unwanted production is not production at all. The industry/agriculture case quoted above is a good instance. On the other hand, the violation of the welfare equations is not an absolute, unconditional crime; it depends how long and how great the violation is. On any common-sense view of interpersonal or inter-temporal utility comparisons a certain increase in growth is worth any amount of minor allocation errors. Rapid growth diminishes the harm done by violation not only of consumer sovereignty but also of rational allocation in general. There are two main reasons for this.

First there is the "hair brushes and nail brushes" argument. As I have said elsewhere

> "in the Soviet economy there are, as it were, always too few hair brushes and too many nail brushes in view of the resources available, while in a 'capitalist' economy this proportion is always more nearly right. But the production of both these articles is growing at about 10% per annum in the U.S.S.R. and at about 2% per annum in 'capitalist' countries. In the end the Soviet citizen will be supplied better even with hair brushes."[2]

The mere fact of growth then floats off even a *permanent* mis-allocation of resources.

But, secondly, the mis-allocation need not be permanent. "Scarcity" need not be violated always in the same direction. Those who object to planning, monopolies, cartels, imperfect competition, etc., on "scarcity" grounds, implicitly assume that these things always exert their malign

[1] This conflict is quite separate, be it noted, from the possibility that one day economic growth will have gone so far that resources will cease to be scarce at all. This is the question of "full Communism," dismissed as irrelevant in Section 2.

[2] Wiles, *Oxford Economic Papers*, October 1953, pp. 315–16.

influence on resource allocation in the same place in the economy; but if monopoly, planning, etc., crop up in different places as time passes—and they do do so—then in the long run the relative quantity of hair brushes and nail brushes will vary about the "scarcity" optimum. If stocks in the hands of the users are large relative to current purchases no great harm at all will be done by these fluctuations, and even if they are not, the right proportion must often be hit as the pendulum of planning, monopoly, etc., swings from one side to the other.

8. "Scarcity" and a Forced Investment Programme

These considerations are particularly important when we weigh the pros and cons of forced saving and forced investment. Both are, as we have seen, clearly inevitable if the actual rate of growth is to exceed the "natural," "warranted" or *laissez faire* rate of growth in the immediate future, whether in undeveloped areas proper or in mature backward areas like Great Britain. This is very far from saying, to repeat, that forced saving and forced investment are the only desideratum for such growth, but they do raise interesting "scarcity" problems that other expansionary measures do not. Suppose that the institutional solution least disruptive of our present political, social and economic structure is adopted in order to effect this programme of forced investment. Current production is sold on a free market, or at least on a market as free as that which we now have. Much greater funds than now are made available for investment by a large Budget surplus above the line. A central committee is set up which in any year must allocate the investment funds that private enterprise has not spontaneously taken up. In practice it will almost certainly do this "irrationally." Ideally, of course, this need not be so. But, in fact, what with human fallibility, the haste with which decisions must be taken, political influence and corruption, the direction of these investment resources will be irrational. Then within twelve months the errors that have been made will be sufficiently clear. In the first instance private enterprise will step in to enlarge the bottlenecks and correct the disproportions created by the planners' previous errors, and these latter will invest the new year's surplus funds in such a manner as to create bottlenecks and disproportions elsewhere. Making *different* errors every year, they will make no serious errors at all.[1]

Again, precisely because of economic growth, really serious over-investment in any particular branch of the economy is unlikely to occur. Provided that a project is technically feasible—that it is not a groundnuts scheme [2]—aggregate demend, growing through additional investment in

[1] The Soviet Five Year Plans have undoubtedly made serious and permanent "scarcity" errors. This is because the *pricing* system, as well as the *allocation* system, has been irrational. Had it not been for this, the very weak but still real influence of the Soviet consumer would have eventually corrected the investment programme. For the extent of this influence compare Wiles, *op. cit.*, pp. 314–15.

[2] This was a technical failure, not a failure to predict demand or an error in the estimation of "scarcity" relationships. It is assumed in the text that gross technical errors of this kind will not be made.

other directions than this, will after an interval float off a particular mistake and render it an *ex post facto* necessity.

Thirdly, even absolute waste—and of this there must be some—is merely a necessary by-product of the superior prosperity that the system brings. Conceive, that is, a project that will become useful neither when completed nor at a later date, but never, no matter how much growth there is. This might be either because it is a technical failure (a groundnuts scheme) or something simply not demanded. Now a fashion house must buy some clothes that turn out to be unsaleable. Champagne manufacturers must make some bottles which explode.[1] If they knew which clothes or which bottles they would, of course, be able to lower their costs. But they do not sit down and produce nothing at all because they do not know; they write off this loss as a cost of production. So the growing economy may write off the irremediable errors of its programme of forced investment as a cost of growth. Suppose a purely numerical example, entirely without empirical warrant: owing to the programme 30% of the national income is invested, instead of 15%, and wasted projects instead of being 2% of the old investment are 6% of the new. Then something like an extra $1\frac{1}{2}\%$ of the national income will be wasted every year. But the rate of growth rises, let us say, from 2 to 3% compound—we suppose rather sharply diminishing returns to the new investment; and already in two years the national income is greater than it would otherwise have been. Thereafter, of course, the excess becomes very great indeed, though consumption takes a good deal longer to catch up.[2]

Fourthly, it is not true that this sort of planning requires an impossibly long view of the future structure of demand. Such foresight, it is objected, is more than is vouchsafed to the wisest of us. Statistical exercises, whether governmental or private, in demand prediction are often simply bogus.[3] Now while this is perfectly true it does not affect the case for investment planning here put forward. The planner is not asked to estimate future demand for a longer period than the life of the particular capital asset he is at any moment considering. If it happens to be very durable he must, of course, just like a private entrepreneur, make a long-term estimate; if not, not. No new problem of forecasting has arisen. Indeed, one problem has fallen away, and actually *less*, not more, forecasting is required. For since

[1] F. H. Knight, *Risk, Uncertainty and Profit*, p. 213.

[2] Let P be the present and F_n the future national income as now expected. Then $P(1{\cdot}02)^n = F$, where n is any number of years. Under the new dispensation we start with $0{\cdot}98\,P$, owing to the wasted investment projects, and $0{\cdot}98\,P\,(1{\cdot}03)^n = F'$, the new terminal national income. Then $F' = F$ when $n = \dfrac{\log 0{\cdot}98}{\log 1{\cdot}02 - \log 1{\cdot}03}$. Consumption, as opposed to income, takes very much longer to recover. Thus it is not until the twenty-third year that it equals what it would have been in the same year under the old dispensation, and not until the eighth year that it regains the level obtaining when the change was introduced (always supposing we continue to invest 30% of the national income; naturally if we invest less after a while we can easily consume more than we should have been able to under the old dispensation). In the dreary length of these periods lies the explanation of much recent Soviet economic history.

[3] That they are indeed bogus is amply demonstrated by Professor Devons, in *Lloyds Bank Review*, July 1954, pp. 30–5.

the economy is growing more quickly than before, the likelihood of an absolute decline in any branch of production is smaller than before. Now when there is the possibility of an absolute decline, not only extensive investment (expanding capacity at present costs) but also intensive investment (reducing costs at present capacity) becomes a doubtful proposition. We must forecast demand to know if it will really be profitable. Only intra-marginal firms should make such expenditure, and it is a matter of prediction to know just how many—and which—*are* intra-marginal. All this problem is much reduced by greater growth, so that we may fairly claim that investment planning of the type proposed actually reduces the amount of crystal-gazing required.

The amount of misallocation can be exaggerated in yet another way. When investing we make an allocation not only of all the ordinary scarce resources but also of "capital," *i.e.*, of "waiting." A programme of forced investment need involve the misallocation of "waiting" only. For there is always at any moment an enormous number of profitable schemes that ought to be undertaken one day, "when the capital is available." There is no need to undertake unprofitable schemes: the more modest proposal suffices that all the profitable schemes be put in hand at once. Just as an investment cut, imposed by the Government, means merely that schemes are postponed, so an increase means merely that they are accelerated. The direction of investment is still determined by the market, or by direct welfare considerations: the amount only is increased over what would naturally have occurred.

There is a certain tendency for welfare economists, when contemplating the rate of interest, to say: "here is this list of possible schemes; the rate of interest tells us in which order, and, indeed whether, they should be undertaken." This is too static a view: there is no finite list of schemes, nor need there be any such thing as the exhaustion of capital opportunities. Investment causes growth. Therefore, *capital expenditure increases the number of capital opportunities*, making some schemes more desirable than before, others desirable for the first time, and some of both classes technically possible for the first time.

Extra funds for investment should then be fearlessly extracted from the consumer and splashed about. "Scarcity" will not suffer greatly—as Stalin said so very rightly:

> "Some comrades conclude from this that the law of the planned development of the national economy, the planning of the national economy, destroys the principle of profitability. This is quite wrong and quite the contrary is true. If one considers profitability not from the point of view of individual enterprises or branches of production, and not within the span of one year, but from the point of view of the whole national economy and within the span of, say, ten to fifteen years—which would be the only correct approach—then the temporary and unstable profitability of individual enterprises or branches of production cannot even bear comparison with that higher, stable form of profitability, which the operation of the law of the planned development of the national economy and the planning of the national economy give us, saving us from periodic economic crises which destroy the national economy and inflict colossal material damage on society, and securing for us the uninterrupted growth of the national economy with its high tempos."[1]

9. Growth and the Climate of Economic Thought

"Plenty, not scarcity, is the essence of economics." There is a sense in which this phrase is the cheapest of unscholarly rabble-rousing. But it contains a great truth. For while an emphasis on choice and scarcity is logically compatible with due insistence on growth, it is not psychologically so. Its implications are all wrong, and economists who are interested in choice are not in fact interested in growth, as Mr. Colin Clark taught us long ago in his brusque but salutary dismissal of the classical economics.[2] Mr. Clark is, of course, as he would be the first to admit, theoretically unsound, but how much healthier than the spectacle of Professor Robbins wringing his hands:

> "The time at our disposal is limited. There are only twenty-four hours in the day. We have to choose between the different uses to which they may be put. The services which others put at our disposal are limited. The material means of achieving ends are limited. We have been turned out of Paradise."[3]

For Communists paradise lies ahead, and we may fairly reply with Karl Marx:

"The philosophers have only *interpreted* the world, in various ways; the point, however, is to *change* it."[4] This means, of course, that economists should make value judgments. But Professor Robbins is most explicitly in favour of that activity, denying to it only the name of economics. His error is merely one of misplaced emphasis, and this article has no other object than to shift that emphasis. It contains, so far as its writer is aware, no concrete innovation. "Scarcity," then, is an effective reply to the redistributive, democratic socialist of the West, whose one idea is to squeeze a quart out of a pint pot. But the totalitarian, growth-conscious socialist of the East has a shattering rejoinder: "Why aren't you making a quart pot, like me?" Over and above all our micro-choices there hangs, as the logicians would say, a meta-choice. The satisfaction of the welfare equations is itself a competing end. We must choose, to some extent, between choice and growth.

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[1] "Economic Problems of Communism," *Bol'shevik*, 18/1952.

[2] *Conditions of Economic Progress*, preface to the first edition. The withdrawal of these strictures in the second edition seems a shade premature: that funds are now available for the study of the national income brings us only a very short way towards an economics of plenty.

[3] *The Nature and Significance of Economic Science*, 2nd Ed. p. 15.

[4] *Theses on Feuerbach.*

MONETARY DISEQUILIBRIA AND THE DYNAMICS OF INFLATION

I. Introduction

The word " inflation " used in the pathological sense denotes either a period of general price increase or the existence of conditions which would produce such a price rise in the absence of external factors such as direct controls. The former is usually called " open inflation " to distinguish it from the latter, " repressed inflation." The degree of pathology cannot be measured by the mere existence of inflation or inflationary pressure or by its extent. For example, comparison of price increases with the accompanying increases in output and employment would help to discriminate among various degrees of inflation. Evaluation for policy purposes would require an appeal to some welfare function. The present paper will not deal with this question.

Open inflation is essentially a dynamic process taking place over time. Hence, analysis of the inflationary process is most appropriately carried out in dynamic terms. This implies specification of the inter-temporal relationships of the various endogenous variables and specification of the initial (disequilibrium) conditions. Writers dealing with the problem of inflation have generally preferred to turn their attention towards the initial conditions and to define in static terms disequilibria which may be characterised as inflationary gaps. Essentially, these conditions have usually turned out to be a net excess supply of money. The intuitive basis for such reasoning is not difficult to discover. If money is in excess supply in the economy as a whole, then, if the price mechanism is free to function, a decline in " the value of money " or a " rise in prices " will follow. But the justification for this view in terms of dynamic process analysis cannot be found in the literature.

It is true that under normal conditions (*i.e.*, negatively sloped demand and positively sloped supply schedules) the existence of excess supply, in terms of money, of any good implies that actual price is above the equilibrium price. Under plausible dynamic assumptions, then, price will decline and the good will fall in value. What is meant by value in this context is relatively clear because value is ascertained by a direct comparison with money. But what is the value of money, and what constitutes a change in its value? This is of course, an old question, though it is unanswered (and perhaps unanswerable) in any theoretically satisfactory way. Nevertheless, pragmatic answers have been made in terms of price indices, and these answers have generally not been unsatisfactory. However, with few exceptions, the problem of relating our concepts of changes in the value of money to the initial conditions

which will produce them has been left untouched. The present paper is an exploration of this and related questions.[1]

II. Dynamic Structure of the Monetary Economy

If we postulate an economic system in which each individual independently maximises a utility function which depends upon the size and composition of his stock of assets, we can deduce the excess demand equations of each individual for each good as functions of current prices, of his price expectations and his initial asset position.[2] Summing over all individuals, we can obtain market excess-demand equations for all of the goods as functions of the same variables.

The number of variables representing expected prices in such a system would be very large, and a theory using all of them would almost necessarily be devoid of content. However, a few simplifying assumptions will enable us to cut down the number and to gain some insight into the relationship between expectations and stability. First of all, we shall assume that for any price, the expectations of all individuals can be adequately represented by those of a " representative individual." This device can be justified by the fact that whatever amount the market demands, there is some price expectation which, if held by everybody, would result in the same demand. Secondly, we shall rule out " cross effects " of price expectations on excess demand, *i.e.*, we shall assume that only expected prices for the ith good significantly affect excess demand for that good. Though not strictly realistic, this assumption is a defensible first approximation to reality.

We still have expected prices for each good for all future time periods. Though the practice is frequent, it is difficult to justify the assumption that expectations for all future time periods can be represented by one " expected price." For a given expectation about prices one month hence, demand can vary a great deal according to what expectations are for subsequent months. Reactions to price changes which are thought to be one way movements will differ greatly from reactions to changes which are expected to be reversed. This difficulty can be partially avoided by the introduction of the distinction between induced and autonomous expectations of price changes. The difference between any expected price and its corresponding current price can be thought of as divisible into two components. One part is, from the point of view of a short-run dynamic model, autonomous. It is the result of knowledge about price histories and about causal factors relating to particular prices. A new invention may set up the expectation that a certain price will fall when the invention is applied to production. This sort of expectation can be taken as exogenous. On the

[1] This paper has grown out of a thesis written at Nuffield College, Oxford, under Professor D. G. Champernowne. It has also greatly benefited from criticisms and suggestions made by Professor Robert Solow of M.I.T. I am very grateful to both for their generous and valuable assistance.

[2] See, for example, Jacob Marschak, " The Rationale of the Demand for Money and of ' Money Illusion,' " *Metroeconomica*, Vol. 2, August 1950, pp. 71–100, and *Cowles Commission Paper*, N.S. No. 46.

other hand, part of the expected change in prices is induced by actual changes in current prices. These expectations are definitely endogenous to the dynamic system, and dynamic stability can be affected by them. The induced component of expected price changes for all future periods is much more likely to have the same sign than is the autonomous part. In the analysis that follows we shall assume that induced expectations can be represented by one " expected price " for each good and that autonomous expected price changes are small.

On the basis of the foregoing assumptions, we can deduce excess demand equations of the form

$$X_i = X_i(P_1, \ldots, P_n, P'_i, A) \qquad (i = 1, \ldots, n) \tag{2.1}$$

for the n goods, where P' indicates the expected price and A is a shorthand notation for the initial asset stock and its distribution. Taking A as a parameter, we have n equations in the $3n$ variables X_i, P_i and P'_i.[1] In equilibrium, demand must equal supply in each market, and expected prices must equal current prices, *i.e.*,

$$X_i = 0 \tag{2.2}$$

$$P'_i = P_i \tag{2.3}$$

The $3n$ equations (2.1), (2.2) and (2.3) are sufficient to determine all of the variables. From a dynamic point of view, the conditions (2.3) are necessary; if expected prices do not equal present prices, the latter cannot be in equilibrium. For if the expectations that prices will change are correct, actual prices will change whence they were not in equilibrium. If the expectations are incorrect, then current behaviour is based upon false expectations, and hence it will be modified as the expectations are proved wrong.

Analysis of the motion of the system requires assumptions about its dynamic behaviour. A variety of fairly simple price-reaction equations and induced expectation functions is possible. The question of choice among them ought to be empirical. However, with no direct evidence available, we are forced to some arbitrariness and can only fall back on intuitive plausibility as our guide. The conclusions of this paper are largely independent of the particular form of the price-reaction equations. Several alternative hypotheses will be discussed. Let us assume that all prices are flexible and that their behaviour is governed by equations of the form [2]

$$\dot{P}_i = K_i X_i \tag{2.4}$$

where the K_i are positive constants. These equations state that the speed of price increase in any market is directly proportional to the size of excess

[1] As Marschak has shown, *op. cit.*, these equations will be non-homogeneous in the actual and expected absolute prices. Non-homogeneity is caused by the effects of price changes on cash balances and other fixed-priced assets and by general hysteresis.

[2] The notation $\dot{P}_i$ will be used to indicate the first derivative of the variable P_i with respect to time.

demand.[1] Further, let us assume that induced changes in expected prices are governed by the relationship

$$P'_i = P_i + \rho_i \dot{P}_i \tag{2.5}$$

This is a simple variant of Metzler's " coefficient of expectations." [2] It is clearly compatible with the static equilibrium conditions (2.3), for when $X_i = 0$, $\dot{P}_i = 0$ and hence $P'_i = P_i$. When $\rho_i = 0$, expectations are " static," *i.e.*, induced expectations are zero and existing prices are expected to persist. When $\rho_i > 0$, expectations are "extrapolative," *i.e.*, expected prices are an extrapolation of the movement of actual prices. When $\rho_i < 0$, expectations might be described as " conservative " in that expected prices lag behind current prices and movements in current prices are expected to be reversed.

The dynamic stability of general equilibrium has been analysed by Samuelson, Lange, Metzler and others, but their analysis has been confined to a model which does not include expectational effects.[3] In the most general case the stability conditions are mathematically quite complicated and do not lend themselves to economic interpretation. However, in some important cases it is possible to analyse the effects of extrapolative expectations on the stability of a system that would be dynamically stable with static expectations.

Consider first the case of an isolated market for one good and let its behaviour be governed by equations of the form

$$X = X(P, P') \tag{2.6}$$

and (2.4) and (2.5), with equilibrium conditions as before and with P^0 the equilibrium price. Expanding (2.6) in the neighbourhood of equilibrium and retaining only linear terms, by Taylor's theorem, we obtain

$$\dot{P} = K[a(P - P^0) + b(P' - P^0)] \tag{2.7}$$

where $a = \dfrac{\partial X}{\partial P}$ and $b = \dfrac{\partial X}{\partial P'}$, both evaluated at the point P^0. For a good that is not inferior, $a < 0$ and normally $b > 0$. Substituting in (2.5) and letting P represent deviations from equilibrium, we obtain

$$\dot{P} = \frac{K(a + b)}{1 - Kb\rho} P \tag{2.8}$$

with solution

$$P(t) = P(0)e^{\frac{K(a+b)}{1-Kb\rho}t} \tag{2.9}$$

[1] Price reaction equations of this form have been used by Samuelson and Lange. See P. A. Samuelson, " The Stability of Equilibrium, Comparative Statics and Dynamics," *Econometrica*, Vol. 9, No. 2, April 1941, p. 102, and Oscar Lange, " The Stability of Economic Equilibrium," Appendix to *Price Flexibility and Employment*, Cowles Commission Monograph No. 8 (Principia Press, Bloomington, Indiana, 1944), p. 94.

[2] L. A. Metzler, "The Nature and Stability of Inventory Cycles," *Review of Economic Statistics*, August 1941, p. 119.

[3] See Samuelson and Lange, *op. cit.*, also Samuelson, *Foundations of Economic Analysis* (Cambridge, Mass., 1947), Part II, and Metzler, " Stability of Multiple Markets: The Hicks Conditions," *Econometrica*, Vol. XIII, No. 4, October 1945, pp. 277–92.

If expectations are static, *i.e.*, if $\rho = 0$, stability requires that $K(a + b) < 0$. If the price is normally flexible, $K > 0$. If the good in question is not an inferior good, it is safe to assume that $(a + b) < 0$, and hence the market is stable. The latter inequality merely states that in the neighbourhood of equilibrium the net effect of a price increase that is expected to persist is to lower excess demand. If the conditions for stability with $\rho = 0$ are fulfilled, what requirements can we specify for ρ in order that expectations will not destabilise the market? A glance at (2.9) will indicate that the necessary and sufficient condition for stability will be

$$\frac{1}{K} > b\rho \tag{2.10}$$

Essentially, this inequality requires that the coefficient of price insensitivity to excess demand, *i.e.*, the reciprocal of the price reaction coefficient, be greater than the destabilising force of the " extrapolative " expectations. It is clear that $\rho \leq 0$ is not a necessary condition for stabillty except in the limiting case of instantaneous adjustment.[1]

This result can be generalised to the multiple market system (2.1). Linearising and letting the P_i and P'_i represent deviations from equlibrium as before, and substituting (2.5) for the expected prices, we obtain the system of equations

$$\dot{P}_i = K_i \sum_j a_{ij} P_j + K_i b_i P_i + K_i b_i \rho_i \dot{P}_i \qquad (i = 1, \ldots, n) \tag{2.11}$$

where $a_{ij} = \frac{\partial X_i}{\partial P_j}$ and $b_i = \frac{\partial X_i}{\partial P'_i}$, both evaluated at the point of equilibrium. If we set the ρ_i equal to zero, the roots of the system with static expectations will be the characteristic roots of the matrix

$$M = \begin{vmatrix} K_1(a_{11} + b_1) & K_1 a_{12} & \ldots & K_1 a_{1n} \\ K_2 a_{21} & K_2(a_{11} + b_2) & & K_2 a_{2n} \\ \cdot & \cdot & & \\ \cdot & \cdot & & \\ \cdot & \cdot & & \\ K_n a_{n1} & K_n a_{n2} & \ldots & K_n(a_{nn} + b_n) \end{vmatrix}$$

According to a theorem proved by Metzler,[2] if all of the goods in the system are gross substitutes, necessary and sufficient conditions for stability

[1] The comparative dynamical properties of this result seem pathological. As ρ approaches its critical value from the stable side, the root of the system goes to $-\infty$. As ρ crosses its critical value, the root shifts to $+\infty$. This is the result of the unreal assumption of instantaneous reactions made in equations (2.4) and (2.5). A better approximation to the phenomena we are considering could be made by postulating lags in the adjustment of excess demand to price changes This would lead to a mixed difference-differential equation of the form $\dot{P}(t) = K(a + b)P(t - \theta) + Kb\rho\dot{P}(t - \theta)$, where θ is a time lag. In order that all solutions of this equation be stable, it is again necessary that $K(a + b) < 0$. It can also be shown that $Kb\rho \leq 1$ is necessary and that $Kb\rho$ will have a critical value less than or equal to unity (for real parts of complex roots). As $Kb\rho$ crosses its critical value, the real part of the dominant complex root will be carried smoothly from negative to positive values. For a larger value of $Kb\rho$, the system will acquire a positive real root.

[2] See Metzler, *op. cit.*, p. 285.

are that the principal minors of the matrix alternate in sign, with sign $(-1)^n$, where n is the order of the minor.[1] The meaning of all goods being gross substitutes is that an increase in the price of the ith good will raise excess demand for every other good, whence $a_{ij} > 0$ for $i \neq j$. Then the system is stable if and only if the matrix M is " Hicksian." The Metzler theorem can be extended to include non-static expectations by the following theorem: *If the parameters of the system with static expectations fulfil the conditions for the Metzler theorem, then a necessary and sufficient condition for the stability of the system with any expectations is that* $1/K_i > b_i\rho_i$ *for all markets.* As in the single market case, $\rho_i \leq 0$ is not generally necessary for stability.[2]

So far we have assumed constant parameters and a constant stock of money. Under such conditions, equilibrium is uniquely defined by equations (2.1), (2.2) and (2.3). Local stability conditions have been discussed. The question of their relevance to the stability of the system in general remains. For larger displacements, local stability conditions will not be relevant, since they are based on linearity assumptions which can be presumed valid only in the neighbourhood of equilibrium. It is necessary to investigate what sorts of non-linearities are likely to be encountered by the system during an inflationary process. First of all, there may be money shortage. As long as the volume of transactions expands along with price increases, one would expect the transactions demand for cash balances to rise less than proportionately with money income.[3]

Once the stage of pure inflation is reached, transactions demand for cash and the price level will be related linearly. However, the damping effect of the constant money supply may be offset by increasing velocity of circulation. Velocity is largely dependent upon price expectations and institutional factors. As the inflationary process accelerates, rising prices will tend to weaken the presumption of stability, and the coefficients of expectations themselves will tend to rise with the rate of price increase. But the resultant increase in velocity will be limited by institutional factors, and

[1] This condition on the minors is known as the Hicks condition. See the mathematical appendix of Professor Hicks' *Value and Capital* (Oxford, 1939). The Hicks condition is necessary and sufficient in other cases also. For example, Professor Samuelson has shown it is also necessary and sufficient when the matrix M is symmetrical, regardless of the signs of the elements. See Samuelson, " The Stability of Equilibrium, . . ." *op. cit.*, p. 110.

[2] This conclusion would seem to conflict with the analysis of Professor Hicks, who uses a related concept, the " elasticity of expectations," with a critical value, unity, which is independent of market speeds of adjustment. " If elasticities of expectations are generally greater than unity, so that people interpret a change in prices . . . as an indication that they will go on changing in the same direction, then a rise in all prices by so much per cent (with constant rate of interest) will make demands generally greater than supplies, so that the rise in prices will continue. A system with elasticities of expectations greater than unity, and constant rate of interest, is definitely unstable " (*Value and Capital* (Oxford, 1939), p. 255). Professor Hicks' analysis is carried on in terms of instantaneous adjustments in discreet successive time periods. In this limiting case the K_i will tend towards infinity and the critical value of ρ_i will tend towards zero. In the more general case the extrapolative expectations described by Professor Hicks need not imply instability, even when the interest rate is constant (and equilibrium is neutral). Because of friction and the inertia of the system, the effects of the expectations may be damped, and the system may asymptotically converge to equilibrium.

[3] See W. J. Baumol, " The Transactions Demand for Cash: An Inventory Theoretic Approach," *Quarterly Journal of Economics*, Vol. LXVI, November 1952, pp. 545–56.

it is probable that an institutional maximum exists. In such circumstances a fixed money supply will eventually limit the possible increase in the price level.

In inflationary conditions assumption of a constant money supply is quite unrealistic. In the face of rising prices, governments trying to maintain the real value of their expenditures usually must resort to some monetary expansion. Political pressures on the monetary authorities are often irresistible. As a working hypothesis, assumption of a constant interest rate might be more realistic. In such a case, the money supply and the price level are indeterminate. In terms of the model, an extra variable will have been added without its corresponding determining equation. The effect of this on the dynamic system will be to make one of its roots equal to zero, whence the system will be in neutral equilibrium, its position depending upon exogenous shocks and its own friction and inertia. Systems in neutral equilibrium may be characterised as more or less sensitive in so far as any given exogenous shock produces a greater or lesser displacement from the old to the new equilibrium position. Sociological considerations would support the view that highly sensitive systems will tend to be unstable.

III. Aggregative Conditions for Monetary Disequilibrium

If barter is ruled out, the demand for any good in a monetary economy is a supply of an equivalent amount of money, and vice versa. Designating money as the $(n+1)$st good, we can state this as Walras' Law in the form

$$\sum_{i=1}^{n} P_i X_i \equiv X_{n+1} \tag{3.1}$$

i.e., the net monetary excess demand for all goods is equivalent to an equal excess supply of money. Excess demands can also be aggregated and expressed in macro-economic terms. Let I represent total *ex ante* investment and let S represent total *ex ante* savings, both measured in money values at current prices. Then we may write [1]

$$I - S = \sum_{i=1}^{n} P_i X_i = - X_{n+1} \tag{3.2}$$

For the sake of symmetry in the discussion which follows, let us modify equation (2.4) and work with the similar hypothesis

$$\dot{P}_i = P_i \,.\, K_i \,.\, \frac{X_i}{q_i} \tag{3.3}$$

where q_i represents the *equilibrium* quantity supplied of the ith good. These equations state that the *relative* rate of change in any price is directly proportional to the excess demand for the good, expressed as a fraction of the quantity supplied. With the static and dynamic behaviour of the system specified, we are now prepared to investigate the nature of situations that will produce inflation.

[1] See, for example, Bent Hansen, *A Study in the Theory of Inflation* (George Allen and Unwin London, 1951), pp. 37 and 202.

Variants of conditions described by

$$\sum_{i=1}^{n} P_i X_i > 0 \tag{3.4}$$

.e., monetary excess demand in the economy as a whole, have most frequently been used as criteria for the existence of inflationary pressure. For example, Keynes defined " a state of true inflation " in these terms: " When full employment is reached, any attempt to increase investment still further will set up a tendency in money-prices to rise without limit, irrespective of the marginal propensity to consume," or, in other words, a state of inflation is reached when investment exceeds savings *ex ante* at full employment.[1] These conditions can be formalised by inequality (3.4) and a similar inequality expressing a non-negative sum of monetary excess demand in the markets for productive services. In his *Study of the Theory of Inflation* Dr. Bent Hansen describes " a monetary pressure of inflation " by inequality (3.4) and the additional conditions that there be no net monetary excess supply either in the markets for productive services or in the composite commodity-market.[2]

The significance of the additional supporting conditions is that the possibility of offsetting or compensating (in a welfare sense) quantity increases in response to excess demand is to be precluded by the postulation of some bottleneck in the expansion of output in order that (3.4) will imply a pathological situation of pure price increases. The Keynes and Hansen subsidiary conditions must stand or fall as empirical judgments. The use of the full-employment condition must be based on the judgment that the economy reaches full employment of labour before it comes up against important capacity limitations. If capacity limitations are likely to be encountered first, as, for example, in an economy suffering from recent war damage, pathology may arise before full employment, and absence of net monetary excess supply in the capital-goods markets might be a more appropriate condition for describing inflation. Both the Keynes and the Hansen conditions rely heavily upon (3.4), the existence of a net excess supply of money. From a static point of view, this procedure is unexceptionable. It essentially relies upon an analogy with the case of one good in excess supply. Since its value must fall, the authors reason, the value of money must also fall when it is in excess supply. But what is " the value of money " that will fall when money is in excess supply? We must define a price index that will move in response to the " error signal " $I - S$. Let us postulate that its dynamic behaviour is governed by the simple law

$$\dot{P}_m = K(I - S) \tag{3.5}$$

where K is a positive constant, whence P_m will rise when $I - S > 0$ and fall when $I - S < 0$. The "value of money" might be defined as the reciprocal

[1] J. M. Keynes, *The General Theory of Employment Interest and Money* (London, 1936), pp. 118–19.
[2] *Op. cit.*, pp. 5–7.

of P_m, though such a procedure would be arbitrary. The equations (3.5), (3.2) and (3.3) taken together imply

$$\dot{P}_m = K \sum_{i=1}^{n} \frac{q_i}{\bar{K}_i} \dot{P}_i \tag{3.6}$$

which, in turn, implies an index of the form

$$P_m = \frac{\sum \frac{q_i}{\bar{K}_i} P_i}{\sum \frac{q_i}{\bar{K}_i} \bar{P}_i} \tag{3.7}$$

using equilibrium values as weights. This index differs from the usual Laspeyres index in that the quantity weights are divided by the price-reaction coefficients. Thus, highly flexible prices get relatively smaller weights than they would in the Laspeyres index, P_L. Consequently, we would expect the time-profile of P_m to display considerably more stability than that of P_L. But whatever its characteristics may prove to be, P_m as defined by (3.7), is the direct logical consequence of the Keynes–Hansen condition in a dynamic context.

A price index of this sort was intuitively perceived by Myrdal when he was attempting to relate the Wicksellian equilibrium conditions in the capital market to constancy of the price level. He argued that maintenance of monetary equilibrium would imply constancy of a price index. "This determining price level should be defined as an index in which the individual prices are weighted, first, with respect to their stickiness of reaction, and, second, with respect to their relative importance in the calculations of profitability by the entrepreneurs and consequently in the volume of real investment." [1] Though his discussion is not entirely clear on this point, the correspondence between what he was trying to do and equations (3.5) — (3.7) and also the similarity between P_m and his description would seem to indicate that Myrdal saw this important relationship.

The Myrdal index, if we may call it that, is vulnerable to serious criticism. The most obvious objection is that it is not a definition of the price level in the usual sense. If all the K_i were of the same, the index would be an ordinary Laspeyres index. But if some of the K_i are relatively large, those prices will receive proportionately less weight. For rigid prices, the K_i will be equal to or nearly equal to zero, and these prices will be given infinite or extremely large weights so that they will tend to dominate the index. If the weights were correctly estimated and the prices rose smoothly, this problem would be less serious because an inflexible price, though having a smaller reaction coefficient and hence a larger weight, would change correspondingly less. Thus, there would be some off-setting. If the coefficient were not appropriate to the period in question, but rather to the historical period in which it was found, then this off-setting would not necessarily occur. Dr. Hansen has suggested that this difficulty can be ameliorated if the reaction coefficients

[1] Gunnar Myrdal, *Monetary Equilibrium* (London, 1939), pp. 136–7.

are defined as their average value over a long period, as practically no price is perpetually fixed.[1] Then, at least, no weights would be infinite. In the present context, the relevant long period would be the length of time that it takes the system to get (arbitrarily) close to its dynamic equilibrium position.

The important point here is that objections made to the Myrdal index must also apply to the Keynes–Hansen conditions if we are considering inflation as a dynamic process. Therefore rejection of the former as a poor indicator of the price level must imply rejection of the latter as a description of conditions under which the price level will rise.

IV. The Initial Conditions for an Inflationary Process

The alternative to the specification of initial conditions and the study of the process that will follow them is to identify the process in which we are interested and to work back to the initial conditions that will produce it. For our present problem, a rise in the price level, an acceptable definition of the price level is necessary. Any aggregative index is bound to be, to some extent, arbitrary. This is true of the Myrdal index and also of the Laspeyres index. Nevertheless, the latter carries a certain amount of intuitive appeal which the former lacks. It bears some relationship, however tenuous, to the rest of economic theory, and it is the index normally computed. Since the argument on this point could be endless, it would be best to accept the case for the Laspeyres index either out of conviction or for the sake of further discussion.

The Laspeyres index is defined as

$$P_L = \frac{\sum q_i P_i}{\sum q_i \bar{P}_i} \tag{4.1}$$

where $\bar{P}_i$ is the base period value of P_i. Our problem is to decide under what conditions P_L will rise, given plausible dynamic assumptions. Differentiating (4.1) with respect to time, we obtain

$$\dot{P}_L = \frac{\sum q_i \dot{P}_i}{\sum q_i \bar{P}_i} \tag{4.2}$$

If we adopt the dynamic hypothesis (3.3), by substitution, (4.2) becomes

$$\dot{P}_L = \frac{\sum K_i P_i X_i}{\sum q_i \bar{P}_i} \tag{4.3}$$

whence

$$\dot{P}_L \gtreqless 0 \text{ as } \sum K_i P_i X_i \gtreqless 0$$

Thus, the initial condition for an inflationary development is that the weighted sum of monetary excess demands weighted by their respective reaction coefficients be positive, *i.e.*,

$$\sum K_i P_i X_i > 0 \tag{4.4}$$

This condition has its analytic basis to recommend it, for under the plausible dynamic assumptions, (3.3), it implies that the price level, as usually defined,

[1] *Op. cit.*, p. 230.

will rise. Furthermore, the size of the weighted sum can be taken as an indicator of the speed with which inflation will proceed.[1] Inequality (4.4) coincides with the Keynes–Hansen condition (3.4) only in the unrealistic case in which all of the K_i are equal.[2]

The economic significance of (4.4) is that a situation can be characterised as inflationary when monetary excess demands are concentrated in sectors which are important in terms of the sensitivity of their prices to excess demands, and hence, which are likely to affect the Laspeyres price index. Excess demands in flexible price sectors receive larger weights than they do in relatively rigid price sectors, for they are potentially more significant for the price level.[3] Sectors with rigid prices receive little or no weight for they are not apt to be of great importance from the point of view of inflation. Thus (4.4) makes allowance for the institutional facts of imperfect competition, lags in adjustment and price rigidities. This result may be thought of as a theoretical basis for the practical point made by Professor Galbraith [4] that stabilisation policies must concentrate upon the flexible price sectors where the problem of control is more serious, whereas the more rigid administered-price sectors are more apt to take care of themselves.

On the other hand, a mere positive sum of monetary excess demands in the economy as a whole does not tell us whether there will be a general price increase because it does not tell us where the excess demands are located. Thus, it is neither necessary nor sufficient for such a price increase: insufficient because with total excess demand positive there may be excess supply in the important sectors; unnecessary because a negative total of excess demands is consistent with a concentration of the positive excess demands in important and sensitive sectors.

V. Generalisation to Other Methods of Price Formation

The results of Section IV were based upon two rather special assumptions, namely, that all prices are flexible and that their motions are governed by a law of the form (3.3). These assumptions can both be relaxed and the principles of Section IV will still be applicable. In general, the procedure will be to substitute other expressions into (4.2) for the individual rates of price change and then to deduce the conditions under which the price index will rise. To do this, we may use a variety of dynamic hypotheses and a variety of " error signals " that will produce price changes.

Methods of price formation may be grouped into three main categories: flexible prices, cost-determined prices and rigid prices. Prices of goods and services traded in perfectly competitive markets are flexible *par excellence*.[5]

[1] It is a general property of linear systems that the speed of reaction is proportional to the magnitude of the disequilibrium.

[2] Hansen, *op. cit.*, p. 222.

[3] They are not weighted in (3.4) because they are inversely weighted in P_m.

[4] J. K. Galbraith, *The Theory of Price Control* (Cambridge, Mass.), 1952.

[5] Use of the words " excess demand " should not be allowed to hide the fact that the " cost-push " side of price increases has not been overlooked. Cost increases, *cet. par.*, shift supply curves to the left, thereby increasing *excess* demand and exerting an upward pressure on prices.

If we appropriately redefine excess demand, we can also include some forms of imperfect competition in this category—in particular, profit-maximising monopoly and monopolistic competition where it exists on only one side of the market with perfect competition on the other so that sellers or buyers are confronted with determinate and differentiable demand or supply functions. Following Lange,[1] we can say that the magnitude which the non-atomistic seller or buyer attempts to maximise is a function of all the prices, or

$$U_i = U_i(P_1, \ldots, P_n). \tag{5.1}$$

Of these prices, he has control over one, P_i, with respect to which he attempts to maximise U_i. We can also define a function

$$X_i(P_1, \ldots, P_n) = \frac{\partial U_i}{\partial P_i} \tag{5.2}$$

which Lange calls a " marginal gain function." When $X_i = 0$, profit is at a maximum and the seller or buyer is in equilibrium. Further, maximisation requires that $X_i \gtrless 0$ as P_i is less or greater than the equilibrium price, so that when X_i is positive he raises his price and when X_i is negative he lowers it. Thus, the function (5.2) behaves in just the same way as excess demand and can be interpreted as a special case of the latter.

A special type of flexible price is one whose flexibility has an upward bias. This case, a consequence of uncertainty and market imperfection, is probably frequent. It results from the fact that a price increase in an imperfect market will be followed by an immediate gain in unit profit, which at worst may be more than offset by a loss in sales volume only after the passage of a period of time during which buyers find new sources of supply, whereas a price decrease results in an immediate loss in unit profit which may be balanced only later by an increase in sales. In the latter case, if sales are to increase as a result of the price cut, to the extent that present customers do not increase their purchases, sales will increase only gradually as potential customers become aware of the lower price.[2] Consequently, one would expect much less resistance to price increases than to price cuts on the part of sellers. This is especially likely in inflationary conditions when sellers can discount heavily the probability of a future loss from the eventual fall in sales because of the likelihood of an intervening general price increase. Such prices can be introduced into (4.4) by the use of a kinked function relating the speed of price change to excess demand, in which the positive branch is steeper than the negative branch. This can be represented by a larger K_i for $X_i > 0$ and a smaller K_i for $X_i < 0$. More complicated non-linearities can be introduced in a similar fashion.

Cost-determined prices rise or fall with an index of other prices.[3]

[1] *Op. cit.*, Appendix.

[2] See Tibor Scitovsky, *Welfare and Competition* (Chicago, 1951), pp. 272–8.

[3] The term is used by Ralph Turvey, " Some Aspects of the Theory of Inflation in a Closed Economy," Economic Journal, Vol. LXI, September 1951, p. 532.

This class includes industrial prices which are set on a cost-plus constant percentage mark-up basis, wages and salaries that are related to a cost-of-living index, some government transfer payments and some government purchases (" cost plus "), and controlled prices which are allowed to rise only with cost increases. For any cost-determined price, it can be said that there exists an equilibrium ratio between it and an index of prices relevant for its determination. It is possible to deal with these prices in a manner similar to the way in which we treated flexible prices. For any cost-determined price, P_i, let there be an index of other prices, π_i, to which it is related, and let γ_i be the equilibrium ratio between them. Then we may define a new variable $\left(\gamma_i - \frac{P_i}{\pi_i}\right)$ with a critical value of zero and which can be thought of as similar, in its effects on prices, to excess demand. For cost-determined prices, then, we may define

$$X_i = \left(\gamma_i - \frac{P_i}{\pi_i}\right) \tag{5.3}$$

and assume that they obey some law of a form such as (2.4) or (3.3).

Cost-determined prices are affected only indirectly by monetary disequilibria. Nevertheless, they are important to monetary theory because of their ability to propagate excess demands and supplies from some competitive markets to others. Markets of this kind can be included in multiple-market dynamic systems, since their rates of price change are linear functions of the other prices. Their role in the dynamic process can be studied in this way. Strictly speaking, it would be incorrect to describe $\left(\gamma_i - \frac{P_i}{\pi_i}\right) \gtrless 0$ as a *monetary* disequilibrium. Nevertheless, we may include these magnitudes in the weighted sum (4.5) if we wish to assess the total extent of price disequilibrium in the system.

Rigid prices may be defined as those prices whose coefficients of reaction, either to excess demand or to other price changes, are equal to zero. This class includes some contractual payments, pensions and the like, some wages and salaries, exports and imports for countries whose sales and purchases are small in relation to world markets, some cases of oligopoly and rigidly controlled prices. In the case of oligopoly a rigid price is likely to become cost determined during a period of inflation when all competitors can be considered to be subject to the same cost increases. The term " rigid " is not meant to imply that these prices are absolutely fixed. Rather, it means that changes in them are not caused by monetary disequilibria, and that they must therefore be considered as exogenous from the point of view of monetary theory.

The formal nicety of condition (4.4) is a direct consequence of the assumption that price changes are governed by the relationship (3.3). This assumption also can be relaxed and other hypotheses substituted for it. In each case a new description of the initial conditions necessary and sufficient

for an increase in P_L will result. Three examples of alternative hypotheses about price formation are the following:

$$\dot{P}_i = K_i X_i \tag{5.4}$$

$$\dot{P}_i = P_i K_i X_i \tag{5.5}$$

$$\dot{P}_i = \begin{cases} K_i & X_i > 0 \\ 0 & X_i = 0 \\ -K_i & X_i < 0 \end{cases} \tag{5.6}$$

The first equation is (2.4) restated. The second equation states that the *relative* rate of price change is proportional to the size of excess demand. The third hypothesis is that the absolute rate of price change is a constant which is independent of the size of excess demand and which is dependent on it only for direction. Substitution of each of these equations, in turn, into (4.2) yields the following conditions for $\dot{P}_L > 0$:

$$\sum q_i K_i X_i > 0 \tag{5.4'}$$

$$\sum q_i K_i P_i X_i > 0 \tag{5.5'}$$

$$\sum q_i K_i > 0 \tag{5.6'}$$

In (5.6') the K_i must be taken with the appropriate sign. If prices in different sectors are governed by different laws of motion, then the aggregative criterion for the existence of inflationary pressure in the economy as a whole will be that the sum of (4.4), (5.4'), (5.5') and (5.6'), where each summation is over the appropriate space, be positive.

The use of these alternative hypotheses about the dynamics of price formation emphasises the special character of the assumptions upon which the Myrdal index was based and casts further doubt on the relevance of the Keynes–Hansen condition, (3.4), to the dynamics of the price level. If all prices are governed by (5.5), then inequality (3.4) will only imply an increase in the price index [1]

$$\frac{\sum (1/K_i) P_i}{\sum (1/K_i) \bar{P}_i} \tag{5.7}$$

which is clearly not related to our usual notions of the price level. Similar operation with the other hypotheses yields nonsense results or no price indices at all. Under no hypothesis about the relationship between rate of price change and excess demand which includes the assumption that speeds of adjustment differ in different markets will the inequality (3.5) yield information about the direction of change in the Laspeyres price index.[2]

[1] The relationship between (3.4), (5.5) and (5.7) is shown by Dr. Hansen, *op. cit.*, pp. 226–7.

[2] Obviously, we have a dilemma. On the one hand, we have the Keynes–Hansen condition (3.4), on the other the Laspeyres price index, both time-honoured concepts. It would be desirable to relate them, and Dr. Hansen has attempted to do so. However, as he has shown, they can be related only when it can be assumed that the reaction equations are of the form (3.3) with all the K_i of equal value. In an interesting discussion he does recognise the unreality of the assumption that all the K_i are equal. Also he criticises the indices (3.7) and (5.7). Yet he retains and relies

VI. Conclusions

The results of this analysis depend upon our beliefs about the values of the expectation coefficients and the market speeds of adjustment. These parameters do not lend themselves to easy quantification. Econometric studies may give us information about speeds of adjustment in some markets, but the difficulty encountered in attempting to measure excess demand will usually make estimation of the K_i somewhat hazardous. Though it is possible to conceive of an ideal experiment which would permit measurement of the coefficients of expectation, thus making the concept operational, it is highly doubtful that any practical method exists for their estimation. Indeed, it is probably true that with the exception of professional speculators, most people do not give precise values to their price expectations. Rather, they react to price movements by extrapolating the trend, by expecting that it will be reversed or by assuming that prices will remain at their new values. However, ease of quantification is not a necessary attribute of economic theory. In the absence of detailed empirical knowledge about the dynamical parameters of the economic system, we can deduce significant *qualitative* conclusions. Though we may not be able to measure them, we can often say that expectations are extrapolative or static. In this paper, it has been shown that the existence of extrapolative expectations is not incompatible with stable equilibrium. If we observe that expectations have a destabilising effect, we may conclude that their force has overcome the damping effects of the lags and general inertia of the system.

The weighted sum of excess demand of the form (4.4) is a more complicated concept than the Keynesian *ex ante* inflationary gap and it is undoubtedly much more difficult to estimate. Nevertheless, it does provide an unambiguous indicator of the direction of movement of the price level. The Keynesian concept, with its equal implicit weights, does not. A casual glance at the variety of market structures in the economy must indicate that the speeds of adjustment differ from market to market. It ought to be possible to devise a set of weights which would roughly reflect this. By the logic of our analysis, we may conclude that the weighted sum would provide an improved guide to monetary policy.

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heavily upon (3.4) throughout the book, thus implying a belief in its relevance. His discussion would tend to support the view that he favors retaining both (3.4) and the Laspeyres index even at the required price. For static analysis of repressed inflation, with which much of the book is concerned, the K_i assumption is probably not seriously limiting. This is one way out of the dilemma. Myrdal chose a second way out. Hansen briefly considers the alternative possibility—the one developed in this paper—of retaining the unequal K_i and the Laspeyres index at the expense of (3.4) (pp. 227–8). However, with a curious algebraic error (last line of p. 227), he incorrectly weights the excess demands, reaches a nonsense result and rejects the whole procedure, having failed to grasp the significance of the correctly weighted sum. Of all possible ways out of the dilemma, he seems most definite in his rejection of this one. "So we shall *continue with the 'relevant'* price-indices, that is those indices for which the unweighted monetary excess demand ... give an unambiguous indication of the development tendency" (p. 228).

31 JUL 1956

RESPONSE OF WHEAT GROWERS TO PRICE CHANGES: APPROPRIATE OR PERVERSE?

I

Since the First World War and particularly since the Great Depression, many economists have sweepingly condemned the free-market mechanism as a means for effecting appropriate demand–supply adjustments for basic agricultural commodities like wheat, cotton and sugar. They have argued that producers and consumers of most of these products respond feebly—at times even "perversely"—to price changes. It has become popular to talk about backward-rising supply curves, backward-falling demand curves and the "perverse" effects of stocks operations of speculators.

This modern theme has been echoed by "practical economists" in national policy-making circles and in meetings of various international bodies, including the United Nations Economic and Social Council and the Food and Agriculture Organisation. Such economic discussion has played a primary role in calls for national and international intervention to fix or stabilise the prices of specific agricultural commodities. For example, in favouring the conclusion of a new International Wheat Agreement for 1953, the F.A.O. Secretariat and Mr. Nicholas Kaldor put great stress on the low supply and demand elasticities for wheat, going so far as to suggest that in some important producing areas where producers derive the bulk of their income from wheat the supply curves may well be "backward rising."[1]

These ideas about the behaviour of individual commodities go a long way beyond the much older concern about inflexibility of agricultural output over the trade cycle. The well-known tendency of agricultural output to fluctuate rather less, agricultural prices rather more, than manufacturing output and prices as the economy goes from boom to depression and back to boom again has evolved, by strange processes of speculative analysis, into the notion that the supply curves for various individual agricultural commodities have negative slopes.

Even the idea that the supply schedule for all farm products combined has negative slope must be seriously questioned. Its supporters usually reason from a Robinson Crusoe model in which variations in output are solely dependent on the efforts of one individual, who is continually balancing the marginal utility of money income against the marginal disutility of labour. Thus Mr. Kaldor and the F.A.O. Secretariat argue that "when prices go up, he [the typical producer] will be inclined to spend some part

[1] Food and Agriculture Organization, *A Reconsideration of the Economics of the International Wheat Agreement* (Commodity Policy Studies No. 1, Rome, September 1952), especially pp. 17–21. Although this study is supposed to be directly concerned with wheat, the writers deal so broadly with "primary commodities" and "agricultural products" that it is often difficult to tell whether particular paragraph or particular concept is, or is not, supposed to apply to wheat.

of his increased real income on increased leisure." [1] Perhaps this is true, and in very primitive subsistence economies, if there indeed be such, it may lead to lower total output. That it does not do so, even in such backward countries as those of tropical Africa, is becoming abundantly clear. And that the model is not applicable in the more highly developed countries of the world—Western European nations, the United States, Canada and Australia—should be obvious. In countries such as these, farmers who wish to trade money for leisure can, and do, keep their land fully productive by:

(1) hiring more labour;
(2) using more labour-saving machinery;
(3) turning part of their land or farm operations over to sons or other relatives; or
(4) leasing part of their land to neighbouring farmers anxious to expand.

Just as a number of farmers die or retire every year without thereby affecting farm output, so a number can reduce their personal exertions without affecting it. Moreover, reduction in the output of an individual commodity need not mean a slackening in the pace of farming activities. Every farmer has a choice of uses for his land, even though some may yield much lower revenues than others. Alternative uses always exist, and if the revenue from current use falls low enough, he will turn to the best alternative use.

Indeed, if the situation were otherwise—if American or Canadian or British farmers, as a group, actually did respond to higher farm prices by cutting farm output and to lower prices by increasing output—we would have to conclude that the war-time economic measures taken by the United States and other countries to expand food production were all wrong. Yet the evidence clearly suggests that the higher real agricultural prices in the Second World War (including special acreage-payments in some countries) did, in fact, bring forth the hoped-for increases in production. And in the United States continued high price supports were largely responsible for the disturbing agricultural surpluses that exist to-day.

It is more difficult to present conclusive empirical evidence to refute the notion that farmers tend to expand, rather than to contract, production in response to sharply falling real prices in a major economic recession (allegedly reflecting efforts to compensate for the adverse income effects of the declining prices). On this point the statistical evidence is meagre, exceedingly complex and conflicting. On the one hand, much fiction attaches to the idea that all farmers were severely pinched by declining agricultural prices in the Great Depression. Although the international price of wheat declined sharply, and much more than wholesale commodity prices in general, the wheat prices received by farmers were well sustained by protective

[1] *A Reconsideration of the Economics of the International Wheat Agreement*, p. 19.

government measures in such important importing countries as Germany, France, Italy and the Netherlands, and, through supplementary "deficiency" payments, even in the United Kingdom. Indeed, it is possible to point to a sizeable number of countries in which the net real price of wheat to producers (including supplementary payments) was higher during most of the depression years than in the preceding decade. This is probably true also with respect to a number of other individual agricultural commodities, though perhaps nowhere with respect to all agricultural commodities combined.

Even if it could be demonstrated that farmers in the highly developed countries of Western Europe and North America have shown a consistent tendency to expand farm output in the face of declining real agricultural prices in the downward phase of the trade cycle, it would seem much more reasonable to attempt to explain this result not in terms of backward-rising supply curves, but in terms of shifts of forward-rising curves.

Under the greatly changed conditions of economic recession—sharply declining urban employment and purchasing power, narrowing market outlets and increasing reliance on government relief measures of varying degrees of inadequacy—the supply curves for many individual agricultural and industrial commodities and groups of commodities can be expected to shift position and even, in some instances, to alter, though not to reverse their slopes. Certainly there is a basic change in the relative attractiveness of farming *vs.* urban work, and of employment in the more stable industries with lower wage schedules (*e.g.*, flour-milling) *vs.* the more variable, higher-wage industries (*e.g.*, automobile manufacturing). With decline of urban employment, many urban members of farm families seek to return to the greater security of farm life; and many farmers attempt to economise by using more family labour as a partial substitute for hired labour, by repairing rather than replacing worn-out farm machinery, and by cutting purchases of yield-raising fertilisers, insecticides and the like. Thus, in an economic recession, very substantial changes are typically made in imputs of land, labour, and capital in agricultural production, some of the changes tending to increase, others to reduce, the total farm output. The net result is likely to be an increase in agricultural production in some countries—in any case, a lesser proportional reduction than in the corresponding national output of all industrial products combined. Yet there appears to be no reason for assuming that any of the changes are such as can appropriately be described by a backward-rising supply curve.

II

The icy fastnesses of the higher Himalayas are visited by few men. What may lie in this lofty world can be known only imperfectly by those of us who must keep our feet on ground much closer to sea-level. Nevertheless, when hardy explorers bring back reports of a man-like creature who lives at home on the icy peaks, and who runs across the eternal snows with his

bare feet pointed backwards, we do well to be sceptical.[1] Perhaps the "abominable snowman," often reported but never captured, actually exists. A footprint, a figure glimpsed dimly, a mysterious attack or equally mysterious rescue, may be the snowman's work—or again may be merely the product of the rarified air and the impersonal cold of high altitudes.

There are several abominable snowmen in economics, not least of which is the backward-rising supply curve. And when a specimen is brought forward for our examination, it is a matter of some importance. Just such a specimen has recently been described by Mr. G. R. Allen, who believes he has found it, not for an obscure product in an out-of-the-way corner of the world, but for one of the world's principal agricultural commodities, and in the heart of one of the major regions of its commercial production.

The assertion that the real price of a commodity has no influence on its supply, or that a price fall causes supply to rise, strikes at the heart of economic analysis as we know it. Some would go farther and say that if price is not the motivator we have thought it to be, then all our economic analysis is chimerical. It is of the greatest importance, therefore, to examine carefully any evidence that may be offered in support of this assertion.

Mr. Allen's discovery was the result of examination of the relationship between the price of wheat and wheat plantings in Saskatchewan Province from 1914 to 1939. He concluded that [2]

> "A change in the real price of wheat between one harvest and the next during the period 1914–39 resulted in an opposing short-term movement in wheat acreages. . . . As far as Saskatchewan farmers were concerned there undoubtedly existed a backward-sloping supply curve in the short run."

These conclusions are out of line with the "expert" opinions frequently expressed in leading North American and British grain-trade journals; and they appear to be at variance with the experience of the United States Commodity Credit Corporation. Moreover, contrary empirical findings have been reported by Mr. J. W. Clarke, who conducted a carefully planned, direct-interview survey in central Saskatchewan farm areas in 1950. According to Mr. Clarke,[3]

> "Sixty-three per cent of the farmers made conscious [appropriate] adjustments to price changes in both crop and livestock production. However, 37 per cent did not make such adjustment and a bigger proportion of the farmers on small farms were in this category. Most of those farmers who made adjustments in production to price changes did so on the basis of the price of wheat."

[1] Reports of the abominable snowman appear to date back at least to Pliny the Elder, cf. Lionel Pearson, "The Diary and the Letters of Alexander the Great," *Historia* (Wiesbaden, Germany), III, 1955, pp. 441–2.

[2] G. R. Allen, "Wheat Farmers and Falling Prices," *Farm Economist* (Agricultural Economics Research Institute, Oxford, 1954), Vol. VII, No. 8, pp. 338–9. In Mr. Allen's opinion only the *deviations* from the primary expected relationship (represented by the backward-sloping supply curve) "could largely be attributed to changes in expectations concerning the future profitability of wheat relatively to other field crops."

[3] J. W. Clarke, *Farm Practices in Central Saskatchewan* (mimeo., Regina, n.d.—1952?), p. 31. This study was sponsored by the Dominion Economics Division, Marketing Service, Canada Department of Agriculture, in co-operation with Department of Farm Management, University of Saskatchewan.

In the present article we shall analyse the evidence underlying Mr. Allen's conclusion. We shall also present additional empirical evidence specifically designed to answer two broader questions:

> (1) Did Western Canadian farmers, as a group, generally attempt to increase or reduce wheat production during 1910–39 in response to changes in the crop-year price of wheat?
>
> (2) If Western Canadian farmers responded "appropriately" rather than "perversely," was the response of sufficient magnitude to make a useful contribution toward adjusting the supply of wheat to the indicated demand?

III

The area selected by Mr. Allen in which to search for the elusive backward-rising supply curve is not to be rejected as atypical or as little explored. Moreover, the period 1910–39 has much to commend it. The Canadian Government has long devoted special attention to wheat as the nation's primary cash crop; and during the first quarter of the present century Canadian officials showed more concern about the collection of satisfactory acreage and production data for wheat than they did for any other crop. Furthermore, Canada is one of the very few major wheat producers that reported estimates of sown (as contrasted with harvested) wheat acreage as early as 1910.

Much may also be said in favour of the several Canadian wheat-price series that might be used for such a study. Although these are not lacking in complexity or in need of adjustment, their interrelationships are fairly well understood. Furthermore, both the market prices and the officially estimated average farm prices of Canadian wheat have typically been more representative of the actual prices received by domestic producers than have the wheat-price series available for most other leading countries, primarily because the Canadian Government has rarely resorted to supplemental subsidies or direct wheat-marketing taxes. Finally, during 1910–39, the closely interrelated wheat prices recorded on the large, well-organised futures markets of Liverpool, Chicago and Winnipeg were widely published in North American newspapers and were carefully watched by many Canadian farmers. During and since the Second World War, on the other hand, the absence of similarly representative futures prices, the compulsory-pooling system for wheat in Western Canada (involving delayed payments difficult to forecast), the Wheat Board's differential export pricing of wheat and restrictive marketing quotas have made crop-year average prices received by producers less satisfactory guides for rational acreage adjustments.

The basic data selected for Mr. Allen's study thus appear to have been well chosen. His analysis involved the following steps:

(1) a long-term trend line was fitted " by eye " to the Saskatchewan wheat-acreage series from 1910 to 1950;

(2) the wheat area sown each year, 1916 to 1940, was expressed as a percentage deviation from the acreage trend line;

(3) the Saskatchewan average farm price of wheat for each crop year was deflated by a roughly corresponding annual index of prices of commodities and services used by Canadian farmers;

(4) the change in the deflated wheat price from one crop year to the next was expressed as a percentage of the deflated price in the earlier year; and

(5) the year-to-year change in the deflated wheat price (from step 4) was plotted against the deviation from trend of the wheat acreage sown for the following year (from step 2).

This analysis led Mr. Allen to conclude that the short-run supply curve for wheat in Saskatchewan was backward sloping. His basic scatter diagram (slightly modified) and " supply curve " are here reproduced in Chart 1A.

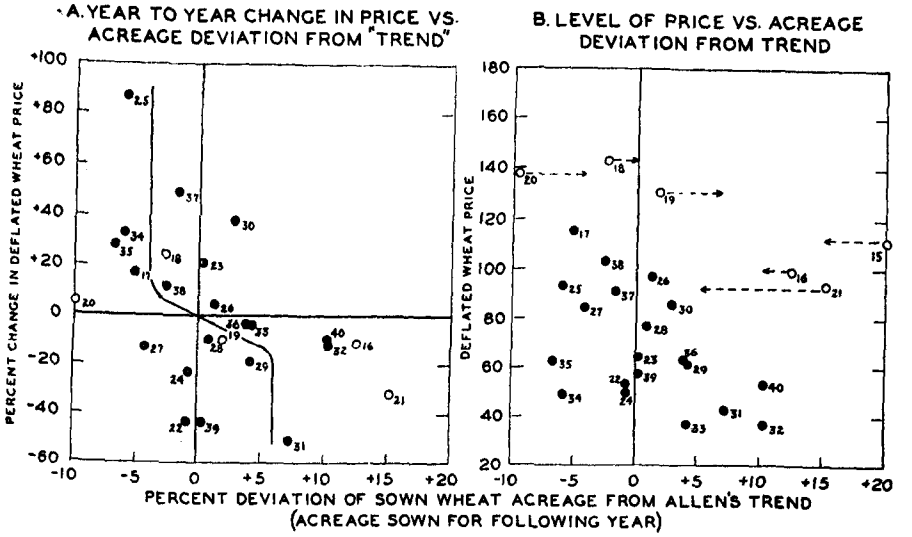
The most pertinent criticism to be directed against Mr. Allen's " backward-sloping supply curve " is that it is not an economic supply curve at all, combining, as it does, *levels* of acreage with year-to-year *changes* in price. Indeed, the price–acreage relationships plotted by Mr. Allen do not fit any recognisable economic model. His chart suggests that Saskatchewan wheat sowings tended to be large (above trend) when the average price of wheat had fallen in the preceding year (regardless of whether the price was high or low preceding or following the fall), and that wheat sowings tended to be small (below trend) in years following an advance in the crop-year average " real " price of wheat (whether the advance was from a level low to high, or from high to higher, or from extremely low to less low). Obviously, a curve that generalises these relationships does not meet the definitional requirement that an economic supply curve relate level of output to level of price.

Mr. Allen might more reasonably have compared either (1) the price of wheat in each crop year with the acreage sown to wheat for the following year's harvest, or (2) the change in the wheat price from one crop year to the next with the change in wheat sowings. It would not be unreasonable to express annual levels of wheat acreage as deviations from the underlying acreage trend if it were possible to determine that trend with a fair degree of accuracy. We suggest below reasons for believing this is impossible. Yet since Mr. Allen drew an acreage trend which he regarded as satisfactory, we show in Chart 1B the relationship between the level of Saskatchewan wheat prices (as deflated by Mr. Allen) and the level of Saskatchewan wheat sowings for the following year, with the latter represented by the percentage deviations from trend published by Mr. Allen. The scatter of the data suggests a very slight negative relationship.

Before proceeding further, it is desirable to examine the validity of Mr. Allen's acreage trend. Detailed study of the acreage statistics leads us to conclude that as the acreage under wheat rapidly expanded from 1910 to 1921, the annual official estimates of wheat sowings progresssively understated the increase between each five-year census report. For 1915 and 1916, for example, the official pre-census estimates were only 6·8 and 5·9 million acres, respectively, as contrasted with the corresponding census figures of 8·9 and 9·0 million acres (eventually accepted as official revisions). The

CHART 1

Relationships Between Deflated Crop-year Prices of Saskatchewan Wheat and Percentage Deviations from Mr. Allen's " Trend " of Saskatchewan Wheat Sowings [1]



The numerals in the body of the chart refer to the years in which the wheat sowings took place. Thus, in Section A, point " 16 " shows the relationship between (1) the percentage change in the deflated wheat price between the two August–July crop years 1914/15 and 1915/16, and (2) the percentage deviation from " trend " of the wheat area sown in the late spring of 1916. The shifts indicated by arrows in Section B represent very rough adjustments made by the present writers to correct for the most striking incomparabilities in the official acreage series and the adverse influence of these incomparabilities on Mr. Allen's acreage trend (see text).

annual intercensal estimates of the Dominion Statistics office were too low, not only for 1915 and 1916, but only moderately less so for 1914 and decreasingly so for 1913 and 1912. Thus, the currently accepted official acreage estimates for 1914 and 1915 are seriously incomparable, one with the other, since the latter but not the former is tied to the much higher 1915 census base. This is clearly evident in the several acreage series shown in Chart 2.

Between 1915 and 1920 the Statistics Office was more successful with its intercensal estimates, primarily because of an improved method of estimation

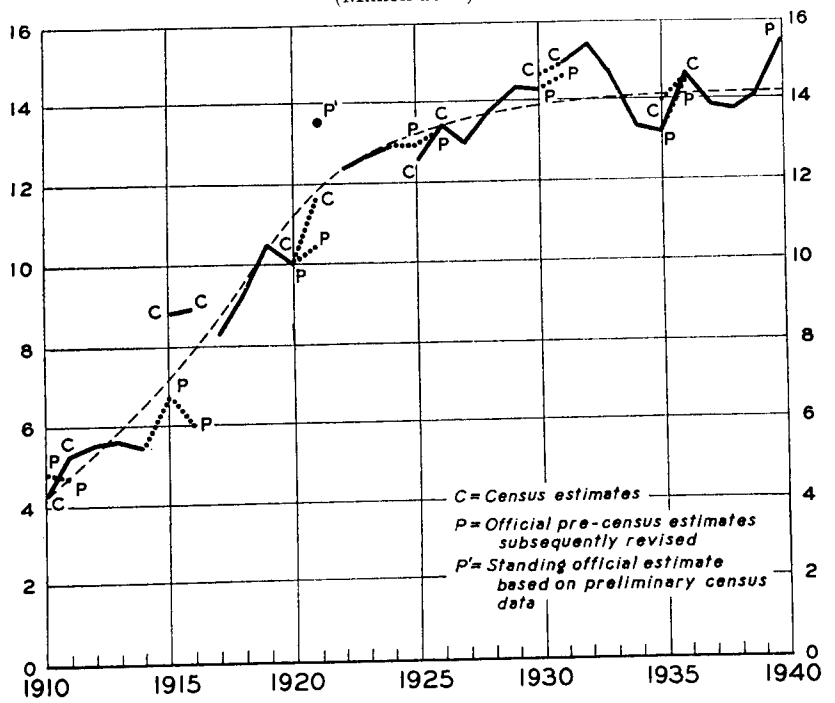
[1] Data from G. R. Allen, *Farm Economist* (Oxford), Vol. VII, No. 8, 1954, p. 340. Section A shows Mr. Allen's basic scatter diagram and " backward-sloping supply curve."

troduced in 1917—an improvement which, in turn, resulted in acreage timates " not strictly comparable with those of 1916 and previous years." [1] ı any case, the Dominion Bureau's pre-census wheat-acreage estimate for)20 closely approximated the census figure subsequently released for that :ar. And had it not been for an unfortunate pre-census revision announced

CHART 2

Official Estimates of Saskatchewan Sown Wheat Acreage, 1910–40, *and Mr. Allen's Acreage Trend* [2]

(Million acres)



'or 1921, the Bureau might well have been congratulated on its improved :rop-reporting system of 1917–21. As of July 1921 the Bureau had reported

[1] *Monthly Bulletin of Agricultural Statistics* (Canada, Census and Statistics office), January 1918,). 4. The incomparabilities in the acreage estimates before *vs.* after 1917 are much greater for)ther grains than for wheat. Saskatchewan wheat sowings undoubtedly declined between 1916 and 1917, primarily because an extraordinarily late spring " made it impossible for farmers to sow as much wheat as would otherwise have been put in . . . " (*ibid.*, p. 1).

[2] Points on the solid line (broken to indicate the incomparabilities in the series) and also the unconnected point *P'* represent the standing official estimates of the Dominion Bureau of Statistics (Canada, Dominion Bureau of Statistics, *Handbook of Agricultural Statistics, Part I, Field Crops*, D.B.S. Reference Paper No. 25, May 1951)—the acreage series used by Mr. Allen. Points designated *P* (from various issues of the Bureau's *Monthly Bulletin of Agricultural Statistics*, earlier entitled *Census and Statistics Monthly*) represent the last official estimates published before the census data became available for census years. Census estimates, designated *C* (Canada, *Census of the Prairie Provinces 1946, Vol. IV, Agriculture*, 1949), may be regarded as comparable at least within each successive pair of census years. Similarly, we assume that the Bureau's *pre-census* estimates for census years, *P*, may be regarded as fairly comparable within each pair of years and as more or less comparable with the estimates for the three preceding intercensal years.

Saskatchewan wheat sowings at only 10·4 million acres—just a little higher than the acreage of the preceding year. Four months later, however, this estimate was revised upward to 13·6 million acres on the basis of preliminary census returns on the number of farms in Saskatchewan. This notably high figure was not revised (as had been promised by the Dominion Bureau) when the final census estimate—11·7 million acres—became available.

Mr. Allen took the standing official wheat-acreage figures at face value (a dangerous practice in commodity analysis). His acreage-trend line therefore rises too rapidly between 1914 and 1921, resulting in excessive deviations above trend in 1915 and 1916 and excessive deviations below trend in 1918, 1919 and 1920. Moreover, because he used the inflated 1921 pre-census figure of 13·6 million acres, rather than the more reasonable final census estimate, his tabulated data and chart show an excessive plus deviation from trend for the 1921 sowings.

Rough adjustment of the acreage series for these major incomparabilities leaves as indicators of a possible " backward-rising supply curve " in Chart 1B little besides the wheat sowings in 1931–33 and 1940, when anticipation of higher future wheat prices and, in 1931–33, special government efforts to aid wheat producers contributed to heavy wheat plantings. Moreover, these four years would not lie so far to the right of the general scatter if Mr. Allen had put his trend line lower during 1917–27 and had continued the upward movement of the line through 1931 or 1932, as the course of " new breakings " and the upward shift in the acreage-estimation base in 1931 would suggest to be more appropriate.[1]

Although we feel confident of the direction of the several adjustments suggested in Chart 1B, the magnitudes can only be approximated. It is thus impossible to draw a realistic trend line—even a series of discontinuous, short-term trends—to apply to the defective Saskatchewan wheat-acreage data.

IV

If no satisfactory wheat-acreage trend(s) can be constructed, further discussion of Chart 1B is obviously unwarranted. Indeed, this would be true in any case, because the deflated price and acreage series shown there are essentially inappropriate for analysing the responses of Saskatchewan farmers to changing prices.

The purchasing power of wheat over the commodities and services used by Saskatchewan farmers (the deflated price in Chart 1) may serve as a rough index of the economic welfare of Saskatchewan producers,[2] but it is not the kind of " real " price of wheat required for constructing an economic supply curve. A much better measure is the ratio of the price of wheat

[1] Since new-broken land in Saskatchewan is normally planted to wheat the first year or two (sometimes longer) after breaking, the sown wheat acreage might be expected to reflect the changing two-year course of new breakings, with some lag.

[2] It is not even a good index of economic welfare when comparisons are made between years widely separated in time, since the real cost of producing and marketing Saskatchewan wheat has declined markedly and irregularly since the beginning of the present century.

to the prices of the chief farm products that compete with wheat for crop acreage.

Similarly, the absolute level of wheat sowings is not as good an index of farmers' intended responses to changing prices as is the ratio of wheat sowings to the area planted to the chief competing crops—in Saskatchewan, oats, barley, rye, mixed grains and flax-seed. In some years, it is true, lateness of spring weather or persistent spring rains have so delayed farm operations in Saskatchewan that farmers could not sow to wheat the full area they had planned; they therefore left more land than intended in summer fallow or planted more land to later-sown oats and barley. Nevertheless, the ratio of wheat sowings to sowings of competing grains and flax-seed may be regarded as a reasonably satisfactory index of the basic planting intentions of Saskatchewan farmers over a period of years.[1]

Chart 3 shows for each crop year during 1910–39: (1) the average farm price of Saskatchewan wheat deflated by an index of the price of the five chief competing crops; [2] (2) the ratio of the per-acre value of the Saskatchewan wheat crop to the per-acre value of the chief competing crops; and (3) the ratio of the Saskatchewan wheat acreage to the area sown to the five competing crops. The value-per-acre ratios are included because of the belief of many economists that farmers more frequently plan crop sowings in response to past-season returns per acre from their various crops than to past-season price relationships among those crops.[3]

All three of the curves in Chart 3 show upward trends in the early part of the period covered. Since many of the defects of the basic acreage series remain in the acreage ratios, and since no good basis exists for determining appropriate trend values for the three series, direct comparison between the annual figures or between their deviations from trend is unwarranted.

The best approach appears to be to compare year-to-year changes in the relative price (or value per acre) of wheat with year-to-year changes in the relative acreage sown to wheat for the following crop year. This makes it possible to utilise the acreage ratios with greater confidence, since incomparabilities in the series are minimised in comparisons between successive years.[4]

[1] Although producers in some countries may respond to changing prices by varying inputs of capital or labour rather than, or in addition to, the acreage planted, sown acreage may be regarded as a generally satisfactory measure of farmers' responses to price changes under the particular conditions that exist in Western Canada. And since all major crops are spring sown in that region, one does not face the further possible problem of dealing with resowings of abandoned autumn-sown acreage.

[2] In construction of the index, the crop-year average farm price of each crop was weighted by its average annual production in 1935–39 and expressed as a percentage of the average price so computed for the five crop years from 1935/36 through 1939/40.

[3] For example, see Wilfred Malenbaum, *The World Wheat Economy, 1885–1939* (Cambridge, Mass., Harvard University Press, 1953), p. 26.

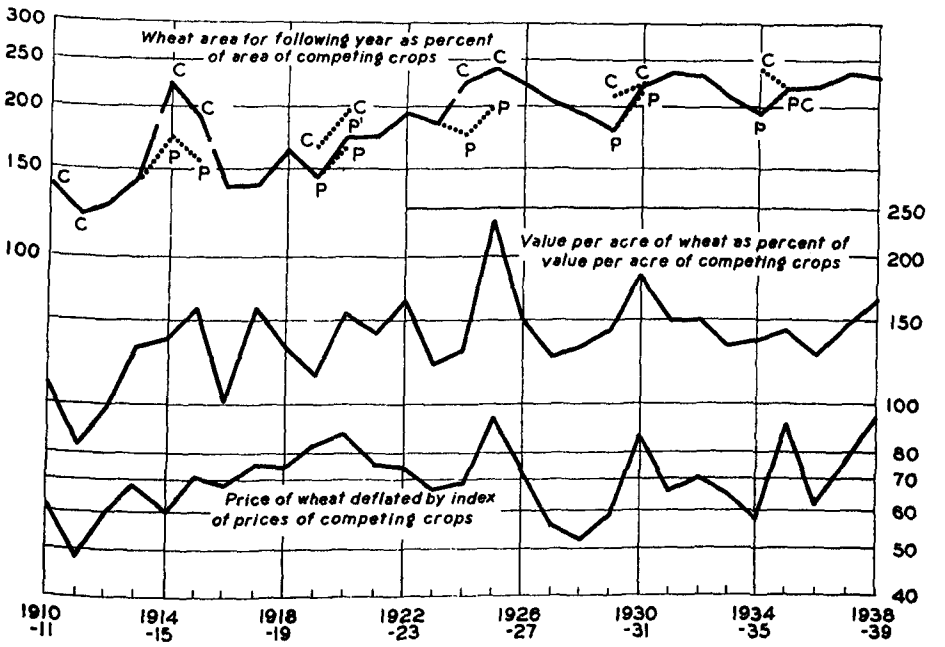
[4] There is the difficulty that disregard of longer-term movements may remove part of the statistical relationship that one desires to study. This is apparently true in some degree with respect to the relationships here considered, but the defects of the basic acreage data leave no alternative.

Chart 4 clearly suggests that Saskatchewan farmers tended to expand their sowings of wheat relative to sowings of other grains and flax-seed following crop years in which the average farm price of wheat (or its value per acre) rose in relation to the weighted average price of these competing crops (or their aggregate per-acre value). And conversely, Saskatchewan

CHART 3

Relative Wheat Prices and Value-per-acre Ratios Compared with Saskatchewan Acreage Ratios, 1910/11–1938/39 [1]

(Logarithmic vertical scale)



farmers typically reduced the proportion of their acreage sown to wheat at the end of crop years in which the price or value per acre of wheat declined in relation to the corresponding weighted price or per-acre value of the five competing crops.

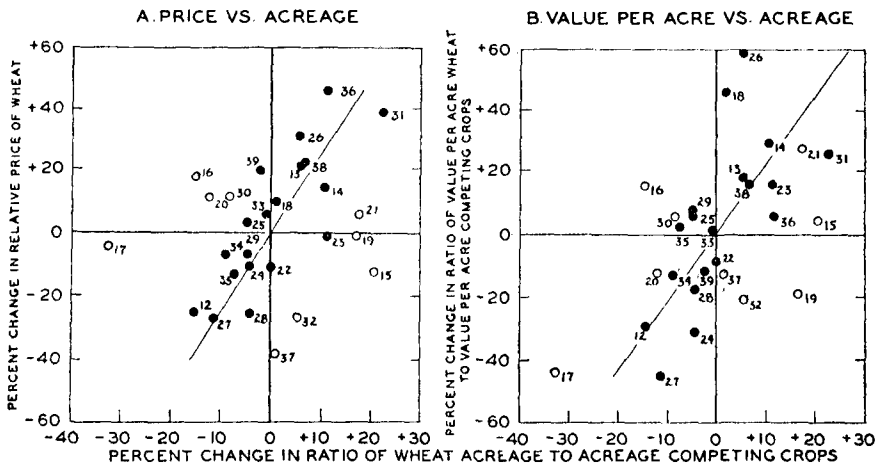
This general statistical indication of a positive-sloping supply curve for wheat—appropriate, not perverse, acreage responses to price changes—is further supported by examination of the apparently abnormal acreage shifts recorded for the nine years represented by hollow circles in Chart 4. In each instance the peculiar response can be attributed to faulty statistics

[1] Based mainly on data from *Handbook of Agricultural Statistics, Part I*, and *Census of the Prairie Provinces 1946*. See Chart 2 for explanation of *C*, *P* and *P'* symbols and also for the basic wheat-acreage estimates here expressed as percentages of the areas sown to competing crops.

or to external factors in the form of unusual weather, war developments, or expected or actual government policy decisions (see Appendix).

CHART 4

Comparisons of Year-to-year Changes in (A) *Relative Wheat Prices and Acreage Ratios, and* (B) *Value-per-acre Ratios and Acreage Ratios, Saskatchewan,* 1910–39 [1]



V

Two questions remain: (1) Was the positive production response of Saskatchewan wheat farmers representative of the response of Canadian wheat farmers generally during 1910–39? (2) Was the response large enough to be economically significant?

These questions can well be discussed with reference to Chart 5, which shows for the Prairie Provinces the same basic relationships between crop-year changes in relative wheat prices and proportional wheat sowings that are shown for Saskatchewan alone in Chart 4A. Since almost 95% of the Canadian wheat crop was produced in the Prairie Provinces during the inter-war period, the data for those provinces may be accepted as representative of Canada as a whole.

Comparison of Charts 4A and 5 discloses that most of the individual points occupy similar positions in the two charts,[1] resulting in similar diagrammatic scatters. Our "judgment lines" of general relationship accordingly suggest roughly the same relative price-elasticity of wheat supply in the three Prairie Provinces combined as in the single province of Saskatchewan.

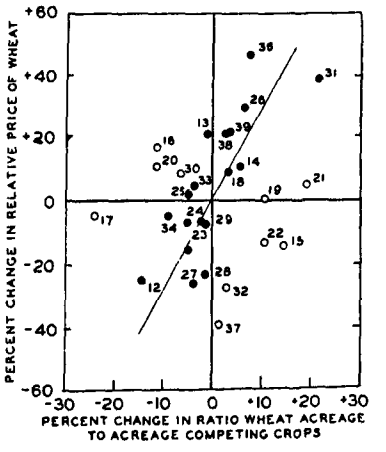
[1] Year-to-year changes in the three basic series shown in Chart 3, with each change here expressed as a percentage of the two-year average for the particular series and pair of years specified. To promote comparability, pre-census official acreage estimates (*P*) are here used for 1915 and 1925 in comparisons between 1914 and 1915 and between 1924 and 1925, respectively, whereas census figures (*C*) are used for the acreage comparisons between 1915 and 1916 and between 1925 and 1926, respectively. For 1931/32 both the relative price and the value per acre of wheat were adjusted to take account of the wheat-transportation subsidy paid that year.

Each numeral in the body of the chart refers to the later of the pair of years compared. Thus, in Section A, the point marked "16" shows the relationship between (1) the change from 1914/15 to 1915/16 in the relative farm price of Saskatchewan wheat expressed as a percentage of the two-year average relative wheat price for 1914/15 and 1915/16 and (2) the change from 1915 to 1916 in the wheat-acreage ratio expressed as a percentage of the two-year average acreage ratio for 1915 and 1916.

The indicated lines of relationship are rough "judgment lines" that partially discount the abnormal acreage-ratio changes represented by hollow circles.

CHART 5

Relationship Between Year-to-year Changes in Relative Wheat Prices and Subsequent Changes in Acreage Ratios, Prairie Provinces, 1910–39 [2]



In neither chart does it appear that acreage adjustments in response to price changes were truly large. On at least two counts this might have been expected. Until 1932 land was coming under the plough at a rapid rate in the Prairie Provinces, with the result that land settlement and technological factors were probably more important determinants of production plans than in older farming areas. Furthermore, the range of crop alternatives is much more limited in Western Canada than in regions with longer growing seasons and higher rainfall, such as, for example, the Corn Belt of the United States.[3] Thus, the climatic conditions of the Prairie Provinces tend to make wheat the most profitable crop to many producers within a fairly wide relative price range.

[1] Only for the points designated "22" and "23" are the positions notably different. This difference reflects (1) the abnormally large proportion (40%) of the Alberta oat acreage cut for green fodder in 1922, and (2) the introduction in Alberta in 1922 and in Saskatchewan in 1923, of a new basis of estimating the oat acreage—a change that involved a shift from estimation of the total sown area to estimation of the sown area on which the oats were allowed to mature for grain. *Monthly Bulletin of Agricultural Statistics*, January 1922, pp. 26–7; January 1923, pp. 25–6; June 1923, pp. 216–17; November 1923, pp. 434–5; January 1924, p. 28.

[2] See footnote to Chart 4, which shows comparable data for Saskatchewan.

[3] For a discussion of wheat-acreage changes in different regions of the United States, see A. E. Taylor, "The Contractibility of Wheat Acreage in the United States," *Wheat Studies of the Food Research Institute* (Stanford University, California), February 1930, VI, pp. 151–87.

Nevertheless, numerous wheat-acreage adjustments obviously took place in Western Canada in response to changes in relative wheat prices during 1910–39. The question is whether the magnitude of such adjustments was economically significant.

Of the relative wheat-price changes shown in Chart 5, over a third exceeded 20%, another third amounted to less than 10% and a fourth were of intermediate magnitude, ranging between 10 and 20%. A 20% change can therefore be rated as relatively large, though well within the normal range. The " judgment " line of general relationship in Chart 5 suggests that a year-to-year change of 20% in the relative price of wheat tended to be associated with a corresponding change of about 7% in the wheat-sowings ratio for the following harvest. A 7% change in wheat sowings is by no means insignificant. At the long-time average yield of 17 bushels per acre, it would mean an increase or decrease of over 25 million bushels in the wheat harvest —10–12% of the Dominion's average annual wheat exports. Such an increase in Canada's annual exportable supplies would have been most welcome in the post-war food-shortage period, and a corresponding decrease would represent an appreciable, if modest, contribution to solution of the existing Canadian wheat-surplus problem.

The basic price–acreage relationships indicated in Charts 4 and 5 should not be taken to represent the full wheat-production (or acreage) response made by Western Canadian farmers to the complex, changing price incentives of 1910–39. Other interrelated forms of price–cost incentives also influenced Prairie Province wheat sowings during that period. Among these might be mentioned: (1) the absolute level of wheat prices; (2) the price trends for wheat and competing grains during the nine months or so preceding planting; (2) the price relationships among new-crop grain futures on the Winnipeg market during March–May; and (4) differential changes over time in the costs of production of wheat *vs.* competing crops. Moreover, many Canadian producers may have made greater changes in their rotational patterns in response to price-relationship changes that persisted longer than a single year. Some suggestion of delayed and persisting acreage shifts (particularly following two or more years of persistently low or declining relative wheat prices) is evident in Chart 3.

In view of the serious incomparabilities in the Canadian acreage figures and the less serious limitations of the price data,[1] empirical investigation of such supplementary price–acreage relationships appears to hold little promise. The attempts we have made in this direction have not been encouraging. Indeed, it is probably impossible to obtain a satisfactory aggregate net measure of the acreage responses of Western Canadian wheat growers to the various forms of price incentives which influenced planting decisions during 1910–39. The price–acreage relationship represented in Charts 4 and 5, however, would almost certainly show up as the dominant element in such an aggregate measure, and the additional net influence

[1] The official farm-price estimates, available only on a crop-year basis, reflect crop-quality changes as well as price changes.

attributable to other income factors would probably not alter the conclusions we are prepared to advance on the basis of the limited empirical analysis presented above.

VI

The conclusions may be briefly summarised.

(1) The abominable snowman presented by Mr. Allen proves on close inspection to be just as illusory as all the preceding members of its genus. It is not the specimen he thought it to be, but is instead the economist's familiar and useful forward-rising supply curve.

(2) Western Canadian farmers, as a group, adjusted their plantings of wheat appropriately to year-to-year changes in the price of wheat relative to the prices of competing crops. Responses to two-year average price relationships may have been even more significant, but this cannot be satisfactorily tested because of the serious incomparabilities in the acreage data.

(3) Although the proportional wheat-acreage shifts were small to moderate, and broadly in line with the view that the price-elasticity of supply of Western Canadian wheat is low, the shifts were nevertheless large enough to result in substantial adjustments in exportable grain supplies.

(4) Increases in the absolute and proportional wheat sowings in the Prairie Provinces in 1931 and 1932—increases referred to as " perverse responses " by some economists who have looked only at the distressingly low wheat prices in those years—resulted from (*a*) continued population settlement and expansion of cultivated land in that region, and (*b*) *positive* responses of farmers to prices and values per acre that were relatively higher for wheat than for the chief competing crops. Moreover, in both 1931 and 1932 Western Canadian farmers had reason to believe that any governmental aid forthcoming would continue to be in the form of measures designed to support or supplement the market price of wheat, and wheat alone.

(5) If farmers in Western Canada typically make appropriate and significant acreage adjustments in response to changing crop-year price relationships between wheat and competing crops, it seems safe to infer (pending further empirical studies) that experienced grain-market analysts are correct in believing that large groups of commercial producers in virtually all major wheat-producing countries make significant *marginal* adjustments in their crop plantings on the basis of past and expected future price relationships. In many countries where the climatic conditions are more favourable and the competing crops more numerous than in Western Canada, wheat-acreage shifts are likely to be proportionally greater in response to given changes in price relationship. These inferences warrant not only further empirical investigation, but also careful consideration by those economists and governmental policy-makers who have recently been preoccupied with the desirability of stabilising wheat prices (independently of other prices) at national and international levels. Such stabilisation holds the threat of interfering with price changes that would encourage desirable

creage adjustments in a large number of countries and, no less important, ppropriate expansion or contraction of the food-feed demand for wheat.

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APPENDIX

The " perverse " wheat plantings in the years represented by hollow circles n Chart 4 were largely due to the particular factors described below.

In 1915 Saskatchewan wheat plantings expanded sharply, and to an unusually igh level, in response to war-time appeals for increased sowings, rapidly rising vheat prices and ideal weather for both fall ploughing (in 1914) and spring seeding.[1] Even if equally favourable price and weather conditions had prevailed the ollowing year, some compensatory contraction might have been expected in the 916 wheat acreage—at least enough to compensate for the extensive 1915 plantings on land that normally would have been summer-fallowed.[2] Such normal contraction was reinforced in 1916 by a late spring that delayed seeding nd resulted in increased sowings of competing coarse grains that could safely e sown later than wheat. In 1917 and 1920, also, the situation again " was notable for the backwardness of the spring . . . which made it impossible for armers to sow as much wheat as would otherwise have been put in." [3] Indeed by April 30, only 5% of the " intended " wheat sowings had been planted in 1917 nd only 4% in 1920 (two of the lowest figures on record), as contrasted with 94% under the favourable weather conditions of 1915. Still more important in accounting for the extraordinarily sharp reduction in the wheat-acreage ratio for 1917, however, was the " improved " method of acreage estimation then introduced, which greatly exaggerated the true increase in sowings of coarse grains between 1916 and 1917.[4]

Anticipation of lower future wheat prices apparently contributed heavily to the abnormal reductions in the proportional wheat sowings of 1920, 1930 and 1939. In the spring of 1920 Western Canadian farmers undoubtedly under-estimated the high supplementary payments that they were eventually to receive from the Canadian Wheat Board on their pooled 1919-crop deliveries and since they then knew that there would be no government-guaranteed wheat price for the the 1920 crop, many presumably expanded their sowings of coarse grains in response to the existing high free-market prices for barley and oats. Again in 1930, Canadian farmers were discouraged about the future price outlook for wheat, this time as a result of deepening concern about the continued downward course of prices, the persisting superabundance of wheat and the widely publicised financial difficulties of the Canadian Wheat Pool.[5] Only moderately

[1] *Census and Statistics Monthly* (later *Monthly Bulletin of Agricultural Statistics*), various issues, including November 1914, May 1915 and January 1916; and C. P. Wright and J. S. Davis, " Canada as a Producer and Exporter of Wheat," *Wheat Studies of the Food Research Institute* (Stanford University, California), July 1925, I, No. 8, pp. 242–5.

[2] *Census and Statistics Monthly*, November 1915, p. 279.

[3] *Monthly Bulletin of Agricultural Statistics*, January 1918, p. 1. This quotation refers specifically to sowings for the 1917 crop, but similar statements were made by the same Office with regard to 1920 sowings (*ibid.*, May 1920 and November 1921).

[4] *Ibid.*, January 1918, p. 4.

[5] Canada, *Report of the Royal Grain Inquiry Commission*, 1938, pp. 35, 76–8.

less striking was the situation in the spring of 1939, when Western Canadian farmers faced the prospect that the minimum guaranteed wheat price of the Canadian Wheat Board would be materially reduced for the 1939 crop and that deliveries at the guaranteed price were likely to be restricted.

In contrast, anticipation of future price support from protective government wheat programmes was apparently largely responsible for the abnormally increased wheat-acreage ratios of 1919 and 1932. In 1919, when there was widespread expectation that world grain prices would decline sharply from their high war-time levels, Canadian farmers had reason to hope that they could induce the Canadian Government to continue for another year its war-time monopoly purchasing of wheat at high fixed prices, thus favouring wheat relative to other grains.[1] Similarly, in 1932, when agricultural prices were disastrously low, Canadian farmers had reason to believe that the Government would give special protection to wheat by continuing to finance " wheat-stabilisation operations," by furthering wheat exports through negotiations at the 1932 Ottawa Conference and perhaps by renewing the wheat-transportation subsidy paid to growers in 1931/32.[2]

Finally, the " excessive " wheat-acreage expansion of 1921 primarily reflected readjustment from the abnormal contraction of wheat sowings in 1920, accentuated by incomparabilities in the acreage data; while the slight increase (instead of appropriate reduction) in the proportional wheat acreage of 1927 was apparently closely associated with the 1936 drought, which resulted in record summer-fallowing of land and shortage of seed oats and barley for the following year.[3] In 1937, relatively heavy early sowings of wheat were facilitated not only by the large area of summer-fallowed land that was ready for planting, but also by favourable early spring weather; later in the spring persistent sectional drought curtailed plantings of the later-sown feed grains.

[1] D. A. MacGibbon, *The Canadian Grain Trade* (Toronto, 1932), pp. 60–4.

[2] *Report of the Royal Grain Inquiry Commission*, 1938, pp. 36, 94–100; W. Sanford Evans, " Canadian Wheat Stabilization Operations," *Wheat Studies*, March 1936, XII, No. 7, especially pp. 259 ff.; D. A. MacGibbon, *The Canadian Grain Trade*, 1931–1951 (Toronto, 1952), pp. 17–25.

[3] *Monthly Bulletin of Agricultural Statistics*, March 1937, pp. 94–5; May 1937, pp. 130–4; January 1938, p. 2; W. Sanford Evans and Co., *Field Crop Acreage: Manitoba, Saskatchewan, Alberta, Prairie Provinces*, 1913–1945, Winnipeg, April 1946.

BENTHAM AS AN ECONOMIST[1]

I

In the spring of 1941, at the original suggestion of J. M. Keynes, th Royal Economic Society commissioned Dr. Stark to prepare a comprehensiv edition of Bentham's economic writings. Dr. Stark's task did not include th tracking down of long-vanished documents as had that of Ricardo's edito but rather lay primarily in deciphering, sorting, selecting from and piecin together the masses of manuscript material at University College, the Britis Museum and Geneva. These vast heaps of papers were only legible wit great difficulty, and were shuffled about in a state of complete confusio which such pagination as Bentham had provided only aggravated rath than alleviated. Everyone interested in the history of economic though and in Bentham in particular, is very deeply indebted to Dr. Stark for tl devotion and skill with which he has produced these three volumes and f the great interest and illumination they afford.

Dr. Stark's problems have inevitably, in the nature of the case, be those of continual selection and arrangement. The more or less insolub problems of selection were on two fronts: that of selecting " economic from " non-economic " writings—necessitated by modern specialism—a that of selecting those worth including from the masses of notes and fra ments. Since, almost by definition, a " scholar " is one who never trus if he can possibly help it, any other selection or arrangement than his ow one might run the risk of appearing " unscholarly " unless, at least formal certain reservations were expressed. (Not that we wish to press su reservations, because Dr. Stark has the obvious and valid reply that if o does not like *his* selection and arrangement, then one can go and bury ones in the Bentham manuscripts for ten years, as he did, and produce one's ow

However, unexhausted by the myriad problems of selection and arran ment posed by the manuscripts, Dr. Stark went on to select and arrange this edition two anthologies, at the start of Vol. I and at the end of Vol. I of passages from Bentham's already published non-economic writin designed to illustrate or unfold his conception first of the Philosophy Economic Science and, at the end, of the Psychology of Economic M But helpful and instructive though these passages are—extending from sin sentences to several pages—one would like to feel certain that their inclus has not taken up space which might have gone to material of interest

[1] *Jeremy Bentham's Economic Writings. Critical edition based on his printed works and unprinted m scripts*, by W. Stark, in three volumes (London: Allen & Unwin. Vol. I, 1952, pp. 412, Vol. II, 1952, pp. 458, 40*s*.; Vol. III, 1954, pp. 600, 45*s*. Obtainable by Fellows of the R Economic Society at the following special prices: Vol. I, 20*s*.; Vol. II, 27*s*.; Vol. III, application, including remittance, should be made to the Secretary, The Royal Economic Soc The Marshall Library, Downing Street, Cambridge.) Physically, these volumes, in particular i spacing and margins, are in marked contrast with the Ricardo edition, and provide a not ent welcome reminder of the austere years in which they were conceived.

economists still unpublished. Perhaps one *should* feel certain about this, in view of the extreme care and competence of Dr. Stark's work. Nevertheless, there is in fact the example of an extremely interesting fragment on the moral calculus, published for the first time in 1952, which would certainly have been a most suitable and valuable item for this edition.[1] We trust that this is an isolated example. Dr. Stark informs us that before the publication of this edition only " at best the tenth part " of Bentham's economic writings had been available in print (I, p. 11). It is difficult to estimate the percentages of new and previously published material in these three volumes, since some of the texts have been re-arranged or expanded as compared with the versions already available. But it does not seem that very much more than a half, or two-thirds at the most, can be new, and therefore very large quantities of Bentham's economic writings must still remain in manuscript, being presumably too repetitive, fragmentary or incoherent to do anything with.

The great services which these volumes afford might be briefly described as follows. First, they enable us to consider for the first time Bentham's contribution to political economy, which though it certainly does not take the form of a carefully finished, well-rounded achievement, easy to weigh up, is nevertheless chock-full of powerful, fertile and independent ideas on some of the perennial and fundamental problems of economic analysis and policy. At least some of the misconceptions about Bentham's standing as a political economist ought now to be removed (at any rate, for example, the statement Keynes once made that Bentham " was not an economist at all ").[2] More particularly, these volumes put before us in all their profusion and variety Bentham's ideas on the theory of money, investment and employment,[3] and they tell a deeply interesting story of the development and the fundamental changes in his ideas on this subject. Bentham devoted about eighteen years to politcal economy (*c.* 1786–1804), and in that time moved from a thorough-going acceptance of the " classical " Smithian doctrines on saving and investing and their implications for policy to what amounts to a thorough-going rejection. After 1804 he never actively returned to the subject or showed much interest in the great new developments of the Ricardo era, except for a very minor pamphlet in 1821. This story provides us with another of those ironies in the history of economic thought—all the more ironical in this case in view of the tremendous fame and influence of our author—where good original ideas, fundamentally acceptable to most economists of a subsequent period, were left buried and suppressed while the stage was dominated by doctrines now mainly and fundamentally rejected.

These volumes add little or nothing to the analysis of utility and diminish-

[1] See Appendix IV of D. Baumgardt's *Bentham and the Ethics of Today*, 1952, pp. 554–66. It might, on the other hand, have been useful and relevant to have included the *Tracts on Poor Laws and Pauper Management* printed in Vol. VIII of Bowring's edition, which contain, among other things, an interesting criticism of minimum-wage legislation, and also *Emancipate Your Colonies*.

[2] *The End of Laissez-faire*, p. 21.

[3] The importance of Bentham as a monetary theorist had been suggested by F. A. Hayek in his " Note on the Development of the Doctrine of Forced Saving," *Quarterly Journal of Economics*, 1932, pp. 123–33. See also J. Viner, *Studies in the Theory of International Trade*, p. 188.

ing utility available in Bentham's already published writings. It has often been pointed out, obviously with much truth, that Bentham's development of, and emphasis on, the two concepts of maximisation and utility make him above all the ancestor of neo-classical economic theorising, and especially of Jevons and Edgeworth. But these ideas were developed in Bentham's political, legal and philosophical writings. As an *economist*, as to-day defined, Bentham made no attempt to develop an economic calculus or a theory of relative values and prices. His economic theorising, in fact, is of an exactly opposite pattern to that typical of the neo-classicals. It is *not* mainly abstract, deductive and "micro-economic," tighly organised around the assumption of a maximising individual; but on the contrary, is rather practical, "macro-economic," concerned with aggregate monetary problems, and if not statistical, at any rate concerned to exploit such crude statistics as were available, while being ready for and calling for more.[1]

Finally, these volumes make it possible to reassess, as seems rather badly needed, Bentham's theory of economic policy, or his views on the role of the state in economic life. Our next three sections will refer briefly to some comments of Bentham on utility and value, will go on to tell in more detail of the development of some of his ideas on money, investment and employment, and will then discuss his doctrines on the role of the state.

II

As we have said, these volumes add very little that is new on the felicific calculus or the analysis of utility, to which Bentham had made such original contributions, mainly in his already published non-economic writings. Nor does Bentham attempt a systematic analysis of value and price. The most important new passage on this subject in these volumes takes the form of an interesting criticism of Adam Smith's treatment of utility. This comes in *The True Alarm* (1801), the opening sections of which are the nearest we get in Bentham's writings to a systematic account of economic principles. After emphasising that "all value is founded on utility . . . where there is no use, there cannot be any value" (III, p. 83), Bentham goes on to Smith's distinction between value in use and value in exchange, complaining that Smith "has not attached to it clear conceptions." Bentham is referring, of course, to the famous fatal sentences in *The Wealth of Nations*, almost the only ones throughout the book where value in use or utility gets any explicit mention, where Smith says, quite definitely, that value in use is in no way necessary for value in exchange, and vice versa, and that the

[1] M. P. Mack in a recent study refers to Bentham "spending at least 10 years of futile effort trying to ferret out correct statistics for the gross national income, tax revenues, agricultural production, etc." See "The Fabians and Utilitarianism," *Journal of the History of Ideas*, January 1955, p. 82. Bentham showed much interest in and reliance on the contemporary attempts at Political Arithmetic of Dr. Henry Beeke, who, in his *Observations on the Produce of the Income Tax* (1800), attempted to estimate the national income. Bentham also refers to the pioneer attempt at a price index-number of Sir George Evelyn Shuckburgh (1798). One may guess that Bentham was far more interested in this practical statistical attempt to measure changes in the value of money than in some of the near-metaphysical arguments over labour as a measure of value.

two are in fact "frequently" quite separate. Bentham criticises Smith not for the distinction itself but for the way in which he formulates it, and for illustrating it by the paradox of water and diamonds. Bentham himself resolves this paradox on lines which clearly point in the direction of the marginal utility theory, that is, by invoking the plenty or scarcity of the supply, though he does not, of course, actually introduce the marginal concept:

> "*Water* is the example he has chosen of that sort of article which has great value with a view to use but none with a view to exchange. In order to realize how erroneous the latter assertion is, he would only have had to consult in London the New River Board, and to remember that at Paris he had seen it sold retail by those who carry it into the houses.
>
> "He gives *diamonds* as an example of that sort of article which has great value with a view to exchange and none with a view to use. This example is as ill chosen as the other. . . . The value of diamonds is . . . a value in use. . . .
>
> "The reason why water is found not to have any value with a view to exchange is that it is equally devoid of value with a view to use. If the whole quantity required is available, the surplus has no kind of value. It would be the same in the case of wine, grain, and everything else. Water, furnished as it is by nature without any human exertion, is more likely to be found in that abundance which renders it superfluous: but there are many circumstances in which it has a value in exchange superior to that of wine" (III, pp. 87–8).

It is clear that if Bentham had ever got down to formulating precisely a general theory of value his approach would have differed fundamentally from the "classical" analysis of Smith and Ricardo. He would have continued in the tradition of Galiani, Pufendorf and the Schoolmen.[1]

III

Bentham's economic writings deal mainly with macro-economic questions arising, in several cases, out of topical issues of war finance and inflation, or

[1] On the subject of the water and diamonds paradox, which had, of course, been satisfactorily resolved by a number of writers before Smith (*e.g.*, Davanzatti, Law and Galiani), Schumpeter writes of "the astounding fact that Smith and Ricardo thought that this alleged paradox barred the way to a theory of value based on value in use" and refers to Smith "thereby barring, for the next two or three generations, the door so auspiciously opened by his French and Italian predecessors" (*History of Economic Analysis*, pp. 300 and 309). Bentham's remarks, if they had had any influence, might have helped to re-open this door. Ricardo, however, when he read this criticism of Smith by Bentham, noted emphatically in favour of Smith (cf. his comments in *Works*, ed. Sraffa, Vol. III, p. 284).

Incidentally, Schumpeter's "astounding fact" becomes all the more astounding when one recalls that Smith's main general statement in the *Wealth of Nations* on utility and value, at any rate at some points, directly contradicts his own statements as reported in the Lecture Notes of 1763 on the relations of "use," demand and value, and also the indications given in the Lecture Notes of the way in which the water and diamonds paradox is to be resolved in terms of scarcities (*v. Lectures*, ed. Cannan, pp. 157 and 176–7). Smith's famous statement in the Wealth of Nations also contrasts at some critical points with the treatments of utility, scarcity and value by his predecessors at Glasgow, Hutcheson and Carmichael (who has a very acute note on the subject). I am indebted on this question to an unpublished essay by Mr. W. L. Taylor.

" how to pay for the war," and his theoretical analysis is centred around questions of capital, saving, investment, money and employment. His starting point was that of a thorough-going, but even then by no means uncritical, disciple of Adam Smith. He accepted, to start with, the Turgot–Smith analysis of saving and investment [1] (the cornerstone of " classical " economics in the Keynesian sense) and, what went logically with it, the unqualified approval of " parsimony " and saving, and what came to be the Ricardo–Treasury view of the uselessness and waste of public works and public investment. On the other hand, in his later economic writings we find Bentham completely and fundamentally rejecting this self-same set of ideas, putting his finger very precisely on the limitations in its assumptions and applicability, and advocating in consequence completely different policies and a very different attitude to the role of the state in economic life. The trend of Bentham's thinking on these subjects is perfectly clear, though in writings that are often unfinished and dashed off in a completely unrevised note form, there are numerous deviations and inconsistencies around the trend.[2] If he had devoted a certain amount of time and patience to the task of working his ideas up into a finished, balanced treatise, or if he had found some understanding disciple to help him in this task—instead of Dumont, Mill and Ricardo—it is clear that Bentham could have produced a work as outstanding as Thornton's *Paper Credit*.

Bentham's first economic work, the well-known *Defence of Usury*, is primarily a policy pamphlet containing little in the way of theoretical analysis. Though devoted to criticising Smith from a more-Smithian-than-Smith point of view, it is entirely under the influence of Smith. We have now an hitherto unpublished postscript to the *Defence* which shows how his theoretical interests were developing. Here Bentham gives us a restatement of the Turgot–Smith theory of saving and investing and draws from it the logical implication that voluntary " parsimony " or saving always must result in, and is unconditionally necessary for, capital accumulation. He writes: " Whoever saves money, as the phrase is, adds proportionately to the general

[1] On the Turgot–Smith analysis of saving and investment, on the sharp break it marks with preceding doctrines and on its dominating influence right down into the twentieth century, see Schumpeter, *History of Economic Analysis*, in particular pp. 191–3 and 282–8. This theory of saving and investment (rather than what is called " Say's Law ") might well be considered the cornerstone of " classical " economics in the Keynesian sense. And, in emphasising the immense influence and wide unquestioned acceptance of the theory in orthodox circles for 150 years, Schumpeter can be said to be offering considerable confirmation of Keynes' generalisation about the history of economic thought.

[2] We must regard as outside the trend of Bentham's thought, as set out in these volumes, such passages as are to be found in his early letters expounding the desirability of public works for the relief of unemployment (1776), and suggesting that with a suitable monetary and investment policy " those commercial distresses which beget distrust and produce ruin to many respectable individuals, while they distrust the beneficial intercourse of commerce *could rarely happen* " (1779, Bentham's italics). See *Works*, ed. Bowring, Vol. X, pp. 85 and 338–9. The throwing out of these ideas could be regarded as a significant foretaste of Bentham's later position, but they come a decade before he began to devote himself regularly to political economy, before he had temporarily adopted the Smithian analysis of saving, investment and capital, and, of course, before any of the writings included in this edition.

mass of capital. . . . The world can augment its capital only in one way: viz by parsimony " (I, pp. 196–8), and " parsimony " here means voluntary private individual saving. This leads on, as Bentham puts it, to " the development of the Principle ' No more trade than capital ' or ' capital limits trade ' " (I, p. 201). In the *Manual* Bentham actually complains that Smith had not been explicit enough in proclaiming this principle, though he adds, with more justification, that Smith " conforms to it in every recommendation he gives, and writes almost throughout as if it were constantly uppermost in his thoughts " (I, p. 233).[1]

The principle, Bentham tells us, " that the trade of every nation is limited by the quantity of capital, is so plainly and obviously true as to challenge a place among self-evident propositions " (I, p. 212). As we know, propositions in economics laid down as plainly and obviously true and self-evident very often, when one begins to dig into them, fold up into definitions, tautologies or, at best, trivialities. So rather than argue over what Bentham " really meant," in the abstract, by this principle, it may be more fruitful to consider what in practice it implied for him by observing the lively political rabbits which he conjures out of this collapsible opera-hat. The first political rabbit to emerge from this proposition " No more trade than capital " has " *laissez-faire* " written all over it. It is the same animal (or at any rate one of a very similar species) as the Ricardo–Treasury view. As Bentham puts it:

> " Therefore no regulations nor any efforts whatsoever, either on the part of subjects or governors, can raise the quantity of wealth produced during a given period to an amount beyond what the productive powers of the quantity of capital in hand at the commencement of that period are capable of producing " (I, p. 201).

Hence government action can only *divert* investment resources from one line to another, not raise the level of investment.

The *second* important political rabbit—perhaps a rather surprising one —which Bentham conjures from his principle of " No more trade than capital " is that it would pay Great Britain to give up her colonies—or at any rate that there are no economic advantages, in the form of the investment opportunities they provide, to outweigh the burdens and expenses of their upkeep.

The chain of argument is that there is only a fixed fund of capital; there

[1] Bentham's " Principle " is suggested, as follows, by Smith: " No regulation of commerce can increase the quantity of industry in any society beyond what its capital can maintain. It can only divert a part of it into a direction into which it might not otherwise have gone " (*Wealth of Nations*, Everyman ed., I, p. 398).

This principle of " No more trade than capital " is, of course, highly reminiscent, or rather anticipatory, of the Wages Fund doctrine. Indeed, Bentham is described as the originator of that doctrine by Marx: " The classical economists have always been fond of considering social capital as a fixed magnitude possessing a fixed degree of efficiency. But this prejudice does not harden into a dogma until we come to the arch-philistine, Jeremy Bentham, the insipid pedantic leather-tongued oracle of the commonplace bourgeois intelligence of the 19th century. . . . I should call Mr. Jeremy a genius in the way of bourgeois stupidity," etc., etc., etc. (*Capital*, Everyman ed., Vol. II, p. 671).

are always just as profitable outlets for this at home, which do not require the extra military and administrative expenses that colonial investment necessitates. This assumption, that there are always just as profitable investment outlets at home—which incidentally seems possibly to conflict with Bentham's often-repeated generalisations about the falling rate of profit—is based on a sort of Say's market analysis applied to agriculture, to the effect that the supply of savings-investment will always create its own profitable demand —which is really implicit in the Turgot–Smith analysis.[1]

After *The Defence of Usury* and a brief essay on *Colonies and Navy* (1790), Bentham's next main economic work is the *Manual of Political Economy* (1793–95), from which we have already inserted some quotations.[2] In this treatise on the principles of economic policy Bentham is still to be found emphasising most strongly the *laissez-faire* conclusion which he takes to follow from his doctrine of " No more trade than capital " : government can only *divert* investment funds, not raise the total level of investment.

> " Whatever is given to any one branch, is so much taken from the rest. . . . If the government money had not taken that direction, private money would if the government would have given it leave. . . . Every statesman who thinks by regulation to increase the sum of trade, is the child whose eye is bigger than his belly " (I, pp. 234, 241 and 252).

[1] Bentham's hypothesis of unlimited investment opportunities in agriculture at home is based on the assumption that the British labouring class provides an ever-expanding market for beer: " In England, the lowest wages of labour will always find a man more bread than he can eat: therefore considerably more wheat than is produced at present, would, if not exported, not find purchasers. But the lowest wages of labour, nor wages much above the lowest, will not find a man as much strong beer as he can drink, nor even as he can drink without hurting himself. Therefore, even independently of exportation, there is no danger of the nation's being overstocked with such of the productions of agriculture as are fit for making beer. . . . Agriculture then will always find a sufficient market for itself: it is impossible it should ever fail to do so " (I, p. 206).

It would be most interesting to follow further Bentham's views on the economics of colonial development. Like those of other economists of the classical period, they tie in very closely with his analysis of saving, investment-opportunities and the falling rate of profit. By and large there seems to be a considerable change in Bentham's attitude to colonial development very broadly—though far from precisely—in tune with the change we are describing in his economic ideas. But the divergencies in Bentham's views on colonies seem very wide and erratic: contrast the vision with which the *Defence of a Maximum* (1801) ends and the preceding argument: " Men spreading in distant climes, through distant ages, from the best stock, the earth covered with British population, rich with British wealth, tranquil with British security, the fruit of British law " (III, p. 302), with Bentham's argument that if the two sides had acted rationally in 1776 the Americans would have sought to remain in the British Empire, and the British would have sought to get rid of the Americans (III, p. 357). The concluding paragraphs of *The Defence* cast some doubt on E. G. Wakefield's claim to have converted Bentham in his last years (1829–31) from his earlier view that colonisation was a waste of capital, to Wakefield's own strongly favourable views. Bentham had at least half-converted himself thirty years before. See *England and America*, p. 252 n., and R. C. Mills, *The Colonization of Australia*, pp. 94 and 152. For the latter reference I am indebted to Professor L. C. Robbins. As a further example of Bentham's vagaries one may cite his attack on the Navigation Laws at one point, and his justification of them at another (Contrast I, p. 211, and III, p. 340). Similarly with the infant industries argument for protection.

[2] What appears as *The Manual of Political Economy* in Bowring's edition is, according to Dr. Stark, concocted from a mixture of manuscripts of two very different dates. Dr. Stark has sorted out the two works. Much of what appears as *The Manual* in this edition is published for the first time and dates from 1793–95, while much of what Bowring published as *The Manual* is now to be found in a work now called *The Institute*, dated 1801–4—the last important work in this edition.

However, though continually repeating such sweeping categorical assertions, Bentham does for the first time introduce a qualification, which was to grow later into an extensive body of monetary analysis. This qualification comes in a note at the end of the *Manual* headed " Connection of the Paper Money Question with the Rest of the *Manual*." Though " forced accumulation " by means of taxation is first referred to in the main part of this work, the proper concept of " forced saving " (though not, of course, the *term*), appears first in this addition on paper money.

Bentham writes, Government " can't increase wealth because they can't increase capital. Is there anything it can and ought to do to increase capital? Does paper money, for instance, increase capital? " (I, pp. 269–70). Bentham's answer in equally brief note form is:

> " If all were fully employed it [the issue of paper money] could not increase industry. If any were unemployed, or not fully employed, it might increase industry *pro tanto*. . . . It actually is productive of an addition to the mass of national wealth, in as far as it gets extra hands, or sets them to work at extra hours " (I, pp. 270–1).

However, at this point, in contrast with his later views, Bentham simply mentions this possibility as an abstract theoretical *curiosum*, and considers that in practice attempts by governments to act on it would be dangerous.

This is the last that we have from Bentham on the subject for several years. But it was a turning-point. For when he returns to the subject Bentham advances straight through the cleft he had thus opened in the Turgot–Smith saving-investment analysis and in the Principle based on it, of " No more trade than capital." In fact, he completely abandons that Principle and the particular assumptions on which it rests, as well as the policy conclusions he drew from it.

His lengthy work on *Circulating Annuities* (1800)—unfinished like so many of the others—is concerned with his scheme for interest-bearing government notes which would serve both as paper money and small savings certificates. Here Bentham strenuously analyses the effects of changes in the quantity of money on the level of economic activity. An increase in the quantity of money may, Bentham repeatedly tells us, either or both raise prices or raise output—if initially there is unemployed or misemployed labour available. He observes:

> " In political economy as in chemistry, results are scarce ever obtained pure: while part of the new influx [of money] is employing in producing the beneficial result of an increase of real wealth through the medium of profitable labour, other part will be employing itself in the raising of prices of labour here and there, and thence of this and that class of goods: and, indeed, it is scarce possible that a new mass of dormant labour should be called forth into act without making some addition to the recompence given to the mass already in employment " (II, p. 313).

Above all, Bentham notes, monetary inflation may be a serviceable policy in " *war time*—a time in which money having to be raised in large quantities

for the service of government, must for a time be diverted from other channels" (II, p. 315).

The effects of monetary expansion depend on how or where the new money initially enters the system and on the propensity to consume or save of those who initially receive it. It is not too anachronistic to use the modern terms, for Bentham quite clearly understands something of the significance of the consumption function and even attempted a very rough calculation of its order of magnitude. For example he notes: "It cannot be supposed that upon the mass of income from labour—most of it . . . being the labour of the poorest classes,—the ratio of savings to income can amount to anything like what it does in the case of income from profit of stock: to anything like $\frac{10}{15} = \frac{2}{3}$ of the amount of income: one should scarcely expect to find it amount to $\frac{2}{30}$ (II, p. 324 *n*)." Bentham also notes that a higher percentage of the new money paid out to highly-salaried officers will be saved than of that paid out to the lower-salaried (II, p. 322).

At one point Bentham rejects the possibility of deflationary cures for unemployment and is led into some most "mercantilistic"-sounding statements, in direct contradiction to his earlier principle of the fixed relation between voluntary saving and capital formation:

> "No addition is ever made to the quantity of labour in any place, but by an addition made to the quantity of money in that place. . . . In this point of view, then, money, it should seem, is the cause, and the cause *sine qua non*, of labour and general wealth" (II, p. 326).

He adds: "This and a great deal more that might be added, is not in Adam Smith—but it belongs not the less to the science so well taught by Adam Smith" (II, p. 330).

In fact, in a remarkable footnote Bentham proceeds to criticise Smith for at least one of the main themes of his attack on mercantilism:

> "Though 2 millions' worth of gold and silver is not worth a farthing more than 2 millions' worth of anything else, there is not on that account any absurdity in the exultation testified by public men at observing how [great] a degree what is called the balance of trade is in favour of this country. . . . Seduced by the pride of discovery, Adam Smith, by taking his words from the kitchen, has attempted to throw an ill-grounded ridicule on the preference given to gold and silver" (II, p. 337 *n*).

In fact, Bentham claims that he has indicated the way in which "an answer may be found to a question for which I have in vain endeavoured to find an answer in Adam Smith and other books" (II, p. 339)—that question is by what process and with what chain of causation new money enters the economic system. He complains that "for my own part, I must confess, I never was able to obtain what to me appeared a clear insight into this part of the subject from the instructions of Adam Smith. Metaphors taken from wheels and water seemed to take place too often of definition and exemplification" (II, p. 342 *n*).

In his different works Bentham alternates, superficially somewhat confusingly, between warnings against the damage done by *de*flation and forebodings as to the injustices of *in*flation—long and short term (as in *The True Alarm*). But whether he is concerned with the one or the other Bentham constantly emphasises the crucial importance of whether the initial situation is one of full employment or one where there are unemployed resources, that is, there is no question for Bentham of full employment, or something near it, constituting some sort of realistic norm or equilibrium towards which the system actually "tends." Bentham fully appreciated the distinctions implied between *in*flation and *re*flation, and *de*flation and *disin*flation. For example, at the end of his pamphlet *Paper Mischief Exposed* (1800–1) Bentham examines the effects of what he calls "the money-hoarding system," or "the system of laying up hoards of money on the part of government, in reserve for casual exigencies" by some kind of budget surplus (II, p. 453). (Incidentally the "Paper-Mischief" is not that of paper money as such, which Bentham approves, but that of the unregulated issue of paper-money by numerous private banks.) In a period of full employment, or over-full employment, with prices rising, such "government hoarding" will not lower output but will damp down the rise of prices. But on the other hand, "let us suppose that there exists in the country a quantity of unemployed capacity for labour. . . . In this case the defalcation from the mass of money is really productive of a correspondent, though not equal, defalcation from the mass of wealth. The money hoarded by government, and hence defalcated from the stock of money in circulation, is parcel of the money raised by taxes: the taxes are imposts laid, for the most part at least, if not exclusively, on expenditure" (II, p. 454).

Bentham's next work is called *The True Alarm* (1801), its subject being the long-term and short-term dangers and injustices of inflation (especially with an unregulated private note-issuing system). Bentham wavered between writing a formal treatise and a polemical pamphlet and in the end—as usual—abandons the work unfinished. However, he turned the manuscript over to his editor Dumont, who ten years later (in 1811) consulted J. Mill and Ricardo about preparing it for publication, and we have the Notes on this work which Ricardo then made (*v.* Vol. III of Sraffa's edition p. 259).

Here Bentham attacks the Turgot–Smith savings-investment analysis at its roots, by setting out the different ways in which the individual can use his money income. Bentham explicitly includes what he calls "laying it up"—a possibility omitted in Smith's analysis of saving and investing. He also very precisely puts his finger on the two vulnerable points in that analysis —which nevertheless, as Schumpeter has shown, remained so extremely influential right through the nineteenth and into the twentieth century. These two vulnerable points are, first, analysis in real terms applied with no (or no adequate) qualification to a monetary economy; and, second, exclusion of the possibility of what Bentham calls "laying up" or the possibility of "hoarding."

Later on Bentham examines the effects of an increase in frugality or

decrease in consumption (III, p. 120). The first effect of a decrease in consumption, if it is not offset, is a fall in prices and then of production. But, of course, the fall in consumption may be offset by an increase in investment either on the part of the savers themselves or of others who have borrowed from the savers, directly or through a banker, either to invest or consume. In this case only frictional adjustments will be necessary. But if the income saved " instead of being put into circulation, is for an indefinite time put into a chest and kept there " then the " case is the opposite of the preceding one." The fall in consumption is followed by a fall in prices, production, profits and investment. Thus frugality is now, for Bentham, by no means unconditionally beneficial as it had been in his earlier writings and in Smith. In fact, Bentham goes on to extol the benefits of luxury expenditure in the manner of Mandeville:

> " Let the rich and those in power spend all their revenue, as far as is possible, on superfluities, they cannot deprive the merchant of his profit on their expenditure : and as for the merchant, . . . he will not be able to rid himself of that disposition to accumulate which, to a greater or less degree, seems to be inseparable from his mode of life. Hence whatever the manner of expenditure . . . the merchant will not fail to levy a tax on prodigality for the encouragement and the increase of industry and wealth " (III, p. 124).

Bentham also takes up in *The True Alarm* his doctrine that an expansive monetary policy can raise the level of economic activity without voluntary saving. The effects of such a policy will, of course, turn on whether or not there are unemployed resources. Here Bentham emphasises how very difficult it is to define or perceive in practice when this exact point of " full employment " has been reached. As to this Bentham makes a statistical estimate that would seem to require some upward revision for the period since 1800:

> " A thousand politicians have ventured predictions, and a thousand politicians have been wrong. Everybody wishes to decide the question in order to declaim about the actual state of affairs and to say with emphasis that we have reached the highest possible degree of prosperity and that that prosperity is no more than a dream which is going to vanish. To me it seems that something is gained if the difficulty of pronouncing on this point is shown. It amounts to a refutation of all the positive assertions of the two parties, to giving both of them a lesson in moderation and toleration. In the eyes of impassioned ignorance there exists no difficult question " (III, p. 148).

It is interesting to turn to Ricardo's notes on *The True Alarm* and find him expressing his complete *dis*agreement with Bentham's doctrine as to the possible beneficial effects of an increase in the money supply—he does so as repetitiously as Bentham states his doctrine.

We find Ricardo asking: " Why should the mere increase of money have any other effect than to lower its value? How would it cause any increase in the production of commodities. . . . Money cannot call forth goods—but goods can call forth money " (reminiscent of a passage in Smith). In fact, Bentham's doctrine is for Ricardo " a stumbling block . . . that money is the cause of riches has been supported throughout the work and has in my view completely spoiled it." [1]

Ricardo, in fact, could see nothing at all in Bentham's doctrine, just as he could see nothing at all in Malthus' ideas on effective demand, and J. B. Say's ideas on utility and value. He was, of course, holding with the strictest logic to the Turgot–Smith theory of saving and investing—to what he called " Mr. Mill's Principle," or the Say–Mill analysis of markets.

There is just one more point to add by way of illustrating the development of Bentham's ideas, and this is from his next work *The Defence of a Maximum* (1801) (*i.e.*, a maximum price for bread). Bentham here referred back to his arguments in the *Defence of Usury*, fourteen years before, where he had *attacked* a *minimum* legal rate of interest. He is at pains, in defending a maximum price of bread, to point out that he did not attribute to the market rate of interest any automatic self-adjusting equilibrating tendencies—a view which supporters of his attack on the control of the rate of interest had ascribed to him. This passage is of considerable general interest from the point of view of Bentham's attitude to the principles of economic policy, and his scepticism as to the methodology of equilibrium theorising and the economic harmonies. His particular point is that the rate of interest does not adjust (or optimally adjust) saving and investment:

> " Gentlemen, when they have done me the honour to join with me, as it seemed to them, in opinion on this subject, have sometimes, whether for shortness or for ornament, referred in this way to a law of hydrostatics as the ground for it. Money, according to my opinion, I mean according to their edition of it, was a sort of thing that would find its own level, or that ought to be left to find it. Between what does naturally take place, and what ought to take place, there is indeed some difference: but it is a difference which moralists are apt enough to overlook, which they constantly overlook as often as they talk of the law of nature. . . . Neither on that or any other occasion have I ever given, or shall I ever give, serpents for fish, sentiment or metaphor for argument. I have not, I never had, nor ever shall have, any horror, sentimental or anarchical, of the hand of government. I leave it to Adam Smith, and the champions of the rights of man (for confusion of ideas will jumble together the best subjects and the worst citizens upon the same ground) to talk of invasions of natural liberty, and to give as a special argument against this or that law, an argument the effect of which would be to put a negative upon all laws. The interference of government, as often as in my humble view of the matter the smallest balance on the side of advantage is the result, is an event I witness with altogether as much satisfaction as I should its forbearance, and with much more than I should its negligence. Neither in that book [*The Defence*] nor in any other book of mine will any expression be found by which any such association is attempted to be made between the idea of money and

[1] See Ricardo, *Works*, ed. Sraffa, Vol. III, pp. 298, 301, 317–18 and 333. See also Ricardo's extensive comments in his first letter to James Mill in 1811 (Vol. VI, p. 14). In 1822, when Ricardo visited Geneva, he further discussed with Dumont Bentham's economic ideas: "There were few of his doctrines, to which Ricardo did not object " (see Sraffa's note, Vol. III, p. 261 *n.*).

that of a level, *i.e.* between rates of interest and levels. I choose rather to remain unread than feed the reader with such arguments. The particles of a mass of fluid, the particles of a mass of water, have a propensity, when left to themselves, to range themselves upon the same level: human creatures have on their part a propensity to save their own lives: and when water in the search after a level is making its way too fast into a ship, pumps are employed by men to prevail on it to get the better of that propensity, and betake itself to a higher level, and this may serve as an argument in favour of a maximum to any gentleman who finds himself disposed to consider it as such" (III, pp. 257–8).

In comparatively a very few years Bentham had moved a very long way :om his earlier wholehearted acceptance of the Turgot–Smith analysis of aving and investment and his dictum that " every statesman who thinks by egulation to increase the sum of trade, is the child whose eye is bigger than is belly."

IV

Our last quotation brings us to Bentham's views on the respective roles of tate regulation and the free price mechanism, or his theory of economic olicy—a subject which is now one on which widely diverging and even liametrically opposite views are authoritatively advanced. For a long time he consensus of opinion held that Bentham was a representative of thorough-going *laissez-faire* doctrines or, at least—which *may* be rather different—vas typical of " classical " nineteenth-century economic liberalism. Dicey nd Leslie Stephen must have had much to do with establishing this view of Bentham. Dicey used " Benthamism " and " Individualism " as alternative erms, and held that " faith in *laissez-faire* . . . is the very essence of legislative Benthamism." [1] Keynes claimed that in Bentham " we discover the ule of *laissez-faire*, in the shape in which our grandfathers knew it." [2] Alternatively, Bentham and Adam Smith are linked together as the two great joint patriarchs of economic liberalism.[3] Dr. Stark's editorial comnents are, with some qualifications, in tune with this conception. He writes of Bentham's " fundamental liberalism " (III, p. 32), noting that he was " a iberal of the socially progressive variety, not a doctrinaire who would have sacrificed everything on the altar of the dead and deadening principle of *laissez-faire* " (III, p. 52). However, Dr. Stark also tells us that Bentham

[1] See A. V. Dicey, *Law and Opinion in England*, 2nd ed., p. 44. Apparently Dicey had some doubts later about his equation of Benthamism and individualism. In the preface to the 2nd edition he writes: " It is a curious question how far Bentham's own beliefs were logically opposed to the doctrine of sane collectivism " (p. XXX). On Bentham and the rule of *laissez-faire* Leslie Stephen wrote: " In purely economical questions scarcely an exception was admitted to the rule " (*The English Utilitarians*, Vol. I, p. 310). See also J. Bonar, *Philosophy and Political Economy*, p. 189, and R. F. Harrod, ECONOMIC JOURNAL, 1946, p. 438, who writes: " We cannot really have a definition of individualism that excludes Bentham."

[2] *The End of Laissez-faire*, p. 21.

[3] See H. Simons, *Economic Policy for a Free Society*, pp. 104–5: writes of " Adam Smith and Jeremy Bentham and the tradition of thought identified with them." W. H. Hutt actually describes Bentham as " holding even more unwaveringly the *laissez-faire* doctrine " [than Smith], *Economists and the Public*, p. 137.

was " a typical 19th-century liberal in economic matters," and " in his heart of hearts a confirmed votary of *laissez-faire* " (II, p. 8). Presumably there is no direct contradiction here, but the category of " a confirmed votary " who nevertheless " would not have sacrificed everything on the altar " seems to introduce an extremely difficult theological subtlety.

However, in contrast with this view of Bentham as a representative of *laissez-faire* or, alternatively, as a leading fellow-" classical " alongside Smith, Ricardo and Senior, a diametrically opposite view has been gaining ground in recent years. For example, in his Centenary lecture C. K. Ogden, the *doyen* of Bentham-*forschung* referred to him as " the greatest social engineer in history bristling with Five-Year Plans." [1] Sir G. M. Trevelyan " concludes generally that Benthamism was ' in many respects the exact opposite of *laissez-faire*.' " [2] Professor J. B. Brebner goes so far as to argue (criticising Dicey) that " in using Bentham as the archetype of British individualism he [Dicey] was conveying the exact opposite of the truth. Jeremy Bentham was the archetype of British collectivism . . . Bentham and Smith were fundamentally contradictory of each other in their ideas of how to secure the general good." [3] Finally, a very recent study has concluded that " thanks to the efforts of many current scholars it is at last becoming clear that Bentham may with more truth be called the patriarch of British collectivism than the father of individualism." [4]

We are prepared to take the risk of opining that at least these more recent views are considerably less misleading than the opposite picture of Bentham as a representative of *laissez-faire* or, alternatively, as a classical liberal. But the one moral which clearly emerges from this rather confusing intellectual situation is that any attempt to pigeon-hole or classify (or " classicalise ") Bentham is bound to be particularly misleading, and any attempt at a precise and concise generalisation about his views on the role of the State especially hazardous.[5] In the first place, much important evidence has not been available, and even now we may not have all that is relevant. Secondly, the writings themselves were often dashed off unrevised, with the author never attempting to reconcile inevitable contrasts, or strike an explicit and clear balance of emphasis. Thirdly, Bentham's own views were constantly changing, sometimes according to a steady long-term trend, while sometimes

[1] Cf. *Jeremy Bentham*, p. 14.

[2] See the quotation by D. H. Macgregor, *Economic Thought and Policy*, p. 68.

[3] See J. B. Brebner, " *Laissez-faire* and State Intervention in Nineteenth-century Britain," *Journal of Economic History*, Supplement VIII, 1948, pp. 59 ff. Brebner refers to the Constitutional Code of Bentham as " that forbidding detailed blueprint for a collectivist state." Professor L. Robbins, on the other hand, refers to the Code as " this great project for a practical Utopia " or " the good society " (*The Theory of Economic Policy in English Classical Political Economy*, p. 42). We are not concerned here with whether the society Bentham was trying to outline was " forbidding " or " good," but simply that it is extremely different from that argued for by Smith, Ricardo, Senior and other " classical " liberals.

[4] Cf. M. P. Mack, *op. cit.*, p. 88.

[5] Of the leading authorities on Bentham's view of the role of the state, Professor J. Viner seems alone to be beyond all criticism. He reminds us of the very wide range of state activities supported by Bentham without trying to categorise, classify or " classicalise " him. See *American Economic Review*, March 1949, " Bentham and J. S. Mill: the Utilitarian Background."

simply fluctuating around the trend or according to no discernible trend. Any attempt at a concise generalisation would at least have to distinguish between Bentham's earlier and later positions.

With these volumes before us it can now be much more safely said that whatever *laissez-faire* maxims Bentham may have emitted from time to time —more frequently in the earlier phases of his economic work (*c.* 1786–95)— as the years went on, he is to be found suggesting more and more economic functions for the State, some of them very fundamental and pervasive. His injunction to the State to " Be Quiet " (" without some special reason "), cannot signify much when one finds him going on to find enough " special reasons " for " noise " to satisfy a whole series of Fabian Summer Schools. But although it seems much less misleading to regard Bentham rather as a prophet of the Welfare State than of the Gladstonian Budget, we do not want to try here to categorise or classify him. We simply wish to contrast his views on the role of the State with those of Smith, Ricardo and Senior and to suggest that he cannot be regarded as one of the " classicals," if this term is to preserve any doctrinal significance.

The contrast between what Bentham had to say on the role of the State in the economic field and the views of any economist reasonably describable as a classical liberal may be summarised under five heads:

(1) We have just seen how Bentham came to reject the Turgot–Smith theory of saving and investing and the idea of the rate of interest as a beneficial automatic regulator of saving and investment. His change of view on this subject obviously has quite fundamental implications for his view of the role of the State in the economic field. None of those regarded as typical " classical " economists argued in the manner of Bentham that the State either could or should beneficently act on the aggregate level of investment and employment, or be responsible for maintaining these at a high level. Even Malthus is hardly a genuine and complete exception.

(2) No " classical " economist sets out with such explicitness and detail so many and varied economic functions for the State: the Bank of England should be nationalised and the issue of paper money should be a monopoly of the Government; there should be governmental licensing and participation in all banking and some government control of speculation; there should be government activity in everything connected with the propagation of knowledge—universities, schools, agricultural and scientific research and the collection of statistics; the Government should also be responsible for hospitals, health services, transport and means of communication. A newly-published paper (*Plan for Augmentation of the Revenue*, 1794–95) suggests that the superior security and longevity of the State, as compared with private enterprise, suits it for the taking over of insurance business on a large scale, in particular life annuities, life insurance, lotteries and the various activities of friendly societies.

(3) Bentham approaches the problem of the agenda of the State by laying down four overriding ends of economic policy, subject only to—(or which are in fact the constituents of)—the supreme end of maximum happiness. The four ends are, in order of importance: subsistence, security, opulence and equality. The fulfilment of these four ends justifies any amount of State action, and three of them in their very nature—subsistence for all, security and equality—are bound to call for far-reaching intervention. This prior specification of overriding ends surely amounts to an approach to the problems of economic policy from a direction diametrically opposite to that of Smith and Ricardo. Smith, at any rate, rather starts from the fundamental beneficence of the free-market mechanism and then traces around this the framework of State activity necessary to maintain, and at exceptional points correct or supplement, this mechanism.[1]

What was really implied for Bentham in his four different ends of policy is brought out in a remarkable outline draft (or " *brouillon* ") dated October 22, 1800, and headed " National Prospects or a Picture of Futurity " (Vol. III, pp. 481–3). " Opulence " includes " maximum opulence of the lower classes. . . . The higher the wages of labour, the better consistent with national security." Nevertheless, Bentham does not believe that government can raise wages above " what is sufficient for bare subsistence to a family of average size." But he *does* believe that government could and should be " giving security to that measure of subsistence." Bentham goes on to note the " Insufficiency of the general propensity to accumulation to ensure a sufficiency of the principal subsistence for man, *i.e.* corn. Necessity of the interference of government for that purpose." Further government could and should promote opulence " so far as concerns the increase of capital: by forcing *savings* from pleasurable expenditure and applying the amount in the shape of capital."

(4) Though repeatedly urging that the individual is the best judge of his own interests, Bentham explicitly rejects the general principle that the hidden hand can be relied upon to work adequately towards the end or ends he lays down: " That the uncoerced and unenlightened propensities and powers of individuals are not adequate to the end without the control and guidance of the legislator is a matter of fact of which the evidence of history, the nature of man, and the existence of political society are so many proofs " (III, p. 311).

[1] F. A. Hayek in his essay on *Individualism True and False* classifies Bentham as a " false " individualist, that is as a rationalistic, in a sense *a priori*, individualist (who is really a precursor of totalitarian dictatorship), rather than a " true," cautious, empirical one. There certainly are some strains of " false individualism " to be found in Bentham's writings, and this laying down of comparatively precise over-riding " ends " of policy is the most dangerous of them, because, of course, the laying down of over-riding ends suggests the justification of *any* means; but there are also still more pervasive strains of " true " (*i.e.*, empirical) individualism and " true " collectivism (if on Hayek's definition collectivism can be " true," and, if it cannot, such arbitrariness would, perhaps, itself be an example of " false " individualism) (see *Individualism and Economic Order*, pp. 4 ff.).

In particular, the primary end of subsistence for all (or for as many a possible) required, according to Bentham, a policy of " magazining," o of the wholesale storage by the state of food supplies, and the fixing o maximum prices: " Insurance against scarcity cannot be left witl safety to individual exertion." On the subject of price-fixing h writes:

" As I have all along suspected, the horror in which it has been hel by the best opinions, has nothing but prejudice, and a too indiscriminat attachment to general principles for its foundation " (III, p. 262). It i not simply that Smith, James Mill, Ricardo or Senior did not happen t put forward such far-reaching proposals, it is rather that one canno conceivably imagine them doing anything but oppose schemes lik Bentham's to the uttermost, as did Burke.[1]

(5) Bentham's explicit mention of equality as an end of polic (although he puts it last), along with the analysis of diminishing utilit on which he based it, has no important parallel in the writings of othe classical liberals. Certainly at other points Bentham emphasises, i direct contrast with his egalitarianism, the importance of preservin established expectations. But this also runs counter to the principle o leaving distribution to the free market, or to Ricardo's dictum, for ex ample, that " like all other contracts, wages should be left to the fai and free competition of the market and should never be controlled b the interference of the legislator." [2] Professor Stigler has emphasise

[1] Contrast with Bentham's statement, Burke's: " To provide for us in our necessities is not i the power of government. It would be a vain presumption in statesmen to think they can do it (*Thoughts on Scarcity*, *Works*, Vol. III, World's Classics, p. 3). James Mill, though not exactl deficient in " presumption," and supposed to be a disciple of Bentham rather than Burke, in fa was explicitly on Burke's side on this issue. In discussing a somewhat similar scheme for " buff stocks," put forward by Sir James Steuart, to counter extreme price fluctuations, Mill write " The author, it is evident, had never reflected with any accuracy, upon the operation of free trad and therefore sees not the equalizing results which it is calculated to produce. He propose accordingly to do that very imperfectly, by a great number of very troublesome regulations, whic perfect freedom of trade would do completely of its own accord. Nothing more is wanting than t leave the farmer at perfect liberty to sell his corn wherever he can get the best price for it, and th consumer to buy it wherever he can get it cheapest, without any restriction, without either burthe or encouragement. The necessary effects of this are to secure to the farmer and to the people a all times those exact prices which are best adapted to their mutual interests. To depart from th course is only to disturb the laws of nature, to gratify the freaks or the interests of particular men (*Literary Journal*, 1806, p. 234). One cannot tell how Professor Hayek would classify this passage b Mill, but it *may* seem a clear case of " false " rationalistic individualism, with the " true " empiricis on the side of Steuart and Bentham. Certainly Bentham would have exploded at this appeal t " the laws of nature " if it had come to his notice. It is also reasonable to guess that Smith, Ricard and Senior would have been on the side of Burke and James Mill, and not on that of Steuart an Bentham. (The above quotation from Mill may be contrasted with Bentham's discussion of th rate of interest quoted at length at the end of Section III above.)

[2] *Principles*, Sraffa ed., p. 105. Or compare Ricardo's statement to Trower (*Letters*, Sraf edition, Vol. VIII, p. 133): " Political Economy, when the simple principles of it are once unde stood, is only useful, if it draws governments to right measures in taxation. We very soon arriv at the knowledge that Agriculture, Commerce, and Manufactures flourish best when left witho interference on the part of Government, but the necessity which the state has for money to defra the expenses of its functions, imposes on it the obligation to raise taxes, and thus interference becom absolutely necessary."

" the relative unimportance of the distribution of income to the classical economists "—a justifiable generalisation so long as Bentham is not included.[1] Bentham's recognition of the egalitarian argument which might be deducible from the principle of diminishing utility, and his multifarious taxation proposals, especially that for limiting inheritance, foreshadow the whole recent trend of British tax policy. At what stage, if any, on the road to our present position Bentham would have wanted to get off the bus, it is impossible to say. But Bentham was unquestionably one of the major influences in getting the bus started on its present route, and this distinguishes him essentially—for better or for worse—from " classical " liberals like Smith Ricardo and Senior.

V

The greater part of this account of Bentham's economic ideas rests on material published for the first time in these volumes. Thus, as an economic theorist this most celebrated and influential of Englishmen is something of a Cournot or a Gossen, that is, one whose work as an economist was largely unknown and of virtually no influence in his own day. In contrast with his political and legislative ideas, his writings on monetary theory found no disciples to follow them up, while what *was* published of his economic writings somehow gave rise to most misleading and confusing accounts of his position on the principles of economic policy.

We have already noted that when Dumont consulted Ricardo and James Mill on preparing for publication *The True Alarm*—perhaps the most important work in these volumes—they were in complete disagreement with its central theories and did not consider it worth proceeding with, or its ideas worth exploring further—in spite of the almost superhuman prestige which Bentham is supposed to have had in their eyes. Nor, for his part, did Bentham ever seem to have shown any interest in or agreement with Ricardo's *Principles*, his sole recorded comments thereon being: " In Ricardo's book on Rent there is a want of logic. . . . He confounded cost with value." As regards economic ideas, therefore, there seems to be no more misleading claim than Bentham's to the effect that Ricardo was (through James Mill)

[1] See *Five Lectures on Economic Problems*, pp. 1–2. Professor Stigler himself notes differences between Bentham and " Classical " economists on this subject. Moreover, though he refers to it rather distastefully, Bentham recognises what might be called " dog-in-the-manger egalitarianism " as a force which policy-makers must take into account from the point of view of social peace and cohesion (and which so many over-simplified theories of economic policy of classical descent do *not* take into account). That is, Bentham did not hold to the facile and far-reaching assumption that the satisfaction an individual gets from his income is a function simply of *its* size alone, while the size of his neighbours' incomes is entirely irrevelant: " If on any occasion the interest of the public and the interest of the individual happened to be so combined and tied together, that on condition of seeing an individual reap a profit to the amount of a hundred thousand, the public might reap a profit to the amount of a million, the plan would be turned aside from or rejected. Whatever satisfaction might be excited by the idea of the million gained by everybody and nobody, would be sowered and turned to regret by a glance of the hundred thousand pound gathered into a store of which the owner was in view " (III, p. 297).

" my spiritual grandson." [1] This could only apply to some of Ricardo's political and parliamentary activities. Bentham's economic ideas, both as regards theory and policy, run on fundamentally different lines from those of Ricardo. There are no grounds for supposing that a single sentence of Ricardo's *Principles* would have been different if Bentham had never existed. The questions Ricardo formulated, the assumptions he reasoned from and the method he used are sharply distinguishable from those of Bentham. In Bentham's economic writings there are no long chains of deductive reasoning. His approach is far more empirical and statistical, and he would have rejected the idea of political economy as a mainly deductive science based on a very few fundamental and more or less self-evident assumptions—as classically described, for example, by Senior. Though J. S. Mill's general approach to economic policy diverges less from Bentham's than does his father's or Ricardo's, the theoretical differences remain fundamental; and there is no sign of the younger Mill ever having read, much less marked and digested, Bentham's unpublished economic writings.

On the two central questions of economic theory, that of the determination of relative values and that of the determination of the main economic aggregates, Bentham in his later and more definitive writings differed from the classical approach of Smith and Ricardo, all along the line. So although like Ricardo, Bentham started from the *Wealth of Nations*, and even in *The True Alarm* writes that the work of Smith " still is and deserves to be the textbook of political economy," this cannot bridge the quite fundamental differences in approach which Bentham had opened up. Bentham himself could not realise or foresee how important and fundamental the difference between his ideas and those of Smith and Ricardo were to become, when the lop-sided classical emphasis on labour and cost of production in value, and on the rate of interest as a smooth and beneficent regulator of saving, investing and aggregate employment were to harden into dominant and largely unquestioned orthodoxies. On the one hand, Bentham's ideas, both on value and on saving-investment and employment, follow the lines of pre-Smithian " mercantilist " writers such as John Law, Berkeley and Sir James Steuart. On the other hand, they point forward to Jevons, Edgeworth and Marshall in one direction, and to Keynes in another. Only as a rather mild and elastic type of Malthusian does Bentham share in any of the main " classical " doctrines. If Bentham is still to be described as a " classical " economist, along with Smith and Ricardo, then this much-controverted adjective is virtually emptied of any doctrinal significance.

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[1] See Bowring's edition of the *Works*, Vol. X, p. 498. We have noted above a practical issue—that of price control of basic foodstuffs—where Bentham and J. Mill were on diametrically opposite sides. The example, surely, has some significance in terms of general principles. J. S. Mill notes the wide differences in cast of mind between his father and Bentham: " His mind and Bentham were essentially of different construction " (*Autobiography*, World's Classics, p. 172). On the other hand, there is certainly a very close intellectual affinity between Mill and Ricardo; see " James Mill and the Political Education of Ricardo," *Cambridge Journal*, November 1953.

WALRAS: A RE-APPRAISAL

AN English translation of Léon Walras' *Eléments d'Économie Politique Pure* has at long last appeared.[1] It may be said at once that Professor Jaffé deserves great praise. His English is lucid, and he has provided an apparatus criticus and an excellent commentary, which are invaluable aids to the study of the text. They have clearly required long and diligent effort, and they show precision of scholarship, balanced judgment and theoretical expertise, which entitle Professor Jaffé in his own right to a high standing among economists.

It is fitting to make this publication the occasion for an attempt to reappraise Walras' position in the history of economic theory. That he was a master mind in some sense is not in doubt. He is essentially an economists' economist; the esteem in which he has been held by theorists has on the whole continued to grow through the years; he has had great influence. One must not, however, lose one's sense of proportion.

In the quest of a just appraisal, it is needful that we remind ourselves of the essential features of our subject as it has been developed so far. Unhappily it is still largely lacking in quantitative laws; this makes the award of honours to economists more difficult. The enunciation or " discovery " of such a law in the physical sciences is usually a definite event, and one's task is thus reduced to estimating its importance and the degree of ability or genius required for its excogitation.

The intellectual achievements that the great economists have to their credit are less distinctly demarcated. Economists may formulate tools of thought which serve to clarify our understanding of the complex economic data with which we are confronted. The tools may consist of concepts, by which phenomena may be classified. These concepts have been many and various; sometimes they complement one another; others represent alternative methods of organising the phenomena to be studied (*e.g.*, " velocity of circulation of cash "; " demand for purchasing power over commodities in the form of cash "). These concepts are to be judged for merit not mainly by the precision with which they are, or could be, defined, but by their serviceability in aiding the thought processes by which the total complex is analysed. They may be capable of generating certain self-identical propositions (quantity theory of money, equality of sales and purchases), which are in turn to be judged for merit by the same criteria.

Then the economist may construct what we have recently come to call a model. This may relate to a complex of events and relations constituting something less than the whole economy, but be serviceable for valid use on

[1] *Elements of Pure Economics, or the theory of social wealth.* By Léon Walras. Translated by William Jaffé. (London: Allen & Unwin, for the American Economic Association and the Royal Economic Society, 1954. Pp. 620. 42*s*. Obtainable by Fellows of the Royal Economic Society at the special price of 28*s*. on application, including remittance, to the Secretary, The Royal Economic Society, The Marshall Library, Downing Street, Cambridge.)

he basis of some *ceteris paribus* assumption. Or, crowning achievement, it nay be a model of the whole economy. Such a model necessarily involves ıbstraction and approximation. Not all motives, not all circumstances, find heir places in it. For a good model it is claimed that the more important notives, the more important relations, are given their appropriate places.

Now when we assign a particular model, which may have played a great ›art in the development of economic thought, to a particular economist and hereby claim greatness for him, it often happens that various concepts and unctional relations, comprised within the model, are found to be attributable o earlier authors, so that the claim for originality on behalf of the economist n question is whittled away. But this may be ill-judged. For it is in the synhesis and the creation of a complete model that his genius and claim to reatness may consist.

There is another more deceptive way by which a reputation may be roded. It may be found on a nice examination that many of the concepts ısed in the model are ill-defined and many of the relations incorrect. This eems very damaging, but it may not be so in truth. It may be necessary, for ood judgment, to look beyond the precise features of the model as specified y the author to its *general structure*. It often happens that various models, liffering in many particulars but having a similar general pattern, are uccessively presented by economists. If an economist invents a model of a ertain general type, which many subsequent economists feel impelled to econstruct and vary, this constitutes the supreme claim to greatness. The laim may be upheld even if—in the worst case—every single feature of the riginal model has to be altered in detail.

If we look about for economists to whom to give the palm—and the search relevant to provide ourselves with a yardstick, since Walras' admirers laim for him nothing less than the highest honours—one can hardly resist he claims of Adam Smith and Ricardo. Models of the general type that hey initiated have been reconstructed over and over again, not only by the nglish classical school, but down to the present day. It is necessary to ıention both names, because, while the essential seminal ideas were in ıdam Smith, his system was fragmentary. Ricardo was the first to present a omplete model—one which, for all its faults, was self-consistent and dislayed the whole economy as a single interdependent system. His presentaon was shocking, but that is a secondary matter. I conceive it to have been n important element in the greatness of Alfred Marshall that he appreciated ıe true quality of Ricardo, despite the existence of certain defects in his ystem and despite his faults of presentation; Marshall was more concerned ith essentials than with flaws of secondary importance.

We must widen the field. With all due apologies to those of my conemporaries who are not convinced, I would claim the highest palm for eynes. I suggest that he has presented a model of which we are likely to et reconstructions and variants for many years. It does not injure the case or him to say that many of the relations incorporated in his model had lready been formulated by other economists, although due credit should

always be given to them. Nor need we be put off by the fact that there may be much in his model to criticise and reject. The claim on his behalf is that the general structure of his complete model was new, and that many variants of the same general structure will be constructed and continue to be used for a long time. That remains to be seen. It might plausibly be objected that this is not likely to be so, on the ground that his model is static, while interest in future is likely to be concentrated upon dynamic models. But statics and dynamics must have some concepts in common and some inter-relation between their principles. Keynes' model, in this being unlike previous complete models of good standing, lends itself easily to dynamisation, so that the movement of interest towards dynamics, so far from being the death knell of the Keynes system, may serve to give it longevity.

How does Walras stand by comparison with these authors of generic model types? The answer to this question is not altogether easy. One way of summarising his achievement is as follows. Adam Smith had the idea that competition and the mechanism of the market together constituted a hidden hand by which the individual's action in quest for his own advantage tended to maximise the economic welfare of society. This is not the whole of Adam Smith, but it is certainly a very central part of him. Walras, subject to all necessary reservations, proved the point with a thoroughness never before achieved or subsequently bettered. He worked on the assumption of perfect competition in the strict sense. The corollary is that we may take what would be the outcome of a system of perfect competition as a criterion, by their likeness to or difference from which we may test the outcomes of other systems. This demonstration was certainly something that needed doing, and may be said to have been done by Walras once and for all. He places himself in this light by some sentences in the introduction to his fourth edition (pp. 47–8):

> "It took from a hundred to a hundred and fifty or two hundred years for the astronomy of Kepler to become the astronomy of Newton and Laplace, and for the mechanics of Galileo to become the mechanics of d'Alembert and Lagrange. On the other hand, less than a century has elapsed between the publication of Adam Smith's work and the contributions of Cournot, Gossen, Jevons and myself." [1]

If one regards Walras' essential task as giving the complete, final and polished proof of Adam Smith's central theorem, then it would seem to follow that he should be accorded a status in the history of economics, not on a level with a great pioneer like J. M. Keynes, but rather one similar to that occupied by his father, J. N. Keynes, in the history of logic. J. N. Keynes gave a far more complete and highly polished account of syllogistic logic than had been given before, and one which is not likely to be improved on. (In fairness to J. N. Keynes one must add that his lucidity and presentation were much superior to those of Walras.)

[1] Menger is not in this list, because his work was not mathematical, and it is to the mathematical presentation that Walras attaches first importance.

This may not, however, be the last word. We have to ask whether it was not the case that, in order to establish Adam Smith's theorem on so firm a foundation, Walras did not have to devise new tools, which might be considered as great contributions to economic thinking in their own right. Here we are concerned with: (i) his mathematical formulations, and (ii) marginalism. Of the former I shall say something presently; I cannot believe that in themselves they are very momentous. The crucial, and indeed controversial, question is that of marginalism.

The idea of applying the marginal principle to economic matters certainly does seem to be of first-rate importance. Credit for this must go to Ricardo and his predecessors, who applied it in part correctly, in part erroneously. Ricardo gave wide notoriety to the technique. However, it was not applied in the early days to utility, save by certain writers whose ideas did not permeate; and conceptual confusion about the relation of utility to value in exchange persisted. How deep did the confusion go? Did it go so deep as to render nonsensical all the arguments of the early classical economists purporting to show that competition and free trade were conducive to welfare? Or was the correct relation between utility and value implicit in their thinking all the time? Was it merely a nicely articulated formulation that was lacking?

When Jevons' *Theory* first appeared (1871), Marshall reviewed it in *The Academy*. In his opening paragraph he wrote (quoting Jevons):

> " Though ' labour is often found to determine value,' it yet does so ' only in an indirect manner by varying the degree of the utility of the commodity through an increase in the supply.' Bearing in mind what has been said about prospective utility, it is almost startling to find that the author regards the Ricardian theory as maintaining labour to be the origin of value in a sense inconsistent with this last position. But the language of Ricardo on this point was loose with system: and that of many of his more prominent followers differs from his only in that its looseness is not systematic. By a natural reaction, attempts have been made by a series of able men to found the theory of value exclusively upon the neglected truth. Although the difference between the two sets of theories is of great importance, it is mainly a difference in form. We may, for instance, read far into the present book without finding any important proposition which is new in substance."

When at length an important proposition appears, Marshall criticises it as confused, on the ground that it does not recognise the interdependence of supply and demand.

The *Theory* appeared and the review was written before the first edition of the *Elements*. Marshall's line is that the part played by demand is implicit in the classical writers, but he recognises that it was insufficiently stressed. To emphasise it with the aid of the marginal principle was useful; but Marshall thought that Jevons made too much fuss, and overstated its novelty. This would apply to Walras equally.

I venture to make a personal digression, because it may afford a kind of

laboratory experiment which is not usually available. At the age of fifteen I read J. S. Mill's *Principles* and took the tools there furnished for my own thinking. In the following seven years I read rather widely in economics. Memory throws up as flotsam and jetsam the names of Bagehot, Giffen, Toynbee, Barbour, Karl Marx, Kropotkin, Cole, Keynes, Cassel (on monetary questions). During those seven years, I thought much about economic questions, discussed much, perhaps with the modesty appropriate to a tyro, more probably with the immodesty appropriate to youth, and judged and criticised current economic policies. Eventually I came to be well versed in the classic blue books on money and finance, knew much of the controversies relating to inconvertibility in the Napoleonic period, Peel's Bank Act, bimetallism, the rupee, free trade, and local and public finance, and I knew Marshall's contributions as a witness before successive Royal Commissions (later published in a separate volume: *Official Papers*) rather intimately. But I had never read Marshall's *Principles*—nor Menger, nor Walras, nor Jevons' *Theory* (although I had read his *Investigations*); I did not do so until the age of twenty-two. It is curious to look back upon these seven years of intense intellectual life in matters economic—pre-natal years, one might almost call them. I believe it must be quite rare for anyone of my age-group to have come to Marshall's *Principles* after so long a period of active interest and wide reading in economics of a kind by no means superficial.

When I came to the *Principles*, I was naturally deeply impressed. I was struck by the lucidity of exposition, the grave thoughtfulness, the sureness of touch, the architectural quality of the book as a whole, the firmness of the skeleton of abstract thought underlying it, the immense pains taken to relate the abstract concepts to the actual phenomena of the world in which we live, the justice done to various points of view, the careful reservations, the nuances, the subtlety and that comprehensiveness which has so often enabled subsequent generations of teachers to prove to some giddy young enthusiast for a new idea that it was in Marshall all the time. But what I do not recall thinking was that my economic speculations during the preceding seven years, which had relied for pure theory almost exclusively on Mill, had been all wrong, or that the gaps in it were very wide and large. I do not think that Marshall would have been shocked by that. Of course, one realised that one had not fully appreciated the fertility of the marginal principle. But I certainly had the feeling that its applications had been to some extent implicit in my mind, although not properly formulated. I was more struck by other novelties in Marshall: his treatment of the long and short periods—Walras' remarks on overhead costs (p. 438) are by contrast very superficial—of quasi-rent, of the representative firm, of increasing returns and those allied matters which in due course led one to think more deeply about imperfect competition. Very different was my feeling of new horizons opening up before me when Keynes began to expound his new model some dozen years later.

Almost all those general qualities that made Marshall's *Principles* a great classic, despite the fact that its original contributions to pure theory are

admittedly limited,[1] are lacking in Walras. He had little regard for the actual phenomena of our economic life, no comprehensiveness, few reservations and little nuance or subtlety. The presentation is extremely clumsy. There is fierce concentration on a single point. Professor Jaffé compares it to " a penetrating pencil of esoteric rays serviceable only to specialists to whom it gradually revealed a clear design of organic unity inherent in socio-economic phenomena." But this was none other than Adam Smith's design. Walras gave precise, explicit and mathematical formulation to thoughts already implicit. To do this was an important task, and it was accomplished with thoroughness and some distinction. Precise formulation is always an advantage, and the power to make it in economics sometimes demands rare intellectual quality. But I would add that the advancement of economics depends on rather different qualities.

A non-mathematician must be diffident in commenting on Walras' mathematics. They strike me as clumsy and tortuous. The theory of exchange of commodities for one another (namely before bringing production and factor prices into account) occupies 128 long (and exceedingly dreary) pages. I had supposed that elegance and economy were regarded as virtues by mathematicians; in these Walras is totally lacking. In the preface to the first edition he wrote, " I am well aware that the notations used will at first appear somewhat cumbersome; but I beg the reader not to be discouraged by this complexity, for it is inherent in the subject." An alternative view is that the cumbersomeness is inherent in the author.

On the other hand, praise must be given to Walras for insisting that economic theory is essentially a mathematical subject and that points at issue may often be capable of being settled only by mathematical techniques. He had to encounter resistance from the literary school. Edgeworth was vehemently insisting on the same point in the same period, and Marshall was engaging in mathematical excursions also, but was more discrete about them. His discretion in that respect was not necessarily praiseworthy. The place of mathematics in economics is now secure.

Indeed, a caution in the opposite sense may be in place. The more recent influence of Walras may not be wholly to the good in this matter. Theoretical economists sometimes present a long list of assumptions with the air of someone laying the dinner-table; in their minds the meal is to consist in the manipulation of the formulæ expressing the assumptions. In economics the choice of appropriate assumptions is often the more important of the two stages. The assumption of perfect competition was no doubt appropriate and worth making for Walras' strictly limited and clearly defined task. We must balance that by saying that his apologists do not always show appreciation of how strictly limited that task was.

Another example may be given. Few subjects are treated in this very long book (483 lengthy pages excluding editorial matter). Its central theme is the interdependent equilibrium of factor and commodity prices. Accordingly, it would seem that the problem of the supply schedules of the factors is rather central to the discussion and worthy of some elucidation. We may raise the question expressed in modern terminology by asking if we should expect the supply schedules to be " forward sloping " or " backward sloping." Walras holds, with scarcely any supporting argument, that they will be forward sloping in the early range of low prices for factors and, having reached at least one maximum (of quantity of factor offered), become backward sloping towards zero (pp. 249–50). This apparently rests in the first instance on the inexpugnable proposition that if a zero price (say, wage) is offered no supply will be forthcoming. But the forward slope in the range of low wages seems to have no better foundation than the quest for a continuous curve. But this is altogether too cavalier a treatment. This cannot be reckoned a trivial point, especially having regard to the extremely narrow range of Walras' theoretical interests. He was just bemused by his own equations. This prime exponent of mathematical treatment, and of the danger of thinking one can rest in a theoretical conclusion without applying a mathematical test, gives an excellent example here of the dangers that beset an economist who relies too much on mathematics.[1] Walras deals in a separate passage with the supply curve of saving (which is not reckoned by him as one of the ultimate factors). If Professor Jaffé's interpretation is correct, above a certain critical rate of interest the supply curve is forward sloping and then, having reached a maximum, becomes backward sloping for still higher rates (p. 275 and note 11). All this is merely subordinate to the exigencies of continuous-curve drawing.

Walras' general theory of commodity and factor prices will already be familiar to readers; for it is nothing less than what may be called *the* theory of commodity and factor prices, as purveyed in any respectable text-book to-day. That is Walras triumphant!

He has an interesting, but obscure and tortured, passage on capital formation. Keynes had no business to say that he could find no coherent theory of interest in classical economics. Walras' theory is, of course, governed by the assumption of full employment (*i.e.*, no " involuntary " unemployment in Keynes' sense), which is made throughout the volume. He not only shows how equilibrium is achieved between savings and investment in general, but also integrates this theory with a theory of how equilibrium is achieved between the cost of production of, and the demand for, each particular capital good. The trouble is not that the theory is lacking in consistency and coherence, but that it is so anæmic. It is postulated that we may desire a slab of permanent income (or of less than permanent income);

[1] Cf. the very fair account given by J. M. Keynes in his Memoir (ECONOMIC JOURNAL, Vol. XXXIV, September 1924, pp. 311–72 and *Memorials of Alfred Marshall*, pp. 1–65).

[1] I once attempted a heroic generalisation of the kind made by Walras. I argued that in the range of wages between a subsistence level and affluence the supply curve must, *on average*, be predominantly backward sloping. My postulate would coincide with that of Walras, if one assumed that the range in which, according to him, the supply curve was forward sloping was that in which, while the labourer was offered more food than none at all, he yet was not offered enough to sustain life on. It would be interesting to know if that was the range which Walras had in mind for his forward-sloping curve (R. F. Harrod, "Progressive Taxation and Equal Sacrifice", ECONOMIC JOURNAL, Vol. XL, No. 160, December 1930, pp. 704–7).

the strength of desire is a decreasing function of the number of slabs propo
That is all he has to say about the propensity to save. There is nothing ab
the telescopic faculty, nothing about the desire to equalise the margi
utility of income through time, nothing about the possible need of capita
future to educate one's children, or to provide for old age or for contingenc
nothing about the distribution of income or other factors affecting the sou
of savings. No considerations are adduced. Here, as throughout the bo
the treatment is exceedingly thin—very " pure " indeed. It is really ex
ordinary how little of the substantial matters with which economists
concerned are touched on in this famous treatise.

The section on money, however, has much more body than the rest.
was enriched during the course of successive editions between 1874 and 19
Here we have the concept of a desired cash balance, measured by its po
to purchase goods. This is in line with the thought which Marshall
developing in about the same period, and which was published by his pu
much later.[1] Walras' desired cash balance corresponds to the magnit
designated by the symbol k in the formulations of what used to be kn
as the Cambridge version of the quantity theory. But Walras has a m
fuller elaboration of this concept than can be found in the Cambri
exposés. Furthermore, he distinguishes between the cash required by c
sumers, that required by producers and that required for money savi
One might almost be tempted to find a distant family resemblance betw
this threefold classification and Keynes' transactions, precautionary
speculative motives. Moreover, the theory of the general price leve
fully integrated with the theory of interest, and the monetary theory of
terest with the more general theory of interest. But the whole accoun
once again, subject to the assumption of full employment. This sectio
certainly powerful, although wretchedly presented, and should com
Walras' more fervent admirers.

He was taken to task by Edgeworth for holding that entrepreneur
equilibrium make neither profit nor loss (p. 225).[2] It is not clear whe
his concept of equilibrium precludes all uncertainty about the future.

Mention should be made of his criticism of British economists.
refutation of the Ricardian law of rent, in the form that " rent does
enter into the cost of production," is classic and universally accepted.
alone, it must gladly be conceded, gives Walras a very high place.
treatment may indeed be thought of as a refutation, as he named it; alte
tively, it may be thought of as an extension of Ricardo's law to cover all
tors of production, in which guise it becomes the marginal producti
theory. Attention should be drawn to an excellent passage (pp. 400–1
another chapter, where a sharp distinction is made between the phenome
of high payments due to monopoly and that of high payments due to

[1] Cf. A. C. Pigou, " The Value of Legal Tender Money," *Quarterly Journal of Econ*
November 1917. J. M. Keynes, *A Tract on Monetary Reform*, pp. 74–87.

[2] Edgeworth, *Quarterly Journal of Economics*, February 1904 (*Papers Relating to Political Eco*
pp. 25–31).

specificity of certain factors for the production of certain products. (The latter are defined as economic rents by Mrs. Robinson in her volume on Imperfect Competition.) There has recently been a tendency to confuse monopoly revenue with economic rent *in this sense*.

On the other hand, his refutation of the English theory of wages (the " wages-fund theory ") is less successful, depending on an inadequate representation of that theory. The wages-fund theory, properly defined, is a self-identical proposition, like the quantity theory of money. It cannot be " refuted "; the most that criticism can achieve is to show that this particular self-evident proposition does not provide a helpful approach to the subject. In fact, it may be unhelpful in a mature economy, while retaining its importance in relation to under-developed countries. Even Russia appears to have suffered from time to time since the Revolution by paying inadequate regard to it. For development technological know-how is not enough; a wages fund to tide over the period of high investment is also needed, if a depression in real wages is to be avoided.

Walras is sometimes thought of as the very type and epitome of the *laissez-faire* school. Such a notion may be encouraged by the concluding sentences of Part II:

> " The law of supply and demand regulates all these exchanges of commodities just as the law of universal gravitation regulates the movement of all celestial bodies. Thus the system of the economic universe reveals itself, at last, in all its grandeur and complexity: a system at once vast and simple, which, for sheer beauty, resembles the astronomic universe."

But in his own person he conceived himself to be at odds with the extreme school of *laissez-faire*, particularly that of France, and sometimes expostulates petulantly against it. In a notable passage (pp. 75–80) he draws a distinction between the laws of production and exchange, which spring, so to say, from the very nature of things, and principles relating to distribution which depend upon the will of man and should be guided by considerations of justice. This distinction has a strikingly close resemblance to that made by Mill, which had such important influence on Mill's own thinking and on that of others. Walras does not, however, express indebtedness to Mill.

In the early classical thought static and dynamic elements were intermingled. From the treatises and text-books of theory during the last three-quarters of a century the dynamic elements seem largely to have disappeared. Walras concentrated his attention on a single aspect. The main interest of his treatment relates to welfare economics: the proposition that perfect competition tends to bring about an optimum position. The results of his great labours for factual economics are meagre; we only reach such propositions as that there is an equilibrium position and that an increase in demand tends to raise price. Walras was perfectly justified in concentrating his interest and labour in this manner. The harmful influence that his work may have exerted springs from the gloss that what is to be found in his *Elements* constitutes the main corpus of economic theory. Marshall has far

greater scope and depth than Walras. But he, too, in his work on principles, concentrated on the static equilibrium; he did not live long enough to write out even an intelligible summary of what may have originally been in his mind for his fourth volume.[1] The consequence has been the neglect of dynamics for too long a period.

Walras fully recognises the static character of his system. He makes occasional references to dynamics. " Had I supposed utility to be a variable functionally related to time, then time would have had to figure explicitly in the problem. And we should then have passed from economic *statics* to economic *dynamics* " (p. 117).

> " We shall describe equilibrium in principle. . . . Our economy will then be ready to function, and we shall be in a position, if we so desire, to pass from the static to the *dynamic* point of view. In order to make this transition we need only suppose the data of the problem, viz., the quantities possessed, the utility or want curves, etc., to vary as a function of *time*. The *fixed* equilibrium will then be transformed into a *variable* or *moving* equilibrium, which re-establishes itself automatically as soon as it is disturbed. In the theory of bimetallism we find an equilibrium of this kind " (p. 218).

These are excellent statements. There follows a reference to dynamics which appears much less satisfactory, but perhaps only because its meaning is not clear. " A *dynamic* phase in which equilibrium is constantly being disturbed by changes in the data and is constantly being re-established " (p. 319). A static or a moving equilibrium may, each or either, have constant disturbances, or they may not; the frequency of disturbance is not the ground of distinction between these two kinds of equilibrium.

There is only one passage (tucked away in his chapter on the Marginal Productivity Theorem: pp. 388–92) where Walras explicitly discusses developments in a progressive economy. The doctrines set out in this sole excursus into dynamics are, surprisingly enough, pure Ricardo!

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[1] I have read some notes preparatory thereto, which were written in his extreme old age; these are not enlightening.

REVIEWS

The Cost of the National Health Service in England and Wales. By B. ABEL-SMITH and R. M. TITMUSS. National Institute of Economic and Social Research, Occasional Paper XVIII. (London: Cambridge University Press, 1956. Pp. xx + 172. 27*s.* 6*d.*)

WHEN its appointment was first announced, it seemed that the Guillebaud Committee was expected to make another Geddes or May Report. It was " to review the present and prospective cost of the National Health Service . . . to advise how, in view of the burdens on the Exchequer, a rising charge upon it can be avoided while providing for the maintenance of an adequate Service." There had been unprecedentedly large Supplementary Estimates for the Service in 1949 and 1950. In the latter year Sir Stafford Cripps had insisted that in future there must be a " ceiling " upon Exchequer expenditure upon the Service. To fulfil this requirement, " charges " for dentures and spectacles were levied upon patients in 1951. Further " charges " were inposed in 1952. Yet the Estimates rose again in 1953. The appointment of the Committee in that year indicated that the Treasury was making another effort to call a halt.

Fortunately, the Trades Union Congress refused to nominate a member to serve on the Committee until assurances were given about its freedom of action. They obtained a " clarification " of the terms of reference, though (presumably to save face) these were not formally changed. Fortunately too, Mr. Guillebaud was an economist, with an economist's understanding of the meaning of " cost." He invited the National Institute of Economic and Social Research to prepare an economic analysis of the costs of the Service. Fortunately, the Institute chose Professor Titmuss and Dr. Abel-Smith to make this study. As a result, the nation has received not only a warning that continuous pressure by the Treasury on successive Ministers of Health has been causing a dangerous run-down in the capital equipment of the Service, but a brilliant illumination of what the service is and does, and of how it can be maintained and improved in the future without any serious increase in its real demands upon national resources.

No doubt there was some waste in the Service in its early days—Hospital Boards had power to spend public money without responsibility either for raising it or for justifying their stewardship to electors; there was over-prescribing; and the salesmen of drugs and dental goods did well. But the total of such excess can have amounted only to a small proportion of the whole expenditure; and by 1951 most of it had been effectively checked through the various controls established by Ministers with the co-operation of the National Health Services Council. In the main, the increase in monetary expenditure was due partly to expansion and improvement of the

Service and largely to the general inflationary rise of prices throughout the economy.

The authors of this book have carried out an immensely useful and very skilful exercise in reinterpreting the official accounts of the Service so as to ascertain accurately what call it makes upon national resources. They find that " expressed as a proportion of total national resources the current net cost of the Service fell from 3¾% in 1949/50 to 3¼% in 1953/4."

It might be thought that this decline in *proportion* of resources devoted to the Service could be regarded with some complacency since the *total* of resources increased substantially in the same period: indeed, the authors show that " the cost per head at constant prices was almost exactly the same in 1953/4 as in 1949/50." But " the rate of capital expenditure in real terms has progressively declined." Moreover, " the rate of fixed capital expenditure on hospitals has averaged about one-third of the pre-war rate in real terms." It is well known that little or no provision of hospital facilities has so far been made in the new towns and new housing estates in which a considerable proportion of our population now lives. The conclusion is inescapable: that the Service is now less than " adequate." As the Guillebaud Committee has rejected any suggestion of further relief of the tax-payer by increasing " charges " upon patients, it follows that if " adequacy " is to be achieved the " rising charge " upon the Exchequer must continue. The Treasury doctrine of the " ceiling " has been demolished. But the effect of the Report and of this book, from which so many of its principal findings were derived, is not merely negative. Misconceptions have been removed, and the way is clear for the adoption of true social accounting.

Looking to the future, Messrs. Titmuss and Abel-Smith have used a statistical tool which has never been employed—nor, so far as I know, ever thought of—before. They have analysed the hospital population of Census Night, 1951, and have used this to examine (and to some extent to predict) the " demand for hospital care." They find, for example, that " the bulk of the population of mental and ' chronic ' hospitals are single people " and that " the married state appears to be a powerful safeguard against admission to hospitals in general and to mental and ' chronic ' hospitals in particular." Moreover, " a higher proportion of the cost of the National Health Service is devoted to the medical care of the under-fifteen age groups (including confinements) than to the medical care of persons aged sixty-five and over." Relating these facts to anticipated changes in the size and make up of the population in future " it can thus be seen that among the group of old people who make the largest demands for in-patient care (single men and women) there is not likely to be any material increase in the population at risk during the next twenty-five years," while of course the numbers of children are likely to be less. This suggests that the future demand for medical care is not likely to increase to anything like the same extent as had been thought. One would like to know how far Dr. Ffrangcon Robertson would be influenced by these statistical findings to modify the interesting

conclusions about the association of old age with ill health which he expounded in *The Cost of Health.*

Examination of the Registrar-General's *Hospital In-patients Statistics for 1949* suggests to the authors that " professional and middle-class men of these ages (25–64) are making full use of National Health Service hospitals, whereas the semi-skilled and unskilled groups are making fewer demands than might have been expected from their relatively higher mortality experience." Taking other " scattered pieces of evidence " into account, " it would seem that in general and for many particular conditions which do not constitute a grave threat to life, the professional and middle classes are keener to go to their doctors and to hospital in the early or premonitory stages of disease; are more disposed to have vague symptoms investigated in hospital, and adopt a more positive attitude to elective surgery or other treatment for relatively minor conditions such as sinusitis." One wonders how far " demand " by the patient may account for these differences or whether, even within a nationalised service, there may still exist some degree (conscious or unconscious) of class preference in hospital admissions. Possibly in future—for one reason or another, including greater ability to " afford " the loss of earnings during a stay in hospital, the pattern of " demand " by working-class citizens may so change that the nation's total requirement of hospital facilities may increase faster than the authors' demographic calculations would suggest. Certainly one can agree with them that " much more research needs to be done before any definite conclusions could be drawn." This book has not only shown the need for that research, it has done pioneer work of first-class quality in showing how to conduct it.

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A Geometry of International Trade. By J. E. MEADE. (London: Allen & Unwin, 1952. Pp. 112. 28*s.*)

THERE has long been a need for a systematic exposition of the basic geometry which has come to be employed in the analysis of general equilibrium in international trade. This book goes a long way towards meeting that need—not all the way, because Professor Meade's long-standing concern with international economic policy and welfare problems has led him to omit entirely the contract-box analysis of the effects of trade on factor allocation and rewards (which is made uninteresting by the assumptions necessary for welfare analysis). On the other hand, Professor Meade has contributed to the geometrical analysis a much improved method of allowing for production variations, a less arbitrary treatment of the expenditure of tax proceeds (and the financing of subsidies) and a treatment of trade imbalance (*i.e.*, transfers). Rather less happily, in view of his prefatory remarks on the usefulness of simplification, he combines all these techniques, together with an arbitrary and questionable assumption which permits discussion of the exchange rate, in a complicated analysis of a " general case " involving import and export duties in both countries and a trade imbalance.

Professor Meade begins with a short statement of the assumptions usually made in geometrical analysis, together with a list of those he intends to relax. He then develops his major contribution, the trade indifference map, derived from consumption indifference curves by sliding the transformation curve along them; the usefulness of this contribution, which at once permits generalisation of many existing results to cases of variable production and clarifies some classical confusions, has already been acknowledged in the literature. While the author normally assumes absence of external economies and diseconomies and increasing (social) costs, two chapters are devoted to constant and decreasing costs; the latter, rather surprisingly, credits R. C. O. Matthews with the discussion of stability conditions but fails to mention the latter's major point that in this case a country may be worse off with trade than without (indeed, Professor Meade's and others' methods can be used to show the possibility that *both* countries can be worse off with trade than without—a proposition with some application to the familiar " infant-industries " argument).

Over a third of the book is then devoted to a chapter on the geometrical representation of commercial policy with a zero trade balance—not an excessive amount of space, since Professor Meade deals with eight " simple " policies (export and import taxes and subsidies in both countries), is concerned with their effects on four price ratios (internal prices, net barter terms of trade, and the exchange rate) and expounds Professor Lerner's technique before presenting his own contribution, which consists in treating the fiscal aspects of taxes and subsidies on trade as equivalent to income subsidies and taxes. He also deals with state trading, the optimum tariff and the Metzler analysis of the effects of protection on domestic production (which loses some of its point when the distributional effects are ignored). This is probably the most thorough geometrical analysis of commercial policy available anywhere—though it might perhaps have been mentioned that Professor Meade's technique excludes certain cases possible on the Lerner assumption, notably that a tariff may turn a country's terms of trade against it if its demand for imports is inelastic and the government has a greater preference for imports than the general public.

A more important criticism, however, can be directed against the introduction of the exchange rate, which in a real model of this type requires an arbitrary assumption about domestic currency prices. The only geometrically manageable assumption is that one money price is pegged in each country, and this hardly provides an interesting case for analysis; unfortunately, it greatly complicates the argument by requiring a distinction between export and import duties, which could otherwise be dealt with together as " a trade tax." In addition, Professor Meade's assumption (stabilisation of the factor-cost prices of exports) is discussed with uncharacteristic obscurity, imposing a severe burden on the reader's intuition or reasoning powers. His statement that " the rate of exchange is thus the ratio between the untaxed-unsubsidised price of B-exportables in B and the untaxed-unsubsidised price of A-exportables in A " (p. 47) is an obvious nonsensical slip. [Professor Meade has since informed the reviewer that what he meant to write was that the rate of exchange between the two currencies will move in exactly the same way as would the terms of trade between the two products if they exchanged at their domestic untaxed-unsubsidised prices.] Understanding of Professor Meade's analysis of the exchange rate may be facilitated by the following precise statement of the effects of his assumption about money prices: on condition that exports are measured in currency-units of factor cost, the exchange rate, defined as the number of units of A's currency required to buy a unit of B's, will be *both* equal to the real (cost) price of B-exportables in B multiplied by one plus the total tax on A-exportables (expressed as a proportion of their factor cost) *and* the reciprocal of the real (cost) price of A-exportables in A multiplied by one plus the total tax on B-exportables (expressed as a proportion of their factor cost).

From the representation of commercial policy with trade balance, Professor Meade proceeds to the representation of imbalance under free trade, and its effects on price ratios (including both gross and net barter terms of trade). This chapter neatly demonstrates the equivalence of imbalance and transfer problems; one regrets only that Professor Meade has not repeated and developed a point made in the *Mathematical Supplement* to Volume I of *The Balance of Payments*, that the stability criterion may be expressed in terms of the demand for one of the commodities. The techniques for dealing with commercial policy and trade imbalance are then combined in a brief chapter dealing with " The General Case," and the book concludes with a few pages on alternative welfare criteria and a plea for striving to maximise world real income.

Taken as a whole, this book should prove a useful and lasting contribution to the pure theory of international trade, providing a consolidation and improvement of techniques from which further analysis can proceed without waste effort—even though few may wish to deal simultaneously with all the complexities of Professor Meade's general case. There are a number of ways in which one would like to see the book extended: for example, to include extant bits of geometry useful for special purposes, such as the production contract-box, Baldwin's technique for incorporating trade opportunities in the production frontier and the devices of various writers for dealing with more commodities and countries; more ambitiously, to include new techniques for dealing with such neglected problems as transport costs (an analogy from the Lerner technique suggests itself), non-constant returns to scale in individual industries and imperfect competition. But this is to ask for a larger and more unwieldy book than Professor Meade has set out to write.

It should be added that the fifty-one diagrams are printed separately from the text and are conveniently detachable, and that remarkably few misprints impede the course of the geometrical argument.

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The Analysis of Family Budgets. By S. J. PRAIS and H. S. HOUTHAKKER Department of Applied Economics, University of Cambridge, Monograph No. 4. (London: Cambridge University Press, 1955. Pp xx + 372. 50*s*.)

THIS work is essentially a sequel to the study carried out more than twenty years ago by Allen and Bowley, and the authors fully acknowledge their indebtedness to this pioneer monograph on family expenditure—a debt which, moreover, is evident in every phase of the present analysis. But in the interval the technical equipment at the disposal of the statistical analyst has improved out of all recognition. The authors, who pursued their researches in the Department of Applied Economics in Cambridge, had at their disposal an electronic computor, and were thus able to attempt a feat of econometric analysis that two decades earlier would have been quite beyond the powers of the most industrious research worker.

The statistical material on which their study is based was provided by two pre-war sample inquiries: that of the Ministry of Labour into working class household expenditure in 1937–38 and that undertaken by the Civil Service Statistical and Research Bureau into the income and expenditure of middle-class households in 1938–39. The working-class sample is represented by data from 2,219 households with 3·80 persons per family and the middle-class sample by data from 1,361 households with 3·26 persons per family.

Even allowing for the substantial technical assistance which they could command, the sheer amount of detailed work that the authors have put into this book must evoke admiration. But it is much more than a monument of ant-like industry. They have plunged into their work with obvious gusto and have produced a piece of research which is not only ingenious in its conception but which, in exposition and treatment alike, will be found interesting and even exciting by many workers in this field. Its central piece is a discussion of Engel's law and its interpretation in precise terms when applied to large samples. The law was defined in the study by Allen and Bowley by the equation $y = \alpha + \beta x$, and although they pointed out that this linear form could be taken only as a first approximation of the function expressing specific expenditure as a variable of income, they found that within the limits of their samples—all of which covered relatively narrow income ranges—it gave a satisfactory fit. Distinct indications of non-linear relationships became evident only in the upper regions of expenditure and income, occupied by a few stray cases of doubtful significance for the samples considered. The ranges of the two samples utilised by the authors of the present work are, however, wide; even if the "fringes" are disregarded, the total expenditure of the households of their working-class sample as well as of their middle-class sample extends, in each case, over a range of about fivefold spread, which for the samples combined becomes about eightfold. If expenditure per household is replaced by expenditure per person, the range is still wider, with a lower limit of about £20 per annum and an upper limit of about £200. Thus it was hardly to be expected that these samples would adapt themselves to a linear presentation—even assuming that they were homogeneous or amenable to being adjusted so as to eliminate, or subdue, the most disturbing heterogeneous factors.

The authors set out on a trail of econometric detection. After a critical discussion and comparison of various possible equations that suggested themselves, they present for their combined samples continuous functions of expenditure on food, and on certain non-food items, in the semi-logarithmic form $y = \alpha + \beta \log x$, which implies that income elasticity is inversely proportional to the level of consumption. In the cases of fuel and lighting, household durables and "literary activities," they prefer the logarithmic form $\log y = \alpha + \beta \log x$, implying constant income elasticity, because it gives the better fit. These curves, related to total expenditure per person, are essentially descriptive. Within the wide limits and loose structure of the combined samples—which not only embrace an extensive cross-section of social strata but also, within this cross-section, extend in time—the assumption that for the food groups (there are fifty-nine of them) and for some non-food items income elasticity is inversely proportional to the level of consumption, while for some other items it is constant, would indeed seem to provide working hypotheses.

The value of this for forecasting consumers' behaviour is difficult to appraise, in view of the complexity of the sampling data employed. However, the authors, although naturally optimistic about the practical value of their findings, are careful to make no exaggerated claims for them; on the contrary, they point out in considerable detail a number of shortcomings and possible objections. Furthermore, they suggest and introduce a variety of ways in which the sampling data can be improved. Prices, which for a sample encompassed within a narrow income range might be treated as invariable and therefore disregarded, are certainly variable with respect to most items in any extensive sample of household accounts, and related to both the structure of the household and its total expenditure, or income. In order to allow for this, a "quality" equation $p = \gamma + \delta \log \frac{x}{n}$ is proposed (where p stands for price and n for the number of persons). Since the product of price and quantity is given by the expenditure function, this easily transforms into a "quantity" equation, which might yield a gauge for comparing relative standards of living. As could be expected, the authors found their Engel "consumption" curves to flatten out in the higher expenditure ranges considerably more than their expenditure curves.

A further refinement, and a highly ingenious one—made possible by the employment of the electronic computor—is the introduction of a unit-consumer scale, evolved from the expenditure pattern of the different types of families for the various items. The authors suggest a weighted index of consumption for each family, dependent on family structure and family expenditure on the several groups of items; they have, in fact, confined their analysis on this basis to the food consumption data provided by the working-

class sample. The behaviour scales thus computed are not unconvincing, even though the underlying equations derive from the assumption that the relative weights for expenditure on food are reflected in the corresponding income (or total expenditure) consumer-unit scales.

The two concluding chapters discuss tentatively, but with considerable discernment, the implications of possible economies of scale, and of social, occupational and regional factors, for the analysis and interpretation of statistics of family consumption. The remainder of the volume—over half of it—is taken up by detailed cross-tabulations of the sampling data employed by the authors.

In spite of the considerable amount of precise and detailed work that has gone into this book, it is in many parts sketchy. The authors' enthusiasm and ingenuity carry the reader along; yet intermittently he may wonder how much solidity the samples employed can infuse into this lofty mathematical structure. But after such moments he will usually either be brought down safely on to solid ground by a common-sense discussion of the technical difficulties inherent in the collection and analysis of household accounts or else he will be stimulated afresh to follow the authors' exploits, by the exhilarating character of the mathematical enterprise.

Two specific complaints, however, must be made. The first is a minor one: the reader is presented with a tiresome puzzle by the authors' failure to indicate the units employed in their equations for expenditure on food; it appears that these are, for total expenditure, £s per year, and for specific expenditure, pence per week—a somewhat strange juxtaposition. Secondly, it would have been advisable to shun the term "income" when the data referred to are actually those of total expenditure, and to use some more objective expression, such as "outlay." It is true that the monograph by Allen and Bowley also took total expenditure as the independent variable, dubbing it "income"; but in the case of these small and (in essential characteristics) supposedly homogeneous samples, this was a less questionable assumption than it is for such large and undoubtedly diffuse samples. The authors, however, had no option but to make it, since income figures—and these incomplete ones—were available only for the middle-class families; but its implications for their whole argument are too serious to be glossed over.

But in general the authors are unbiased critics of their own work; and by candidly pointing out many of the weak spots, and exposing the loose ends, of their study, they not only largely disarm adverse comment but are also helping the reader towards a full appreciation of the substance of their research.

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An Econometric Model of the United States, 1929–1952. By L. R. KLEIN and A. S. GOLDBERGER. Contributions to Economic Analysis, IX. (Amsterdam: North Holland Publishing Company, 1955. Pp. xv + 165. 34*s*.)

IN 1950 Dr. Klein published his study of *Economic Fluctuations in the United States 1921–41*, which was the first extensive application of the econometric methods developed at the Cowles Commission for Research in Economics, then working at the University of Chicago. At that date it was clear, as Dr. Klein stated in the preface to that monograph, that as yet "only tentative and preliminary steps in econometric model building" had been undertaken and that further exploratory work was necessary before a satisfactory model would be available. The present study describes the results of a further three years' work on the ambitious task of estimating an econometric model for the United States: its findings are clearly of first importance for all interested in forecasting the economic weather.

At a first reading the book appears admirable in its conciseness and readability. There is an Introduction on the virtues of learning from experience; a chapter setting out the main relationships in the model and, to one's pleasant surprise, avoiding the familiar tedium of deriving everything from the most general of first principles; a chapter on the system as a whole; a chapter on the statistical estimates, complete with diagrams showing the fits of each of the equations to the observations; this is followed by some forecasts from the model and, finally, there is a revision of the model (termed here the Revised model in contrast to the Main model) to take into account later data. But the reader who is sufficiently interested to go through the work a second time will find that a price has been paid for the brevity of the exposition: in order to discover the improvements in the model he will have to refer to *Economic Fluctuations* and make the comparisons for himself, and if he is interested in the way the cross-sectional and time series estimates of the propensity to consume have been combined, he will have to refer to a third publication. In addition, more comment would have been in order on the reasons for the changes introduced in this model and some hints on changes which may be desirable in future work.

The period covered in the present study consists of the pre-war years 1929–41; together with the post-war years 1946–50 in the Main model, and the years 1946–52 in the Revised model. These two models are thus respectively based on eighteen and twenty annual observations, as compared with the twenty-one observations for the years 1921–41 in the Original model (as it will be termed here) of *Economic Fluctuations*. It seems a pity that the years 1921–28 are now omitted; the reason given is that they are not available on the revised basis issued by the Department of Commerce in 1951, but it should not have been too difficult to find some method of splicing the old and new series together to make use of the experience of the twenties.

The main changes introduced in the system of equations are the entire omission of the house building and rental sector, which took four out of the

twelve equations in the Original model, and their replacement by equ tions to explain the absolute level of prices and other money-market variabl In these new models there is a total of fifteen equations which are estimat from the data, and while all have their points of interest, only two w be mentioned here. First, and undoubtedly of most interest, is the consum tion function, which has now become rather more complicated than t constant marginal propensity of 0·73 and the trend term of the Origin model. Carl Christ in his (1951) test and revision of the model (publish in the N.B.E.R. *Conference on Business Cycles*) had included liquid assets in t function, and a term in the previous year's consumption to allow for t inflexibility of habits; both of these terms are now included in the ne models (though the reviewer would prefer total assets to liquid assets, as the recent work of Modigliani and Brumberg). In addition, income h been split into three components: wages, profits and farm income, so th there are now three marginal propensities to consume—with long-r values estimated at 0·81, 0·60 and 0·51 respectively—instead of the sing global propensity used previously. These have been estimated by combi ing information from family budget data with time series; the relative valu of the three propensities have been estimated from the budget data, and the absolute level from the time series. The effects of such a combined meth of estimation on the sampling errors of the propensities are not considere but there can be little doubt that further progress in econometric mod building will depend to an increasing extent on the combination of differe types of information, whether in this or other ways.

Turning next to the investment equation, we find that gross priva investment is now treated as a single variable, the movements of which a made to depend mainly on gross profits; the previous year's value of profi is used in the equation, though this seems to put most of the turning points the fitted series one year too late. In addition, the estimated equati contains a liquidity term with a positive coefficient, and the stock of capit to which a negative coefficient is attached: neither of these coefficients statistically significant, so that most statisticians would omit these tw variables from the equation on the evidence presented. The relative brief treatment of such an important sector of the economy in this study co trasts with the four equations for investment in the Original model (one f plant and equipment, another for stocks, and two for housing); the resul for the Original model seem to be statistically preferable to the newer effort if one may judge from the standard errors given for the single equation est mates. Unfortunately the authors do not comment on these changes.

The other equations are often unexciting. Some are included in a mere formal way to complete the system of mutual determination, and these a especially unsatisfactory; many others have serially correlated residua which cast doubt on their satisfactoriness. No summary measures of goo ness of fit are given for the equations, but standard errors are given for t coefficients.

Perhaps the most serious methodological fault of this study is the absen

of standard errors (or tolerance intervals) for the forecasts made from the model. Since the equations explain the past only to a certain extent, any forecast made from them is subject to uncertainty, the margin of uncertainty depending on the satisfactoriness of the fits in the past. Unless such margins are calculated—and there is a standard procedure for such calculations—it is impossible to judge whether a forecast from the model which turns out to be satisfactory arose just as a matter of chance, or is in fact the proper result of our better understanding of the economic mechanism. The presentation of forecasts in a precise form may give the lay reader an entirely specious impression both of the accuracy of these particular forecasts and of the nature of econometric research in general.

The book, of course, does not pretend to be more than a report on work that is still in progress. As such it will be welcomed by all engaged in similar work in other countries as well as by those who, with its aid, will now wish to make their own predictions of the movements of the U.S. economy.

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A Study in the Analysis of Stationary Time Series. By HERMAN WOLD. Second Edition with an Appendix by PETER WHITTLE. (Stockholm: Almqvist & Wiksell, 1954. Pp. vii + 236. Sw. kr. 28.)

IN the preface the author states that the main text of his thesis, first published in 1938, is left unchanged (except for minor alterations) in this second edition. Recent developments in topics mentioned in the text proper are dealt with in two appendices, the first by Professor Wold himself, consisting of a number of notes, and the second by Dr. P. Whittle.

In an interesting introductory conspectus the author shows that earlier work on time series was dominated by the search for periodicities by means of periodogram analysis and harmonic series. One of the principal instruments in this approach is the well-known Schuster periodogram $C^2(\lambda)$, a binomial function of the observations with coefficients $\sin \lambda t$ and $\cos \lambda t$. Values of λ which yield peaks in the function graphed against λ indicate periods when regard is had to significance tests, of which the best known is perhaps R. A. Fisher's (1929). The harmonic series is an appropriate introduction to the autoregressive series with which the work mainly deals by the fact that when the time interval is unity the harmonic series is a particular case of the general solution in x_t of

$$\sum_{r=1}^{k} a_r x_{t-r} = 0$$

The autoregressive system comes in through the introduction of a random variable η_t instead of zero on the right side of the equation. The correlogram, *i.e.*, the graph of correlation coefficients $r(x_t, x_{t+k})$ against k, is also dealt with.

A discrete random process is one in which each observation is a random variable extended in time at fixed intervals, which may be taken as unity.

Successive observations may be, and usually are, related: hence, *inter alia*, the phenomenon of serial correlation. Stationary series are those in which the inherent multiple frequency distribution of any set of observations at points of time $t_1, t_2, \ldots, t_h$ is the same as for the observations at $t_1 + t$, $t_2 + t, \ldots, t_h + t$, where all the t are arbitrary. The solution of the autoregressive equation

$$\Sigma a_r x_{t-r} = \eta_t$$

constitutes a stationary process. One attractive theorem proved is that if $r_k (k = 0, \pm 1, \pm 2, \ldots$ *ad inf.*) be an arbitrary sequence of constants, a necessary and sufficient condition that there exists a discrete stationary process with the r_ks as auto-correlation coefficients is that the r_k are Fourier coefficients of a non-decreasing function $W(x)$ so that

$$r_k = \frac{1}{\pi}\int_0^{\pi} \cos kx \, dW(x),$$

of which an inversion gives

$$W(x) = x + 2\sum_{k=1}^{\infty} \frac{r_k}{k} \sin kx$$

This the author terms the " generating function " of the r_k. It is now more commonly known as the " spectrum." Another important theorem proved is that any discrete stationary process with finite dispersion can be represented as the sum of two processes, one of which is singular (*i.e.*, with a Fourier-type solution) and the other represented by the infinite series

$$\sum_{r=1}^{\infty} b_r \eta_{t-r}$$

where the η_t are non-auto-correlated and have expected values zero, the coefficients b being real and such that Σb^2_r is convergent.

The author uses, as illustrations for analyses, a number of constructed series as well as the Beveridge annual wheat-price series 1770–1869 (previously worked on by Kendall as well as Beveridge), Myrdal's annual Swedish consumer price indices 1840–1913, and extended annual series for the level and rainfall in and about Lake Väner. He is careful to point out that he attaches no objective significance to his results. His applications are merely exercises in method, mainly with a view to determining whether the measured phenomenon can be represented by an autoregressive system of low order, after elimination of trend where necessary. He has perhaps hampered himself in his analytical method by the fact that, as tests of significance had not been much developed at the time the first edition appeared, he has to determine whether the fit is good by appeal " to the eye." Though the Myrdal series yielded a very smooth correlogram, the reviewer must confess that (also to the eye) any of the autoregressive approximations do not seem satisfactory, perhaps an example of the fact, generally accepted nowadays, that no single economic series can be expected to hold within itself the seeds of its own perpetuation, and this is what is implied by the

single autoregressive series. The phenomenon measured is influenced by, and influences, other series, which is why modern research tends to deal not with one equation but with systems of equations. It is true that, confining attention to linear systems, if the number of unknowns equals the number of equations, the general solution for each unknown x_t can be expressed formally as a linear function of the errors, as in the case of the single equation. Even with many variables we are still far from the efficient economic forecasting formula, derived from actual data,

$$y_t = f(x_{1t}, x_{2t}, \ldots) + u_t$$

where f is the forecast desired, y_t what actually transpires and the x_{it} are the predetermined values, which may contain lagged y_ts, and u_t is the error. If the function f is linear and the number of observations large the mathematical problems of efficient estimation and significance-testing may be regarded as solved. The trouble is that in the application of the theory to actual data we cannot be sure that the variance of the residual u_t will be small in relation to the variance of $(y_t - y_{t-1})$. As matters stand, we can be by no means certain that mathematical forecasts yield results which are better than intelligent guesses consistent with the social accounts.

It would appear that in a few instances the exposition would have been simplified by using the now well-known operational method for finding the solution in x_t of the equation

$$\sum_{r=0}^{k} a_r x_{t-r} = \eta_t$$

in the form

$$x_t = \{F^{-1}(D)\}\eta_t$$

where D is the operation $Dz_t = z_{t-1}$ and $F(D) = \Sigma a_r D^r$. This device (to which Dr. Whittle refers at the end of his appendix) at once high-lights the essential role at the roots of the characteristic polynomial $F(z)$ and readily yields the values of the coefficients a in terms of the b, and vice versa. Perhaps the author makes unnecessarily heavy weather with what he terms " forecasts," namely the problem of estimating the variate k time intervals forward. If this estimate be X_{t+k}, he shows that

$$X_{t+k} = \sum_{r=0}^{\infty} b_{k+r} \eta_{t-r}$$

Without any recourse to regression methods, this formula could have been anticipated, as X_{t+k} is the value of x_{t+k} in terms of η_s when all the s for $s = t + 1$ to $t + k$ inclusive are set at their mean values zero, which seems a sensible thing to do. The expression of X_{t+k} in terms of previous " forecasts " is also a simple matter of substitution. More serious, however, is the objection to the term " forecast " as applied to X_{t+k}, if only because it approaches absolute inefficiency as the interval k increases, as the author shows. It would be better to call X_{t+k} an " extrapolation " or something of the sort.

One must also be a little unhappy about a brief incursion into significance

testing (p. 21). It is surprising to read that the ω^2-method of testing goodness of fit " does not suffer from the well-known arbitrariness implied in the χ^2-method." In the application which the author gives on p. 30 of ω^2 he appeals only to its expected value and not to its probability, whereas using χ^2, the actual probability could have been given with complete confidence.

There are many excellent things in the book. Even though its scope is restricted, since for the greater part it deals with what was known up to 1938, the treatment has the merit of being in the main mathematically rigorous. It therefore represents a consolidation of the theoretical position for the " early modern " period.

Dr. Whittle's appendix is an admirable summary of certain aspects of modern research, including testing of the values of autoregressive approximations to time series for significance. As the author explains, he confined himself to developments which lent themselves to uniform treatment. He very largely makes good the claim that wide inferences as to the nature of the time series can be derived from the spectrum—see above—and its derivative the spectral function, if in one or two applications his man is sent on a boy's errand. In particular, there is a beautiful theorem about the nature of the roots of a particular determinantal equation. Of this and other interesting theory, it is a pity that proofs were not supplied, no doubt because of exigencies of space. The treatment is for the greater part asymptotic (*i.e.*, large sample approximation). One would have wished for a few practical applications, *e.g.*, to determine whether Professor Wold's three- or four-term autoregressions to Myrdal's price data were adequate.

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Finanspolitikens Ekonomiska Teori. By BENT HANSEN. Penningvärdeundersökningen: Del. II. (Uppsala: Almqvist & Wiksell, 1955. Pp. 403.)

IN the early nineteen-thirties the Swedes produced a series of officially sponsored monographs on various problems associated with unemployment, written by some of the members of the now famous " Stockholm School." Now a similar series is being published dealing with the problem of inflation, and it will be interesting and instructive to compare these new works with their distinguished forerunners. The immediately obvious contrast in subject-matter merely reflects the fact that the problems facing both economic policy and theory in the nineteen-fifties are very different from those that the earlier generation had to grapple with. The new committee, set up in 1951 under the general direction of Professor Erik Lundberg, is only incidentally concerned with the maintenance of full employment—its main task is to inquire into the means by which the value of money may be stabilised. The first monograph dealt with foreign-trade problems, and the second, under review here, is entitled " The Economic Theory of Fiscal Policy."

Those who are familiar with Bent Hansen's *Study in the Theory of Inflation*

will recognise the same hand at work here. This is not to suggest that the two works overlap—far from it. In the earlier work great stress was laid upon the interplay of inflationary pressures between the commodity and labour markets, both of which were assumed to be sensitive to the usual market forces of supply and demand. In his new work Hansen virtually throws in his hand when it comes to analysing the labour market. He is content to let *money* wages be determined how they will, and devotes his energies to examining the various countermeasures that the government must be prepared to undertake in order to control the level of *real* wages. This might be thought to be a considerable advantage, but the results are in fact disappointing. The Government is set the very real task of keeping real wages at a certain level, while at the same time maintaining full employment and a stable general price level of consumers' goods (including indirect taxes). But this formidable assignment is achieved quite simply, within Hansen's model, by appropriate variations in direct tax rates; indeed, a plan is proposed whereby the Government " declares " what the appropriate level of money wages is, and then backs this up by further " declaring " that if the trade unions try to set money wages at any other level it will bring the mighty fiscal machine to bear in such a way that the outcome in terms of real wages will be worse than if the Government's advice had been heeded.

This example illustrates both the strength and weakness of this work. A relatively simple theoretical model is constructed, lucidly and painstakingly, within which the goals of full employment and a stable value of money are given explicit meaning. Some elements in the model, the " permissible and controllable parameters " (those variables that the government is both willing and able to use for the given policy ends, which in this case are the direct and indirect tax/subsidy rates, official purchases and the rate of interest) are used as the means by which the other variables attain the desired values when the model is subjected to a series of " shocks," such as changes in defence expenditure, productivity or money wages. The analysis is fairly exhaustive in this respect, and there is a wholeness of conception and a singleness of purpose that makes it something of a work of art.

In so far as the model is relevant to the current scene, useful results are obtained, and not the least of these are to be found in the sections devoted to some ruthless debunking of many popular fallacies about the economic significance of " under- " and " over-balanced " budgets. But like all simple logical structures that are used to analyse complex and pervasive economic processes, its immediate relevance is limited to those very few points where it touches reality directly. Elsewhere, considerable sophistication is required in interpreting the results, since the basic model is a short-term, comparative-static one, operating under conditions of perfect competition, perfect knowledge and foresight, and within specific structural assumptions. (The effects of introducing dynamic considerations and uncertainty are outlined briefly, it is true, but they are not really integrated with the general analysis.) This book will be valuable, indeed stimulating, to those

versed and interested in economic model building, but by the uninitiated or unsympathetic it will probably be considered just another theorists' toy—but it is more dangerous than most theorists' toys, because it often seems to be talking about the world around us.

ALAN WILLIAMS

University of Exeter.

Making Money on the Stock Exchange. A beginner's guide to investment policy. By C. GIFFORD and J. A. STEVENS. (London: Macgibbon and Kee, 1955. Pp. 255. 15*s*.)

This beginner's guide to investment policy is primarily intended for readers with something to invest, but my own interest in the book has been largely academic. However, even from this restricted point of view I found it unusually stimulating. For here we have an honest and lucid (if elementary) account of how the investment game is played by a skilled player, and one, moreover, with a highly sophisticated understanding both of the limitations of human judgments about the future and of how to make the best use of inadequate and frequently unreliable evidence. That much of the relevant evidence is in a general sense economic serves to whet still further the interest of an economist-reader.

The general topics dealt with in the book are the *modus operandi* of the stock exchange, the analysis of company accounts, the interpretation of economic evidence and the formulation of an investment policy. In addition, there are chapters on three special topics: mining companies, investment trusts and foreign investments.

My only adverse comments amount to three trifles and one more serious criticism. The *first* trifle is that insurance companies are incorrectly described as liable to income tax at the standard rate (p. 40). The *second* is that the way to " avoid uncertainty " is not necessarily to hold shorter-dated stock (p. 41), for this achieves greater certainty of money-capital only by sacrificing certainty of money-income, so that choice between short- and long-term stock ought, strictly speaking, to be said to depend on which kind of uncertainty the investor finds less objectionable. The *third* is that I do not agree that " the shares of local [overseas] companies quoted in the local [soft] currency on local Stock Exchanges . . . must always be worth less to the [U.K.] investor . . . than to the local investor, who has no transfer problem " (p. 205). This conclusion might be falsified if, for example, there was a very poor local supply of investible funds.

My more serious criticism concerns the amount of extra depreciation (in excess of that shown in the published accounts) a prudent investor should deduct from a company's profits at times of rising prices. The authors reasonably argue that if the fixed assets, valued in the balance sheet at historical cost, would be twice as valuable if valued at replacement cost, then the published provision for depreciation should be doubled. It is, however, further argued (p. 118) that if prices have risen in the current year, say by 5%, yet another addition to depreciation is required. " This is needed because the 5 per cent rise in prices has made the accumulated depreciation already provided, which was previously adequate, inadequate." Such a conclusion would surely follow only if the accumulated depreciation provision was held as money (or in promises of money), a practice which need not be followed and usually is not followed, and certainly had not been followed by one of the two companies mentioned as examples.

BRIAN TEW

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Économie et Espace. Essai d'intégration du facteur spatial dans l'analyse économique. By C. PONSARD. (Paris: Sedes, 1955. Pp. 467.)

Two books in this series produced under the auspices of the *École Pratique des Hautes Études* attempt to enlarge the scope and horizon of economic analysis. An earlier volume by Raymond Barre, *La période dans l'analyse économique*, dealt with the integration of time concepts into economic analysis, and thus with the evolution of economic dynamics, whilst this book investigates the integration of spatial concepts and the resulting formulation of " dimensional economics." Since a considerable amount of work has already been done in this field, the author presents primarily an excellent " intellectual balance sheet " (p. v) of the current position in spatial economic thinking. In view of the very rapid recent advances in spatial economics, the publication of this balance sheet, written by an outsider not attached to any of the existing schools, is very timely.

The discussion proceeds in a framework which conceives spatial relations as akin to a magnetic field. The poles in this field are economic decision making individuals or institutions which act on either micro- or macro-economic levels. Each pole has a supporting space as well as an economic horizon, and its universe is also attached to the totality of spaces by means of external economies. Within this framework the author's analysis proceeds at various levels of activities—for example at the level of competing firms or at the level of interstate relations—in order to discover the various sets of spatial relations. The procedure results in a relatively concise discussion of spatial theories and their integration with aspatial theories that have been evolved at similar levels of analysis. The framework is also useful in the systematic consideration of differences between homogeneous and heterogeneous spaces and in the resulting evaluation of macro-economic regions. The author regards heterogeneity in space as a function of the multiplicity of the activity of poles which is made variable by the introduction of concepts from economic dynamics. However, the question of the number of poles is not investigated, and thus this inquiry does not reach any satisfactory results and, in particular, prevents a transition from the spatial concepts of the economists to those of the geographers. In this respect the advance from von Thuenen's concepts of a uniform space, which has generally dominated spatial analysis, is still very limited. Altogether, Ponsard's framework appears to be primarily a pedagogical device—necessary due to

the confusing views of spatial economists—which does not lead to any significant advances in spatial thinking.

The author discusses in great detail the outstanding contributions of Lösch. He realises that Lösch's macro-economic investigations, despite his basically liberal outlook, supplied in fact a scientific substratum of theory for the German *Lebensraum* myth by providing " at least analytical elements . . . for its internal logic " (p. 224). Alfred Weber's work, which has been depreciated in many recent studies, is acclaimed for its historically early introduction of the concept of spatial equilibrium (p. 130). Of special interest today is the discussion of the little-known work of Miksch on the evolution of spatial economic structure under the impact of economic development (pp. 150 ff.).

In the concluding chapter Ponsard admits that spatial economic theory is, despite its long history, still in the early stages of its evolution. For this reason the status of the author's " dimensional economics " cannot yet be compared to the status of " economic dynamics," although both sets of theories present only different points of view from which to investigate the body of economics. Ponsard is now writing a history of spatial economic theory which together with the present volume should contribute further to the advance of this so far sadly neglected aspect of economics.

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The Poverty of Philosophy. By KARL MARX. (Moscow: Foreign Languages Publishing House (London: Lawrence & Wishart), 1956. Pp. 256. 3*s.*)

To a modern reader the *Philosophy of Poverty* is a dead horse, and Marx belabouring Proudhon is of highly specialised interest. The entertainment value, also, is not great. There is no wit in the *Poverty of Philosophy* apart from its title; Proudhon's ideas were confused enough to begin with, and Marx's presentation of them makes them totally unseizable, so that there is little sport to be got out of following the argument. All the same, for anyone interested in " What Marx Really Meant " some passages in this book are very valuable. In some ways they bear the same relation to *Capital* that Marshall's *Pure Theory* does to his *Principles*. Ideas that are clear in the early and short version were later elaborated into obscurity.

Here we can see that Marx's theory of relative prices is quite straightforward. Market values fluctuate around normal values under the influence of supply and demand for particular commodities (p. 39). Normal value of a commodity depends upon the minimum labour time required to produce it, that is, upon cost of production by the most efficient method known at any moment (p. 73). (Engels points out in the preface to the 1884 edition how this has to be modified to allow for different ratios of capital to

labour in different lines of production, p. 13.) The point of the Labour Theory of Value does not lie in the analysis of relative prices, still less in the doctrine that labour has a right to the whole produce. The point is that labour itself is paid for at its value, that is, that the normal level of wages is equal to the value of " the objects indispensable to the constant maintenance of labour, that is, to keep the worker alive and in a condition to propagate his race. The natural price of labour is no other than the wage minimum." It is clearly stated that, while wages may for a time depart from value, the value of labour is not influenced by the wages actually received (p. 56 note).

Another point of some interest in the light of latter-day controversy is that Marx specifically repudiates the idea that money prices are determined by the labour cost of gold. " Gold and silver, as money, are of all commodities the only ones not determined by their cost of production " (p. 97). The quantity of money is determined by the needs of circulation. This leaves the question of the money price level quite open, for Marx will have none of the idea that money-wage rates govern prices. Proudhon asserts, " It is impossible, I declare, for strikes followed by an increase in wages not to culminate in a *general rise in prices* " (p. 188). (This view leads him to be hostile to trade unions.) Marx replies, " If the price of everything doubles at the same time as wages, there is no change in price, the only change is in terms " (p. 188). This seems to concede the point, for a change in terms is exactly what is normally meant by the change in nominal values when the purchasing power of money alters. But in the next sentence Marx asserts that a rise in money wages raises real wages and lowers profits while leaving prices unchanged. This can be of no benefit to the workers, for the employers counter by introducing labour-saving machinery, create unemployment and bring wages back to the value of labour—that is to subsistence level.

Here is the essence of the whole argument. Marx contends that the workers cannot do themselves any good within the existing system, whether by strikes or by some fancy device such as substituting labour tokens for money. He is in favour of trade unions not because they can better the position of the workers immediately but because they goad the capitalists into increasing productivity and meanwhile prepare the workers to organise themselves for the revolution which will come when capitalism has ripened to the bursting point. In 1847 he expected this moment soon to come, for he speaks of " the conflict between the productive forces already acquired by men and their social relations, which no longer correspond to these productive forces " (p. 214). This conviction is itself an important part of the history of the intervening century.

The translation is the same as that used in the edition of 1935, with some notes and appendices added. The book is excellently produced, and very cheap by the standard to which we are sadly accustomed.

JOAN ROBINSON

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Towards the Rescue of Sterling. By R. G. HAWTREY. (London: Longmans, 1954. Pp. 159. 12*s.* 6*d.*)

"WHAT is likely to be an urgent problem in the near future is the immediate need for a fiscal policy and a credit policy which will put an end to excess spending, and to the inflation and adverse balance of payments which it causes" (p. 144). Whatever may be thought of his methods of diagnosis and specific prescriptions, Professor Hawtrey, writing towards the end of 1953, has proved a better prognosticator than have many other practitioners equipped with newer-fashioned techniques and favoured with a longer case-history of the patient, and much in this book is still directly relevant to the current situation.

The purpose of the book, as the quotation implies, was both to give warning of impending trouble and to prescribe remedial action. But somehow the execution falls short of the intention: the writing lacks the sense of urgency essential to good pamphleteering, and the prescriptions lack incisiveness and coherence. Partly this is because Professor Hawtrey's general position has been defined in previous works, and is largely left implicit here, partly it is a consequence of his habit of writing in the form of disconnected notes on the various phases of a topic. Nevertheless, as one would expect of him, he offers the reader original insights and angles of approach, and presents him with challenging questions.

The book falls into two sections: the first three chapters survey the three post-war crises, the last three discuss the contemporary situation and the remedies for it. The major theme is that the dual problems of inflation and balance-of-payments difficulties are the consequence of excess spending, in turn made possible by the redundant money created by war finance. This theme is given an individual twist by the proposition that excess spending initially impinges on stocks, and that stocks are replenished through an adverse trade balance, and also by the author's concentration on unfilled orders and delivery delays rather than prices as the main variable by which inflation influences the balance of payments. The solution, which hinges on the author's well-known views as to the central place of stock-holding in the determination of economic activity, is to ensure that government expenditure is adequately covered by taxation and borrowing from current saving, and to tighten credit so as to reduce excess spending, immediately by cutting stock accumulation and in the longer run by reducing the money stock.

This solution is open to the familiar Keynesian objections to its emphasis on stocks rather than fixed capital investment as the prime source of instability—the latter rather than the former surely explains the most recent crisis—and on the quantity of money rather than the level of interest rates as the governor of spending. On its own grounds, it is open to other objections which the author himself recognises but does not adequately discuss, notably the small proportion of stocks which is financed on credit (p. 91), and the difficulty of controlling bank advances when they form an abnormally small proportion of bank assets and the authorities are inhibited from raising interest rates by a large floating debt. Nor is it clear how tight credit is to be reconciled with the author's view (p. 138) that industry must not be starved of the capital resources required for technical progress.

The minor, but more intriguing, theme of the book is that the 1949 devaluation was a stupid blunder, which imposed a drastic undervaluation of the pound in relation to the dollar from which the pound has not yet escaped, and which is now (p. 127) the main cause of overemployment and excess demand. The fact of undervaluation is established by the debatable procedure of comparing the movements of British and American wages since before the war. It has persisted, Professor Hawtrey argues, because on the one hand demand for exports has been choked off by the lengthening of order books, thus keeping the price of exports too low (and, though Professor Hawtrey does not develop this implication, the volume of exports too large), and on the other hand, membership in the International Monetary Fund ties the pound to a dollar standard, and American wages have been rising roughly as rapidly as British. To cure the undervaluation, Professor Hawtrey recommends appreciation rather than an increase in money wages, the appreciation to be introduced after a reduction in excess demand has improved the balance of payments; but he is rather imprecise about the desirable extent of appreciation, suggesting at one point (p. 116) that the dollar proceeds of exports should be maximised, at another (p. 132) that the rate should be set free to conform with a policy aimed at maintenance of a constant basic wage level.

This and other ambiguities and inconsistencies make the book difficult and frustrating to read: it has to be mined rather than mastered, and the seams often give out before yielding a profit. But it does undoubtedly have the suggestive value of an independent approach to the problem of sterling, which attempts to view it from a broader angle than that of the immediate state of the international reserves.

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The Theory of Customs Unions. By J. E. MEADE. (Amsterdam: North Holland Publishing Company, 1955. Pp. 121. 15*s.*)

THIS work embodies the De Vries Lectures delivered by Professor Meade at Rotterdam in April 1955. It is "a critical examination, not so much of customs unions themselves, but rather of the tools of economic analysis which have been used in the past in order to pass judgment upon customs unions" (p. 13).

Professor Meade excludes from his purview the initial difficulties in forming a customs union and the loss due to the displacement of productive resources from their pre-existing employment. His approach to his subject is on the lines of classical free-trade theory. Wherever there is a gap between the marginal cost of a product and its marginal utility, whether caused by

a tax, a subsidy or a monopoly profit, welfare can be increased by diminishing the gap.

Where a customs union removes the duty on a product which is supplied by one of the participating countries to another, and is not imported by the latter from elsewhere, there is an obvious gain (p. 32). The gain is not only from production at lower cost (setting free productive resources for other uses) but also from the consumer's surplus in respect of any increased consumption (p. 49). But if there is what Professor Viner calls " trade diversion " (p. 31), that is to say, a displacement of imports from a third country, which are produced at lower cost but are subject to duty, there is a loss to set against the gain. Moreover, additional exports from one participating country to another may be in part supplied by a diminution of the exports of the former to a third country where they are subject to duty. A diminution of dutiable imports into the third country " will represent a loss of economic welfare," because the high price is associated with high marginal utility to the consumer (p. 69).

In Chapter V (pp. 67–82) Professor Meade follows out some of the more remote repercussions on production and consumption, especially in relation to complementary and substitutable products. For this purpose he assumes not an entire customs union, but a small reduction in the duty on a single commodity, as on the importation of beer from Belgium into Holland, the duty on beer from other countries remaining unchanged (p. 63). To assess the effect on economic welfare, " one must trace out the repercussions of this change upon all the quantities of all products traded internationally, and one must then weight each change in the volume of a product traded by the difference between its price in the country of export and its price in the country of import " (p. 83).

His analysis does not seem to require the limitation to a " small " reduction of duty which he assumes. The limitation seems to be dictated by the mathematical formula in an Appendix (pp. 120–1). The application of the calculus requires the very artificial assumption of *continuous* variations of price and of utility. It is only in virtue of that assumption that utility can be supposed to tend to a true maximum, but for Professor Meade's purposes it is not necessary also to assume that the change of duty is small.

His whole analysis is subject to certain narrowing postulates. Within each trading country there are initially to be no divergence between marginal costs and values and no external economies or diseconomies of production (p. 57). Costs also are to be subject to decreasing returns (p. 54). The effect of introducing increasing returns is briefly dealt with (pp. 93–4). But for practical purposes Professor Viner's implicit assumption of constant returns (pp. 44 and 53) is usually more appropriate to a manufacturing industry than either increasing or decreasing returns.

Professor Meade fully recognises that the validity of his conclusions is limited by his assumptions, and even within this limitation " it is impossible to pass judgment upon customs unions in general. They may or may not

be instruments for leading to a more economic use of resources. It all depends upon the particular circumstances of the case " (p. 107).

Nevertheless, the absence of any clear-cut general conclusion does not detract from the value of his very acute analysis. It supplies a method of approach to one important aspect of the practical problem of a customs union, and will help the projectors to find their way through the labyrinth of repercussions with which the problem is beset.

RALPH HAWTREY

London.

Income and Wealth, Series V. Edited by SIMON KUZNETS for the International Association for Research in Income and Wealth. (Cambridge: Bowes and Bowes, 1955. Pp. xiv + 242. 42*s.*)

Now that the problem of economic growth has become a major preoccupation of theorists and policy makers, the need for empirical evidence on past experience is widely felt. The quantitative evidence is surprisingly scanty. In 1950, however, Professor Simon Kuznets, under the joint auspices of the International Association for Research in Income and Wealth and the U.S. Social Science Research Council, initiated a programme of research designed to fill the gap on an international scale. This volume, which contains papers arising out of the Castelgandolfo (1953) Conference of the International Association, is a result.

It is the second in the Association's series of conference volumes to be devoted to the topic of economic growth. The first, *Income and Wealth, Series II*, dealt with the case of the United States. The present book examines long-term estimates of national income and expenditure and of related or component aggregates for six countries—France (1780–1950), Germany (1860–1950), Denmark (1870–1952), Hungary (1900–49), Japan (1875–1942) and the United Kingdom (1870–1952). We have here, therefore, a variety of case histories covering periods ranging from fifty to one hundred and fifty years, and dealing with countries at widely different stages of development. The United Kingdom, for example, was an industrial economy at the beginning of the period under review: Hungary was still in the early stages of industrialisation at the end of it.

The papers vary in length, quality and character. There are full annual series for the main national-income aggregates for the United Kingdom, Denmark and Hungary. Period averages and estimates for benchmark years are given for France, Germany and Japan. With the notable exception of Professor Perroux, whose lively essay on the economic growth of France is inspired by more than the mere statistics of the case, the authors have been regrettably restrained in their attempts at economic analysis. Possibly it is inevitable and proper that in the early stages of a path-breaking enterprise of this magnitude the individual investigators should be too preoccupied with the problems of their raw material to generalise more ambitiously than most of them have done so far. Possibly also the compilers

of the basic estimates are temperamentally disinclined to subject them to the stresses and strains of advanced economic analysis. The consequence is, however, that although the volume is important as a source book of statistical data on economic growth, it is disappointing in its contribution to theory.

The task of new estimation and revision of estimates in this field is a continuing process and the work has been brought to different stages for each of the countries considered here. The paper by Bjerke on Denmark is a summary of preliminary estimates prepared in the Danish Statistical Department and in that sense is an interim report on work still in progress. Yamada's paper on Japan is a critique of recent estimates which underlines the need for a drastic re-consideration of the basic data for this country. The paper by Perroux knits together the implications of a series of quantitative studies recently carried out by research workers at the *Institut de Science Économique Appliquée*. Eckstein for Hungary and Jostock for Germany give for the first time the results of original and scholarly inquiries in this field for their countries. The paper by Jefferys and Walters on the United Kingdom is the product of a long and respectable tradition of national-income research.

The contribution for the United Kingdom is something of a milestone. The authors have built into their estimates of national income and expenditure the work of Bowley, Hobson, Clark, Prest, Chapman, Stone, Bellerby, Utting, Barna, Cairncross, Imlah, Phelps Brown, the Central Statistical Office and many other careful investigators in this field. They have constructed their own series for certain sections of national expenditure, and they have made their own adjustments for errors and omissions in some of the series they have taken over from other investigators. But the outstanding feature of their contribution is the fact that it constitutes a practical summary and a synthesis of past work in this field.

In effect this volume is likely to constitute a standard work of reference on its subject for some time, not only because it contains the results of a considerable effort in original statistical research, but also because it offers a critical review of past estimates for the countries it considers.

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The Growth of Physical Capital in Agriculture, 1870–1950. By A. S. TOSTLEBE. *Capital and Output Trends in Mining Industries, 1870–1948.* By I. BORENSTEIN. National Bureau of Economic Research, Studies in Capital Formation and Financing, Occasional Papers 44 and 45. (New York: National Bureau of Economic Research, 1954. Pp. 92 and 81. $1.00 and $1.25.)

THE two studies under review are part of the series relating to trends in capital formation and financing, and present results in advance of full publication. The inquiry as a whole is under the guidance of Professor Kuznets and is supported by the Life Insurance Association of America.

The practice of the National Bureau of releasing the results of its research fairly quickly in the form of occasional papers is to be commended. As usual with these papers, the presentation of the statistical material is excellent and the text concise and lucid. The findings are usefully summarised and interpreted, partly in Professor Kuznets' introductions, yet space is found for a description of statistical sources and techniques (including in the paper on agriculture an appendix on " Methods of Estimating the Number and Value of Chickens, by States, Census Years, 1870–1920 ").

Capital in these studies is understood in the financial rather than in the physical sense, and it includes land and reproducible fixed assets, as well as working capital. Although the basic concepts are not discussed at length, the aim appears to be to measure something corresponding to market values and then correct for price changes. Agricultural capital consists of land and farm buildings (including dwellings), machinery (including motor cars), livestock and growing crops; minor items of working capital are ignored. The data come from national agricultural censuses and similar statistics. In mining all working capital, including cash balances, is included, and the data are derived from company balance sheets. Assets owned rather than assets employed are included, and the relationship of the two may have changed over time (for example, the importance of leasehold mining rights has changed).

The first study brings together the essential and very interesting information relating to the long-term development of American agriculture in terms of man-power, capital and output. The discussion of the changing regional pattern is particularly interesting, but it is impossible to comment upon it here in detail.

The number employed in American agriculture reached its peak in 1910 (already in 1890 in the north-east, but only in 1930 in the western regions) and, as a result of the decline precipitated by full employment in the last fifteen years, less than 7 millions are now in agriculture. This number is the same as in 1870, but the proportion of the occupied population engaged in agriculture declined from 53 to 11% during the period. The acreage of farms and output, however, continued to grow almost uninterrupted. Capital, as defined here, grew in terms of 1910–14 prices from $20 billion in 1870 to $54 billion in 1950; excluding land, the growth is from $6 billion to $19 billion.

In spite of mechanisation, the great bulk of agricultural capital is still represented by land. Of the rest, machinery and livestock account for two-fifths each, and growing crops for one-fifth. In the course of time the share of machinery increased at the expense of the share of livestock, as, since 1910, horses and mules disappeared. The value of assets per farm was only one-third of the national average in some regions, but more than double the average in others in 1950.

The output of United States mines grew parallel with gross national product, that is, growth has been rapid except for the dip in the thirties. First precious metals, and later other metals and coal, reached a peak, but

the figures for the speedily expanding petroleum output increasingly domina the total. Employment reached its peak in 1919, and has slowly declin since. The value of capital, excluding land, grew in 1929 prices from $0 billion in 1870 to $8·5 billion in 1929. The striking conclusion is th reached that there was a decline to $6·7 billion by 1940, and only a parti recovery to $7·7 billion by 1948. In particular, capital in petroleum a natural gas, which accounts for the bulk of the total, was the same in 19 and 1948.

One of the main objects of the inquiry of which these papers form pa is to throw light on capital–output ratios, and to make thereby possible t projection of future capital requirements. Underlying this object is t belief, evident in Professor Kuznets' recent writings, that long-term econ mic growth, as indicated by the usual social accounting measures, exhib certain regularities and certain stable relationships between the differe variables considered. Much of the discussion in the paper on mining centred on the capital–output ratio, which between 1870 and 1919 rose fro 0·7 to 2·3, and fell since to 1·3 in 1948. This main conclusion remai intact, even if each branch of mining is taken separately; the domina petroleum ratio rose from 1·8 to 5·9 and fell back to 1·8. The auth examines the qualifications, but remains convinced that the conclusion correct. (It should be noted that capital per worker continued to increas

In the paper on agriculture the subject of capital–product ratios is on brought up in Professor Kuznets' introduction. He estimates that, on crude basis, the ratio fell 18% between 1880 and 1910 and 33% betwe 1910 and 1950.

Do these findings indicate long-term trends in capital, or are they depe dent on the concepts chosen, the statistical data available and the peri considered? A reading of the carefully worded qualifications certain makes it evident that generalisations, such as those contained in Mr. Col Clark's broadcast early in 1955, are meaningless without an adequa definition of the concepts.

It is relatively easy to establish conclusions for agriculture which a different from the above. If product is measured as net output instead gross output, the ratio (as Professor Kuznets suggests) would have declin by 10% only during each of two periods mentioned above. The decli would be smaller if capital were measured in 1950 prices, and can probab be accounted for by imperfections in the data. For instance, the farme dwelling is included, and the number of farms has risen less than other capit and then declined. Nor do the estimates allow for any improvement p unit of livestock. All in all, one might say that capital grew about pr portionately to output, but it is not possible to be more exact.

The findings on mining are heavily dependent on the concept of capit chosen—depreciated book values deflated by the use of cost index-numbe Apart from the well-known imperfections of these index numbers, it is with certain scepticism that one looks on trends in real economic variables derive from company accounts. If we assume that accounting is generally co

servative, and that there is a tendency in accounts to follow cyclical and other fluctuations (through revaluations and premature writing off), the validity of this approach may appear doubtful. It is significant that the author finds a connection between rates of growth of output and the capital–output ratio. Fluctuations in new investment, together with imperfections in book-keeping, are sufficient to cause a certain degree of fluctuation in the capital–output ratio. In particular, investment after 1929 has been exceptionally low. That, however, does not imply that capital—in some significant economic sense—has been "eroded" in the way book-values have diminished. Suspicions increase by a comparison of Dr. Borenstein's figures for plant in mining with the estimates, based on the perpetual inventory method, of Dr. Goldsmith. The latter only covers part of plant in mining, apparently two-thirds in 1929; but for 1940 and 1948 Dr. Goldsmith's figures are nevertheless higher than Dr. Borenstein's. Moreover, 1948 is the last year for which estimates are made here, and the post-war investment boom had as yet little effect on the figures. Currently expenditure on plant and equipment alone is running at an annual rate of nearly $1 billion, which indicates additions at a fast rate to the stock of capital.

It is to be hoped that when the full findings of this inquiry are considered, the authors will check the consistency of their estimates with other indicators of capital, and examine in particular the suitability of the concepts used for the main objects in hand. For the time being, the capital–output ratio ought not to be used without a precise understanding of the way in which the estimates were made.

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The Economic Development of Malaya. Report of a mission organised by the INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT. (Baltimore, Maryland: The Johns Hopkins Press (London: Geoffrey Cumberlege), 1956. Pp. 707. 60*s.*)

THIS report of the International Bank's mission to Malaya is, like that of other similar missions, a general study of the country's economy, but this mission's overriding objective was the production of a realistic programme for the quinquennium 1955–59. The general report occupies 234 pages, or roughly one-third of the volume, and is a summary in four parts of Part V, which occupies the other two-thirds, and consists of twelve Technical Reports, the principal topics being agriculture, mining, power, transport and communications, industrial development, education and social services, currency and banking. Part I gives a very short general background survey, which high-lights the essential characteristics of the Malayan economy to-day and is adequate for the mission's short-period objective, though hardly perhaps for longer-period considerations: and it ends with a summary of the mission's programme of public investment. Part II deals with the Productive Factors. Part III covers the Social Services, and Part IV, entitled

Financing and Organisation of Development, considers the financial resources which can be made available, and proposes certain changes of governmental organisation for planning, and the institution of a central bank. Part V, as already stated, contains the technical reports on which the previous parts are based.

In general, the report is unexciting, and probably all the sounder for that. The mission has not discovered any key to a golden future for Malaya which has been missed by the Malayan governments or by private entrepreneurs. "The public investment programs which we recommend for the Federation and Singapore do not represent significant departures from the recent patterns of public investment in both territories, either in amount or character." Thus the governments have got the confirmation of outside experts that they are on the right lines, rather than any bright new ideas. At the same time the mission has not been afraid to criticise, or to suggest modifications of present policies and projects: some examples are the discussion and conclusions concerning the rubber replanting problem and its financing, concerning the minimum price policy for padi and the mission's proposal for an import duty on rice combined with subsidies to domestic padi producers; and concerning the issue of protective measures for industry in the Federation, as well as critical comments on particular projects, and the proposals for a central bank and some form of credit institution. The report is often notably cautious, and its general tone is realistic, and the mission would seem to have done its job in a way which should be really helpful. This is perhaps particularly true of Part III, The Social Services, and of the very thorough technical report on Education (a preliminary draft of that part of this report concerned with the Federation was made available to the Federation Government in mid-1954, and the conclusions in the Federation White Paper on Education October 1954 are substantially the same). So far as a layman can judge, the same applies to the report on Public Health and Medical Care. These two technical reports occupy nearly 200 pages out of the 400 pages of Part V, but they should not overshadow some of the others: Technical Report No. 8 on Industrial Development is an admirable economic essay in twenty-two pages, and No. 12 on Currency and Banking in fourteen pages not only gives a clear account of the working of the present system, but sets out a succinct case for a central bank.

For the Federation the mission recommends a public investment programme for the quinquennium 1955–59 totalling Malay $775 million, of which 25% is allotted to agriculture, 20% to transport and communications, and 11% to power, and most of the remaining half to social services. For Singapore the programme amounts to $610 million, over half to be spent on essential city services of all kinds, and the rest on social services, especially housing and education. To finance the Federation programme, income tax is to be stiffened, State and local revenues increased, and internal borrowing expanded to the feasible limit, and this should result in an overall deficit by 1959 of about the $220 million available government balances at the end of 1954. The Singapore programme is to be financed by stiffened income tax,

increasing the education and other rates and by domestic borrowing and use of reserves, leaving an uncovered deficit of $74 million to be adjusted in the light of developments.

To whet the appetite of potential readers, here are two of the many topics of interest in this large volume. The education programme is almost staggering. In Singapore in 1947 gross public expenditure on education was $4 million, in 1954 over $30 million, and the mission suggests that it may well be more than double that in 1959, because, to quote one factor, the primary school-age population may by then have increased by 50%. The problem in the Federation is even more serious: about 50% of the primary school-age population now attends school, and merely to maintain this proportion will mean an increase in costs from $102 million in 1954 to $145 million in 1959, that being reckoned the limit of available resources.

Secondly, there is the proposal for a central bank, which is probably all the more topical now that Malaya's political independence is definitely scheduled, for as the mission says, "A central bank has become the symbol of monetary independence without which political independence is thought to be incomplete." The mission's case, however, rests on economic arguments: that while Malaya's economy has in the past gained great advantages from the exchange stability and security of the currency board system, the economy to-day is very different—a national economy with its own settled labour force, local capital and enterprise and an indigenous banking system at least as important as the facilities provided by overseas banks, while both the need and the opportunity for local monetary management are much greater, more especially as Malaya must now think of its future development in terms of domestic savings rather than of foreign capital. But of course in the foreground is the objective of smoothing-out economic fluctuations, and here the mission thinks that something may be achieved despite a carefully worded estimate of the limited scope for typical central bank action in Malaya's circumstances, and of the requisite safeguards against abuse. "There are no 'tricks' by which a country can maintain a scale of private and public investment in excess of the flow of capital from domestic saving and from abroad" is a dictum which might well be inscribed over the new bank's doors, and on the desks of the new finance ministers.

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The Great Experiment. By F. Thistlethwaite. (London: Cambridge University Press, 1955. Pp. ix + 335. 25*s*.)

Despite the efforts of a handful of stalwart enthusiasts, the teacher whose task it is to introduce the British student to American history still has to rely almost entirely on the writings of Americans themselves. He is acutely aware of the inappropriateness for that purpose of American history books, written as they are for American readers and based on assumptions which,

in Mr. Thistlethwaite's words, " are not those which an Englishman instinctively understands." *The Great Experiment* is an apt title for a book which attempts to remedy this situation by presenting some two hundred years of American history, in a form designed for the British student, within the span of just over 300 pages of text.

The only reasonable way to appraise a book of this nature is not to discuss whether one agrees with this or that interpretation, whether one approves the degree of emphasis placed here or there, but to ask whether the book appears likely to succeed in its prime purpose, of " explaining " American history to the British student. From this point of view the book is admirably, even triumphantly, successful. The author combines a knowledge derived from experience of the difficulties of the British student with a detailed familiarity with the American scene and with all aspects of American history. The book does not fit easily into any one of the usual categories into which history is divided, diplomatic, political, economic, social, cultural. It contains something of all these diverse elements; how else, indeed, can American history be satisfactorily written? If the author has a single theme, this is to answer Carleton H. J. Hayes' question, " the American frontier—frontier of what? " Hence the two factors which make American history so unlike European history—immigration and the settlement of a continent—are rightly given a predominating role in the story which is told.

Although intended as an introductory text, it is not a book for the lazy. As well as instructing, it stimulates to further research. The author has concentrated on interpreting rather than merely reciting his material, assuming that many facts, if not already known, are easily obtainable by the reader with an atlas and an encyclopædia at his side. Footnotes are used sparingly, with the primary purpose of introducing the student to further reading. The choice of references has been made judiciously; the works cited open up interesting vistas of reading not only to the beginner but also, this reviewer freely confesses, to those who already know a little about the subject. The bibliography of American history is so frighteningly large that readers will, no doubt, have their own suggestions to add to the references: given the main argument of the book, however, it is surprising to find no mention of R. T. Berthoff's *British Immigrants in Industrial America* (Harvard, 1953), the only satisfactory work on that subject; similarly, V. L. Parrington is mentioned but not J. Dorfman, M. L. Hansen but not J. B. Brebner.

In a work which is so comprehensive in scope, ranging from Willa Catha and Hamlin Garland to the Marx Brothers, from Henry George and Thorstein Veblen to Jenny Jerome, from railroads and monopolies to architecture and education, omissions and minor inaccuracies are excusable. The role of West Point and the scientific schools of Rensselaer, Harvard and Yale in developing American engineering techniques is neglected. The evolution of banking and financial institutions and the significance of currency problems are treated all too sketchily. It was the grandson, not the son (p. 222), of Junius Morgan who underwrote American war loans in 1915, J. P. Morgan senior having died in 1913; the initials I.W.W. stand for Industrial,

not International (p. 241), Workers of the World; the Hawley-Smoot Tariff was introduced in 1930, not 1920 (p. 280). Since the book will very obviously be used for reference purposes, the index is most inadequate: its omissions are countless and inconsistent.

Those who believe that a scientific approach to history is not incompatible with the production of a work of literary merit will have their faith greatly strengthened by Mr. Thistlethwaite's book. The greatest of its many virtues is that it is beautifully written. It is worthy to reach a very much wider public than that, the history undergraduate, to whom it is immediately addressed.

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Essays in Economic History. Edited by E. M. CARUS-WILSON for the Economic History Society. (London: Edward Arnold, 1954. Pp. viii + 438. 45*s.*)

THE university teacher of economic history in England has for a great many years now been in a difficult position with regard to recommended reading. Articles and monographs have run well ahead of general works, so that even a fairly minimal minded student must have some recourse to the journals. But the mechanics of access are notoriously difficult, and zeal can expire if the needed volumes have been thumbed and annotated by margin-bugs, are out or, even worse, missing. Miss Carus-Wilson and her committee have sought to remedy this situation; they have brought together in a single volume those articles in the *Economic History Review* and *Economic History* published between 1926 and 1948 which have been most in demand from the teaching point of view. The result is a book which all who are really interested (and those with an eye to examinations) should possess. Here the undergraduate may study both the method of contemporary scholars and how things stand at the frontier of discussion.

In some ways it is an austere volume. It deals with economic rather than social history. Miss Levett once described the latter as " that kind of history which Dr. Coulton writes ": vividly conceived, dangerously fired by imagination, full of the loving observation of the artist. This finds little place. There is no dallying to watch the woollens and silks worn, the houses lived in, the spices consumed; in fact, each essay is going somewhere—economic historians as here represented pass by " the inwardness of daily life," in favour of Alfred Marshall's view that it is change over time which is the essence of economic problems. Nor is there much of the kind of history to which Sir John Clapham aspired in his major work, presenting events as " a continuous stream of facts." Nor does economic history as the adjunct and foil to a political theme figure here.

But, it should be noted, these kinds of economic history found little place in the *Review* itself in these years. Some might feel that this meant that it

was impossible for economic historians to meet the requirements of the " history as literature " school, as represented by the recent volume of essays in honour of Professor G. M. Trevelyan. Yet, most of these articles have their own kind of felicity in the development of a thesis, and most lead quickly to important general issues. The characteristic approach in the *Review*, from which most of these contributions come, was the selection of a problem arising from economic data as such: economic historians, as reflected here, seem to have had a strong sense of their own identity and function. There are clear signs of an apparatus of theory behind most articles. But it remains in the background: these are not mere attempts to clothe other people's models with facts.

This, of course, may simply mean that social and politico-economic history require more space than a review can offer, putting a premium upon more structured articles. Whatever the factors at work, they have operated to the advantage of the hard-pressed economist who wishes to keep contact with the historian. Some of the articles are pioneering and painstaking investigations of blind spots designated as important by some general frame of reference: Beveridge on corn yields in the Middle Ages, Bishop on open fields, Fisher on the London food market 1540–1640, Davies on the small landowner, Shannon on limited liability. Some are " revisions "—Postan dispelling error about the money economy or credit in the Middle Ages, Carus-Wilson and Nef describing their respective anticipatory industrial revolutions and Dorothy Marshall on the old poor law. Some are more in the nature of general syntheses: Fisher and Nef on the sixteenth century, T. H. Marshall on population, Beales on the great depression, Pares on the empire. Then there is Professor Tawney's celebrated article on the gentry, around which so much controversy has centred.

Do these excerpts exhaust the *Economic History Review* in these years—have we here, like the trailer of a film, all the exciting bits? Certain articles are not reproduced: those incorporated in later published work have been omitted. The twenty-two articles that do appear probably represent some three-quarters of those coming within the committee's terms of reference, namely as having teaching value.

Was this a wise criterion for a volume of reprints? On balance, yes. Utility dictated it; in any case there is unlikely to be a yawning gap between what active teachers and their pupils find helpful and the growing points of the subject. The main criticism might take the form that such a principle tied selection to the teaching prospectuses of British universities, where these might be out of date or affected by peculiar circumstances. The degree to which teachers were concerned with historians or economists respectively might be relevant. Or the extent to which non-British economic history is taught might affect choice. The volume is strongly English: Nef discusses Spain and France, Hamilton writes of Spain, Barbour and Wilson treat the Netherlands, usually with an eye to England. But even this nexus is cut in the sixteenth or seventeenth centuries, confining treatment thereafter to England and the Empire. But all this, involving the omission of

the Americas, Asia and Africa, is a reflection of the contents of the *Review* itself, rather than of the choice of the selectors.

It is to be hoped that the publication of this volume of excerpts will not discourage altogether the use of the back numbers. There remain the painstaking and scholarly monographs which have been winnowed away, there are the reviews which often reach the heart of a matter more quickly than more extensive treatment, and there are the bibliographical articles, which remain of great value. Indeed the Economic History Society might consider the case for a bibliographical volume.

All in all, a job well worth doing, and well done.

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Britain Between the Wars, 1918–1940. By C. L. Mowat. (London: Methuen, 1955. Pp. v + 694. 30*s*.)

This book is a considerable feat of historical craftsmanship. In some 660 pages Professor Mowat attempts a comprehensive account of British experience between the wars. His interest is chiefly in politics, but the economic sections are substantial and few if any aspects of life are quite neglected. Topics range all the way from women's fashions in the 1920s to Keynesian economics, the general strike, Munich and the Norwegian campaign. Not everyone is an admirer of " total history," and some may deplore Professor Mowat's extensive reliance on derivative as opposed to original sources of information. Of the personalities who cross the stage only Baldwin comes alive, and the flavour of the book is of something read about, dissected and studied, rather than relived and understood from within. Yet in the end the result is impressive. The accumulation of detail comes to produce the illusion, almost, of reality. Here is the chronicle of an era, a guidebook to an entire period.

The years from 1918 to 1940 constitute a historian's nightmare. If ever there was an age of transition, this was it. It was intensely self-conscious, and is therefore abundantly documented. Yet even to those who lived in it it was a mysterious universe, abounding in paradox, even in contradiction. Everywhere nationalism and isolationism were the background to the activities of the League of Nations, while disarmament conferences were the accompaniment of constant rearmament. In Britain, socialistic and egalitarian policies were pursued by conservative governments, while a rapid improvement in the standard of living of most British people was achieved along with persistent and heavy unemployment and mounting dissatisfaction with the standard of life of the poorest members of the community.

Professor Mowat's will to see the period steadily and see it whole is much to be admired. It is also, unhappily, almost unprecedented, and his achievement is therefore the more outstanding. It is, however, strictly limited in its nature by his eschewing almost all comment. The facts are

left to speak for themselves, or at least they appear to be. This is never a satisfactory procedure, and it is singularly ill-suited to a period as turbulent as this one. The reader in search of an explanation must work out for himself the guiding ideas and the long-range trend of dominating circumstances which chiefly determined the history of these two decades. But it would be worse than ungrateful to complain that Professor Mowat has not explained the period when he has performed the prodigy of reporting it.

The economic sections are less good than the political ones. Characteristically, the author is at ease when writing about the tactics of the general strike, which he does at length. But his explanation of recovery from depression after 1932—increased consumption—is unlikely to satisfy any economist; and one of the few omissions in the book, although a most important one, is any reference, save for a single line on p. 457, to new product or cost-reducing innovation.

In dealing with measures of economic policy Professor Mowat is inclined to allow his narrative to become coloured by the views of those authors whose books he uses. This leads, accidentally, to instructive results. Protection, for example, is presented in an unfavourable light, apparently because almost all economists who wrote about it in the 1930s wrote from the point of view of orthodox classical doctrine, and so condemned it. But was some measure of protection really so absurd in 1932? Similarly, it is easy to poke fun at the vacillation and feebleness of policy regarding the coal-mines or at the absurdities which resulted from the Agricultural Marketing Acts of 1931 and 1933. But what were the alternatives? The implication of writing as Professor Mowat does is that some form of the rejected policies of socialisation or nationalisation or a return to the nineteenth century was the answer. But what form? We cannot rest satisfied to-day with a view of the inter-war period based on opinions some of which might have been held by Professor Cole and some by Professor von Mises twenty years ago. We could not be satisfied, for that matter, with a view based on the opinions of either one of them. What do we really think now, in the light of later experience, of the policies pursued between the wars—and of those rejected? Present-day thought on economic policy is in many ways, perhaps in most ways, staggeringly different from that of two or three decades ago. But this only strengthens the case for a critical review of the makeshift policies of the inter-war years. Such a review would be most valuable. But to see the years themselves in perspective is the first task, and Professor Mowat's book is a welcome beginning.

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Merchant Shipping and the Demands of War. By C. B. A. BEHRENS. *Agriculture.* By K. A. H. MURRAY. History of the Second World War, United Kingdom Civil Series, edited by Sir Keith Hancock. (London: H.M. Stationery Office and Longmans, 1955 and 1956. Pp. xv + 494, and xii + 422. 35*s.* and 30*s.*)

THESE two volumes in the civil series of the history of the Second World War deal with what are in effect two facets of the same fundamental problem —that of maintaining supplies and moving troops with limited and depleted shipping resources. Miss Behrens' volume deals with the more central problems; Sir Keith Murray's with the remarkable contributions of British agriculture to the economising of imports.

Miss Behrens' book begins with the pre-war planning. Here, as throughout the book, she stresses the difficulties and uncertainties of the calculations. I wonder whether she has not absorbed a little too thoroughly the atmosphere of the war-time Ministry of Transport and does not exaggerate, both in this and other cases, the difficulties of marshalling the statistical evidence sufficiently accurately to establish the dangers and difficulties that were likely to arise beyond any real doubt. For if one re-reads the history and sees it developing through Miss Behrens' eyes, the thing which strikes one most forcibly is the muddle and mishandling of all the problems associated with importing-capacity—stock-building, economy of food and raw-materials, as well as use of shipping itself—through not only the post-Munich period of peace, but also the first nine months of war, and the failure to use that period to stock this country against the siege that was almost undoubtedly to come. It was not, of course, the sole responsibility of those concerned with shipping, but a vigorous and foreseeing government and civil service should surely have dealt more effectively and more promptly with those problems. Indeed, as emerges from Miss Behrens' narrative, it was not really until February 1940, when Sir Samuel Hoare (as he then was) was asked to review the shipping situation, that a serious attempt was made to see the whole range of relevant problems, and even thereafter neither those responsible for food nor for raw materials would seem effectively to have restricted consumption and to have accepted and operated import programmes within the limits that had been set for them. Over the next few years these initial failures could have lost us the war.

I cannot hope, in a short review, to follow Miss Behrens through all the events, all the crises and all the achievements of the following five years. She traces them first down to the fall of France, and through the period to Pearl Harbour, with the attempts and remarkable successes in persuading shipowners and ship-masters (and it was the latter who had in most cases to make the difficult decision) to bring their ships into British ports when their countries were forced to surrender to Germany. It was at this time that concentration on the West Coast ports was forced on us, with consequences which were difficult to predict, but ultimately proved to be less disastrous than had been feared. It was at this time also that the bombing of Liverpool and other West Coast ports caused such havoc that for a short period it

seemed that imports would be reduced far below the danger point. Miss Behrens attempts an estimate of the consequential loss of imports through delays in port, which she puts at no more than 12,000 tons on a total of just under 31 millions in 1941. But the total loss of potential imports over the next twelve months resulting from the sinking and damage of ships and the stocks that were destroyed in the eight nights of raids would seem to have been nearer to 300,000 tons.

The real crisis came in the next phase, with the intensification of the submarine war on the one hand and the increase of demands for shipping for military purposes—to the Middle East in particular—on the other. Down to 1942 the military requirements, broadly speaking, were accepted without criticism, but as shipping became scarcer and military needs mounted, the relative claims of minimum imports and of military needs came more clearly into conflict. And after Pearl Harbour the growing American requirements made the strain constantly greater rather than less, even though their vast expansion of shipbuilding began at a later stage first to balance the sinkings and ultimately to give a growing total of available shipping for the Allies as a whole.

Miss Behrens brings out with great clarity the difficulties that arose over the following years in working out between the Allies a system of effective combined control over the common pool of shipping, and in particular the difficulties of securing, at a time when we were constant claimants on American building, that the American Services should subordinate their claims to the needs of our civil import programmes, even when the President had, as it seemed to us, established the matter in principle.

But what seems to emerge from this book even more significantly is a paradox about the whole planning of the war. There were in effect two powerful limiting factors on all our activities: man-power and shipping. The problems of man-power were, in the United Kingdom, integrated into all our thinking about the formulation of war policy. They dictated the extent of the call-up each year; the scale of the munitions programmes; the whole deployment of the Forces. And through the Ministry of Labour, on the one hand, and the Cabinet Committee on man-power, on the other, this limitation was constantly watched, and serious and carefully thought-out policies were framed to make the utmost of this limiting resource; the results may not always have been perfect, but they were effective and all-pervasive. With shipping, it was almost the exact opposite. There was wide consciousness of it as a limiting factor, but it did not, despite the existence of a central organisation for the allocation of importing capacity, exercise a similar direct influence on the day-by-day planning. It is not easy in retrospect to explain why. Man-power and shipping were alike in transcending the boundaries of the purely civil world of war-time, and were alike in being common to both civil and military sectors. Yet we find, at one stage in Miss Behrens' book, Lord Leathers remonstrating to the Chiefs of Staff late in the War that military planning had rushed ahead without adequate consultation with the shipping authorities.

I believe the explanation is to be found in the maintenance throughout the war by the Ministry of Transport of a curious *mystique* with regard to all attempts by others outside the Ministry to share in serious statistical thinking about the problems, and in consequence a curious isolation from other Departments. Miss Behrens has herself somehow managed to assume this *mystique*: the experts within are not prepared to make an estimate; the amateurs outside are incompetent to do so. Occasionally the foolhardy statisticians on the Prime Minister's staff are prepared to stick out their necks, but no one else is ever so brave as to do so. I myself venture to doubt whether the *mystiques* of the Ministry of Transport were really more mystical or more incomprehensible to normal educated human minds than were the *mystiques* of the Ministry of Labour. Operating ships so as to minimise the tons-days of shipping per ton of imports or military cargo is an immensely complex task; but so is the operation of the call-up so as to enable an infinitely elaborate munitions programme to be manned up. The Ministry of Labour solved the problem of retaining and mastering its own *mystique* and at the same time guiding others in thinking in the broader and cruder terms in which the big decisions of deployment had to be made. I am not at all convinced that the Ministry of Transport could not have enabled others to share in its thinking in terms of the ton-days of shipping involved in all the various activities of 1944, and have helped others to steer planning into a framework in which shipping could be most effectively used.

Sir Keith Murray's book, by contrast, is much less in the midst of the hurly-burly. There is a much clearer feeling not only of pre-war thinking, but also of readiness and ability to carry thinking into effect when war came. The emphasis is in this volume inevitably on the carrying out of policies; the examination of war-time food policy is, of course, the responsibility of Mr. Hammond's two volumes in the same series. The result is a sense of order in contrast with the half-ordered chaos of shipping policy, and of quietly operating machinery putting into effect a very remarkable revolution in British agriculture. For if one measures the achievement in terms of output net of imports, this increased by 25% between 1936–39 and 1943–44; if one measures in terms of the output of agriculture itself, net only not of imports but also of industrial output, the increase was 15%.

But Sir Keith Murray does not rest content with this achievement. He finds in effect four main points for criticism. First, there was in the early years of the War a serious failure to maintain the output of milk, which was badly needed as an element in the war-time diet; this failure he attributes partly to weather but mainly to a failure to foresee the probable effects on milk yields of the drastic changes of feeding habits to which the dairy herds were subject through reduction of feeding-stuffs. One suspects that this in turn traces to the inadequate pre-war thinking about importing capacity to which I have referred above. Second, there was a failure to frame a price policy during the first two years of war which would give a clear indication of relative priorities and the right incentives to adjust to those priorities. Third, there was ineffective control over the output of agriculture once it was

produced, and in particular over the rate of marketing of livestock and the sale of cereals for off-farm consumption. Fourth, the machinery for the formulation of general agricultural policy was deficient, in Sir Keith Murray's view, in the first two years of the war largely as a consequence of divergent interests and lack of clear demarcation on broader policy between the Ministry of Food and the Ministry of Agriculture. After mid-1941, in his view, the machinery worked fairly smoothly.

By and large this is the story of a great achievement, but in the light of Miss Behrens' story one is tempted to ask whether agriculture really did or did not just all that was possible to economise shipping. Over the six years 1940 to 1945 imports of food and feeding-stuffs, apart from luxury foods, were about 43 million tons less than they would have been on a pre-war basis; calories per head per day were not greatly reduced—they averaged about 5·0% less. This was a great contribution to the shipping problem. But it is not easy in the light of the evidence that Sir Keith Murray provides to judge whether other alternative food and agricultural policies might have yielded greater savings of imports with an equal maintenance of diet, and a diet which would equally have maintained morale.

If one lesson seems to emerge from these two books, it is surely how very much more practicable it is to exercise effective and rational control in war-time in matters that concern only one's own nationals than in those which concern a whole group of allies. Have we not undeservedly acquired a reputation, which at least one other great nation is wresting from us, for a preference for muddling through.

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NOTES AND MEMORANDA

ECONOMIC GROWTH AND THE PRICE LEVEL FURTHER CONSIDERED

SURELY Messrs. Phelps Brown and Ozga in their article in this JOURNAL (March 1955) have overstated their case when they say " that monetary changes have done little to cause or control the movement of prices," particularly when the word " little " is, read in the context of the whole article, apparently an understatement meaning " no " or, perhaps, " almost no." The traditional explanation to which reference is made is that of Alfred Marshall from his paper " Remedies for Fluctuations of General Prices." It would be well, however, to go back to the explanation by Adam Smith in the Digression on Silver in Chapter XI of the *Wealth of Nations*. There Adam Smith applied to gold precisely the kind of analysis that Phelps Brown and Ozga apply to raw materials. Compare for instance:

> " If by general progress of improvement the demand of this market should increase, while the supply did not increase in the same proportion, the value of silver would gradually rise " (*Wealth of Nations*, Cannan edition, p. 176).
>
> " When industrial capacity tends to grow more quickly than the output of primary products, a shortage of these products is felt and their prices rise, in terms of money, and also relatively to the price of industrial effort " (Phelps Brown and Ozga).

Here we have the same analysis of relative rates of growth of supply and demand applied first to one " primary product," silver, and then to all such products except silver. Adam Smith and Phelps Brown and Ozga agree that the result will be an increase in " labour command "; but the modern authors are not quite convincing when they state that in the one case the result will be a rise in money prices of the various raw materials, and when they deny in the other case that there will be any change in the goods' price of the money metal.

Some revision of the " traditional " view was necessary. Some of the effect of the gold discoveries was the effect of the " investment " in exploration and development which led to the discovery, and to the investment in developing the discoveries. But if one is less ready to accept the change in the supply of the money metal as " initiating " price changes, one may continue to accept the importance of its supply in permitting or inhibiting certain movements. To suggest that the traditional view under-estimates the freedom of the money supply to adapt to monetary needs in spite of its metallic base is not to accept the view that such freedom was as complete through the nineteenth century as it has become by 1955.

I would like to comment on a number of the theoretical points raised in this article:

(1) The authors make a point of the fact that the monetary stock wa only a part of the whole stock of gold. But Adam Smith discussed th growth in the demand for gold in its non-monetary use as well as in it monetary use. For instance: " A greater annual produce would require greater quantity of coin to circulate it; and a greater number of rich peopl would require a greater quantity of plate and other ornaments of silver (*Wealth of Nations*, p. 181; cf. *ibid.*, pp. 202–7). For the non-monetary par surely the authors' theory of relative supply holds. But is the monetar value entirely unrelated to the non-monetary value, and vice versa? Surel gold is homogeneous and must have one value in all uses.

(2) The authors tell us that " the connection between the monetar stock of gold and the quantity of means of exchange in actual use was bot indirect and flexible: it was liable to change, and was in fact changed, a many points within the inverted pyramid of the banking system." C course it was flexible; the question is how flexible. Of course there wa change. But was it not change in the form of progressive economy in th use of the money metal? The rate of such change may well have bee affected by the greater or less scarcity of the metal. But if this rate of chang was not quite independent of the gold supply it was, surely, largely so.

(3) The authors further point to the amount of money held under th " precautionary " motive and therefore " available to reinforce the circulat ing balances." But increasing income and wealth involve an increase i the demand for " precautionary " balances; and these are not " available unless some incentive is offered to their holders to part with them. Her indeed lies part of the explanation of the behaviour of Consols. (In par this behaviour may be explained by the change in the marginal efficienc of capital associated with the favourable expectations induced by gol discoveries.)

(4) The authors state that " a change in prices brought about from th side of money must be expected to raise most product and factor prices . . but in fact the British terms of trade suggest strongly that the movements c wholesale prices were systematically connected with changes in the term on which primary products were available to the industrial worker." Suc changes in the terms of trade between raw-material producers and manu facturers can surely be explained equally well in terms of the greater degre of sensitiveness and flexibility in the prices of raw materials (perhaps relate to the different degree of competition) when general monetary demand i rising or falling.

(5) The authors tell us that there is no evidence of the " tilting " of th trade cycle, " making the phases of monetary ease and expansion rathe longer or further reaching when the price trend was rising." Yet one forr of " tilt " is evident. Prices come out of each cycle lower than they went i on the secondary swing down, and higher than they went in on the secondar swing up.

(6) Finally, the adjustment of monetary habits and institutions to plent or scarcity of gold had to be " international " in scope. In so far as th

world adjustment was inadequate, and the particular country (say England) was committed to the international standard, its freedom of adjustment was limited, or its problem of adjustment made more difficult.

There was a lot of muddy water in the bath. But have not Phelps Brown and Ozga thrown out a rather healthy baby with the bath water? Is not the real problem to examine the characteristics of the now cleansed baby?

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A NOTE ON INCOME DISTRIBUTION AND THE MEASUREMENT OF NATIONAL INCOME AT MARKET PRICES

In the course of his most interesting article in the Economic Journal for June 1955 Mr. J. L. Nicholson refers to the assumptions upon which valuation in market prices can be regarded as a significant method for measuring changes in the national income. In this matter he is a model of caution, stressing that " estimates of national expenditure at market prices " can be given no more than " limited meaning in terms of welfare." " Such an interpretation would, strictly speaking, apply only at the margin (*i.e.*, for comparisons of relatively small changes) "; and, even more important, it is only valid on the assumption of unchanged income distribution. (" A rather more serious limitation, not mentioned by Hicks, is that the assumption about a single consumer can be generalised to consumers as a whole only on the further assumption that the distribution of incomes remains unchanged; in order to get a valid measure of change in real income, the change has to be the same for everybody.") Regarding this latter assumption, it may be worth while to point out that in one context of thinking about the problem of defining an increase of national income this qualifying assumption is not needed (the context of Professor Hicks' 1940 article), and in the other context, where it is certainly needed (of which one might perhaps speak as the Pigouvian context), to say a word or two more about its implications.

The reason why Professor Hicks did not need to make the assumption is clear, I think, as soon as we take his statement, that " prices which actually confront the consumer " should be taken as weights [1] " because prices give us some indication of marginal utilities," in the context of his article as a whole. It will be remembered that he was there concerned with defining an increase of social income independently of welfare and hence of distribution changes (independently in the sense that one might speak of an increase of social income where there was no increase, even a decrease, in welfare). The crucial condition about the equality between the ratios of marginal utilities and the ratios of prices (tangency of indifference curve to price-line)

[1] Professor Hicks added here the words, " when measuring social income as an index of social welfare." Perhaps it would have helped to avoid misunderstanding if he had said here " an index of *potential* economic welfare " (to borrow Professor Robertson's phrase).

was necessary to show what index-number data would suffice to demonstrate that a single (consistent) individual was better off in one situation than in another. Without it there would have been no point in defining an increase in social income in the way that the article proceeded to do; since this consisted in taking as the criterion of an increase between situations 1 and 2 the possibility of some income distribution in the former that would have made all individuals less well off than they severally were in the latter. And if index-number data could give no clue to whether a single individual was better off, they could give no indication of whether *all* individuals were better off than they might have been. But since this definition made no reference to any summation of individual utilities into a social total (and was, indeed, explicitly designed to avoid doing so), no assumption about income distribution was involved. One can say this much, however: that this way of defining an increase of social income was virtually equivalent to defining it as a change of output which *would* have led to an increase of welfare if income distribution in the first situation had been the same as the income distribution that existed in the second situation.

If one does not believe, however, that a change in national income can be satisfactorily defined in this (or some analogous) way, one has to fall back on the kind of notion that Mr. Nicholson evidently has in mind, according to which an increase of national income is identified with an increase in the total utility enjoyed by all individuals, and is measured in terms of this. For this purpose some assumption about distribution is necessary, since the summation of individual utilities is involved:[1] that is, it is necessary if we are to use an increase of values, when appropriately measured (*i.e.*, $\Sigma P_2Q_2 > \Sigma P_2Q_1$), as indicating an increase in utility, and *a fortiori* if we are to take it as affording a measure of the order of magnitude of such an increase.

Although consumption of various commodities by each individual will be carried to the point where the tangency-condition is fulfilled, an assumption about distribution is needed because these commodities will be consumed by different individuals in different proportions owing to differences of income (as well as of taste), and a given value-increase of output will have a quite different utility-content according as the proportions in which outputs are changed conform to the consumption pattern of the poor or of the rich. Thus, valued at market prices, a change of output may represent very different changes in the real income of the community; and it is even possible for values to increase and real income to fall (*e.g.*, when the output of wine rises and that of bread falls).

Changes in relative outputs may be caused either by a shift in the distribution of money income, and hence in the pattern of demand, or by a change in relative costs. If Mr. Nicholson's condition is interpreted simply as meaning constancy of distribution of *money* income, then the above

[1] An assumption which, it will be remembered, Professor Pigou made in discussing the measurement of national income in terms of "satisfaction." If the solipsist will not permit the notion of such an aggregate of utilities (or of individual "better-offnesses"), then without some version of the compensation principle he must, of course, keep silent about national income.

difficulty remains for any output-changes resulting from a change in relative costs; except that the possibility of an increase of values being correlated with a decrease in real income is excluded [1] if the change in productivity is such as to decrease the output of no commodity in the course of increasing the output of some.[2] Mr. Nicholson's condition must, therefore, be interpreted to mean that all output-changes are quite neutral in their distribution-effect, so that the real incomes of rich and poor are affected equally ("the change to be the same for everybody"). Interpreted in this way, it must imply that, with a given initial distribution, changes of output, to be significantly measurable in terms of market prices, must be always of the same composition (or rather, of a composition which, if it changes, changes in a prescribed way).[3] This, surely, represents a very drastic restriction on measurement in market prices—more drastic even than Mr. Nicholson's statement at first glance implies?

To labour this point might seem a waste of time, were not misunderstanding quite common, apparently, about the precise significance of the tangency-condition as a justification for using market price valuations in measuring social income. For example, the tangency-condition has been taken to imply "the identification of equal value units with equal amounts of consumer satisfaction." From what has been said above, it should be clear that such an "identification" is only possible for changes in total output with very severe qualifications, and certainly cannot imply that "equal value units" of bread and of wine added to the community's supply of these things represent equal increments of utility when income distribution is unequal. One writer, feeling perhaps that such an identification must be associated with some kind of *optimum* situation, goes so far as to suggest that it applies only in conditions of "consumers' sovereignty as distinguished from consumers' choice"; which I take to mean that all the so-called "optimum conditions" have to be fulfilled (*other* than distribution-conditions presumably), and prices be proportional, not only to consumers' marginal rates

[1] Provided, of course, that changes in taxation or in the degree of monopoly do not have the effect of raising the price of some commodity.

[2] For example, this possibility is not excluded if, say, the output of bread is at all reduced in augmenting the supply of wine. At first glance it might seem as though the tangency-condition, which applies to all consumers including the poorest, would suffice in this case to exclude this possibility because it ensures that the price-ratio of bread and wine shall express the substitution-equivalent of wine for bread even to the poorest consumers. But if there is any fall in the output of bread, there will be an income-effect on poor consumers of the rise in bread-prices which may prevent them from substituting at the margin wine for bread along the same indifference curve. To put it differently: even if the Laspeyres price-index $\left(\frac{\Sigma P_2Q_1}{\Sigma P_1Q_1}\right)$ for consumption in general has fallen relatively to the ratio of money expenditures in the two situations (which is the condition for $\Sigma P_2Q_2 > \Sigma P_2Q_1$), it does not follow that a Laspeyres price-index appropriate to the quantities of bread and wine consumed by the poor in Situation I has fallen relatively to the ratio of their money expenditures (which must be uniform for rich and poor with a constant distribution of money income).

[3] Prescribed, *i.e.*, by differences in the income-elasticities for different commodities, when real income rises with distribution of money incomes constant; or alternatively by the condition that changes in the composition of output and accompanying changes in money incomes must be such as to keep movement along a "compensation line."

of substitution, but also to marginal costs.[1] Such a conclusion evidently rests on a misunderstanding of the tangency-condition and its implications (this condition requiring no more for its fulfilment than free and unrationed consumers' spending, *plus* sufficient responsiveness of price to demand to preclude shop-shortages and queues; and implying a comparability of value-changes and welfare-changes only in the very qualified sense we have described). The misunderstanding may well have been connected in some way with the common "delusion" mentioned by Professor Hicks that a welfare-measure must be simultaneously a productivity-measure. That this kind of restriction upon the use of market prices should be suggested, while the difficulty about income distribution is ignored, is, at any rate, curious, and may serve as some justification for stressing in this Note what many of those who were reared on *The Economics of Welfare* may regard as the obvious.

What is less obvious is that a factor-cost measurement, in a productivity context, is subject to the same limitation. Here the rôle played by the equality of the ratios of marginal productivities and of factor prices is the provision of a standard whereby heterogeneous factors can be equated to form a cost-unit, and the productivity of a composite dose of them be given a meaning (for small marginal changes). But the factor prices as well as the marginal productivities (which are of course expressed in *values*) are derived from market prices; and the notion of a factor-cost aggregate has always an implicit reference to market prices and is meaningless without the consumers' tangency-condition (otherwise the particular ratio of factor prices selected would be as arbitrary as any other ratio). This form of measurement can therefore bypass neither the ordinary index-number problem nor the income-distribution condition, as some practitioners of "net value-added weights" and "adjusted factor cost" (*e.g.*, in comparative analysis of components of national income) seem to have supposed.

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THE INDUSTRY AND THE MARKET

IN commenting on Mr. J. N. Wolfe's article on "The Representative Firm,"[2] Mr. J. H. Davies[3] writes: "Any attempt to reconcile the views of those economists who regard the 'group and the industry as useless concepts' and those of business-men, who still seem to think and act as if there were such things is to be commended." The divergence of views to which he refers seems to arise from an attempt (on the part of economists) to define an industry in terms of the market for a commodity. A commodity may be regarded as "a chain of substitutes surrounded on all sides by a marked

[1] Cited in the ECONOMIC JOURNAL, December 1955, p. 705. The conclusion drawn was that valuation of output at market prices loses its point in a planned economy (where these conditions were assumed not to be fulfilled).

[2] ECONOMIC JOURNAL, June 1954.

[3] "The Industry and the Representative Firm," ECONOMIC JOURNAL, December 1955.

gap.' "[1] That commodities in this sense do exist is obvious, though it is ot possible to divide all production neatly up into discrete commodities. n industry may be regarded as a group of firms having certain technical aracteristics in common. They may be bound together by using similar ethods of production, dealing with the same suppliers or supplying the me dealers, drawing upon the same labour force, or merely by a historically termined sentiment that they *are* members of an industry. "A precise d meaningful definition of an industry"[2] is a vain objective. There is advantage (and much error) in making definitions of words more precise an the subject matter that they refer to. But rough working demarcations industries are required, for instance, by a group of business-men con-lering who is eligible to join a trade association or by the compilers of the ensus of Production.

It is very rare (if not unknown) for an industry, in this everyday sense, to selling one commodity. To take an obvious example, there is only a tiny nge of substitutability in demand between men's, women's and children's oes, and it is reasonable to regard them as distinct commodities. The ot and Shoe Industry (producing mainly with leather) is a fairly definite tity, supplying these three commodities. Some firms in the Industry ecialise on commodities, but many produce all three. The three com-odities are also supplied by the products of the Rubber Industry. A few ms straddle both Industries while supplying all three markets. On the her hand, each industry supplies commodities (leather goods and rubber ods) which are extremely remote from shoes in the chain of substitutes.

Questions relating to competition, monopoly and oligopoly must be con-lered in terms of markets, while questions concerning labour, profits, chnical progress, localisation and so forth have to be considered in terms of dustries. Once this is recognised most of the cross-purposes referred to Mr. Davies can be avoided.

In the far-off pioneering days of Imperfect and Monopolistic Competition was necessary to make very drastic simplifying assumptions to get to grips th problems that then seemed strange and mysterious. For instance, I sumed one-product firms and clearly demarcated commodities. An onomy conforming to these assumptions would consist of one-market dustries. After more than twenty years the argument should surely have t beyond this primitive stage of development.

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A NOTE ON THE BALANCED-BUDGET MULTIPLIER

I

THE object of this note is to provide a simplified proof of the generalised lanced-budget multiplier theorem. It has been pointed out by various iters that the famous Haavlemo theorem, which proved that the balanced-

[1] *Loc. cit.* [2] *Ibid.*

budget multiplier is equal to unity, is a very special case. The multiplier can be positive, zero or negative.[1] The proof offered by Baumol and Peston is such a general one that it is difficult to identify in their multiplier formula the normal inter-sector flows found in the system of social accounts implicit in the Keynesian model. The proof offered here is less general, in the sense that particular inter-sector relationships are assumed, but will perhaps be more readily understood by those who are familiar with Keynesian models. The proof is implicit in Mr. Turvey's analysis, and only requires minor elaborations and modifications of his system.

II

We shall assume: (*a*) a closed economy in which national income at factor cost and factor payments to households are identical, *i.e.*, we assume that business saving is zero; (*b*) a balanced budget made up of government expenditure on goods and services plus transfer payments as receipts and direct taxes and expenditure taxes (— subsidies) as payments.

Thus

$$Y \equiv C + I + G_c - T_i$$

where Y = national income of factor cost; C = consumption of households at market prices; I = investment by firms at market prices; G_c = government purchases of newly produced goods and services from firms at market prices; T_i = taxes on expenditure—subsidies.

Also $$G_c + R \equiv T_d + T_i \equiv G$$

This is the balanced-budget condition where R = transfers from government to households; T_d = direct taxes paid by households to government; G = total government receipts (or payments) on current account.

We shall further assume: (*a*) that T_d, T_i, R, G_c and I are autonomous; (*b*) that the marginal (= average) propensity to consume of both direct tax-payers and transfer receivers is the same [2] and that transfers are not subject to tax; and (*c*) that there is " money illusion " in the consumption function.[3]

Putting these assumptions into symbolic form, we have

α = marginal (average) propensity to consume of households, where $\alpha < 1$

$I = \bar{I}$, $G_c = \bar{G}_c$, $T_i = \bar{T}_i$, $T_d = \bar{T}_d$, $R = \bar{R}$

C = proportion of income spent by households after receipt of transfers and payment of direct taxes.

$$= \alpha[Y + R - T_d]$$

[1] See particularly, R. Turvey, " Some Notes on Multiplier Theory " (*American Economic Review*, June 1953, pp. 285–6) and W. J. Baumol and M. H. Peston, " More on the Multiplier Effects of a Balanced Budget " (*American Economic Review*, March 1955, pp. 140–8).

[2] We shall modify this assumption later.

[3] That is to say that expenditure on goods and services by households out of income is maintained only in money terms. For a fuller account of the implications of this assumption, compared with others, see Turvey, *op. cit.*, p. 285, and E. Cary Brown, " Analysis of Consumption Taxes in Terms of the Theory of Income Determination," *American Economic Review*, March 1950, pp. 74–89.

We now substitute these assumptions in our basic identity and have

$$Y = \alpha[Y + \bar{R} - \bar{T}_d] + \bar{I} + \bar{G}_c - \bar{T}_i$$
$$= \frac{\bar{I} + (\bar{G}_c + \alpha R) - (\alpha T_d + T_i)}{1 - \alpha} \quad . \quad . \quad . \quad (1)$$

But $R = G - G_c$ and $T_d = G - T_i$, if the balanced-budget condition holds. Accordingly we can re-write our equation as follows:

$$Y = \frac{(G_c - T_i)(1 - \alpha) + \bar{I}}{1 - \alpha}$$

Furthermore, if $\Delta I = 0$, then

$$\Delta Y = \frac{(\Delta G_c - \Delta T_i)(1 - \alpha)}{1 - \alpha} \quad . \quad . \quad . \quad (2)$$

or more simply

$$\Delta Y = \Delta G_c - \Delta T_i$$

Thus the balanced-budget multiplier will be positive, zero or negative, depending on whether the increment of government expenditure on goods and services is greater than, is equal to or is less than the increment of indirect taxes.[1] For a given marginal propensity to consume of households, it simply depends on the composition of government expenditure. That is all that is required in order to reduce the Haavlemo theorem to a special case.

The formula can be elaborated in order to take account of the more realistic case where the marginal propensity to consume of direct tax-payers and transfer receivers is different, it being assumed that direct tax-payers are excluded from receiving transfers by, say, a means test, and transfer receivers are below the tax-exemption limit.

Let β = the marginal (= average) propensity to consume of direct tax-payers

and γ = the marginal (= average) propensity to consume of transfer receivers.

Let z = the proportion of national (= factor) income going to direct tax-payers

and x = the proportion of national (= factor) income going to transfer receivers. Also $z + x = 1$.

Then $C = \beta(zY - \bar{T}_d) + \gamma(xY + \bar{R})$

and

$$\Delta Y = \frac{\Delta G_c(1 - \gamma) + \Delta G(\gamma - \beta) - \Delta T_i(1 - \beta)}{1 - (\beta z + \gamma x)} \quad . \quad . \quad (3)$$

III

It may be convenient to demonstrate the Haavlemo case for both the simple and more complicated models shown in formulas (1) and (3) respectively.

[1] This may also be written $\Delta Y = \Delta T_d - \Delta R$ where $G_c = G - R$ and $T_i = G - T_d$.

In the Haavlemo case formula (1) is reduced to

$$Y = \frac{\bar{I} + G - \alpha T_d}{1 - \alpha}$$

or, when $\Delta I = 0$ to $\frac{\Delta Y}{\Delta G} = 1$

This is because there are no transfers and no indirect taxes in the mode so that $\overline{T}_i = 0$, $\overline{R} = 0$, and so $G_c = T_d = G$.

Formula (4) requires the additional condition that $\beta = \gamma < 1$ and reduc to

$$\Delta Y = \frac{\Delta G(1 - \beta)}{1 - \beta(z + x)}$$

As $z + x = 1$, then $\frac{\Delta Y}{\Delta G} = 1$

IV

As governments generally control tax *rates* and not *yields*, then thes models suffer from the disadvantage that they do not allow any expansion incomes produced by the balanced budget to induce further changes in ta yields and, in consequence, further changes in government expenditur If G_c is given *ex ante*, then the yield of taxes is determined *ex ante*. Th difficulty can be overcome by a very simple device suggested to me by M A. C. L. Day, which can be illustrated by considering the Haavlemo ca again. From an initial equilibrium with a balanced budget, we assum that direct taxes are increased, for an initial income, by δT_d, and G_c simultaneously increased by the same amount. (The initial disturbanc might equally well be an increase in autonomous investment). Writin $0 < t < 1$ where t is the direct (proportional) tax rate, then, as incom increases on account of the initial increase in government expenditure o goods and services, there is a further induced increase in direct taxes equ to $t\Delta Y$, and, given the balanced-budget condition, the whole of the addition receipts is spent. Given that $0 < t < 1$, then the rise in income must brin about a further rise in both taxes and government expenditure, so that th balanced-budget multiplier must be greater than one. Writing ou balanced-budget conditions as $\Delta G_c = \delta T_d + t\Delta Y$, then by simple substitu tion in our model we shall find that $\Delta Y = \frac{1}{1 - t} \cdot \delta T_d$. This reduces t the simplified Haavlemo case if $t = 0$.

V

Obviously, the basic model will be modified if more complicated inte sector payments are introduced and if the number of sectors is increase For example, we can assume that firms save and are subject to corporatio taxes without having to increase the number of sectors. We could introduc a Rest of the World account and include government transfers to and fro

abroad as items in it. All these complications serve to warn us that in practical policy each individual situation has to be investigated separately. But we require no more than two additional government transactions on current account transfers and indirect taxes, in order to demonstrate that the *sign* of the balanced-budget multiplier can be positive, zero or negative. The conclusions of the general proof are therefore reached without having to go much beyond the text-book formulations of the theory of income determination.

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BALANCED GROWTH ON STATIC ASSUMPTIONS

IN the June 1955 issue of the ECONOMIC JOURNAL Mr. Marcus Fleming subjects the " doctrine of balanced growth " to a critical examination based on assumptions that seem to me not altogether relevant and appropriate. He refers to my *Problems of Capital Formation in Underdeveloped Countries* (1953) as one of three expositions of the doctrine, the other two being the well-known articles by Allyn Young and Rosenstein-Rodan in this JOURNAL in 1928 and 1943.

After his own—generally fair—presentation of the doctrine, Fleming proceeds on p. 245 to examine it: first, supposing that labour is the only factor of production and is *in fixed supply*; next, supposing that there are several factors, each *in fixed supply*. This enables him to say that " whereas the balanced-growth doctrine assumes that the relationship between industries is for the most part complementary the limitation of factor supply ensures that that relationship is for the most part competitive " (p. 246). The point stands out again in the final summary:

> " We have concluded that the argument as usually presented over-emphasises the repercussions on the demand for, and ignores repercussions on the costs of, the other industries, and that, in an economy where factors of production are in fixed supply, the introduction of unprofitable though efficient large-scale production in one industry is more likely to reduce than to increase the profitability of other industries " (p. 254).

We are not told who ever presented the balanced-growth argument on the assumption of fixed factor supplies. I fully agree that *on these terms* the argument does not make sense. Any deliberate expansion of one industry, instead of helping others, hurts them by drawing on their factors, and must lead away from optimum allocation of the given stock of resources. This is even intuitively fairly obvious, which is probably why no one has advanced the case on these terms.

Having dealt expertly with the allocation of fixed factor supplies, Fleming changes his approach: " In order really to salvage the doctrine . . . it is

necessary to drop the assumption that the supply of factors of production is fixed in favour of the assumption that the supply varies positively with real factor prices" (p. 248). The salvaging is only needed for his own previous construction. And the salvaging operation to which he turns is rather cramped by a framework that remains essentially static, assuming in effect a given functional relationship between factor supplies and factor prices. There follows a consideration of factor-supply elasticities, which shades into a more dynamic discussion where his findings are correspondingly less unfavourable. Towards the end (p. 252) he momentarily approaches my own initial set-up by positing a perfectly elastic supply of capital, in which case he grants the mutually supporting nature of investments in different industries. But this appears merely as a qualification appended to a negative verdict.

A closed system of variables interlinked along given schedules still need not favour expansion, and the switch made later from interest elasticity to income elasticity of capital supply does not help. It may be that "any increase in real income associated with the expansion of capital and output at *A* would tend to raise the domestic supply of *saving* and gradually and cumulatively the domestic supply of *capital*" (p. 253). But the initial capital-expansion at *A* is left unexplained and must come from outside the system.

Instead of trying, as he says at the start, to "reconstruct the logical presuppositions" of the doctrine, Fleming examines it, in the main, under a series of static assumptions of his own making. The object of this procedure is not clear. The word "growth" alone hints that something more is involved than, *e.g.*, the rules of allocating a given factor stock (which, in their proper place, are not to be disparaged). This is all the more evident if attention is paid to the context in which the balanced-growth idea has turned up in the literature.

My own assumption, in Chapter I of my book, was that of a given labour force being equipped with an increased stock of capital. (This appears even in the sentence Fleming quotes on p. 242.) My thesis was, in substance, that if all the capital were applied to, say, shoe production, sharply diminishing returns would soon set in, while if it were distributed over a range of industries returns need not diminish and might increase. "People working with more and better tools in a number of complementary projects become each others' customers." In poor countries, I suggested, small and inelastic consumer demand is apt to make investment in any *single* project unattractive in private business terms. This leads up to a study of the peculiar pattern of foreign entrepreneurial investment in such countries, a pattern consistent with my view of the relation between "The Size of the Market and the Inducement to Invest" (the title of Chapter I). It is in this context that I make use of the notion of balanced growth.

My assumption of an increase in capital supply and in capital intensity is the same as Allyn Young's, though he puts it in Böhm-Bawerkian terms—capitalistic or roundabout methods of production. Perhaps this is what

Fleming's own "vertical" economies amount to, which interestingly enough, he, too, describes in Austrian terms: stages, intermediate products, original factors (pp. 249–50).

Far from assuming fixed capital supplies, my opening chapter—being concerned with investment *incentives* alone—assumes away any inelasticity in the supply of capital. It concentrates on the demand for capital, as exercised by individual entrepreneurs, and abstracts from any supply difficulty. This is made clear at the beginning and the end of the chapter, though I admit that the conditions should have been stated more precisely, with some reference also to interest rates. The aim of this set-up was to keep it open for policy considerations. Later chapters deal with the supply side not only in terms of elasticities and propensities, but especially with reference to—national and international—policy measures relating to the supply of capital; and if these are to be interpreted in schedule terms at all, they can be thought of as *shifts* in capital supply conditions.

This framework, as well as the discussion within it, undoubtedly has its shortcomings. Thus balanced growth enters only on one side of the picture and takes an increased capital supply for granted. But that is not the point of Fleming's criticism, as I understand it. His criticism is that the balanced-growth argument does not stand up on assumptions on which, so far as I know, it was never put forward.

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A NOTE ON RETAIL DISTRIBUTION IN NEW ZEALAND

IT may be of interest to carry a little further the international comparison of distributive trades made by Lady Hall and Mr. Knapp in a recent ECONOMIC JOURNAL.[1] The first census of distribution in New Zealand, taken in 1953, provides enough information to make this worth while. No attempt is, of course, made to duplicate all Lady Hall's and Mr. Knapp's calculations, but we present our results in such a way as to facilitate comparison.

The categories of shops and trades in the New Zealand census do not accord exactly with the British nor is the coverage as wide, so that complete comparability between New Zealand and British results cannot be achieved. For reasons mentioned elsewhere,[2] comparison with the United States and Canada is even more difficult. The most important groups of the British census not included in the New Zealand survey were XI (coal, builders' materials and corn group) and XVIII–XIX (motor vehicle dealers and repairers, cycles, accessories and garages group). In order to make international comparisons easier we have expressed the number of shops in the remaining groups as percentages of the total number of shops excluding these

[1] "Numbers of Shops and Productivity in Retail Distribution in Great Britain, the United States and Canada," ECONOMIC JOURNAL, March 1955.

[2] *Ibid.*, p. 73.

groups in Great Britain, the United States and Canada. Table I shows th result of these calculations.

In the structure of its retail trade New Zealand clearly resembles Grea Britain more closely than either the United States or Canada. Grocer

TABLE I

Retail and Service Trades : Numbers of Shops in New Zealand, Great Britain, United States and Canada

Kind of business by major groups of the British *Census of Distribution* (1950).	New Zealand 1953		Great Britain 1950.	United States 1948.	Canada 1951.
	Number of shops.	% of total.			
				% of totals.	
I. Grocery group	3,770 [1]	17·1	21·0	25·4	24·0
II. Other food retailers	3,582	16·3	20·6	9·1	11·4
III. Confectioners, tobacconists and newsagents	1,974 [2]	9·0	10·8	3·5	8·0
IV. Clothing group	3,215	14·6	14·6	9·7	14·0
V. Hardware group	832	3·8	5·0	5·0	5·3
VI. Booksellers and stationers	748 [3]	3·4	1·5	0·5	0·5
VII. Chemists' and photographic goods group	664	3·1	2·7	3·8	3·2
VIII. Furniture group	958	4·3	2·6	3·9	2·1
IX. Jewellery, leather and sports goods group	637	2·9	2·5	2·7	2·7
X. General group [4]	183	0·8	0·2	1·5	1·4
XII. Other non-food retailers	2,011	9·1	1·8	3·4	2·4
XIII. Catering group	1,634 [5]	7·4	7·3	12·4	9·6
XIV. Hairdressers	735	3·4	4·9	11·1	8·8
XV. Funeral furbishers	96	0·4	0·5	1·2	0·7
XVI. Portrait photographers	249 [6]	1·1	0·3	0·8	0·7
XVII. Repairers group	730	3·3	3·7	6·0	5·2
TOTAL	22,018	100	100	100	100

Sources : *New Zealand Census of Distribution*, 1953.
ECONOMIC JOURNAL, March 1955, p. 73.

[1] Includes dairies.
[2] Excludes newsagents and dairies.
[3] Includes newsagents.
[4] Departmental and variety stores only.
[5] Includes hotels.
[6] Includes commercial photographers.

shops in New Zealand are relatively fewer than in any of the other countrie but the reason for this is simply that many other stores also sell groceries Thus no fewer than 944 general stores (group XII) and 176 other store also deal in groceries. The number of booksellers " and stationers " shop in New Zealand is relatively high, but as this group includes newsagents this fact may not be significant. Furniture stores and other non-food re tailers are, also, relatively more numerous, but hairdressers scarcer.

The number of shops (in our restricted sense) in relation to populatio may be seen from Table II, in which we also show the proportions for group I to XII only, *i.e.*, excluding service trades. According to both classifica tions, New Zealand shops cater for more people than British but fewer tha

North American. The relatively greater importance of service trades in the United States and Canada is clearly shown.

In the absence of estimates of the purchasing-power equivalents of the £N.Z. we cannot compare, with any accuracy, volumes of goods and services sold in New Zealand shops and those sold in Great Britain. If, however, we take £stg. = £N.Z. as an approximate estimate of the purchasing-power parity we find that *per capita* sales in New Zealand amounted to £175 and in Great Britain only £102—a ratio of 1·7. This difference is too large to be explained by an inappropriate exchange rate only, and we must conclude that New Zealand shops handled a considerably greater volume of goods in 1953 than did British shops in 1950. It will be recalled that there were also fewer shops in New Zealand in relation to population than in Great Britain.

TABLE II

Population in Relation to Retail Shops and Services, New Zealand, Great Britain, the United States and Canada

Country.	Population, millions.	Shops, thousands.		Number of people per shop.	
		All groups.	Groups I–XII.	All groups.	Groups I–XII.
New Zealand, 1953	2·01	22·0	18·6	91	108
Great Britain, 1950	49·1	614	511	80	96
United States, 1948	146·1	1534	1048	95	139
Canada, 1951	14·0	145	108	97	130

Sources : *New Zealand Official Year Book*, 1954.
New Zealand Census of Distribution, 1953.
ECONOMIC JOURNAL, March 1955, pp. 73, 74.

From the above considerations we see that the volume of retail goods distributed per shop in New Zealand is greater than in Great Britain. What of productivity per person? Again assuming that the current exchange rate between the countries is equal to the purchasing-power parity of the currencies, we find that average sales per person engaged was £3,709 in New Zealand and £2,173 in Great Britain for all shops, and £3,935 and £1,998 respectively for groups I–XII only. It would appear that labour productivity in the service trades in Great Britain is higher than in retailing, whereas the opposite is the case in New Zealand.

The results which we have obtained are in some ways surprising. One might have expected retail shops to be relatively more numerous in New Zealand than in Great Britain because New Zealand is much more sparsely populated. That the volume of sales per person is higher in New Zealand is not so surprising, as it is generally accepted that real *per capita* income is higher there than in Great Britain. The most interesting comparison, however, is that of volume of sales per person engaged. A New Zealand retail employee, it seems, distributes about 1·9 times as much as his British counterpart. We may note that according to Lady Hall and Mr. Knapp [1]

[1] *Op. cit.*, pp. 80, 81.

in the case of the United States and Great Britain the productivity ratio is nearly 2 and the corresponding ratio of real purchases per person nearly 2·4. As with the structure of retail trade, New Zealand distributive services seem to lie between those of Great Britain and North America in terms of volume of sales per shop and per person engaged.

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OFFICIAL PAPERS

The Royal Commission on the Taxation of Profits and Income

The Royal Commission on the Taxation of Profits and Income was appointed on January 2, 1951

> " to inquire into the present system of taxation of profits and income, including its incidence and effects, with particular reference to the taxation of business profits and the taxation of salaries and wages . . . "

The Third and Final Report [1] of the Commission was signed on May 20, 1955, by the Chairman and nine members: on the same day a Memorandum of Dissent was signed by the remaining three members. The Commissioners were first told that their recommendations must be such as on balance to leave the revenue unchanged, but later (March 1952) they were given a little more rope: if recommendations were made which would reduce the revenue they were to assign priorities. In the event the Commission tactfully, but firmly, refused to do this, beyond saying that if they cannot have all of each recommendation, they prefer some of many to all of a few. Twice the Commission sought a ruling on their terms of reference. To the question could they consider taxes on capital gains the Chancellor, Mr. Gaitskell, replied Yes. To the question could they consider an expenditure tax, his successor, Mr. Butler, replied No, on the grounds that they could not examine such a tax without also examining " on fairly fundamental lines the scope and purposes of indirect taxation " as well. This argument is not wholly convincing. It would have been possible to compare the merits of a tax on spending with those of the present system of taxes on income (or a modified system which included capital gains) on the assumption that revenue was not to be changed. Of course, if an expenditure tax had received support from the Commission the further question whether some or all of indirect taxation ought then to be shifted and absorbed by an increase in

[1] Cmd. 9474, June 1955. The First Report, dated February 13, 1953 (Cmd. 8761), dealt with certain problems of the taxation of overseas profits and relief from double taxation. The Second Report, dated April 9, 1954 (Cmd. 9105), dealt with " problems of progressive taxation as applied to individuals and the allowances, reliefs and rates of tax that form part of the system of progression," taking for granted for the time being the existing concept of taxable income (*i.e.*, excluding capital gains). There were important minority reservations to this report, to which was appended the important study undertaken by the Social Survey in 1952 of P.A.Y.E. and incentives.

the *rates* of an expenditure tax would naturally follow. Be that as it may, the enterprise of Mr. Kaldor in publishing his study of an expenditure tax [1] ensures that in the ensuing debates the case need not go by default.

The Commission added a further restriction of their own: " We have taken it as our general premise that there will not be any marked decrease or increase in the purchasing power of money in the United Kingdom " (23).[2] Whether this assumption is compatible with the recommendations of the Majority Report is a question to which we must return, but it was obviously necessary to make a definite assumption about the future movement of the general level of prices as a background to the detailed matters treated by the Commission.

There is not room here even to list the thirty-four chapter headings of the Majority Report, which give rise to ninety specific recommendations. Since this note will be exclusively concerned with two major questions, on which the dissenting members—it will be convenient to call them the Minority—disagreed with the Majority, it should be recorded that they endorsed twenty-one of the Majority recommendations. They dissented specifically from ten of the Majority recommendations, and added thirty recommendations of their own, to replace a large number of those of the Majority. It should also be recorded that several of the Majority signatories entered reservations on one or more specific points.

The two most important issues for domestic economic policy are a tax on capital gains and the tax on corporate profits. The Majority recommend against the former: the Minority recommend that capital gains of individuals should be subjected to income tax, but not to surtax, and that capital gains of companies should be subjected to the new corporation profits tax which they propose. The Majority recommend that the present " profits tax " discrimination between the tax on distributed and undistributed profits should be abolished and there should be instead a flat-rate tax on profits (profits, as now, also to be subject to income tax at the standard rate). The Minority recommend that if there is not to be a tax on capital gains, the discrimination should stay. If, however, their proposals to tax capital gains are accepted, they recommend that corporate profits should no longer be subject to income tax at all, but should pay a flat-rate tax of 40%, to be reduced to 33⅓% to offset increasing revenue from the tax on capital gains. Although companies would no longer in any sense *pay* income tax, they should continue to act as agents of the Revenue in collecting standard-rate income tax on dividends paid to shareholders.

Capital gains as such are not included under the present tax code in the United Kingdom, which is based on the notion of different " sources " of income. It distinguishes between the fruit and the tree, taxing only the former, except in the case of those whose business it is to deal in " trees." If the tree grows, there will be more fruit, and that is taxed. In terms of

[1] N. Kaldor, *An Expenditure Tax* (Allen and Unwin, 1955).

[2] References to the Majority Report are given by the paragraph numbers. Numbers of paragraphs in the Memorandum of Dissent are preceded by the letters MD.

this metaphor the case for including capital gains within the concept of income is that the growth of the tree increases the power to spend, or save, of the owner, who, besides picking fruit, can at any time lop off a bough from the tree and sell it.

If the kinds of property which yield capital gains were distributed proportionately among tax-payers, and if the gains themselves were fortuitous, then their exemption might not seem inequitable. The mere fact that gains were fortuitous would not of itself be an argument against taxing them. Windfalls do increase the power of the recipient to spend or save, and to tax them would not, precisely because they are windfalls, have adverse effects on production. Nevertheless, the various practical difficulties which arise, and to which we refer later, might in this instance decide the issue. But capital gains are concentrated in the hands of owners of property, especially of equity shares, and furthermore the distribution of property among those who have any is very skew (much more so than income), so that the exemption from tax constitutes a discrimination in favour of a particular class of tax-payer. Moreover, as the Minority point out, the extent to which rewards take the form of tax-free capital gains rather than taxed dividends is not fixed by Nature but can be, and is, manipulated by the tax-payer, and they give examples of how this can be done.[1]

The Majority, to borrow the tax terminology, evade the latter argument by not making a declaration at all. And they avoid expressing an opinion on the question of principle, by turning it into another one to which they give a negative answer. If, say the Majority, the principle were conceded one must find a method to bring gains within the tax net. To base assessments on *accruals* is administratively impossible: one could tax gains only when they are *realised* (*e.g.*, by sale of an asset or on the death of the owner). But this raises a whole set of issues which could be settled only by arbitrary rules. And they conclude: (i) if a capital-gains tax is regarded as a means of taxing expenditure which is left untaxed by the present system, it does not hit that object at all squarely; and (ii) if a capital gain is fairly to be regarded as income the recipient ought to be taxed on it at the full progressive rate, but, on the other hand, if it cannot be so regarded there is no good reason why his capacity to pay income tax or surtax should be thought to be increased by its receipt. The first of these arguments is, of course, irrelevant to the terms of reference of the Commission: the same might be said in some degree about income tax and lead naturally on to the argument that expenditure would be a fairer basis for taxation than income, with or without capital gains. The second argument is not very convincing: it may be, as is indicated in the important memorandum of the Board of Inland Revenue on this subject, which is appended to the Report, that in particular instances, to bring under income tax and surtax gains which have

[1] A further argument implicit in the Minority Report, and more fully developed in Mr. Kaldor's book, is that one of the aims of surtax was to limit the consumption of the rich and that it has not been conspicuously successful in this object. The sluggishness of the yield of surtax, by comparison with the buoyancy of other sources of revenue, is certainly disquieting.

hitherto been untouched would be virtually confiscatory, so that it might be wise to temper logic with expediency. To put the point differently, both the extremes of 95% tax at the margin and zero tax involve "inequities" of different kinds: an intermediate rate of tax on capital gains might also be shown to involve inequities and yet be better than either extreme. My own view is certainly that the inequity of not taxing capital gains is strong enough to make *some* tax on them desirable, even if it falls short of the complete assimilation of accrued capital gains with income.

A word before we consider some of the practical problems of taxing income so defined. Capital gains should, presumably, include all accretions of wealth, including gifts, football-pool winnings and the like. Capital losses should be taken into account as well as gains. The objections to taxation on *accruals* basis are several. The most important are: (i) It would require an annual valuation of all assets, a large and extremely difficult administrative task which would give rise to endless disputes and litigation. (ii) With *progressive* rates of tax, annual fluctuations in capital values could easily lead to a tax-payer paying substantial taxes on capital gains, even though at the end of a period of years the value of his wealth had returned to what it was at the beginning. For these reasons both the Minority and the Majority agree that any tax would have to be on the basis of *realised* gains and losses. But if gains are taxed only when they are realised, the tax liability would be the same whether the whole of a gain had accrued within the tax-year, or had been accruing, not necessarily evenly, over a long period of years. This would not matter if there were a separate, unchanging, flat-rate of tax on gains, but it would matter very much indeed if present income tax and surtax were applied to realised gains. Either some form of averaging over a period of years must be introduced, or else the full assimilation of gains to income abandoned, and a flat-rate on gains adopted as an approximation to the ideal. The objection to the former is administrative. Take the case of a gain from the sale of an asset acquired twenty years previously. Ideally one should estimate the change in value of the asset for each year since it was acquired, and, in accordance with the income tax and surtax rates at the time, re-assess the tax-payer for each of the twenty years. This, surely, would be an impossible task. One would have to compromise and simply mitigate the progressiveness of income tax and surtax by going back for a limited period only, say five years. Even this involves a considerable administrative burden, which the Minority accept as decisive against it. But once it is admitted that one would have to depart from the ideal, by averaging for a *limited* period, why is it necessary to go backwards and not forwards? That is to say, the capital gains realised in a particular year are recorded at, say, £1,000. Then the Inland Revenue simply put down £200 for each of the next five years to be added to whatever income is earned in those years. It is true that if income tax or surtax are changed the tax-payer may pay more, or less, than he would have done if the backwards averaging were adopted. But since the latter method was in any case in some degree arbitrary, and since also large changes in income- and surtax rates are not

foreseeable, such a scheme would not seem to be substantially less equitable. It might also be possible to allow an extension of the five-year period in the case of exceptionally large gains where evidence can be produced that they accrued over a longer period in the past. All this is largely avoided if the Minority's proposal of subjecting capital gains to income tax only is adopted. But this reduces only, without eliminating, the tendency to turn dividend income, which would be liable to income tax and surtax, into capital gains subject only to income tax.

The Minority agree with the Majority that gains arising out of the sale of owner-occupied houses (one per tax-payer) should be exempt from tax. The argument is rather out of line with the main body of the Report, since it specifically refers to the case of inflation. Moreover, while on the face of it the charging of tax when a man needs the whole of the proceeds of his old house to buy another one involves a hardship, exemption would create an inequity between house-owners and others who have been compelled by circumstances to live in rented accommodation and have been putting by savings to buy a house in the future, which savings have fallen in value because of the inflation. The inequity would remain even if the latter had put their savings, not in bonds, but in shares whose money value had risen; for when these shares were sold to buy a house the capital gain would be taxed. In so far as taxation of realised gains from sales of houses would reduce mobility, the fairer solution would be not to exempt such gains, but to assess owner-occupied houses on an *accruals* basis, which should not be particularly difficult. In this way the tax-payer would not find himself liable for a large lump of tax to pay when he is changing houses.

The Majority argued that capital gains are saved. " Certainly," they added, " it is the sensible thing that they should be " (106). This is not evidence. And it is the more surprising because elsewhere the Majority say: " In times of very heavy taxes on capital and income it is only natural that men should be more disposed to try to retain for themselves and their families their accustomed standard of living than an undiminished volume of capital " (535). If it is only natural to dissipate capital, it would seem even more natural, under these pressures, to spend out of capital gains.

The Majority examines the basis of the present taxation of company profits. As with so many British institutions, the only satisfactory " explanation " of what we do now is to be found in history. The arrangement which assesses gross profits of corporations to income tax before payment of dividend and then requires those who draw dividends virtually to " refund " the tax to the corporation dates back to 1803. Corporate taxation began as part of a tax system which contained only income tax and virtually no progression. Since then the development of various allowances and reduced rates of income tax and the imposition of a graduated surtax has reduced standard-rate to little more than a rather broad step in a long ladder of progression for the individual tax-payer. The Majority has little difficulty in showing that the profits tax, especially in its discrimination between distributed and undistributed profits, cannot be subsumed under any clearly understood

principles of " fiscal equity." If, on the one hand, profits of corporations are regarded as ultimately belonging to the shareholders they ought to be assessed to surtax in the way they are at present assessed to income tax (with the corresponding refund of tax from the shareholder when dividends are paid out). And if, on the other hand, a company has a personality of its own, is an entity distinct from the shareholders, there is no reason why a profits tax should not be regarded as different in kind from the taxation of individuals: variations in the one tax need not entail, on the grounds of " equity," variations in the other.

The Majority came near to this view, but not the whole way. " It seems to us a wrong principle to subject . . . the shareholder to income tax liability on his receipt from the company in any way that altogether ignores the fact that the profits from which the dividend is drawn have paid corporation tax in the company's hands " (544). They then seek a way of allowing credit to the individual tax-payer for corporation tax already paid on income he receives. They regretfully conclude that the attractions of the single-tier corporation tax are outweighed by administrative complications. The Minority reply, and they are surely right, that the argument of double taxation " assumes in effect that the Government would levy the corporation profits tax at the same rate (whatever that rate is) irrespective of whether the tax is credited against the shareholder's income tax or not " (MD 91). If profits are first subjected to corporation tax and then, when distributed as dividends, are subjected to income tax and surtax on the individual tax-payer, the *rate* of corporation tax would be less than would be needed to reap the same revenue if individual tax-payers were given a credit against corporation tax already paid. The rate of a quite separate corporation tax, that is to say, could be fixed to leave shareholders, as a body, with the same net disposable income as under the present system, although, of course, individual shareholders would do better or worse by the change according to assumptions made about the share of total profits distributed.

There remains the question of the discrimination between the tax on distributed and undistributed profits. Both the Majority and the Minority agree that at the time of its introduction in 1947, and in the years since, the short-run effects were good, but that long-run weaknesses are beginning to show themselves. The latter, they argue, are of two kinds. First there is the extreme complexity of administration which leaves firms more and more uncertain what their liability is if profits retained in the past are now distributed. Secondly, the effect of the discrimination has undoubtedly led to lower dividend distribution and higher company savings, so much so that companies as a whole have *saved* more in recent years than they have invested. It is difficult to see any advantages to be derived from *net* savings of corporations (in excess of their accumulation of real capital) in the long run. Apart from this the high retention of profits may lead to too much ploughing back in existing firms, while it would be better if funds were freed for diversion to new enterprises. The situation here is not, I think, as clear-cut as it is sometimes suggested. If companies were blinkered and would only re-

invest in industries in which they had already acquired experience the answer would be obvious. But there are many companies which are prepared to branch out into quite new lines, and it is not nearly so obvious that the directors of industrial companies are worse judges of which new products and processes to back than insurance companies, and other " institutional " savers or the " market " of private savers taking up new issues on the Stock Exchange. The class of companies which are likely to use the market is, to a considerable extent, the same as the class of companies which accrue undistributed profits. Moreover, the process of distributing dividends which are saved by individuals and institutions and then supplied back to enterprises *via* the Stock Exchange involves the costs of issuing, which are often extremely high. A flat corporation tax has clear administrative advantages, but I am not convinced by the other arguments of the Majority and Minority that discrimination ought to be abolished.

The Minority impose an essential condition. Discrimination should be dropped, in favour of a flat-rate profits tax, only if capital gains are subjected to tax. For the effect would undoubtedly be to raise the share of total profits distributed in dividends. This might lead to some increase in consumption demand, statistically small, but not necessarily negligible in its " demonstration " effect on wage claims. What really worries them is that the rise in dividends would be accompanied by a rise in share values—they estimate a capital gain of £12,000 million, which is of the order of one year's total consumer's expenditure at current prices. If only 10% of these gains were spent, the demand effects would be seriously inflationary in an economy already fully employed. Once again we come back to the crucial sentence in the Majority report: " It seems to us much better to assume that, on the whole, capital gains will be saved. Certainly it is the sensible thing that they should be." The Majority may have found it convenient to assume there would be no inflation, but they miss the point that their recommendations might make it more difficult than ever to control it.

Taken together, the Minority proposals make the structure of income- and profits-tax more equitable in a number of ways. Their economic effects would seem to be advantageous, with one important qualification. They reduce the opportunities of spending out of capital gains (by taxing them), but they equally reduce the opportunity of saving. While it is likely that some capital gains are spent, it is plausible that less is spent out of a given sum of money if it accrues as a capital gain than if it takes the form of income. Thus if total revenue is kept the same, less will be saved out of income and capital gains left at the disposal of individuals after tax. Any decline in private saving can, of course, be offset by increased Government saving achieved by higher tax rates and a budget surplus. In so far as the taxing of capital gains of *companies* reduces their saving substantially below their internal accumulation of real capital, that, too, could be offset by introducing discrimination in the corporation tax in favour of retention of profits. Thus it would seem that the Minority proposals could be carried out, if suitably modified, without adverse economic consequences.

But it is, perhaps, worth bringing out in conclusion the broader question of economic policy which lies behind direct taxation but on which, by their terms of reference, the Commission could only touch.

I take the central domestic problem of contemporary Britain to be the achievement of both a high rate of capital accumulation and greater equality. As for equality, income tax and surtax seem to be less and less effective at the margin, the two big loopholes being capital gains and " expenses." The Minority's proposals would sharply narrow these loopholes.[1] But they still only make possible equalisation of the *accruals* of spending power, whether from income or capital gains. They leave untouched the existing accumulation of wealth, especially inherited wealth in private hands. The Majority touched on the spending out of capital to maintain accustomed standards of living. " Accumulate, Accumulate! That is Moses and the prophets," wrote Marx. In the nineteenth century it was indeed regarded as wicked to spend out of capital. If it would be an exaggeration to say that the twentieth century law has become " Dissipate, Dissipate ! " it is certainly the case that the spending of capital to maintain standards is no longer regarded as morally wrong. But to the extent that it occurs it frustrates the intentions of redistributive taxation. Provided that most property owners remain accumulators, and there are only a few dissipators, high taxation *cum* budget surpluses might secure a steady reduction in inequality. But there is a lurking danger that gradualism might overshoot the mark: " It is true on the other hand that a capital gains tax so severe in its incidence as to cause the property owner to wish to dissipate his capital would, for a short period, increase spending " (MD 61, footnote).

It is just this possibility that Mr. Kaldor's expenditure tax would seem to take in its stride. He would leave private wealth as it is, but tax all spending at a progressive rate so that dissipators would pay heavily for their pleasures, while accumulators would pay no tax at all. The neatness of this solution is indeed breath-taking; the problem of capital gains, for example, simply dissolves. But administrative problems are as formidable as the principle is simple, and resort may have to be made to a more untidy strategy.

G. D. N. WORSWICK

Magdalen College,
Oxford.

[1] On expenses the Majority would reduce the inequity between Schedule " D " and Schedule " E " incomes by relaxing under Schedule " E "; the Minority would tighten up under Schedule " D."

CURRENT TOPICS

THE Annual Meeting of the Royal Economic Society will be held at the ondon School of Economics at 5 p.m. on Wednesday, June 27. After ormal business, there will be a discussion on the subject "How should we ontrol monopoly?"

MAY we offer our good wishes to Sir Sydney Caine on his election to the ffice of Director of the London School of Economics and Politics in succeson to Sir Alexander Carr-Saunders, who has held the office with such bility since 1937? Sir Sydney Caine, a former student of the College, after istinguished service in the Colonial Office and the Treasury, was made ice-Chancellor of the University of Malaya in 1952; he has served multaneously as Economic Adviser to the Singapore Chief Minister. His iends will be unanimous in welcoming him back to this country. We are elighted that Sir Alexander Carr-Saunders has accepted the nomination f the Council for the office of President of the Royal Economic Society or the coming year.

PROFESSOR FOSSATI writes:

> "Half a century ago the *Manuale di economia politica* of Vilfredo Pareto appeared in Milan. It was a small book, but it marked a very important epoch in economic inquiries. As is well known, the *Manuale* reached its culmination three years later, when its French edition, including a reformulation of the mathematical appendix, was published. It was, however, the Italian edition that established Pareto's new position in relation to pure economics. With the *Manuale* Pareto broke his strict ties with Walrasian formulation of the theory of general equilibrium and presented it as a system of states and obstacles. This new system provided not only a superb static construction, but also a powerful apparatus for dynamic analysis. While it is true that it is a system where every variant is referred to the same instant of time, and in that sense a static system, it is equally true that it shows itself to be a powerful instrument for dynamic analysis; for it offers a deep insight into the reactions of representative consumers and entrepreneurs to given situations, and thus, through a process of model construction, paves the way for economic analysis."

Admirers of Pareto may be interested to know that the Royal Economic Society has under consideration the preparation of an English translation of the *Manuale*.

THE following have been admitted to life fellowship of the Society:

Blankson, A. K.
Drayson, G. R.
Foldes, L. P.
Furth, C. A.
Hargreaves, R. E.
Kuen, T. Le C.
Tsuru, Professor S.

The following have been admitted to fellowship of the Society:

Ayorinde, L. A.
Bada, D. I.
Baddeley, F.
Baker, F.
Barnard, S. A.
Baxter, I. S.
Bellamy, R.
Bowley, Miss M. E. A.
Burchell, G. G. M.
Butler, F. W.
Byrne, F. O.
Camu, A.
Carpenter, T. J.
Chan, L. C. C.
Chapman, G. C.
Connor, D. G.
Constanticatos, M. E.
Coppieters, Dr. E.
Coughlan, M. J.
Craufurd, R. J.
Dalvi, M.
Dean, W. E.
Dholakia, Professor J. L.
Dinning, Miss A. M.
Dubey, V.
Duffy, J. R.
Eke, J. U. O.
Ezenkwele, A. A. C.
Franceskides, G. A.
Fruin, A. H.
Gaitan, R. T.
Garg, R. P.
Gourdie, R. W.
Grant, S. I.
Gupta, Professor G. P.
Gvirtzmann, M.
Hackman, E. B.
Haran, E. F.
Hawkins, E. K.
Henderson, F. T.
Hillman, S.
Hon, Lew Sip
Howard, R. J.
Iheme, J. E.
Ikpen, J.
Iwuagwu, E. O.
Jack, O. P.
Jackson, D. S.
Jain, U. K.
Jaiyesimi, S. O.
Jamaluddin, K. B.
Jha, N.
Jones, Miss S. M.
Jones, W. V.
Joshi, N.
Kansara, M. M.
Katzen, L.
Kim, Hr P. L.
Lakha, A. A. K.
Leach, K. P.
Lim, R. K-H.
Livingstone, D. A.
Lloyd, E. H.
Lomas, P. K.
Macinnes, F.
Maheshwari, M. L.
Maxwell, J.
Michaely, Dr. M.
Miller, A. P.
Mills, G.
Mitchell, E. M.
Morag, Dr. A.
Moss, L. A. W.
Nayar, V. P. D.
Nwofor, B. N.
Odey, D. C.
Ojugbele, A. O.
Oluborode, B. A.
Ong, Soon Ee
Oti, C. J. U.
Owook, E. P. W.
Ozga, S. A.
Parasher, R. N.
Patel, V. H.
Pek, B. K.
Phelps, E. S.
Portela, Professor G. P.
Prasai, C. K.
Profitt, J. W.
Ray, H. S.
Raymond, D. A.
Rimmer, D.
Robertson, W.
Rodrigues, J. L.
Schweitzer, P. R.
Shah, N. A.
Shah, R. N.
Shakespeare, P.
Simnett, E.
Simon, P. W.
Simpson, J. T.
Singh, Dr. V. B.
Smith, E. F.
Spiegelglas, S.
Stenhouse, W.
Sutton, D. F.
Szczepanik, E. F.
Tan, Teng Chao
Tebbutt, M. R.
Thakkar, B. M.
Thakkar, S. G.
Thorne, A. L.
Trend, H. G.
Unnithan, K. B.
Vaena, M.
Wai, J. K. C.
Woods, J. H.
Yaşa, Doç Dr. M.

The following have been admitted to Library membership of the Society:

Bibliotek Facultet Pertanian, Bogor, Indonesia.
California State Library, Sacramento.
Council of Economic Advisers, Washington.
Department of Extra-Mural Studies, University of Birmingham.
Economic Development Institute, Washington.
Free Library of Philadelphia.
Gallaudet College Library, Washington.
Joint Bank Fund Library, Washington.
Ministero del Tesoro, Rome.
School of Administration, University of Minnesota.
University of Oklahoma Library, Norman.

The Royal Economic Society would be glad to acquire a number of returned copies of the Economic Journal for September 1955. The Secretary will pay 3s. 6d. a copy for any copies that are sent to him in good condition at the Marshall Library, Downing Street, Cambridge. No other issue than that mentioned is for the moment required or can be purchased.

RECENT PERIODICALS AND NEW BOOKS

Applied Statistics

VOL. V, NO. 1, MARCH 1956. *The Use of Statistics in the Investment of Funds:* G. H. ROSS GOOBEY. *Modified Control Limits:* D. HILL. *A Regression Control Chart for Use in Personnel Selection:* F. SANDON. *Factor Analysis as a Technique for Examining Complex Data on Foodstuffs:* R. HARPER. *Field Work in Sample Surveys of Household Income and Expenditure:* D. E. COLE.

Economica

VOL. XXIII, NO. 89, FEBRUARY 1956. *Industrial Growth and Industrial Revolutions:* D. C. COLEMAN. *Marshall's Demand Curve:* R. F. G. ALFORD. *Robert Torrens—1780–1864:* S. A. MEENAI. *Earned and Investment Incomes, U.K. 1952–53:* E. C. RHODES. *The Purchasing Power of British Exports: A Rejoinder:* R. MARRIS. *Trade and State Action in an "Underdeveloped" Economy:* SIR S. CAINE.

The Review of Economic Studies

VOL. XXIII, NO. 61, 1955–56. *Alternative Theories of Distribution:* N. KALDOR. *The Production Function and the Theory of Capital:* R. M. SOLOW. *Technology and the Price Structure in General Equilibrium Systems:* V. ZARNOWITZ. *Some Monetary Aspects of Multiplier Theory and Fiscal Policy:* L. S. RITTER. *A Note on Definitions of Related Goods:* M. MORISHIMA. *Pearce, Monopoly and Socialism:* K. LANCASTER. *Pearce's General Equilibrium Model:* S. A. OZGA. *A Reply:* I. F. PEARCE. *Oligopoly and its Problems:* J. N. WOLFE.

Oxford Economic Papers

VOL. 8, NO. 1, FEBRUARY 1956. *The Raw Cotton Commission, 1948–52:* J. WISEMAN and B. S. YAMEY. *Benelux and Problems of Economic Integration:* W. ROBERTSON. *The Holding of Assets: "Gambler Preference" or "Safety First"?:* R. A. D. EGERTON. *Growth of Employment and Diversification of Industry in the Development Areas:* P. ROBSON. *A Note on Index-numbers and Compensation Criteria:* M. H. DOBB. *Straightforwardness in Voting Procedures:* R. FARQUHARSON. *Marshall and the Trade Cycle:* J. N. WOLFE.

The Journal of Industrial Economics

VOL. IV, NO. 2, FEBRUARY 1956. *The Report of the Attorney General's National Committee to Study the Antitrust Laws:* W. S. BOWMAN. *A Survey of Management Education in the United Kingdom:* D. K. CLARKE. *Uncertainty, Prices and Entrepreneurial Expectations—An Applied Study:* M. WRAY. *A Survey of the Annual Costs of Contractors' Mechanical Plant:* P. A. STONE. *The Supply of Capital to New Businesses:* F. R. JERVIS.

The Manchester School of Economic and Social Studies

VOL. XXIV, NO. 1, JANUARY 1956. *The Climacteric of the 1890's: A Critical Note:* D. J. COPPOCK. *Some Aspects of Building Society Finance:* G. W. MURPHY. *A Women's Clothing Multiple:* M. J. WRAY. *A Note on Managerial Incomes in Retail Distribution:* S. POLLARD. *The Development Areas: A Further Note:* J. H. DUNNING.

Scottish Journal of Political Economy

VOL. III, NO. 1, FEBRUARY 1956. *Marshall on Economic Growth:* A. J. YOUNGSON. *Electricity in the North of Scotland:* D. L. MUNBY. *The Construction Costs and the Value of the British Merchant Fleet, 1850–1938:* K. MAYWALD. *The Retail Distributive Trades in Scotland:* W. R. MATHESON.

The British Journal of Sociology

VOL. VII, NO. 1, MARCH 1956. *Sociology and the Study of Values:* A. M. ROSE. *Social Science:* P. WINCH. *Family Allowances:* N. D. VANDYK. *Employment of Sociology and Anthropology Graduates, 1952 and 1954:* J. A. and O. L. BANKS. *Some Reflections on the Sociology of Knowledge:* T. B. BOTTOMORE. *Anthropology Today:* T. H. MARSHALL.

Population Studies

VOL. IX, NO. 3, MARCH 1956. *Population Trends and Population Policy in Ceylon:* N. K. SARKAR. *A Study of Demographic Trends in West Bengal during 1901–1950:* A. GHOSH. *The Demography of Chile:* O. CABELLO. *A Critique of the Glass-Grebenik Model for Indirectly Estimating Desired Family Size:* R. G. POTTER. *Some Remarks on Coverage Checks in Population Censuses:* S. S. ŽARKOVIĆ.

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VOL. IV, NO. 1, FEBRUARY 1956. *Devolution Reconsidered:* R. J. LAWRENCE. *Politicians, Public Servants, and the People in New Zealand: II:* P. CAMPBELL. *American Parties: A Wisconsin Case-study:* L. D. EPSTEIN. *Planning: A Case-study:* H. ECKSTEIN. *The Federation of British Industries:* S. E. FINER.

International Affairs

VOL. 32, NO. 2, APRIL 1956. *Crown and Commonwealth in Asia:* SIR I. JENNINGS. *The H-bomb: Massive Retaliation or Graduated Deterrence?:* SIR A. BUZZARD; SIR J. SLESSOR; R. LOWENTHAL. *The Revolution in Argentina:* G. PENDLE. *India and the Russian Visitors:* G. TYSON. *German Foreign Office Documents on Financial Support to the Bolsheviks in 1917:* G. KATKOV. *Resources on International Affairs in London Libraries:* B. KYLE.

Journal of Agricultural Economics

VOL. XI, NO. 4, JANUARY 1956. *A Review of Fifty Years Farm Management Research:* J. R. CURRIE. *The "Example" Farm in Management Investigation:* A. S. BARKER. *The Dissemination of Technical and Economic Information in Farm Advisory Work:* M. L. M. REEVES. *Labour in Scottish Agriculture:* G. F. HENDRY. *Agriculture in an Expanding Economy:* R. C. TRESS. *Agrarian Reform in Sweden:* F. MEISSNER. *Linear Programming and the Cost of Pig Fattening Rations:* H. C. MACKENZIE and T. E. GODSELL. *Accounting for Farm Planning:* V. LIVERSAGE. *Teaching Agricultural Economics at University Level:* W. H. LONG.

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VOL. VIII, NO. 3, 1955. *Credit for Agricultural Land Purchase in England and Wales:* S. G. STURMEY. *Economy in Pig Feeding:* A. H. MAUNDER. *Farm and Non-farm Capital, 1867–1938:* J. R. BELLERBY.

VOL. VIII, NO. 4, 1955. *The Productivity of Major Factors in British Farming:* J. O. JONES. *Regional Agricultural Rents and Types of Farming Land:* E. B. BUTLER. *The Rate of Yield on Investment in Tenanted Farms, England and Wales, 1937-9 to 1955:* J. T. WARD.

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VOL. IV, PART I, 1956. *An Agrarian History of England:* H. P. R. FINBERG. *The Statistical Assessment of British Agriculture:* J. T. COPPOCK. *A Review of Balks as Strip Boundaries in the Open Fields:* H. A. BEECHAM. *An Answer to Poverty in Sussex, 1830–45:* A. C. TODD.

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VOL. 7, NO. 1, JANUARY 1956. *The Measurement of Profits—A Study in Methods: III: The Profits Index:* R. K. NIGAM. *The Audit of Government Accounts in Britain:* J. P. KELLY. *Accounting Dynamics: IV:* F. SEWELL BRAY. *The Accounts of a French Émigré Officer:* R. R. COOMBER. *The Antecedents of American Public Accounting:* J. D. EDWARDS.

Journal of the Institute of Actuaries

VOL. 81, PART III, NO. 359, 1955. *Ordinary Life Office Organization Using a Large-scale Electronic Computer:* A. C. BAKER. *Deferred Annuities with Participation in Profits:* M. E. OGBORN and G. E. WALLAS.

The Banker

VOL. 106, NO. 361, FEBRUARY 1956. *The Bankers and the Squeeze. The Soviet Economic Offensive. As I See It:* SIR O. HOBSON. *Is Britain Against Monopoly?:* J. E. HARTSHORN. *How Dearer Money has Cut Credit. Latin American Currency Practices:* J. C. HUNT.

VOL. 106, NO. 362, MARCH 1956. *No Epitaph to Freedom. What Future for Gold? How State Industries Should Work. As I See It:* SIR O. HOBSON. *Will Brazil Unravel its Exchanges? Belgium's Uneasy Prosperity:* A. LEEMAN. *Irish Banks Feel the Pinch. Is Life Assurance Keeping Pace?*

VOL. 106, NO. 363, APRIL 1956. *Should Liquidity Ratios be Prescribed? Dearer Money and the Sterling Area. As I See It:* SIR O. HOBSON. *The Coming Test of the D-Mark:* C. W. LAYTON. *Alternatives to Surtax:* U. K. HICKS. *Raising Wages without Inflation: I: Dangers of Productivity Link:* C. HENNIKER-HEATON; *II: The Economic Argument Restated. How Vulnerable is Welsh Industry?:* E. V. MORGAN.

VOL. 106, NO. 364, MAY 1956. *A Funding Budget. Too Much Investment?:* J. E. HARTSHORN. *As I See It:* SIR O. HOBSON. *New Facilities for Export Finance? Malaya Faces Independence:* F. KING. *Britain's Strain on Sterling. Building Societies in the Credit Squeeze:* M. NAYLOR. *Scotland: A Financial and Industrial Survey.*

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VOL. CLXXXI, NO. 1343, FEBRUARY 1956. *Bank Chairmen and the Credit Squeeze:* S. H. FROWEIN. *Banking Profits in 1955. As Others See Us:* J. E. WADSWORTH. *The Future of Monetary Policy in Australia:* D. C. ROWAN.

VOL. CLXXXI, NO. 1344, MARCH 1956. *Employment and Bank Rate:* SIR R. HAWTREY. *The Practicability of an Expenditure Tax in the Light of the Oxford Savings Survey:* L. R. KLEIN. *The Irish Economy in 1955:* G. A. DUNCAN. *The Credit Squeeze and the Sterling Exchange:* H. E. EVITT.

VOL. CLXXXI, NO. 1345, APRIL 1956. *The State of the Nation. Survey of Economic Conditions in the U.S.A. Measuring the Overload:* T. C. MAYNARD. *A General Sales Tax:* D. WALKER.

VOL. CLXXXI, NO. 1346, MAY 1956. *The British Balance of Payments 1955–56:* S. FROWEN. *The Export Value of Tourism:* J. R. WINTON. *Survey of Economic Conditions in the U.S.A. Exports to India, Pakistan and Burma. Canadian Banking in 1955:* J. MUIR. *The Republic of India—Planning and Administration:* SIR J. THORNE.

Barclays Bank Review

VOL. XXXI, NO. 1, FEBRUARY 1956. *The Chairmen's Statements. Export Incentives.*

District Bank Review

NO. 117, MARCH 1956. *The 1956 Budget:* A. R. PREST. *The Post-war British Budget:* E. NEVIN.

Lloyds Bank Review

NO. 40, APRIL 1956. *The Pace of Soviet Economic Development:* A. NOVE. *The Floating Debt Problem. Post Office Finance:* J. K. HORSEFIELD.

Midland Bank Review

FEBRUARY 1956. *Sterling in the World Today. Trends in British Agriculture. New Capital Issues in 1955.*

MAY 1956. *Monetary Survey 1955–6. Business Conditions in Scotland.*

National Provincial Bank Review

NO. 33, FEBRUARY 1955. *Great Britain's Export Problem—a Longer View:* SIR S. RAWSON. *Economic Welfare and the Industrial Prospect before Us:* J. H. DUNNING.

The Three Banks Review

NO. 29, MARCH 1956. *Recent American Monetary Controversy:* P. A. SAMUELSON. *Prospects for British Paper. The Royal Bank Branches Out.*

Westminster Bank Review

FEBRUARY 1956. *The Chairman's Statement. Prospects in the Retail Trade:* M. ABRAMS. *Covent Garden and all That:* G. R. ALLEN. *Further Thoughts on the Terms of Trade:* R. L. MARRIS.

The Journal of the Institute of Transport

VOL. 26, NO. 9, MARCH 1956. *Urban Passenger Transport—Problems: Palliatives: Cures:* J. B. BURNELL. *London Transport Route C:* SIR J. ELLIOT. *Development of Inland Water-Ways:* W. FRASER.

Planning

VOL. XXII, NO. 392, FEBRUARY 1956. *Publishing and Bookselling.*
VOL. XXII, NO. 393, FEBRUARY 1956. *What's in the Papers?*
VOL. XXII, NO. 394, MARCH 1956. *Business Forecasting.*
VOL. XXII, NO. 395, APRIL 1956. *Britain's Iron Ore Supplies.*

Town and Country Planning

VOL. XXIV, NO. 142, FEBRUARY 1956. *The "Changing Britain" Conference. Dutch Views on Housing Density:* F. J. OSBORN.
VOL. XXIV, NO. 143, MARCH 1956. *Scotland Wants More Planned Industry:* SIR P. DOLLAN. *Reclamation of Scottish Peat Land:* E. L. BIRSE.
VOL. XXIV, NO. 144, APRIL 1956. *A New Town for the Midlands:* M. C. MADELEY. *Toll Roads and Public Policy:* L. L. MOAK. *Tychy New Town:* K. WAJCHERT.
VOL. XXIV, NO. 145, MAY 1956. *New Way of Life in Britain's New Towns:* A. MAYER. *The Regional Economics of Marginal Farming:* G. R. ALLEN. *Parking Meters and Public Opinion:* G. D. M. BLOCK.

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VOL. 45, NO. 249, WINTER 1955–56. *The Challenge of Britain's Roads:* SIR D. GAINER. *Church and Industry in Modern Europe:* M. GIBBS. *Raw Materials:* J. GRAY. *The Place of the Business Man in Business:* C. WILSON. *Cattle Raising in the Belgian Congo:* H. R. F. COLBACK. *The Oxford Business Summer School:* C. A. C. DE BOINVILLE. *The Wholesale Trading House in Rotterdam:* A. VAN DER VET.

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NO. 20, MARCH 1956. *Forecasts for 1956. Abaca—a Declining Commodity.*

The Canadian Journal of Economics and Political Science

VOL. 22, NO. 1, FEBRUARY 1956. *Implications of United States Policy for the Canadian Wheat Economy:* G. E. BRITNELL. *The Combines Investigation Act:* L. A. SKEOCH. *Combines Policy:* S. STYKOLT. *Clergymen, Teachers and Psychiatrists:* K. D. NAEGELE. *Ground Rent for Provincial Forest Land in Ontario:* G. C. WILKES. *The National Accounts: Whither Now?:* S. A. GOLDBERG and F. H. LEACY.

The Economic Record

VOL. XXXI, NO. 61, NOVEMBER 1955. *Economic Development and Financial Stability:* H. C. COOMBS. *External Economies in Economic Growth:* H. W. ARNDT. *The Definition of Economics:* K. RIVETT. *The Future of Inter-industry Analysis:* B. CAMERON. *The Economic Limits to Population Increase:* W. M. CORDON. *An Empirical Micro-study of Some Factors in Influencing Farm Net Investment:* R. A. PEARSE. *Wool Prices and Pastoral Policies, 1867–75:* A. BARNARD.

The South African Journal of Economics

VOL. 23, NO. 4, DECEMBER 1955. *Central Banking in South Africa:* C. S. RICHARDS. *Some Aspects of Profit Reinvestment in the Union:* P. K. LOMAS. *A Neglected Forerunner of Adam Smith—An Appraisal of the Place of Henry Martin's (?)* Considerations on the East India Trade (1701) *in the History of Economic Thought:* M. ARKIN. *Some Notes on the Commercial Sector of the South African Economy:* H. S. MABIN. *The Development of Insurance Business in the Union of South Africa:* H. SPYROU.

Union of South Africa Finance and Trade Review

VOL. 1, NO. 8, JANUARY 1956. *The South African Railways and the National Economy:* D. H. C. DU PLESSIS. *The Objectives of Post-war Economic Policy in the Union:* M. VAN DEN BERG. *Major Trends in the Economic Development of South Africa since 1948:* C. V. H. DU PLESSIS.

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Probleme Economice (Rumanian text)

No. 10, 1955. *Ten Years Since the National Conference of the Rumanian Communist Party. Economic Policy in the Transition from Capitalism to Socialism:* I. ANGHEL. *The Introduction of New Technology: The Basis for Raising Productivity in Coal-mining:* N. SCHWARTZ. *Aspects of Profitability in the Food Industry:* GH. POSTOLEA. *The Rational Use of Agricultural Land:* S. HARTIA and O. GHEORGHIU. *The German Democratic Republic on the Road of Economic Progress:* G. VIRGILIU. *On Anglo-American Economic Contradictions:* GH. NISIPEANU. *Ion Ionescu de la Brad—a Progressive Economist:* B. ZAHARESCU.

No. 11, 1955. *The Socialist Economic System—the Basis of the Elimination of Economic Inequalities Between the Peoples of the U.S.S.R.:* E. PRAHOVEARU. *Reflections on Market Problems and Price Policy in Rumania:* A. NEGREA. *Automation in Industry and Transport:* M. POPA. *The Economic Law of the Uninterrupted Growth of Productivity Under Socialism:* C. PINTILIE and V. WEISS. *Financial Autonomy in Socialist Trade:* GH. FETEANU. *Successes of the European Popular Democracies in Socialist Industrialisation:* A. TOTH. *The Vulgar Theories on Economic Crises of Certain Bourgeois Economists:* L. STROJA (discusses Boulding, Bratt, Gordon, Haberler, Hansen, Lerner, Mitchell, Reynolds, Sternberg and Wright). *The Rôle of the Finance and Credit System in the Distribution of the National Income:* I. VĂCĂREL.

No. 12, 1955 (henceforward with French and Russian summaries). *The Rumanian Workers' Party—Initiator and Organiser of the Socialist Construction of the Rumanian People's Economy:* V. RAUSSER. *Considerations on the Correct Correlation Between the Rates of Growth of Producer and Consumer Goods:* E. BALAȘ. *The Importance of a Right Ratio between Increments in Labour Productivity and Average Wages:* I. BATI and P. COPPELOVICI. *The Role of Heavy Industry in the Socialist Transformation of Agricuture:* F. BURTAN. *The Influence of Socialist Trade upon Industrial Production Since the Abolition of Rationing:* J. PODOLEANU. *Some Aspects of the Absolute Impoverishment of the Working Class under Contemporary Capitalism:* G. MARIONOVICI. *Price Policy To-day:* R. MOLDOVAN.

No. 1, 1956. *On Production and Consumption Under Capitalism and Socialism:* E. DAN. *The Gradual Elimination of the Contradictions between Town and Country in the Transitional Period from Capitalism in Rumania:* I. ADAM. *Certain Theses of Bourgeois Economists on the Agrarian Problem in Bourgeois–Landlord Rumania:* C. MURGESCO. *National Income in Bourgeois–Landlord Rumania:* D. GRINDEA.

NEW BOOKS

British

ABEL-SMITH (B.) and TITMUSS (R. M.). The Cost of the National Health Service in England and Wales. National Institute of Economic and Social Research, Occasional Paper No. XVII. London: Cambridge University Press, 1956. 10″. Pp. xv + 176. 27*s.* 6*d.*

[Reviewed in this issue.]

CHARLESWORTH (H. K.). The Economics of Repressed Inflation. London: Allen & Unwin, 1956. 8½″. Pp. 126. 13*s.* 6*d.*

[To be reviewed.]

COLERUS (E.). From Simple Numbers to the Calculus. Mathematics for everyman. Translated from the German by B. C. and H. F. BROOKES. London: Heinemann, 1955. 7½″. Pp. ix + 255. 12*s.* 6*d.*

[This is an extremely accomplished, excellently presented and well-translated introduction to mathematics. No attempt is made to evade the difficulties inherent in the subject, and they are clearly and carefully explained. The author's admirable object is to increase understanding rather than to leave the reader grasping formidable tools, the use of which he does not fully appreciate. He follows in the worthy tradition of Courant and Robbins, the authors of *What is Mathematics?*, though necessarily at a lower level of abstraction and with a much smaller compass. The book can be most warmly recommended as a first course for economists with no basic mathematical training as a prelude to more specialist mathematical reading.]

CROSSMAN (R. H. S.). Socialism and the New Despotism. Fabian Tract No. 298. London: The Fabian Society, 1956. 8½″. Pp. 24. 1*s.* 6*d.*

[Mr. Crossman here argues that the Labour Party will be both unfaithful to its traditional principles and unlikely to recapture public allegiance if it neglects to challenge the present tendency to concentration of power and diminution of personal freedom and responsibility. This tendency exists not merely in private business but also in trade unions, in the nationalised industries, in political parties and in the organs of the state. The need for a socialist party to challenge this "new despotism" is all the greater, since the relatively satisfactory economic performance of capitalism in recent times has forced socialists to revert to "Tawney's case for Socialism . . . not that it is easier to work than the acquisitive society but that it is morally superior—and politically essential to the realisation of freedom."]

DEPARTMENT OF AGRICULTURAL ECONOMICS, UNIVERSITY OF BRISTOL. Cattle Fattening on Grass: a study in South West England, 1954; Report No. 87; pp. 13; 1*s.* 6*d.* A Comparison of Pig Production before and after the War, with special reference to South West England, by E. BURNSIDE and W. M. STRONG; Report No. 88; pp. 27; 2*s.* 6*d.* An Investigation into Some Financial and Physical Aspects of Lowland Sheep Farming in Mid-Devon, 1952–53 and 1953–54, by E. T. DAVIES; Report No. 90; pp. 23; 2*s.* 6*d.* Newton Abbot: Department of Economics, University of Bristol, 1956. 10½″.

[These are three reports based on sample investigations of farms in the South-west. An interesting finding of the report on pig production is that in the farms studied efficiency appears to have been no higher in 1954 than it was in 1938. It is suggested that the absence of improvement may have been due partly to the drastic restriction of pig production during the War, and that better results may be attained in the future if producers enjoy more stability.]

FERNS (H. S.) and OSTRY (B.). The Age of Mackenzie King. The rise of the leader. London: Heinemann, 1956. 9″. Pp. 356. 25*s.*

[In a period of unprecedented political and economic disturbance, an apparently unlovable Canadian managed to break the British record for Prime Ministerial longevity. The enigma of Mackenzie King's success contains the secrets of Canada's national identity; yet it has become, if anything, more puzzling since his death. This book contributes to its solution an examination of the relatively unexplored forty-five years of King's life prior to his election to leadership of the Liberal party. The central theme is that King was successful because he understood the social and economic forces underlying Canadian politics. This fundamentally Marxist theme is developed with an equally Marxist vindictiveness towards the subject of the study, reminiscent of left-wing Canadian politics in the 1930s. Both the evidence and its unsympathetic interpretation frequently support an alternative hypothesis: that King, like many other products of the Canadian small town, was peculiarly fitted for the career of incessant compromise without loss of self-esteem required of leaders in modern American society; and that while he was often singularly inept, he was saved from disaster by luck, the shortcomings of his opponents and his own talents for weasel-wording. In the course of their painstaking and well-documented examination of the highlights of King's early career, the authors destroy one after another of the myths which served King well in later years; it is perhaps a final manifestation of his luck that the publication of what might once have been political dynamite has been delayed until King has become part of the Canadian national heritage.]

From Profit Sharing to Common Ownership. A practical example of growth from the old to the new. Wellingborough: The Scott Bader Commonwealth, 1956. 8″. Pp. 38.

[This describes the constitution of the Scott Bader organisation, which produces synthetic resins and has some 170 employees. This constitution is rather unusual, and it does not conform to any of the best known types of co-ownership or profit sharing. The ownership of the firm has been made over almost entirely to its employees, but responsibility for management effectively remains with the founders. The ideals animating the founders are those of the Society of Friends. They involve a much more thorough-going rejection of normal notions of the proper relation between work and remuneration than has usually been involved in schemes of profit sharing.]

HELLER (F. A.) (Ed.). New Developments in Industrial Leadership in Great Britain, the United States, Germany and France. Polytechnic Management Association, New Development Series, No. 1. London: Department of Management Studies, The Polytechnic, Regent Street, 1955. 8½″. Pp. 75. 5*s.*

[This contains four lectures. In the first, Dr. J. A. C. Brown discusses in general terms the revolution in thought about industrial psychology brought about by the work of Elton Mayo and his associates and assesses the regrettably limited extent to which these ideas are understood and applied by management in Great Britain. The second lecture, by Jerome F. Scott, further considers American ideas and practice about human relations in industry, with special reference to the problem of how to make changes in productive methods acceptable to workers. The scope of the other two lectures is rather different. Frank A. Heller describes the system of joint management

at has been instituted in Germany since the War. He explains how in the coal, iron and steel dustries legislation has secured really effective participation in management by workers' representatives, as distinct from mere consultation. In the rest of industry, worker representation is good deal less effective, but it is still important. Mr. Heller considers why it is that the objections at have been raised in this country when such arrangements have been proposed do not appear far to have been applied to the German experience. In the final lecture H. Hanck describes the tent of workers' participation in management in nationalised industry and in private industry in rance.]

LACHMANN (L. M.). Capital and its Structure. London: Bell, for The London chool of Economics and Political Science, 1956. 8½″. Pp. 130. 15*s.*

[To be reviewed.]

Local Government and Central Control. A West Midland Group Study. London: outledge & Kegan Paul, 1956. 8½″. Pp. 296. 28*s.*

[To be reviewed.]

NATIONAL INSTITUTE OF ECONOMIC AND SOCIAL RESEARCH. Register of Research in the ocial Sciences in Progress and in Plan and Directory of Research Institutions. No. 12, 955. London: Cambridge University Press, 1956. 10″. Pp. 168. 25*s.*

[The present issue of this valuable register follows the lines of its predecessors. The physical ppearance of the volume is much improved compared with previous years.]

NATIONAL INSTITUTE OF ECONOMIC AND SOCIAL RESEARCH. Thirteenth Annual Report, 955. London: National Institute of Economic and Social Research, 1956. 10″. Pp. 39.

[This contains the usual lucid survey of the Institute's current research activities. The account iven of the various projects in hand is mainly confined to their scope and purpose. In a few cases n interim outline of findings is also indicated, but the report does not set out to do this systematically r all research projects, in the way that is done, for example, in the annual reports of the National ureau of Economic Research.]

Oxford Regional Economic Atlas of the U.S.S.R. and Eastern Europe. Prepared by ie Economist Intelligence Unit and the Cartographic Department of the Clarendon Press. ondon: Oxford University Press, 1956. 10½″. Pp. 134. 42*s.*

[This is the first of a series of regional economic atlases which is planned to cover the world in ght volumes. In lay-out and design it resembles the *Oxford Economic Atlas of the World*, published 1954 (see ECONOMIC JOURNAL, December 1954, p. 877). The amount of detailed information hich it contains will make it an indispensable work of reference for students of the region. In ddition to the general maps and those showing geology, relief, soils, vegetation, climate and transort there are numerous detailed and easily usable maps showing the amount and distribution of roduction of the chief commodities. Supplementary information and comparisons with other ountries are provided in the accompanying text, which, together with the gazetteer, occupies ather less than half of the total space.]

PRESSNELL (L. S.). Country Banking in the Industrial Revolution. London: Oxford niversity Press, 1956. 8½″. Pp. 591. 70*s.*

[To be reviewed.]

Readings in Fiscal Policy. Selected by a Committee of the American Economic ssociation. London: Allen & Unwin, 1956. 9″. Pp. 596. 30*s.*

[To be reviewed.]

RICHARDSON (P. P.). The Profitability of Fattening Cattle 1953–54. Loughborough: niversity of Nottingham School of Agriculture (Department of Agricultural Economics, utton Bonington, Loughborough), 1955. 10″. Pp. 28. 2*s.*

[The chief purpose of this report is to compare the profitability of two groups of herds, in which ie cattle were wintered in yards and outwintered respectively. The latter group were found to be uch more profitable. Within each group the cattle which yielded the highest profit received less utrients than average.]

ROBERTS (B. C.). Trade Union Government and Administration in Great Britain. ondon: Bell, for The London School of Economics and Political Science, 1956. 8½″. p. vii + 570. 31*s.* 6*d.*

[To be reviewed.]

TITMUSS (R. M.). The Social Division of Welfare. University of Birmingha Eleanor Rathbone Memorial Lecture. Liverpool: Liverpool University Press, 19 8½″. Pp. 23. 2*s*. 6*d*.

[Professor Titmuss here joins issue with those economists who maintain that the social servi will or ought to wither away in time as the growth in the national income leaves fewer and fe people in a state of poverty. He points out that the implications of such a doctrine are a gr deal more far-reaching than is commonly understood. For it is quite arbitrary to confine discuss of social security to separately administered schemes such as family allowances and national ins ance, when precisely similar provision for dependency of various types is made in the income- system. Nor is it fair to neglect the welfare benefits, in cash or in kind, which employers provide their employees. The state has an interest in these, both because they enjoy tax privileges a because the state is itself such a large employer. The neglect of fiscal and occupational welf benefits gives a quite misleading picture of the present operation of the welfare state. For examp the plea for giving larger family allowances to people with higher incomes, on the grounds that cost of a child varies with income, looks a good deal less convincing when it is pointed out t already under the existing system the annual net bounty, including tax relief, enjoyed by a marr man with two children (as compared with a married man with no children) is nearly four times great if his income is £2,000 a year as it is if his income is £400 a year. Much inconsisten and inequity has resulted from failure to appreciate the close similarity between fiscal and occup tional benefits and social-security benefits in the narrower sense. Professor Titmuss suggests th so far from economic progress causing the need for the social services to wither away, the tenden is rather for " states of dependency," which have inevitably to be defined in terms that are larg social and conventional, to become more widespread on account of increased specialisation. T point, along with one or two others in this stimulating lecture, remains a little unclear in Profes Titmuss' exposition, and we shall look forward to the more extended treatment of the subj which he promises.]

WALLACE (C.) (Ed.). The Investor's Pocket Book. London: Evans, 1955. 6½ Pp. 160. 5*s*.

[This is one of a series of " Pocket Books " of practical information published by Evans Brothe It contains an elementary introduction to problems of investment, addressed chiefly to the sm capitalist who is interested in a decent return and security for his money capital rather than appreciation. The workings of the stock exchange are lucidly expounded, and there is a go glossary of technical terms.]

WRIGHT (R.). The Colour Curtain. A report on the Bandung Conference. Londo Dennis Dobson, 1956. 8″. Pp. 187. 12*s*. 6*d*.

[This is a slight but readable book in which the well-known American negro novelist descrit the Asian-African Conference held at Bandung in Indonesia in April 1955 and gives expression some reflections on racial problems stimulated by it. Much of the book is taken up with recor of conversations between the author and the people whom he met on that occasion.]

Indian

Taxation of Bonus Shares. Bombay: Association of Indian Trade and Industry (Hamam Street, Fort, Bombay), 1955. 9½″. Pp. 22.

[It is argued that the issue of bonus shares is normally no more than a book transaction, desirab in order to represent properly the company's capital position but not conferring a tangible bene on shareholders. Bonus shares are not therefore a suitable subject of taxation. It is admitt that in certain circumstances the capitalisation of reserves by the issue of bonus shares prior to t liquidation of a company may be a means of tax avoidance, but it is suggested that this loopho could be closed without resorting to any general taxation of bonus issues.]

American

ABBOTT (L.). Quality and Competition. An essay in economic theory. New Yor Columbia University Press, 1955 (London: Geoffrey Cumberlege, 1956). 9″. Pp. 22 30*s*.

[To be reviewed.]

BARGER (H.). Distribution's Place in the American Economy since 1869. Princeto New Jersey: Princeton University Press for the National Bureau of Economic Researc 1955 (London: Geoffrey Cumberlege, 1956). 9″. Pp. 222. 36*s*.

[To be reviewed.]

BLUMENTHAL (W. M.). Disability Retirement in Industrial Pension Plans. Princeton, New Jersey: Industrial Relations Section, Princeton University, 1956. 9½″. Pp. 62. $2.00.

[This is concerned with the problem of providing under industrial pension schemes for workers who are obliged to give up work before the normal retirement age on account of disability. The proportion of workers who have to do this is not normally very large, but those who do are often not at all well provided for. The survey is based on an inquiry into the practices adopted in a sample of 127 leading American companies. Various suggestions are made by which the treatment of the disabled worker might be made more generous without undue cost to the employer.]

BOK (D. C.). The First Three Years of the Schuman Plan. Princeton Studies in International Finance, No. 5. Princeton, New Jersey: International Finance Section, Princeton University, 1955. 9″. Pp. 79. 25*c*.

[After describing the aims and institutions of the European Coal and Steel Community, the author recounts the steps that have been taken to create a common market and the extent to which effective competition has been established. He then considers the consequences that would be likely to follow if competition should in the future become more severe. The goal of competition is, in his view, still largely unattained; equalisation of cost has not been achieved, and prices are probably above what would be a truly competitive level. However, the result no doubt compares favourably with what it would have been under an international cartel, and investment and modernisation have probably been encouraged by the existence of some degree of competition and by the expectation that competition might increase.]

BONER (H. A.). Hungry Generations. The nineteenth-century case against Malthusianism. New York: King's Crown Press, Columbia University (London: Geoffrey Cumberlege), 1955. 8″. Pp. 234. 30*s*.

[This is " a history of the rise and fall of the Malthusian theory in nineteenth century England," taking the phrase Malthusian theory in a broad sense to include not merely Malthus' analysis of population but also the fatalistic social and political doctrines that were derived from it. The author makes no attempt to conceal which side he is on: he shares to the full the indignation expressed by Coleridge, Hazlitt and the rest at the inhumanity and injustice which the Malthusian theory was used to justify. His very readable book is primarily an account of the literature of protest against this theory. It is intended less as a study of the population problem itself—in the discussion of which the author is not always entirely sure-footed—than as a contribution to the history of thought and the history of letters. One of the chief findings is that while hardly any of the political economists expressed serious doubts about the Malthusian position until a generation or so after the appearance of the *Essay on Population*, the poets and the men of letters were aroused to protest at once: " few of the great names of the time were absent from the list of participants in the Malthusian battle; and of these participants, all but a small band . . . stood in the anti-Malthusian ranks."]

CASSELMAN (P. H.). The Economics of Employment and Unemployment. Washington, D.C.: Public Affairs Press, 1955. 9½″. Pp. 183. $3.25.

[A survey of the principal causes of unemployment in industrial countries and of the ways in which the problem of unemployment may be tackled. The book is clearly written, and certain passages in it are of interest, but the analysis does not in general contain sufficient novelty or subtlety of treatment to enliven its very well-worn theme.]

The Challenge of Automation. Papers delivered at the National Conference on Automation. Washington, D.C.: Public Affairs Press, 1955. 9½″. Pp. 77. $2.50.

[A collection of addresses delivered at a conference convened under the auspices of the Congress of Industrial Organisations. Most of the speakers are either in academic life or representatives of organised labour.]

COOKENBOO (L.). Crude Oil Pipe Lines and Competition in the Oil Industry. Cambridge, Mass.: Harvard University Press, 1955 (London: Geoffrey Cumberlege, 1956). 8½″. Pp. 177. 32*s*.

[The problem which provides the subject of this monograph is how to reconcile the great economies of scale that exist in the operation of crude-oil pipe-lines with the desirability of enabling independent refiners to compete on fair terms with the vertically integrated companies. This problem has been the subject of much controversy in the United States. Professor Cookenboo precedes his discussion of it by a statistical analysis of the structure of the industry and of the costs of operating pipe-lines. He believes that there has been a tendency to exaggerate the handicap imposed upon independent refiners by the present system of crude-oil pipe-line ownership by the integrated major companies, since most of the existing independent refining capacity is situated sufficiently close to supplies of crude oil for transportation not to be a problem. He admits,

however, that the present system may discourage new entry to the refining section of the industry. The author sees serious objections to attempting to deal with the situation by compulsory divorcement of pipe-line ownership from refinery ownership or by government regulation of the rates charged for the use of pipe-lines. The scheme which he himself most favours is one of joint ownership of pipe-lines by all companies willing to pay for a share of the cost, with some government regulation, chiefly to ensure that no company wishing to join in the scheme is excluded from it. He believes, however, that in most cases where new pipe-lines have to be built the pursuit of private interest will probably tend in any case to bring about some such system of combined transportation.]

CRAIG (H. F.). Administering a Conversion to Electronic Accounting. A case study of a large office. Cambridge, Mass.: Harvard University Graduate School of Business Administration, 1955 (London: Bailey Bros. & Swinfen, 1956). 8″. Pp. 224. 20*s*.

[This is a case study of business administration in the familiar tradition of the Harvard Business School. It is concerned chiefly with the staff problems that arose in connection with the change-over to electronic accounting methods in a large insurance office. In this case the change-over was made very successfully, and the author analyses the ways in which this result was achieved.]

FELLNER (W.). Trends and Cycles in Economic Activity. An introduction to problems of economic growth. New York: Henry Holt, 1956. 9½″. Pp. 411. $5.00.

[To be reviewed.]

FISHER (R. M.) (Ed.). The Metropolis in Modern Life. Columbia University Bicentennial Conference Series. Garden City, New York: Doubleday, 1955. 9½″. Pp. 401. $6.00.

[This contains the proceedings of a conference held in connection with the Bicentennial Celebration of Columbia University. Sociological, political, economic, legal and religious aspects of urban development are among the subjects discussed. The papers on economic aspects are "Economic Efficiency in the Metropolis," by P. Sargant Florence, and "Efficiency and the Location of Urban Activities," by Richard U. Ratcliff.]

GREEN (J. F.). The United Nations and Human Rights. Washington, D.C.: The Brookings Institution, 1956. 9″. Pp. 194. $1.50.

[This is one of a series of studies of the United Nations projected by the Brookings Institution. It describes attempts to define human rights and the controversies aroused by the draft covenants that have been put forward in order to define more closely the general intentions of the United Nations charter. An account is also given of the action taken in the United Nations to safeguard human rights in specific cases that have arisen.]

GROSSMANN (K. R.). Germany's Moral Debt. The German-Israel Agreement. Washington, D.C.: Public Affairs Press, 1955. 9″. Pp. 71. $2.00.

[This is a brief history of the negotations that led up to the Luxemburg agreement of 1953. Under this agreement West Germany agreed to make reparation payments to Israel over a period of twelve to fourteen years in compensation for the material losses suffered by Jews at the hands of the Nazis. About half the text of the booklet is occupied by a reprint of the agreement and other documents.]

HABERLER (G.). A Survey of International Trade Theory. Special Papers in International Economics, No. 1. Princeton, New Jersey: International Finance Section, Princeton University, 1955. 9″. Pp. 68.

[Economists interested in international-trade theory will be grateful to the International Finance Section of the Department of Economics and Sociology at Princeton University for making available this English version of Professor Haberler's contribution to the *Handwörterbuch der Sozialwissenschaften*. The survey explains the separate existence of international-trade theory, and outlines the classical theory of comparative costs and international values, before discussing modern developments in the pure theory, the terms of trade, the balance-of-payments mechanism and the theory of international trade policy. Much material is lucidly compressed in a short space, at a more elementary level than Metzler's contribution to the first *Survey of Contemporary Economics*; and a useful bibliography is appended. There are two or three minor points on which others might not agree with Professor Haberler: on p. 19, the restrictiveness of the assumptions required for factor-price equalisation is surely understated on a reasonable interpretation of the writings of Lerner and Pearce; and on p. 47 n. 2 the multiplier stability conditions are surely not quite as stated. The chapter on the balance-of-payments mechanism might perhaps have benefited by more reference to the contributions of Meade and Alexander. The author seems, moreover, to have made more generous concessions to the protectionists than are strictly required by modern welfare economists and policy theory: departure from ideal competitive conditions, ideal income distribution or full employment justifies intervention of some kind, but interference with the freedom of international trade is generally a second-best policy which must be justified on practical rather than theoretical grounds. Nevertheless, the survey combines a remarkably high standard of reliability with a scholarly sense of the continuity of the subject, and should prove an extremely useful introduction for students.]

MEADE (J. E.). The Belgium–Luxembourg Economic Union, 1921–1939. Lessons from an early experiment. Essays in International Finance, No. 25. Princeton, New Jersey: International Finance Section, Princeton University, 1956. 9″. Pp. 41.

[This has been prepared as an introduction to a larger work on the Benelux Economic Union which Professor Meade is engaged on. The economic union between Belgium and Luxembourg between the wars is commonly considered to have worked well. Professor Meade examines the reasons for this success and describes the difficulties that were encountered and the respects in which the principles of full economic union had to be departed from. The difference between the size of the participating countries greatly eased a number of problems, in his view: Luxembourg was willing to fall in line with Belgian arrangements to a large extent, and the Belgians on their side were able to make concessions where required without their much larger economy suffering any appreciable damage. It is interesting to note that in the one industry where the scale of production was comparable in the two countries—iron and steel—an unusual amount of difficulty and resistance to the application of the principles of union was experienced. Exceptional treatment had also to be granted to a number of other industries, notably agriculture. One reason for this was that before 1914 Luxembourg, but not Belgium, had been a member of the German Zollverein, and the transfer of the economic link from Germany to Belgium involved considerable readaptation. In some industries complete readaptation was impossible or unacceptable. The author also emphasises the importance of the existence of a common currency (the Belgian franc) within the area in preventing the occurrence of any balance-of-payments problems and so smoothing the working of the union.]

NADWORNY (M. J.). Scientific Management and the Unions, 1900–1932. A historical analysis. Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 1956. 8½″. Pp. 187. 30*s*.

[This monograph traces the history of the relations between organised labour in the United States and the "scientific management" movement associated with the name of Frederick W. Taylor. Up till the First World War the relations were frankly hostile on both sides, but a marked change came about in the 1920s. In that decade labour unions were generally on the defensive, and one of the means by which labour leaders sought to make unionism more acceptable to businessmen was by adopting a co-operative attitude towards proposals designed to increase efficiency. At the same time the exponents of scientific management were moving away from the more rigid doctrines of their founder and were coming to appreciate more clearly that improvements in efficiency depended on satisfactory relations between management and the worker. In the course of developing his main theme, the author provides what is in effect a survey of the evolution of the scientific management movement generally. He shows how it came about that by the 1930s, although many of Taylor's doctrines had passed into general acceptance, they had in the process become diluted and combined with ideas stemming from different sources in such a way that scientific management had ceased to be the self-contained and distinctive philosophy that it had been in its early days.]

O'CONNOR (H.). The Empire of Oil. New York: Monthly Review Press, 1955. 8½″. Pp. 372. $5.00.

[This survey of the American oil industry, with briefer treatment of the oil industry in the rest of the world, is written in the radical tradition that is now so out of fashion in the United States. It contains a great deal of information in highly readable form. The general approach and the slashing style are similar to, say, Matthew Josephson's *Robber Barons*. It is well-informed, hard-hitting journalism, for the most part, rather than economic analysis in the academic sense. A good many statistical data are scattered through the text, but they are mostly used for purposes of illustration rather than submitted to systematic analysis. Granted the sort of book the author set out to write, the job has been very well done. And with this industry, more perhaps than with any other, there is surely room for such an approach as that which Mr. O'Connor has chosen—an approach which places the emphasis less on the purely economic issues and more on questions of power and politics.]

ORNATI (O. A.). Jobs and Workers in India. Cornell International Industrial and Labor Relations Reports, No. 3. Ithaca, New York: Institute of International Industrial and Labor Relations, Cornell University, 1955. 9″. Pp. v + 215. $4.00

[This is designed as a hand-book of information about the problems of industrial labour in India. The main emphasis is therefore on facts rather than interpretation. The topics covered include the growth of industrial employment, wages and working conditions, labour organisation and collective bargaining.]

PARNES (H. S.). Union Strike Votes. Current practice and proposed controls. Princeton, New Jersey: Industrial Relations Section, Princeton University, 1956. 9½″. Pp. 141. $3.00.

[Proposals have recently been made in the United States that strikes should not be permitted unless sanctioned by a majority of the workers affected in a secret ballot conducted under government auspices. Professor Parnes here provides an analysis of the issues involved and an account of past experience bearing on the question. A large part of his study is taken up with a description of the strike vote procedure actually adopted by unions. He finds little to support the allegation that workers are often pushed into strikes against their will by union leaders. Isolated instances of this may occur, and in voting on strike proposals workers are no doubt influenced by considerations of loyalty to their leaders; but at the same time no union leader would normally instigate a strike if he felt it lacked general support, simply because in such circumstances it would be unlikely to succeed. On the general principle involved by proposals for compulsory strike vote legislation, Professor Parnes points out that it is not always clear whether the purpose is to make strikes more difficult to call and thereby diminish the powers of unions or whether it is to secure more democratic control of union decisions. The "democracy" argument does not, he suggests, provide an adequate basis for the proposed legislation. In the first place there is no obvious reason why different criteria of democracy should be adopted in trade unions from those adopted in other elective institutions, such as government and business corporations. In the second place, if it is really desirable that the strike issue should be directly controlled by the rank and file of workers, provision should surely be made for workers to engage in a strike against the advice of their union leaders if a majority of them wish to. Needless to say, this is not provided for in the legislation that has been proposed.]

ROBINSON (M. A.), MORTON (H. C.) and CALDERWOOD (J. D.). An Introduction to Economic Reasoning. Washington, D.C.: The Brookings Institution, 1956. 9½″. Pp. 335.

[To be reviewed.]

RUSSELL SAGE FOUNDATION. Annual Report, 1954–55. New York: Russell Sage Foundation (505 Park Avenue, New York 22), 1955. 9″. Pp. 54.

[The progress of the various activities supported by the Foundation is reviewed. A large proportion of the Foundation's projects are concerned with the utilisation in professional practice (health, social welfare, education, government) of lessons learnt in the social sciences (social psychology, social anthropology, sociology).]

SELTZER (L. H.). Interest as a Source of Personal Income and Tax Revenue. National Bureau of Economic Research, Occasional Paper 51. New York: National Bureau of Economic Research, 1956. 9½″. Pp. 82. $1.25.

[This is reprinted from the *Journal of the American Statistical Association*. The author presents data indicating the proportion of personal incomes derived from interest (as distinguished from dividends) in the United States between 1919 and the present time, together with similar data about tax revenues derived from interest incomes. The paper arose out of a larger study on the personal income tax. In seeking to explain the trends revealed by his data, the author considers the effect of movements in interest rates; the attractiveness of fixed-interest securities compared with other forms of asset both to borrower and lender (this being a good deal influenced by tax considerations); and the increasing proportion of fixed-interest securities held by institutions.]

SCHULTZ (G. P.) and BALDWIN (G. B.). Automation. A new dimension to old problems. Washington, D.C.: Public Affairs Press, 1955. 9″. Pp. 20. $1.00.

[The authors describe what is meant by automation and the probable extent of its application in the near future. "As the first Industrial Revolution gave men radically new forms and applications of *energy* and *power*, this second Industrial Revolution promises to provide them with radically new methods for exercising *control* over processes and operations." They then go on to consider the effect of automation on industrial relations, particularly with regard to existing skill requirements and seniority rules and the wage differentials associated with them. They point out that in office occupations, where automation is likely to have its chief immediate application, the difficulties of adjustment should not be too great, since there long-service employees normally comprise a small proportion of the labour-force.]

THOMSON (C. A. H.). Television and Presidential Politics. The experience in 1952 and the problems ahead. Washington, D.C.: The Brookings Institution, 1956. 9″. Pp. 173. $1.50.

[The author discusses the part played by television in the presidential election of 1952 and the prospects for 1956. He describes the various controversies that have arisen about the rights and duties of the television industry to provide coverage of political events, and makes a number of

recommendations. He admits that little reliable information is yet available about the political impact of television, but he suggests that potentially it is a most valuable source of contact between politicians and the public, and should contribute both to political education and to politicians' responsiveness to public opinion.]

WENDT (P. F.). The Role of the Federal Government in Housing. National Economic Problems, No. 460. Washington, D.C.: American Enterprise Association, 1956. 9″. Pp. 48. $1.00.

[The author is Professor of Finance at the University of California at Berkeley. He traces first the very diverse objectives that the federal government has at various times sought to attain by intervention in the field of housing—slum clearance, creation of employment, housing war workers and veterans. He then analyses the consequences of what he considers to have been the too liberal system of mortgage guarantees and other encouragement to building that has been adopted by the federal government since the war. Looking at the future, the author admits that the problem of slum clearance is a serious one, but he regards it as essentially a matter for state and local government. Moreover, he maintains that the solution of this problem has been made more difficult by the dogma that slum dwellers should be rehoused in newly-built accommodation rather than be induced to "filter up" into existing dwellings vacated by higher income groups.]

French

MARCZEWSKI (J.). Planification et Croissance Économique des Démocraties Populaires. Vol. I: Analyse Historique. Vol. II: Analyse Économique. Paris: Presses Universitaires de France, 1956. 9″. Vol. I: pp. 312; Fr. 1200. Vol. II: pp. 313 + 572; Fr. 900.

[To be reviewed.]

German

ALBRECHT (G.). Sozial Politik. Göttingen: Vandenhoeck & Ruprecht, 1955. 9½″. Pp. 242. DM. 14.80.

[This book is for the greater part concerned with the various attempts made to ameliorate the conditions of life of working people in Germany. It is divided into two principal sections. After a brief theoretical discussion, the first section deals with the history of those who attempted to improve their lot by banding together in consumers' associations, co-operatives and trade unions. Unfortunately, no more than three pages have been allotted to the very interesting problems of the reconstructed trade unions after 1945. The second and major section of the book deals systematically with the several topics of protective labour legislation, including safeguards for special groups (women, juveniles and homeworkers), the regulation of hours and conditions of work, safety and the period of notice. The characteristics of German social insurance and its prospects are discussed in another chapter. A further chapter covers employment exchanges, youth-employment counselling, unemployment assistance, political measures to regulate wages contracts and settlements by arbitration. The last chapter in the book will probably contain most of interest to English readers, since it concerns the experiments in works councils and limited workers' control which are now being carried out in Germany and, in a different way, in Jugoslavia. The book contains a full bibliography.]

BAADE (F.). Obst und Gemüse in Westeuropa. Erzeugung und marktverflechtung. Hiltrup bei Münster: Landwirtschaftsverlag, 1955. 9½″. Pp. 205. DM. 21.00

[This is a compendium of statistics relating to fruit and vegetable production in Western Europe. For each of eleven vegetables and fifteen fruits, details are given of the amounts grown in each of some of five hundred "counties" into which Europe is here divided. Information is also given on the quantities imported and exported by each country. The whole is excellently illustrated with maps showing the density of growth of the various products, and with many time-series charts relating to the years 1929–53.]

GOLDSCHMIDT (D.). Stahl und Staat. Eine wirtschaftssoziologische untersuchung zum Britischen nationalisierungsexperiment. Stuttgart and Düsseldorf: Ring-Verlag, 1956. 9″. Pp. 290. DM. 27.80.

[To be reviewed.]

Swiss

WEBER (K.). Dividendenpolitik. Zürich: Schulthess, 1955. 9″. Pp. 197. S.Fr. 16.

[Companies make distributions to their shareholders in various ways: by rights issues, bonus issues, capital distributions and, not least, by straightforward dividend distributions. The latter may fluctuate as widely as profits, or be nearly as stable as debenture interest, depending on the policy of the company. Dr. Weber discusses here, in general terms, the policies that may be followed by a company and illustrates his remarks extensively with examples of the larger firms in Europe and the United States.]

Official

CANADIAN

RESTRICTIVE TRADE PRACTICES COMMISSION, DEPARTMENT OF JUSTICE, OTTAWA. Report Concerning an Alleged Combine in the Manufacture, Distribution and Sale of Transmission and Conveyor Equipment and Related Products. Ottawa: Department of Justice, 1955. 10″. Pp. 143.

[It is found that members of the Conveyor and Power Transmission Institute of Canada have engaged in common pricing arrangements which have had the effect of interfering with competition to the detriment of the public interest.]

INTERNATIONAL

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT. The Economic Development of Malaya. Report of a mission organized by the Bank at the request of the Governments of the Federation of Malaya, the Crown Colony of Singapore and the United Kingdom. Baltimore, Maryland: The Johns Hopkins Press (London: Geoffrey Cumberlege), 1956. 9½″. Pp. 707. 60*s*.

[Reviewed in this issue.]

INTERNATIONAL LABOUR ORGANISATION. National Housing Programmes and Full Employment. Report prepared by the International Labour Office for the fifth session of the Building, Civil Engineering and Public Works Committee. Geneva: International Labour Office, 1955. 11½″. Pp. 124.

[This report stresses the difference between the problems involved by housing programmes in advanced and backward countries. In advanced countries one of the chief problems, it is suggested, is to mitigate the violence of the fluctuations that have characterised the building industry in the past; national housing programmes must be adapted to take account of this problem of instability and of the relation between building activity and the general level of employment. In backward countries, on the other hand, instability is not such a difficulty, but the conjunction of widespread underemployment and acute shortage of saving raises other problems. The report is devoted to a consideration of these issues and of certain others that are common to all countries, such as questions of town planning and the need to reduce building costs.]

UNITED NATIONS. Economic Survey of Europe in 1955, including studies of investment problems and policies of European countries and labour market problems in western Europe. Prepared by the Research and Planning Division, Economic Commission for Europe. Geneva: United Nations, 1956. 11″. Pp. 247 and appendices. 18*s*.

[To be reviewed.]

UNITED NATIONS. The European Housing Situation. Prepared by the secretariat of the Economic Commission for Europe. Geneva: United Nations, 1956. 11″. Pp. 56. 3*s*. 6*d*.

[This useful work of reference brings together data on the housing situations in all the countries in Europe for which information is available. Where possible, particulars are given of the number of dwellings, the number of rooms and the total floor space, viewed in relation to the size, age-composition and marital structure of the population; the supply of electricity, running water and other amenities; the proportion of very old houses; regional variations in the housing situation, especially between town and country; and future trends, taking account of demographic prospects, the present rate of building and computed replacement needs. Extensive particulars are given about the housing situation in the U.S.S.R., some of which were made available by the Soviet

authorities specially for the purpose of the survey. The concluding chapter provides some interesting international comparisons. On the criterion of "rooms per thousand inhabitants," the United Kingdom comes third from the top, after Belgium and Switzerland. A noteworthy conclusion is that "in virtually no country would the continuation of housebuilding on the 1954 level for about the next ten years be excessive in relation to reasonable requirements."]

UNITED NATIONS. Non-ferrous Metals in Under-developed Countries. New York: United Nations Department of Economic and Social Affairs, 1956. 11″. Pp. 129. 0*s*. 6*d*.

[The four main chapters of this report consist of an analysis of the present patterns of world consumption, production and trade in non-ferrous metals; an account of international control schemes in these products; a survey of the present role of mining, smelting and refining in the economies of under-developed countries; and an analysis of the developmental significance of mining and smelting for these countries.]

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANISATION. Social Sciences Publications. Bibliographical List No. 4 of social sciences papers published in the Middle East. Cairo: Middle East Science Cooperation Office, 1954. 10½″. Pp. 46.

[536 items are enumerated, including both books and articles in periodicals. The arrangement is by subject, with an index of authors.]

UNITED NATIONS FOOD AND AGRICULTURE ORGANISATION. Yearbook of Forest Products Statistics, 1955. Rome: F.A.O., 1956. 11″. Pp. 161. 12*s*. 6*d*.

[The statistical tables are preceded by a brief review of the salient features of the world situation in forest products in 1954.]

THE ECONOMIC JOURNAL

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COMPETITION IN TRANSPORT AS AN INSTRUMENT OF POLICY[1]

I

THE economist trained in the classical tradition, as indeed I was, is bound to be attracted by price as the means of distributing resources between the several employments in which they can be occupied. The argument is well known, and the provision of facilities for transport is no exception. The charging of a price effectually discourages all those the urgency of whose demand for the goods or services in question is less than their disinclination to pay that price. Supplies are thus confined to satisfying those wants of greatest urgency; and the more urgent demands, measured by the purchaser's willingness to pay the price, are satisfied before scarce supplies are absorbed in the satisfaction of demands the urgency of which is less. If the urgency of a demand to the individual is any indication of its importance to the community—and to all of us committed to the principle of consumers' choice it cannot be otherwise—distribution by price ensures that scarce supplies go where they are most needed.[2] But demand, to paraphrase Alfred Marshall's famous simile, is one blade only of the scissors. The other is furnished by the cost of production.[3] Price in a competitive market cannot fall permanently below the cost of production. No supplier, deliberately and for long, can afford, nor indeed should he be expected, to work for less than the addition to outlays already incurred including an element for the normal profits of the trade. Competition between suppliers holds prices to the costs at which the particular services can be provided by those already in the trade; and price, where there is free entry for capital and enterprise, cannot rise more than temporarily above the average cost of production except by an amount which depends upon the customer's preference for the one carrier, the absence of any real alternative or ignorance that there is any!

[1] Presidential Address delivered before Section F of the British Association, Sheffield, September 1956.

I have had the advantage, when preparing this paper, of discussions with Dr. Michael Beesley and Mr. A. A. Walters, both of the Faculty of Commerce and Social Science in the University of Birmingham.

[2] The parking of cars (and of other vehicles) on the public highway is at once topical and an excellent illustration of the point. Day and Turvey, *Journal of the Institute of Transport*, July 1954.

[3] Marshall, *Principles of Economics*, 8th Edition, Book V, Chapter III, Section 7.

There is of course, no free access to the transport market. Competition as I have remarked elsewhere [1] though active is neither perfect nor pure as those terms are understood in our professional cant. Nobody but the British Transport Commission may start a new public line of railway, and entry to the trade of road haulage lies within the discretion of the licensing authorities. Only the private carrier is free to run more lorries as he pleases and he, by the terms of his licence, may not carry for others. Transport, as one member of the Commission has told us, is not a commodity which, once produced, can be stored and withheld from sale until there is prospect of a better market. The conveyance of a consignment or a passenger is a service which has to be consumed at the moment of its creation or be lost for ever. A capacity for passengers around the middle of the day, consisting of empty seats on the 12.40 p.m., entirely disappears when the journey is ended. The railway wagon or the carrier's lorry would not be run unless receipts from the consignments it carries at least cover the outlays directly incurred in the journey.

A transport operator, concerned to maintain the service, counts as his costs expenditures laid out in providing for all traders with traffic to consign and fare-payers wanting to travel; but the prices of transport to the buyers are the rates for the consignments and the fares. Neither the one nor the other measures real cost as the amounts of resources consumed by the several purveyors of transport in performing the services the subject of competition. The construction of the lorry and of the bus has to satisfy certain statutory rules and orders. The operations of the carrier must conform with statutory provision and regulation governing speed limits, wages and the hours for which drivers may work. But carriers by road undertake no such legal obligations as the liability imposed on the British Transport Commission to find each year the interest guaranteed by the Treasury upon the stock issued in compensation to railway proprietors. Motor operators do not pay for the use of the road over which their vehicles run, but they are taxed both on the vehicle itself (registration duty) and at 2*s.* 6*d.* on every gallon of fuel they burn. In common with all private business, professional motor carriers have to make both ends meet (and pay their taxes) or go out of business by bankruptcy or otherwise.[2]

Mechanical inland transport on the surface (I know that their omission will be forgiven by any inland waterways men who may be among my audience) is supplied to-day by British Railways and by road motor carriers

[1] See my *Road and Rail* (2nd edition, 1947), p. 26.

[2] The annual proceeds of tax raised upon motor vehicles and upon motor fuel now exceeds by four or five times the sum spent annually upon all highways by all authorities. The proprietors of buses and lorries taken as a class are paying collectively in tax more than the annual expenditure upon the roads which they may be supposed to use. I know of no data drawn from British experience bearing on this point, but I assume that the taxes raised specifically from owners of these heavy vehicles are sufficient at least to recoup any costs to which the highway authorities are put in furnishing the track over which these vehicles are run. See the presumed distribution of taxation raised from the several classes of motor owner prepared by the British Road Federation and reproduced in the current issue of the *Journal of Industrial Economics*, June 1956 (Walker, "Highway Finance").

both privately and publicly owned. The first are controlled by the law and by their own sense of the obligation owed by a great undertaking to a public who have also been their owners since January 1, 1948. The second, excluding the traveller in (and on) the 3½ million private cars and 1 million motor cycles, are governed by a number of Acts of the British Parliament and by those parts of the Transport Act of 1947 as amended by the Transport Acts of 1953 and 1956, which regulate the activities of the British Transport Commission as a carrier of goods and passengers by road. The Transport Act of 1953 has removed the most onerous of the disabilities previously bearing upon the railways. The business of carrying goods by road motor for hire has been reopened to the private owner. For many years I have been an unregenerate upholder of free competition in transport. That principle has now been adopted in the Transport Act of 1953 and the present is an appropriate occasion to examine some of its consequences.

The Transport Tribunal, on the application of the British Transport Commission to confirm a schedule of maximum rates under Clause 20, Section 2, sub-section (*b*), of the Transport Act of 1953, sat for forty-three days in 1955 and 1956. Evidence and argument occupy 947 closely printed folio pages.[1] The Commission propose to base their scales of maximum rates upon the loadability of the merchandise, upon the weight, that is, which can be loaded into a normal 10-ton truck. These maxima are assessed as the sum of the costs to which the railways are likely to be put in carrying a consignment of given weight in adverse circumstances. 5–10% of all traffic by volume, it was estimated, might be carried at these maximum rates. The cost of such traffic was expected on the average to be twice as much. This excess of cost over rate the Commission are willing to absorb. The Commission, following the practice of many another commercial concern, can be expected to issue price lists. In addition, there will be a "great variety of charges" negotiated directly with the trader, at the discretion of the Commission with neither condition nor limitation. The obligation to publish the rates paid for freight has now been repealed. Nothing need be disclosed except the legal maximum, unless the trader is able to claim the protection of the Tribunal under Clause 22.[2]

The Commission are obliged by the Act of 1953 to dispossess themselves of the business of carrying goods by road and they may not now purchase road passenger services except by consent of the Minister. The Act also empowers the Minister to require the Commission to dispose of their present holdings in bus and coach companies if he sees fit.[3] Amended by the

[1] In the Court of the Transport Tribunal: Transport Acts, 1947 and 1953: In the matter of the application of the British Transport Commission (1955, No. 2): To Confirm the British Transport Commission (Railway Merchandise) Charges Scheme. (H.M.S.O.) These proceedings, and especially the evidence of the witnesses for the Commission, are warmly recommended to students of economic policy.

[2] Transport Act, 1953, Clause 20, Section 2 (*d*); Clause 21, Section 1 (*d*); Clause 22 authorises the Tribunal to remedy complaints from traders who allege, successfully, that the railway rate is unreasonable and that their traffic could not reasonably be carried by any other means.

[3] This power has not yet been exercised. I doubt if it will be.

Transport (Disposal of Road Haulage Property) Bill, 1956, the law now permits the British Transport Commission to retain the lorries—about 7,000—required to maintain the trunk network built up by the British Road Services. All services for hire and reward, whether worked by publicly owned undertakings or by private operators, are once more prohibited except under licence.

I add a statement of the total estimated expenditure on transport in all its forms, private and public. The total of national expenditure at factor cost in Great Britain in 1953 was £14,540 million. At that rate current expenditure upon inland transport was of the order of 15%.

The Herbert Committee, reporting on another nationalised industry, were led to remark that "matters of supposed national interest, if they conflict with the economic operation of the industry, should be recognised as essentially political matters to be decided by the Minister subject to his responsibility to Parliament." Earlier they had said that "it is not for the persons running the industry to undertake uneconomic schemes of development within rural or urban areas in the supposed national interest, if the effect is to subsidise one particular body of consumers out of the pockets of others." [1]

The Commission have not concealed the principles on which they propose to make their charges nor have they made any attempt to do so. The price of rail transport in the future, as the Chief Commercial Officer of the British Railways has argued, must reflect—

> "a very great variety of operating conditions such as . . . the weight and loading characteristics of the consignment, the volume and regularity of the traffic and the volume and balance of the traffic over particular routes. All these things are just as familiar to us; but they are not, at the present time, reflected in the structure of our rates sytem in that kind of way. If the railways are to be competitive within their proper sphere and are at the same time to fulfil their duty to pay their way, it seems to me that their charging methods must on the one hand be such as to display a wide measure of elasticity in application, and on the other, they must conform to a general pattern which pays a good deal more regard to the particular character of the operations entailed and the circumstances in which they are performed." [2]

Some averaging of costs between one freight and another of course here must be, by the Commission as by any other large concern, as witnesses for the railway were quick to point out. But there is room no

[1] Committee of Enquiry into Electricity Supply Industry: (Herbert) Report, Cmd. 9672, para. 373.

[2] Question 524. Some of the consequences of permitting competition between railways, compelled by law to charge according to certain statutory (and conventional) principles, and road hauliers, free to make what rates they pleased, have been extensively canvassed in evidence before the Transport Tribunal, particularly by Mr. J. R. Pike (an extract from whose examination in chief is cited in the text), by the Commission in their annual reports and in a paper which I read before this Section when we met in Leicester in 1933. See my contribution in the ECONOMIC JOURNAL of that year.

Gross Expenditure in Great Britain on Road and Rail at Factor Cost and Net of Duplication in 1953 [1]

£000,000.

	Freight.	%.	Passenger.	%.	Total.	%.
1. Transport Industries:						
Rail . . .	299 [2]	26	130 [3]	13	429	20
Road . . .	176 [4]	15	273 [5]	28	449	21
Total . .	475 [6]	41	403	41	878	41
2. Private Transport:						
Road . . .	676	59	579 [7]	59	1,255	59
GRAND TOTAL .	1,151	100	982	100	2,133	100

[1] I am indebted to Mr. A. A. Walters, Lecturer in Statistics, Faculty of Commerce and Social Science in the University of Birmingham, for permission to reproduce this table.

[2] Including collection and delivery by road. Excludes miscellaneous receipts such as demurrage, fees for customs clearance certificates, lavatory takings, etc. Source: *B.T.C. Report and Accounts*, 1953.

[3] Including London Transport (Rail). Excludes shipping services such as cross-Channel passenger ships, etc. Source: *B.T.C. Report and Accounts*, 1953.

[4] B.R.S. gross revenue from carrying operations *plus* an estimate of the expenditure on carriage of goods by "A" licence, "A" contract and 60% of "B" licence vehicles. Source: *B.T.C. Report and Accounts*, 1953.

[5] Includes taxi-cabs, tramways and trolley-buses.

[6] "C" licence, 40% of "B" licence operation and goods-carrying vehicles operated by Government Departments, including Post Office.

[7] Excludes pedal cycles and hackneys.

longer for that wholesale cross-subsidisation [1] of one traffic by another which was (and is) a usual feature of the conventional system of railway rates based on the uniform mileage scale, the classification of goods by value and the prohibition of undue preference. All these elements of equity between traders requiring transport in unlike circumstances will be gone from the rates for railway transport now emerging from the Act of 1953. Should the direct cost by rail be demonstrably higher than the charge at which the traffic could be carried by road, the railway, so we are now informed, may refuse to compete, either by charging a high figure, possibly as much as the maximum or by withdrawing the service entirely. Freight costly to convey is to be found wherever there is irregularity in dispatch, awkwardness of loading and little to bring back, even supposing the merchandise to be consigned over a route otherwise well patronised. Nobody can properly object, though many might be tempted to do so, should he be asked to pay high for freight when direct cost by rail can be shown to be high and there is road carriage to be had at a lower price. But what of those consignments which do not attract the road haulier and are sent to places from which there is no weight of traffic back? There must be whole areas—the rural districts and the remoter regions generally—accepting and receiving a freight so light that no regular service could be expected to pay. The privately owned public carrier by road cannot be asked to

[1] Cross-subsidisation is an apt term popularised by the British Transport Commission to denote that transfer from the more profitable to the less which occurs when services which cost different amounts to provide are charged at the same price.

shoulder an obligation to carry at rates which do not pay nor to places which cannot provide a profitable traffic. Before the Act of 1953 the railways were under a statutory obligation to carry at the appropriate standard and exceptional rate.[1] Now the Commission can point to their statutory undertaking to levy such rates, fares, tolls, dues and other charges "as to ensure that the revenues of the Commission are not less than sufficient for making provision for the meeting of charges properly chargeable to revenue, taking one year with another," [2] and can plead their inability to go on affording facilities for transport except at rates which cover at least the direct costs incurred.

II

The British Transport Commission proposed in 1954 to spend, on their railway, over the next fifteen years, some £1,200 million, a sum just about equal to the figure at which the properties were taken over on nationalisation in 1948. Beesley and Walters [3] have estimated at about 9% the gain the Commission hoped to make; and about half the money is to be raised in the market, where the requirements of the Commission (supported by the Treasury guarantee) will compete with private demands. What is the present cost of the road improvements announced by the Minister to the House in February 1955 is not precisely known (even if the programme were). Experts more knowledgeable than I have attempted their estimates of the probable cost in the large of the congestion and the delays to which traffic is subjected on the Queen's highway. They have arrived at the happy conclusion that the money sunk in a motorway or other considerable improvement by public authorities would be well repaid in the savings enjoyed by the users in time and in the reduced expenses of running their vehicles. It should always be possible, if I may borrow a phrase from the White Paper on Employment Policy of 1944, for a "small central staff" to compare the financial returns expected from the investments projected in railways and in roads—and in waterways and airways for that matter. There is unhappily no "official organisation with the knowledge and reliable information" [4] required for the task. Railways are the responsibility of the British Transport Commission. The returns expected from the £1,200 million now to be sunk appear to have been forecast without

[1] The obligation to charge no more for transport by rail than a certain sum fixed by law, in spite of the considerable variation in the costs of working, has been eased in the past by the closing of a station, the withdrawal of the more expensive passenger service or the abandoning of the line outright when the Consultative Committee, the Tribunal and the Minister could be brought to agree. Such schemes have reached Parliament and, on a recent occasion, drawn a statement from the Minister (537 H.C. 1672). The Commission can and do support their case by figures demonstrating the loss to which they are condemned by the continued provision of the facility, and the opposition can be non-suited, morally at least, when the Commission show, as they so often can, how few of the objectors have recently used the station or the line! British Transport Commission Report, 1955, para. 30, Walker and Maddick "Responsibility for Transport" *Political Quarterly*, 1952.

[2] Transport Act, 1947, Clause 3, Section 4. The obligation was not abrogated by the Transport Act, 1953.

[3] In an article in the *Westminster Bank Review*, May 1955.

[4] Cmd. 6527, para. 81; Cmd. 7046, 1947, para. 12 (*a*).

onsidering the probable effects of the new rates for freight which the ommission have recently been discussing (or rather refusing to discuss, est too much be disclosed) before the Transport Tribunal. Investment n trunk-roads is financed by the Exchequer, administered by the Ministry of ransport and undertaken by the 1,286 local highway authorities who do the ctual work. Scrutiny of this expenditure, we were told in evidence before Select Committee of the House of Commons in 1953, has been designed to acilitate oversight by Parliament of public moneys spent by the Ministry nd of grants from the Ministry spent by the officers of local authorities. ut at no point in this double review is the opportunity taken to consider ne improvement of communications by road as a question of policy and ne relation of an expenditure upon highways to an investment in the rail- ay. The House of Commons debated plans for the modernisation of ailways just six days after they had listened to the Minister announce the xpanded road programme. No wonder the member for West Bolton was oved to ask "how the Government proposed to decide whether, financially, s size (the Commission's plan for railway modernisation) was right or hether it is much too big or not nearly big enough." Had the Minister, Ir. Arthur Holt went on to say—

> "been talking to a group of wealthy people who were to be asked to put money into the scheme he (the Minister) would not have convinced us that we should part with our money and give it to the railways. He did not convince us that we would get a good return or even some return or a better return than if we put our money into, say, electricity or roads." [1]

We were encouraged during the 1930s to see in capital outlay the key to n increase in employment and in times of general distress to measure the dvantage of investment by the addition which resources used for some on-current purpose could make to the men and machines brought into ainful occupation. Close on half the year's total gross domestic capital rmation is to-day in public hands, including therein both public depart- ents and nationalised industries. There is no question now, nor can there ave been since the War, of applying the national resources to non-current urposes in order to make work. When in 1956 a scheme of public invest- ent running into millions of pounds a year is decided upon, it can be only ecause, in the opinion of a body of officials, the condition of the country emands that resources be invested in this particular improvement—or that e central financial authorities are now more reassured about the risks of flation.

Officials of the Ministry of Transport were satisfied, we were told in 1952, outlay on highways was kept within 60 or 70% of the total expenditure voted to that purpose before the War. The £80 million or so being spent n the roads in 1952 amounted to £32 million in 1938 values, and the real

[1] 536 H.C. 1797. "The right honourable gentleman," said Mr. Holt, concluding this part of speech, "gave no economic reason whatever, but finished his speech by saying the best argument the proposals was that they were a morale raiser."

resources applied to road maintenance and repair had thus fallen by half since 1938.[1] A much greater expenditure on roads is now contemplated, rising to some hundreds of millions a year if the interested parties get their way. The authorities who lay out funds on the highways are not also the carriers. The costs of an investment in roads are borne by the public. The gains are enjoyed by the users, including the millions of private motorists. In assessing the return to an outlay on highways, there is to be reckoned in addition to the lessened expenditures of those whose costs can be counted, the great satisfactions of motor owners generally. Most of these cannot be valued in pounds, shillings and pence, and many of the beneficiaries being private motorists may not be susceptible to the financial calculus.

III

The charges of the public carrier cannot for long exceed the figure at which the trader might do the job for himself, running his own lorries for the purpose. Owing to the legal restriction which prevents a trader from carrying in his own vans any but his own goods, this cost may rise to a figure representing a haul loaded one way and empty in the other. Transport by road cannot at the other extreme be done at a cost below the normal outlays of a public carrier, one that is, who is licensed to carry for others, and thus has the opportunity of running full both out and home. The costs of carriage by road may be reduced by the construction of motorways and by large (and expensive) improvements to the existing roads.

The rebuilding of a highway will certainly increase the convenience brought by the ownership of a motor vehicle. Much depends upon the nature of the improvement and where it is made. The widening of a congested city street, for example, is more likely to be followed by a reduction in costs than the construction of a new motorway through the countryside, however much a new road free from obstruction may add to the ease of the fast driver.[2] But the private carrier gains, and so does the private motorist. The second will get there quicker and with less frustration. The first will have his goods carried more cheaply and with greater speed and convenience. We need not expect to see similar reductions in the prices which public carriers by road ask for their services. Their costs will be lower, it is true, to the extent which they work over the new and improved highways. They can always be induced to lower their rates following the reduction in their

[1] Fifth Report from the Select Committee on Estimates 1952–53 of Roads; Walker, Beesley and Walters, *Westminster Bank Review*, May 1953, " Transport Policy and Investment in Roads."

[2] The cost of the improvement could be brought home as a price to each user by the charging of a toll. Tolls have this advantage, that the user can be asked to pay a price not less than the worth to him of the highway each time he runs over it. But the raising of a toll, it must always be recognised, diminishes the use that is made of the facility. Nobody who values his purpose at less than the amount of the toll will go upon the toll road, bridge or whatever it may be. The new road is built and the improvement undertaken to ease the flow of traffic.' The object should be therefore to get the motorists off the old congested road and on to the new and presumably uncongested motorway. This is done, not by asking a toll on the new road but by a levy upon those who persist in using the old!

costs if other carriers, private and public, are attracted on to the new road and licensed to work over it. An influx of private lorries can no doubt be looked for, owned by those traders who hope to gain from the improvement; but invasion by the lorries of public carriers is limited by discretion of the licensing authorities and the addition of public vehicles working over the new or improved road thus restricted to those " A " licensees who under the law can safely divert their vehicles from other hauls.

The right to run over the public highway is a valuable franchise, and one the worth of which will rise as the condition of that highway is improved. The refusal in these circumstances of a licence to any applicant confers an element of monopoly upon those already fortunate enough to possess them. The monopoly enjoyed by the holder of an " A " licence is limited by the costs and convenience of the trader who works or who may work his own vans; and it depends upon the licensing authorities, who have full power in their discretion to grant or refuse applications for public " A " and limited " B " carriers' licences. This power is exercised in the manner prescribed by the Act and interpreted by the Rail and Road Traffic Appeal Tribunal and their successors, the Transport Tribunal. Hauliers granted an "A" licence are free in law to ply their trade anywhere and in any part of the country. But the Act of 1933 includes the previous conduct of the holder of the licence among the considerations which should guide the licensing authority, and they may now take into account, under clause 9 of the Act of 1953, the relative prices which are asked for the facilities applied for. Their discretion has thus been enlarged. What use will be made of the enlargement one cannot yet say, for the addition has not yet been tested; but the conduct of the licensee has in the past been held to warrant the refusal of an application for renewal on the grounds that a licence sought in one area has been used in another. Public " A " and limited " B " licences alone are subject to the discretion of the licensing authority. The private " C " carriers licences shall be granted unless the applicant is the holder of a licence which has been suspended or has been revoked. Licences can be revoked or suspended on the ground that any of the conditions of the licence have not been complied with. The Minister has included a clause in the Road Traffic Bill now before Parliament empowering licensing authorities to suspend or revoke " A " and " B " licences should they be satisfied that the licensee has been " persistently charging " for carriage by road " sums insufficient to meet the cost of rendering those services, and has thereby placed other holders of licences at an undue or unfair disadvantage in competing with him as respects the carriage of goods by road." [1] These provisions, besides opening the way to the exercise of forensic skill, may impose upon the licensing authority, if unwisely interpreted, some part of the responsibility for managing the carrier's business. Licensing authorities are already invited, on the applications before them, to decide whether or not the case has been made for adding to the public facilities for transport. They can now consider the rates proposed by applicants. Should

[1] Clause 35, Section 1.

this clause stand part of the Bill when it comes back from the Lords, they a their staffs may also be required to review the costs at which business being done. Who in these circumstances, one is tempted to ask, is the carr —the man who sets the rate or the authority who determines that the pric insufficient to cover all the outgoings? These powers will certainly lir still further the competition offered by public carriers licensed to run o the public road; and administrative officers forced to embrace so onerou liability are not perhaps to be envied.

Consideration of the cost at which carriage can be afforded by rail a road may not be the most important of the factors dominating competiti between them. Comparisons of cost, however elaborate, even of margi cost, supposing always that a meaning can be attached to that term in t context of a consignment of freight or of a passenger, do not get us very f Nothing is to be gained, as I had thought earlier,[1] in the pursuit of so chimerical notions of "fair" competition between road and rail, partic larly when railways are required by law to pay compensation upon a p investment and motor hauliers privileged to work over the public roa It was, I believe, Immanuel Kant who remarked that the better part of w dom is to know what questions may properly be asked. May I comme that conclusion to my audience and ask them to devote their attention inste to the question more significant to competition between carriers by ro and rail, of the issue of motor road carriers' licences, public, limited a private, by those twelve good men and true with two added for Scotlan the licensing authorities?

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[1] See my study of transport in Nova Scotia in the *Reports of the Nova Scotia Economic Coun* Vol. VI, No. 48, particularly pp. 74–86 (Queen's Printer: Halifax, N.S., Canada, 1942).

MEASURABLE UTILITY AND PROBABILITY— A SIMPLIFIED RENDERING

THE modern version of measurable utility is a part of a theory of human behaviour in the conditions of risk. Its consistency with certain basic axioms has been the subject of an extensive discussion on a high technical level.[1] The present note has hardly anything to add to this discussion and is not meant to be on a high technical level. Written by a non-specialist, it can serve no other purpose than to help a fellow non-specialist to see the wood without bothering about the trees. The stress is laid on easy reading, even if it means missing some finer points.

THE HYPOTHESIS OF MORAL EXPECTATION

The main hypothesis of the theory with which the present note is concerned is that in the conditions of risk people behave *as if* they were maximising mathematical expectation of utility, Bernoulli's moral expectation. The condition "as if" is important, because in choosing between alternative courses of action in the conditions of risk people are not supposed to make all the calculations explained in the following paragraphs; no more than in estimating the distance of an object are they supposed to calculate the size of the triangle formed by the object and the eyes, although they behave as if they were doing this.

The following example may help to explain what is meant by moral expectation as the principle governing behaviour in the conditions of risk. Suppose that an individual has to choose between two alternative acts. One is to buy a bicycle; the other is to buy a lottery ticket with a chance of 50 : 50 to win a motor car or nothing. Suppose also that the price of the bicycle is just equal to the price of the lottery ticket, and that there is no other way of using money; our individual must have either the bicycle or the lottery ticket. What will he choose?

If we accept the hypothesis that the individual is maximising mathematical expectation of utility, the answer is given by the following calculation. Suppose that the numerical measure of utility of the motor car is 1, the

[1] Besides von Neumann and Morgenstern's *Theory of Games*, (2nd ed., pp. 15–31 and 617–32) the articles most often quoted are: M. Friedman and L. J. Savage, "The Utility Analysis of Choice Involving Risk," *The Journal of Political Economy*, 1948; J. Marschak, "Rational Behaviour, Uncertain Prospects, and Measurable Utility," *Econometrica*, 1950; and P. A. Samuelson, "Probability, Utility and the Independence Axiom," *Econometrica*, 1952. A. A. Alchian ("The Meaning of Utility Measurement," *American Economic Review*, 1953) and R. H. Strotz ("Cardinal Utility" in *Papers and Proceedings, American Economic Review*, 1953) are moving on a less formal plane. Professor Georgescu-Roegen in his article "Choice, Expectations, and Measurability," *Quarterly Journal of Economics*, 1954, gives a list of other references. The item which must be added to this list is the relevant chapter in Professor R. G. D. Allen's forthcoming book, which I have had the privilege of reading before its publication.

measure of utility of the bicycle is 0·3, and of nothing is zero. The moral expectation of the lottery ticket with a chance of 50 : 50 (*i.e.*, 0·5 : 0·5) to win the motor car or nothing is then $1 \times 0{\cdot}5 + 0 \times 0{\cdot}5 = 0{\cdot}5$. This is more than the numerical value of utility of the bicycle (0·3). Thus according to the hypothesis of moral expectation our individual will choose the lottery ticket. If utility of the bicycle were greater than 0·5, or if the chance of winning the motor car were less than 0·3 : 0·7, the individual would choose the bicycle.

The same argument may be applied to more complex situations. A lottery ticket may stand for any course of action involving risk, and our individual may have to choose between more than two alternatives. Also the prizes to be won (two or more of them) may themselves be in the nature of lottery tickets. One of the alternatives may be, for instance, to invest money in a certain plot of land with a chance to strike oil there. Oil may be a source of income, provided that it is not displaced by some other type of fuel. If in the case like this utility of the expected income is 1, the probability of oil being displaced by some other type of fuel is 0·2 and the probability that oil will be struck is 0·5, the mathematical expectation of utility of the oil is $1 \times 0{\cdot}8 + 0 \times 0{\cdot}2 = 0{\cdot}8$, and the mathematical expectation of utility of the plot of land is $0{\cdot}8 \times 0{\cdot}5 + 0 \times 0{\cdot}5 = 0{\cdot}4$. According to whether it is greater or less than the mathematical expectation of utility of alternative investments, our individual will, or will not, buy the land.

If this theory is to have any meaning, a satisfactory answer must be given to the following questions: (1) what significance is to be attached to numerical measures of utility and how can they be ascertained, and (2) what significance is to be attached to, and how can we ascertain, the numerical measures of probability? These two questions are the subject-matter of the main part of this note. The last three sections deal with the logical consistency of the theory and with its empirical verification.

Intuitive Measures of Utility

There is one point about utility we may agree upon at once. Utility is like temperature; to be measured it must be referred to a scale of arbitrary units and an arbitrary origin. To measure temperature we may use Fahrenheit, Centigrade or Réaumur scale. The same applies to utility. To measure it we must first have a scale to which it is to be referred.

The scale must be fixed with reference to the individual in whose behaviour we are interested. The origin of the scale may be, for instance, at the position in which this particular individual has not yet either the bicycle or the motor car. In this position his utility is said to be zero. The unit of the scale may be fixed by attaching the value of unity to utility derived by him from the possession of the motor car in addition to what he has got in the zero position. The problem is then to attach numerical measures to utilities derived by this individual from other combinations of goods, such, for instance, as the goods he has got in the zero position plus a bicycle instead of the motor car.

One way of solving the problem may seem to be simply to inform the individual of the positions we have chosen for zero and unity, and to ask him to determine the numerical value of utility of the bicycle combination by intuition. Such a straightforward method, however, cannot be accepted for at least two reasons. One is that it is generally believed that our intuition does not go so far as to make such an intuitive measurement possible; we can *rank* utilities in the sense that we can say that we prefer the motor car to the bicycle, but we cannot say by how much or how many times we prefer it. The other reason is that even if somebody would think that he is able to attach numerical values to utilities by intuition, this would not be the same thing as measuring them; it would be simply to make a guess, not confirmed by any observable phenomena and not verifiable by any sort of test or experiment.

The Jevonsian Method

The method described in this section corresponds more or less to Jevons' views on utility.[1] It is based on the belief that we can rank not only utilities but also differences in utilities.[2] To quote Professor Robbins' example,[3] it is believed to be possible to say not only that we prefer a particular Rembrandt to a particular Holbein and the Holbein to a Munnings, but also that our preference of the Rembrandt over the Holbein is less than that of the Holbein over the Munnings. If this is true, then it is possible to attach numerical values to utilities without any further appeal to intuition.

Suppose that in our former example the individual finds his preference for the motor car over the bicycle greater than that of the bicycle over nothing (the motor car, the bicycle and nothing being in addition to what he has got in the zero position). This means that if utility of nothing is zero and utility of the motor car is unity, utility of the bicycle must be something between zero and 0·5. There must be, however, a good which is exactly in the middle between the motor car and nothing, the individual's preference of this good over nothing being exactly the same as his preference of the motor car over it. Utility of this good is 0·5. We may further find a good which is exactly in the middle between zero and 0·5, its utility being 0·25. If the individual prefers the bicycle to this latter good, utility of the bicycle is now between 0·25 and 0·5. Proceeding in this way, we can make the limits on either side of the bicycle move closer and closer, and determine the latter's utility with as much accuracy as we like.

The Jevonsian method does not require any intuitive measurement of either utilities or the differences in them. It requires only the ability to rank the differences, the ability to say that we prefer one good to some other more, exactly as much or less than we prefer the latter to yet another good.

[1] See D. Ellsberg's paper "Classic and Current Notions of Measurable Utility," Economic Journal, 1954.

[2] The term "differences in utilities" is used in the sense of differences of distance (see C. Kennedy, "Concerning Utility," *Economica*, 1953).

[3] "Robertson on Utility and Scope," *Economica*, 1953. See also Professor Hicks' comment in "Robbins on Robertson on Utility," *Economica*, 1954.

Whether we possess such ability is a question open to dispute. But even if we believe that we do, we must bear in mind that there is an important difference between the ranking of utilities and the ranking of the differences in them. The former may correspond to certain acts which can be observed and tested. We may, for instance, let our individual choose between the motor car and the bicycle, and conclude that utility of the alternative chosen is greater to him than utility of the alternative forgone. If the individual refrains from making the choice and does not mind if it is made for him by somebody else, he may be described as being indifferent; the two utilities rank equally high to him. If, however, he is asked to rank differences in utilities, this principle does not apply, because it is impossible to choose between the addition of a bicycle to what we possess now and the addition of a motor car less the bicycle (the exchange of the bicycle for the motor car) after we have got the bicycle. It does not make sense to speak of such a choice because it is impossible to choose the second alternative without having previously obtained the first. Ranking of differences in utility requires the ability to project oneself in two different situations, one before having got the bicycle and one after having got it; and as in fact nobody can be in two situations at the same time, the ranking cannot be verified by experiment or observation. The Jevonsian method is not a scientific operation, at least not in the modern sense of this word.

The fact that ranking of differences in utility cannot be verified by observation does not mean that it does not make sense to speak of them. On the ground of past experience, and using our powers of imagination, we often make a sort of mental picture of how we would feel about certain things in certain hypothetical situations; about having the Rembrandt instead of the Holbein if we had the Holbein already, or about having a motor car instead of a bicycle if we had the bicycle. And there is nothing nonsensical in making comparisons between such imaginary feelings. The only point is that a mental picture of how we would feel in a hypothetical situation is not the same thing as the actual feeling when the hypothetical situation becomes real. The point is that not only may it not be correct, but also that it is a different thing. If we say that we rank our preference of the Rembrandt over the Holbein lower than that of the Holbein over the Munnings, we rank in fact not our actual preferences but only the mental pictures we form of them.[1]

Von Neumann and Morgenstern's Operation

Suppose that as in the first section of this note, an individual has to choose between a bicycle and a lottery ticket with the 50 : 50 chance of winning a motor car or nothing. If he prefers the lottery ticket and his utility scale is adjusted so that zero corresponds to winning nothing and unity to the motor car, we conclude that utility of the bicycle is to him less than 0·5. His choice between the bicycle and the lottery ticket depends on the degree of

[1] On the dependence of the kind of utility we measure upon the operation by means of which we measure it see also Ellsberg's article, *op. cit.*

probability of winning the motor car. If by changing the rules of the lottery we reduce the chance of winning it, we make the lottery ticket less attractive. We may, therefore, adjust the chances so as to make the individual indifferent between the lottery ticket and the bicycle. Suppose that this happens when the chance of winning the motor car is 0·3. According to the hypothesis of moral expectation the utility of the lottery ticket is then $1 \times 0{\cdot}3 + 0 \times 0{\cdot}7 = 0{\cdot}3$, and as the individual is indifferent between the lottery ticket and the bicycle, utility of the latter is also 0·3.

This is what we understand by von Neumann and Morgenstern's operation of measuring utility.[1] It does not make any other requirements on our intuition than the ability to rank the alternatives between which we may be asked to choose. Unlike the Jevonsian method, it may be tested, in principle at least, by observation or experiment; we may ask people to choose between alternatives involving risk.

There is, however, one point which requires further consideration. In order to be able to measure utility we must first measure probability. We must be able to attach some significance to the number 0·5 or 0·3 as a measure of probability, and we must be able to determine it. In the majority of writings on behaviour in the conditions of risk the question whether we are able to do it was either not asked at all or it was dealt with in a very arbitrary manner.[2] The bulk of the theory was developed without bothering much about how to measure probability. It was simply taken for granted that its measurement was possible and that there was a meaning in such statements as, for instance, that the probability of oil being discovered under a certain plot of land was 5 to 10, *i.e.*, 0·5. The following sections deal with certain difficulties involved in this attitude and explain an attempt at getting rid of them.

Personal Probability

Von Neumann and Morgenstern's argument was based on the measure of probability as frequency in the long run. This means that if, for instance, the lottery is a toss of a coin, heads being the motor car, tails being nothing, the probability of winning the motor car is for our individual 0·5. If the lottery is based on drawing a number out of ten, the numbers one to three being a win, the numbers four to ten being a loss, the probability of a win is 0·3, etc.

It must, however, be borne in mind that frequency distribution in the long run is the proportion of the number of wins or losses to the number of trials, *the number of trials approaching infinity*. If there is one trial only, that is to

[1] However, the credit for priority must be given to F. P. Ramsey, who had thought it out already in 1926. (See his *Foundations of Statistics*, 1931.)

[2] Samuelson, in the article mentioned before (*op. cit.*, p. 671), says that to simplify the exposition he assumes without discussion that the primitive notion of numerical probability is "well defined and applicable to our consumer." Von Neumann and Morgenstern's argument is based explicitly on the interpretation of probability as frequency in the long run (*Theory of Games*, 2nd ed., p. 19). In Marschak's paper (*op. cit.*) the question of whether probability is measurable or not has not been raised at all. The same applies to Alchian and Strotz (*op. cit.*).

say, if there is one lottery ticket or a unique decision, frequency distribution has no meaning at all. To regard it as a measure of the probability *with which one expects to be a winner in this particular case* is a very arbitrary procedure. We may have a hunch that this time it will be heads, and we may feel so strongly about it that we may regard the possibility of winning the motor car as nearly a certainty, in spite of the fact that the objective chances are only 50 : 50. And it is this feeling of certainty, the personal, subjective probability, that governs our behaviour.

This has a bearing on the determination of the numerical values of utility. Suppose that in the example mentioned above we want to determine the numerical value of utility of the bicycle by means of von Neumann and Morgenstern's operation. This means that we have to make the numerical value of the probability of winning the motor car so great as to make the individual indifferent as to whether he has the bicycle or the lottery ticket. But if the probability is subjective, there seems to be no other way to ascertain it than to ask him how he feels about it. In other words, we must ask him to attach a number to his feeling of uncertainty which would make him indifferent between the bicycle and a chance of having the motor car. And this, in principle, is the same problem as to attach numbers to utilities. It is impossible to attach to either of them any numerical measures by intuition.

In order to measure utilities by means of von Neumann and Morgenstern's operation it is thus necessary to devise an operation which would permit us to measure subjective probability. The first solution of this problem was given again by Ramsey as far back as 1926. Savage's development of some of the ideas put forward by de Finetti has been the most recent attempt to formulate a theory of probability as an integral part of the theory of human behaviour in the conditions of risk.[1]

Measurability of Probability

The present section is based on Savage's analysis of quantitative personal probability, but it is not a summary of it. It is rather in the nature of a paraphrase, the purpose being to explain the rules of an operation by means of which it is possible to get rid of the difficulties mentioned at the end of the previous section.

The first steps are very similar to those of the Jevonsian method of measuring utility. First we have to fix the scale. If we are absolutely certain that an event will not take place (for instance, that we will not strike oil on a certain plot of land), we say that its probability is zero. If we are absolutely certain that it will take place, we say that its probability is unity. If we are uncertain as to whether it will take place or not, its probability to us is something between zero and unity.

Now by means of the following device it is possible to split the distance between zero and unity into halves and to find an event the probability of

[1] L. S. Savage, *The Foundations of Statistics*, 1954; B. de Finetti, " La prévision, ses lois logiques ses sources objectives," *Annales de l'Institut Henri Poincaré*, 1937.

which (subjective) is 0·5. Suppose that we toss a coin and offer a prize for the right guess of the result. If the individual in whose subjective measures of probability we are interested says that he expects heads, this means that heads is more probable to him than tails. If he says tails, tails is more probable. But if he does not insist on either heads or tails and does not mind if the guess is made for him by somebody else, heads and tails are equally probable to him, and the probability of either of them is 0·5.

As we are speaking not of frequency distribution but of subjective probabilities, we must not rule out the first two possibilities; our individual may be prejudiced in favour of one of the results. In this case we must modify the rules of the game in the following way. Let the coin be tossed not once but, for instance, three times. This means that we have $2^3 = 8$ different sequences of heads and tails. Four of them begin with heads and four with tails. The probability that one (any one) of the first four comes out is thus the same as the probability of heads on the first toss, and the probability that one (any one) of the other four comes out is the same as the probability of tails on the first toss. If now our individual is prejudiced in favour of heads on the first toss, the former probability is greater to him than the latter.

In this case, however, we may group the eight sequences in a different way. Only three of those beginning with heads may form the first group, and the remaining five (those beginning with tails and the remaining one beginning with heads) the second group. The probability that one of the sequences of the first group comes out is then less than the probability of heads coming out on the first toss, and the probability that one of the sequences belonging to the second group comes out is greater than the probability of tails on the first toss. If, therefore, our individual is prejudiced in favour of heads on the first toss, he may be indifferent between the alternatives of the first and the second group. If he is not, we must increase the number of tosses. As it can be made as great as we please, we may always arrive at such a great number of sequences that it is possible to achieve a very fine balancing of the probabilities of the two groups formed of them. And then we say that the probability that one of the sequences belonging to one of the two groups comes out is to our individual 0·5. As the probabilities are subjective, the number of sequences may not be the same in both groups.

In spite of certain similarities between the first steps of this operation and the Jevonsian method of splitting the differences in utilities, there is an important difference of principle between the two. In the former the individual is asked to rank alternatives which are both available to him; he may choose one group of sequences as more probable than the other, and he may put his stake on whichever group he likes. In the Jevonsian method the individual is asked to rank alternatives one of them not being available unless the other has been chosen. Even, therefore, if one decides to reject the Jevonsian method of ranking differences in utilities on the ground of its having no operational meaning, the ranking of subjective probabilities is acceptable.

The next step in measuring subjective probabilities is to compare the

probability of one of the sequences of heads and tails, belonging to one of the two groups, both equally probable, with the probability of such an event as, for instance, striking oil on a certain plot of land. If our individual thinks that the latter is more probable, we say that its probability to him is greater than 0·5; if it is less probable, its probability is less than 0·5.

In order to arrive at the exact measure of the probability of this particular event we must split the distance between zero and unity not in two but in a much greater number of alternatives, all equally probable to the individual in question. The procedure may be the same as in the former case. We may contemplate a certain number of tosses of a coin, leading to a certain number of sequences of heads and tails, and then combine the sequences into groups in such a way as to make the groups equally probable to our individual. As we are concerned with subjective probabilities, the groups need not each contain the same number of sequences; and as there is no limit to the number of possible tosses, we may have as many groups as we like. The probability measures attached to each of them is then the corresponding fraction of unity. These numerical measures of subjective probabilities are then amenable to the same mathematical operations as frequency distributions. Thus if we have, for instance, 100 groups, the probability measure of each of them being 0·01, the measure of the probability that one of the sequences belonging to 30 groups comes out is 0·3. The distance between zero and unity is divided into 100 equivalent parts in the same way as 1 metre is divided into 100 centimetres or 1 yard into 36 inches.

The procedure also serves the same purpose. We measure the probability of a certain event by relating it to the probability that one (any one) of the sequences belonging to a certain number of groups comes out, exactly in the same way as we measure the length of an object by relating it to a certain number of centimetres or inches. If, for instance, our individual thinks that the probability of oil being discovered under a certain plot of land is the same as the probability of one of the sequences belonging to 30 groups (from 100) coming out, its numerical measure is 0·3. A greater precision can be obtained by dividing the distance between zero and unity not into 100 but into 1,000 groups, as we divide 1 metre into 1,000 millimetres. As the number of tosses and of possible sequences of heads and tails is unlimited, the number of equivalent groups can be made as great as we please, and *in principle* we may achieve any degree of precision.

The Logical Consistency of the Theory

The outcome of the above discussion is that by means of the operation described in the previous section we can attach numerical values to subjective probabilities, and then by means of von Neumann and Morgenstern's operation we can attach numerical values to utilities. Both operations refer to facts which can be observed and tested, and they provide us with all the data we need to calculate mathematical expectations of utility of various acts involving risk. An example of such acts may be to buy a lottery ticket

with a chance of winning a motor car or to invest money in a plot of land in the expectation of striking oil there. Thus the hypothesis that in the conditions of risk an individual behaves as if he were maximising mathematical expectation of utility (moral expectation) provides us with a theory of his behaviour which is operationally meaningful; it refers to observable facts and can be tested by experiment. The question which remains to be settled is only whether it is also logically consistent.

In what sense could it be inconsistent? Suppose that as the first step in the calculation of mathematical expectation of utility we want to attach numerical values to the utilities of four alternatives: (1) to a motor car (in addition to what the individual under investigation has got in the initial position); (2) to a bicycle (in addition to what he has got in the initial position); (3) to a motor cycle (in addition to what he has got in the initial position), and (4) to what he has got in the initial position without any additions. According to the procedure explained before, we fix the origin of the scale at the last alternative, unity at the first, and we determine the utility of the motor cycle by asking our individual to choose between the motor cycle and a lottery ticket with a chance of winning the motor car. If the rules of the lottery are so adjusted that with the resulting subjective probability of winning the motor car our individual is indifferent between these two alternatives, the mathematical expectation of utility of the lottery ticket is the numerical measure of the utility of the motor cycle.

So far the procedure is unambiguous, and there is no place for any logical inconsistency. Suppose, however, that as the next step we want to attach a numerical value to the utility of the bicycle alternative. One way to do it is to ask our individual to choose between the bicycle and a lottery ticket with a chance of winning the motor car. But as we know already the numerical value of utility of the motor cycle, we may also ask him to choose between the bicycle and a lottery ticket with a chance of winning the motor cycle. The point now is whether these two ways lead to the same result. If they do not, the mathematical expectations of utility derived from them may be different too, and our theory is inconsistent; according to which way we choose, we may arrive at different predictions of behaviour in the same conditions.

Most of the technical literature on moral expectation deals with this question of consistency. Its outcome is that if we accept certain axiomatic restrictions on our preferences, such, for instance, as that the individual is not choosing the lottery ticket for the sake of the pleasure of taking part in the game, the theory must be logically consistent; whichever way we choose to ascertain numerical values of utilities, they must yield the same results. This is what is meant by utility measures being uniquely determined up to the linear transformation, *i.e.*, up to the arbitrary units and the origin of the scale. If, instead of choosing as zero and unity the utilities of the initial collection of goods and of the initial collection of goods plus the motor car, we had chosen the utilities of some other collections of goods, the numerical scale of utilities would be different. As long, however, as we stick to a certain origin and arbitrary units, it does not matter what a combination of

prizes we choose for the lottery ticket; all of them must lead to the same utility measure.

In this non-specialist note no attempt is made to reproduce either the axioms put forward by various writers or the logic of the deductions derived from them. It must suffice to point out the sense of these deductions. And this is that if an individual's system of preferences satisfies the conditions implied by axioms which are easily acceptable to most of us by intuition, his numerical measures of utilities are uniquely determined up to the arbitrary units and the origin of the scale, and the theory of moral expectation is logically consistent.

Empirical Verification and Rationality

The theory of moral expectation satisfies all the conditions of a scientific theory in the modern sense of this word; it implies operations the result of which can be ascertained by experiment or observation,[1] and it is logically consistent. What remains to be done is only to put it to a test by means of an empirical study.

An attempt at such empirical verification was made by Mosteller and Nogee,[2] who performed an experiment on a number of people taken from undergraduates at Harvard College and from a regiment of Massachusetts National Guard. The participants were asked to play a game devised specially for this purpose. On the ground of the results the authors came to the conclusion that " the notion that people behave in such a way as to maximise their expected utility is not unreasonable." [3] The predictions of behaviour based on the data established in the experiment were " not so good as might be hoped," [4] but their general direction was correct.

The experiment was based not on personal probability but on frequency distribution. As, however, each person was taking part in a game consisting of a great number of " trials," it is unlikely that this might have affected the results much. There is no doubt that for some persons they were negative. The question, therefore, arises how we must interpret these negative cases.

Two answers suggest themselves at once. One is that the particular individual's system of preferences does not satisfy the conditions implied in the axioms; the other is that this particular individual does not behave according to the hypothesis of moral expectation. In either case the theory is thus wrong in the sense that it does not apply to the individual in question.

There is, however, a third answer, put forward by Professor Marschak.[5] The theory of moral expectation may also be interpreted as being of a normative character; a person *does* not so much behave as he *should* behave according to it. Otherwise he would not behave rationally.

[1] It has been pointed out to me by Professor R. G. D. Allen that an individual may behave differently if he is being observed than if he is not, because if he knows that he is being observed, he may take into account the utility he derives from the effect his behaviour has on the people who are observing him.

[2] " An Experimental Measurement of Utility," *The Journal of Political Economy*, 1951.

[3] *Op. cit.*, p. 403. [4] *Op. cit.*, p. 399. [5] *Op. cit.*

The point may be explained by means of the following analogy. If a man is walking to work every morning it is a reasonable hypothesis that, other things being equal, he takes the shortest route. None the less, it may happen that he may make a mistake; he may think on the ground of an intuitive impression that a particular route is shorter than some other, although in fact the opposite is true. If, however, somebody shows him on a plan that his impression is wrong, he should admit the mistake and take the other route, the truly shorter one.

The same may apply to behaviour in conditions of risk. An individual may choose an alternative with a lower moral expectation simply because he is acting on the ground of an intuitive judgment; he would behave differently if the calculus of moral expectation were explained to him. If he would not, that is to say, if he persisted in choosing the alternative with a lower moral expectation, this would mean that he behaves irrationally.

If we accept Marschak's approach there is no point in any empirical verification of the theory. In fact, it ceases to be a theory of human behaviour at all. The calculus of moral expectation becomes rather a principle of rational behaviour, like strict calculation in business; and an empirical study of the type described above is then a test not of the applicability of the theory but of the rationality of the behaviour of the individuals participating in it.

Is Utility Measurable?

The possibility of irrational behaviour casts some doubts on the value of von Neumann and Morgenstern's operation as a method of measuring utility. For if the behaviour of the individual under investigation happens to be irrational, the measures of utility arrived at in different tests are not the same, and it is impossible to say which of them is to be regarded as the true one.

Suppose, however, that the irrationality of the individual's behaviour is explained to him, and that he is prepared to modify it so as to make the measures of utility absolutely consistent. Can we then say that we have solved the problem of measuring utility, and that utility has become cardinal again?

The answer depends on what we understand by utility, and the analogy with temperature may again be of help in clarifying the point. We know that we cannot measure temperature by hand because we cannot measure the intensity of the feelings we experience when we touch cold or hot objects. We can measure it if we use a thermometer; then, however, what we measure is not our experience of hot or cold, but a change in the volume of mercury (or some other stuff) in the thermometer. It is true that both the change in the volume of mercury and the experience of hot or cold are due to the same cause: to a movement of molecules in the stuff the temperature of which we try to measure. But they are not the same thing, and the temperature shown on a thermometer is not the measure of the intensity of our feelings. In fact, if we could measure the intensity of our feelings of hot or cold, the

relation between them and the temperature of the object we touch would no doubt be an interesting subject for study in psychology.

Utility which we measure by means of von Neumann and Morgenstern's operation is like temperature. It may be defined (and this is no doubt the original meaning of the word) not as satisfaction, welfare or happiness, but as a certain property of goods which makes them desirable to us. There is no single cause of utility, such as the movement of molecules is supposed to be the cause of high temperatures, and the same physical characteristics of goods may make them more desirable to some people and less to others. None the less, if we interpret utility as a sort of a general assessment of those characteristics from the point of view of their making the goods more or less desirable to a particular person, we can speak of measurable utility in the von Neumann and Morgenstern sense.

Utility as welfare, happiness or satisfaction corresponds to our feelings of hot or cold when we touch hot or cold objects. There is nothing in the axioms of the theory of moral expectation that would suggest either identity or any linear relation between the utility measures they imply and the feelings of welfare, happiness or satisfaction we derive from consuming or possessing goods. All we need for the axioms to be intuitively acceptable is that their utility measures are consistent with our ranking of various combinations of goods as more or as less desirable to us. But the pleasure, welfare or satisfaction we derive from them is not measurable; utility in this sense must still remain ordinal.

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WAGE POLICY AND A LABOUR STANDARD

IN recent years the general level of wages has attracted growing attention in Britain and other countries because of its importance as a factor in inflation, and in problems of balance of payments and monetary standards. Indeed, the claim is sometimes made that we are no longer on a gold standard or a Government-managed currency standard but on a labour standard dominated by the trade-union movement.[1]

Monetary conditions to-day differ greatly from those before 1914, when the gold standard was in operation and provided the basis for currency values and for regulating the economy. Then, values were related to a single commodity. It was a period of *laissez-faire*, with minimum intervention by Government in economic affairs, and the trade-union movement was relatively weak. If labour costs became too high and the balance of payments became unfavourable because of falling exports, credit was restricted, gold might have to be exported, unemployment grew and wages declined until the strain on the economy was removed. To-day, by contrast, the era of *laissez-faire* is over, and the Government assumes wide responsibilities for economic conditions, including the maintenance, as far as practicable, of a high stable level of employment. Also the powers of the Government and its experience in economic affairs are now much greater than they were two or three generations ago. The trade-union movement is strong, and the determination of wages by collective bargaining is widespread. Instead of monetary standards determining the general level of money wages, it is claimed that the price level and the foreign-exchange value of the currency have now to adjust themselves to a wage (labour) standard.[2]

The operation of a labour standard is based on the assumption that the aim of government policy will be to ensure full employment in all circumstances. Whatever the wage level may be, the supply of labour will not be allowed to exceed demand, and the ordinary adjustments of demand for and supply of labour would no longer determine wages. If this aim is realised, then, whatever the wage level, either selling prices will yield such profits that private industry will provide full employment or the Government must do so directly by increasing its own demand for labour or indirectly by subsidising private industry. These conditions would place the trade unions, perhaps in

[1] In a Memorandum on Wage-fixing According to the Price Index, Jørgen Pedersen says, "An arrangement which leaves wage-fixing entirely to the organisations of the labour market in fact gives these organisations sovereign control over the development of the monetary system" (*International Economic Papers*, No. 4, 1954, p. 106).

In his Presidential Address to Section F of the British Association's meeting in Bristol, September 1955, Professor Hicks said: "Since 1931, wages questions have been closely associated with monetary questions; it is even true that the *general* level of wages has become a monetary question. . . . It is hardly an exaggeration to say that instead of being on a Gold Standard, we are on a Labour Standard" (ECONOMIC JOURNAL, Vol. LXV, September 1955, p. 391).

[2] This might, in a sense, be regarded as an application in a special field of a labour theory of value.

collusion with employers, in a position to push wages successively higher Money wages would be rigid against a fall, but would almost certainly mov persistently upwards, with inflationary consequences. This would be mainly because, released from the necessity to take unemployment into account, th trade unions in exercising their essential function of getting what they con ceived to be the best terms for their members would apply continuous pressur for higher money wages.[1] The effects of trade-union pressure would b aggravated by wage increases caused by competition for labour by employers The Government would increase the supply of money to meet the needs o rising costs and prices. As soon as costs of production rose above those ir competing countries abroad, exports would fall, the balance of payment would become adverse, the gold reserve would be drained and, finally, th foreign-exchange rate of the currency would fall.[2] In effect, money value would adjust themselves to wages and not wages to money values. Full employment would be maintained whatever happened to the price level, the balance of payments and the rates of foreign exchange.

If the objective of maintaining a high stable level of employment is achieved and if, in a pluralistic society, freedom to fix wages is retained by trade unions and employers' organisations supplemented by wage councils and arbitration tribunals independent of Government control, then inflation can be avoided and stable exchange rates ensured only if these bodies show a sufficient sense of responsibility and regard for the public interest. But if this sense of responsibility is not shown and the economic interests of the country are endangered by a rapidly rising price level and depreciating exchange rates, can the Government abdicate its authority over monetary policy and standards? In a pluralistic democracy many important functions are exercised by voluntary unofficial bodies. In Britain and many other democratic countries it is widely accepted, with some qualifications, that employers and trade unions are the most suitable instruments for wage regulation. For the Government, however, to approve or acquiesce in their exercising this function, it must be satisfied either that the balance of forces between these two groups will ensure that the resulting wage standards will be appropriate in the interests of the economy as a whole, of which they together form so large a part, or that in their negotiations and agreements they do not neglect these wider interests. But if these results are not realised, the Government cannot relinquish its responsibilities. It cannot attempt to

[1] This pressure would be greatest where each union is autonomous in its wage policy and negotiations, but where the Trades Union Congress or similar central bodies in other countries exercise influence on their affiliated unions and account is taken of the common interests of workpeople in all industries, the wage policy might be sounder and more restrained. In some post-war years the central trade-union bodies in Scandinavian Countries and the T.U.C. in Britain have, in varying degrees, been influential in this way.

[2] Weakness of the exchange rates would be increased if wage trends in relation to productivity gave competing countries advantages in foreign markets or if the terms of trade became unfavourable. Where exchange rates are liable to change the main alternatives are free exchanges which adjust themselves continuously to variations in the demand for and supply of the currency, and fixed rates, but with the probability of considerable changes at intervals, with the uncertainties and dislocations to trade which such changes would cause.

ensure full employment if the trade unions pursue irresponsible wage policies. It must try to prevent a sound monetary policy from being undermined by sectional interests, it must use its power and influence as an impartial authority to restrain such interests from injuring the country's economy, and must adopt credit, fiscal and other measures to secure a stable economy.[1]

The close association between wages and monetary questions is unquestioned. This was so both before the First World War and in the inter-war years as well as to-day, although the closeness of the association varied in different periods. Before 1914, Britain's competitive power in world markets was strong enough to ensure monetary stability. Since the First World War, for a multiplicity of reasons, Britain's balance of payments, and therefore her monetary problems, have been difficult, and this has increased the effect of any factor, including wages, which may influence the balance of payments adversely.[2] But many other things in addition to wages are closely linked with monetary questions, and wages alone, which form only a part of the national income and of costs of production, do not provide a satisfactory standard for measuring the values of goods, services and capital investments.

Those who claim that we are on a labour standard outline some of its features and emphasise its dangers and defects, but rarely indicate how it is supposed to work. The claim itself seems to be made on the basis of short-period conditions and social factors without allowing sufficiently for the long-term force of economic factors. It is usually argued that the strength of institutional and social or non-economic factors in wage determination, and the power of the trade-union movement in wage negotiations, have greatly reduced the effects of economic factors. It can be agreed that the levels of wage-rates result from an interaction of social and economic factors and are not based solely on demand and supply, or more generally on economic forces. In the short period, which may indeed extend over a decade or more, the part played by non-economic factors, particularly social factors, is often considerable, but in the long run the tendency is for the economic factors of demand and supply and for technological changes to become dominant in determining wage standards. The long-period strength of economic forces is often underestimated, and undue weight is given to social factors.

In many countries a high stable level of employment has been maintained during the short period from 1940 to 1956, of which ten were years of war or of early post-war reconstruction. It seems to be assumed that full employ-

[1] Such measures include raising the Bank Rate and other credit restrictions, commodity taxes, import control, budgeting for a surplus and reduced Government spending. Some measures, for example, commodity taxes, would have little effect in closing the inflationary gap if, in conditions of full employment, the trade unions insisted on securing higher wages to offset the increased prices resulting from the taxation. For an interesting discussion of these and other measures (including possible direct Governmental control over wages) by the Swedish economists, Eric Lundberg, Rudolf Meidner, Gösta Rehn and Krister Wickman, see *Wages Policy under Full Employment*, edited by Ralph Turvey.

[2] The adjustment of currency rates of exchange to bring a country's foreign trade into line with economic trends abroad is not new. Many countries did this during the past hundred years. It was, however, new for Britain in the conditions which prevailed after the First World War.

ment will continue, though few economists would predict its permanence. What assurance is there that with a labour standard unemployment will not occur? If full employment is an essential feature of a labour standard it has still to be shown that adequate measures could be taken in all circumstances to maintain that standard. The experience of the past ten years, with its many special conditions, is much too short to sustain this thesis. Even in the short period if wage-rates are maintained substantially above "equilibrium" rates appropriate for a high level of employment, earnings will fall because less overtime will be worked and there will be more short-time and some unemployment, and governments may be unsuccessful in restoring a high level of employment. In the long run, such factors as mobility of labour, mechanisation, automation and other labour-saving methods will bring about a correction. When preference is expressed for monetary instability without unemployment on a labour standard to monetary stability with periodic unemployment, the assumption is made that what is preferred can be achieved. Experience over the past five or ten years is insufficient to prove that monetary instability on a labour standard would prevent unemployment.

The statement often made nowadays that agreed wage-rates can go up but cannot go down is also based on the much too limited experience of the past five or ten years when conditions were highly favourable, but such experience could be reversed in periods when conditions were unfavourable. Even to-day in the British cotton-textile industry wages have lagged because, relatively to many other industries, the industry is depressed and declining. This lag would have been still greater if cotton workers had stayed in the industry instead of moving to light engineering and other trades.

Can it be accepted that wages are now determined mainly by social forces, with economic forces playing only a secondary role? Can the parties to wage bargains set aside economic considerations and fix wages at levels which they consider to be "right" and "just"? Those who give affirmative answers underestimate the strength of economic factors. Often what is accepted as just and right is the result of rationalising on the basis of economic realities. A real wage which would be accepted as just and right in India would be rejected as intolerably unjust and wrong in England or the United States. In the main, social forces adjust themselves to economic conditions. If the desirability of having real wages as high as possible, consistently with high employment, is a social objective, it is equally an objective of economic policy. Increases in the general level of real wages result from increases in productivity, and social policy has little influence. Social forces have done little to raise the general level of real wages in Britain. By collective bargaining, and by the action of wages councils and similar statutory bodies, minimum or basic rates of wages have been standardised in many industries, but the general level has been raised over the years by industrial progress and not by non-economic pressures.[1]

[1] The fixing of minimum wages applicable throughout an industry may have forced some inefficient employers out of business and diverted their workers elsewhere, thus somewhat reducing wage inequalities without, however, doing much to raise wages.

Payment of a "living wage" might be expected to be one of the most powerful of social pressures. Yet in any country the amount of a living wage is estimated in relation to the general level of wages over a wide range of industries, and social pressures have little effect on that general level, though they may cause some changes in distribution. Also, when a living wage is fixed, full-time employment is assumed, but in periods of depression the actual earnings of many workers fall below the living wage because of short-time and unemployment.

References are not infrequent to the supposed rigidity of money rates of wages in the inter-war years and to their persistent upward but never downward movement since the War.[1] It is argued that in those years social forces held money wages up at a time when the economic forces of depression and unemployment would have tended to force them down. Experience in the inter-war years gives little support, however, to the predominance of non-economic over economic forces in determining the general level of wages. In the long period it is not the rigidity but the flexibility of wages which is remarkable, and this is due to the force of economic and technological changes. The index numbers of weekly wage-rates do, indeed, show little variation from the middle 1920s until the late 1930s, but these indexes are averages which conceal wide differences both in levels and movements. The period was one of big disparities between wages in sheltered home-market industries and unsheltered industries directly exposed to the full blast of competition in world markets. The sheltered industries, including many light industries in London and other southern districts, were prosperous by contrast with the depression in Lancashire, Tyneside and South Wales. Economic factors enabled relatively high levels of wages to be paid in the sheltered industries. Social forces were powerless to prevent severe wage reductions in the unsheltered industries. It would be impossible to convince coal-miners and textile operatives that their wages showed rock-like stability in the inter-war years. The miners, who were among the most strongly organised workers in the country, remained away from work for six months in 1926 in unavailing resistance to wage reductions, but economic forces were too strong for them; they were compelled to acquiesce in substantial wage-rate reductions, and the fall in their earnings, resulting from unemployment and short-time, was greater still. Long-period flexibility is illustrated by the fact that in the inter-war years the wages of miners were low in the scale of relative wages in different industries, whereas now they are in the top group. Flexibility is also shown by actual or effective rates rising appreciably above agreed rates in periods of prosperity, and falling to or even below agreed rates in bad times.[2]

[1] For example, Professor Hicks has spoken of the rock-like stability of wage-rates in the middle 1920s, noting that Professor Bowley's index of weekly wage-rates in Great Britain "never moved by as much as a point" between 1924 and 1928, and he has called attention to the fact that, although there were wage reductions under the impact of the depression, the wage index of 1937 was within 1% of its 1924–28 figure (ECONOMIC JOURNAL, September 1955, p. 392).

[2] The statistics available are not adequate to measure the magnitude of these movements, and it would be useful if such data were compiled.

In the post-war years of full employment and rising prices the increase in money wages was inevitable, as it would be in any period with similar conditions. The essential difference from the inter-war years is not that wages are determined by different forces, but that then there was substantial unemployment, whereas now there are labour shortages. But there is nothing new in this. Changes in prosperity have happened before, and they will happen again, though they may be less severe than in the past. Wages may seem unduly rigid now, but in changed conditions both wage-rates and earnings would become flexible again. During full employment, many firms, especially in some of the more prosperous industries, may pay more than the agreed rates. In times of depression in some industries few firms are likely to do so, and some may pay wages below the agreed rates.[1] This danger was so serious in the Cotton Manufacturing Industry during the depression that legislation was passed in 1934 to enable statutory force to be given, in defined conditions, throughout the industry by the " common rule " to rates which were fixed in collective agreements concluded between sufficiently representative organisations of employers and work-people. In some industries many employers and workers are not parties to agreements and are free to pay wages below agreed rates, and experience shows that they do so during depressions. Thus there is considerable flexibility in rates. Earnings are still more flexible and can change substantially without any alteration in rates. Moreover, labour costs per unit of output also may vary appreciably between periods of full employment and of unemployment.[2]

Since the War the rise in money wage-rates has, in the main, followed and not preceded the rise in prices, and in some years has been less than the increase in productivity; 1955 was an exception.[3] Some of the rise in prices has resulted from the removal of war-time controls which had concealed war-time inflation, and this was one of the causes of increases in money wage-rates between 1952 and 1955. The prime mover in inflation since the War must be sought mainly elsewhere than in wage pressures, though each round of wage increases in this period of full employment has underpegged inflation, and if the pace of increased productivity were to slow down it is not unlikely that the making of regular, often annual, demands for higher wages which has grown into a habit during the past ten years would persist for a time after economic conditions had become less favourable. If so, industrial conflicts would increase and any wage gains would be inflationary until economic realities were recognised.

Wages could be persistently inflationary and full employment maintained

[1] Even in industries where various additions or supplements to agreed or basic rates are normal practice, these supplements are reduced during periods of depression. Not infrequently in wage discussions, clear distinctions are not maintained between agreed and actual money rates, actual money earnings, real wage-rates, real earnings and their relation to changes in productivity.

[2] The more efficient workers are in the main retained in periods of unemployment, and some of those who remain in employment make special efforts to work well in order to keep their jobs.

[3] Where wages follow prices and productivity, they would not replace or control the monetary standard, but would themselves be determined by the factors affecting price and productivity trends.

in a self-contained economy, but not in Britain or in other countries for which foreign markets are vital. If, because of a world depression, Britain's foreign markets seriously contracted the Government might not be able to maintain full employment. Because of overseas conditions the Government is not master in its own house, and the cost of creating sufficient demand by public spending to prevent unemployment might prove to be beyond its resources. Repeated currency devaluations would be disastrous. The fact that in the last few years Britain's export industries, with one or two exceptions, have worked full time and overtime, have had full order books and have not priced themselves out of world markets is evidence that British wages in those industries have not been too high in relation to world prices. If, because of greater foreign competition or any other cause the prices of British exports became too high, then unemployment would result, and labour costs would have to come down.[1]

Several different price and wage trends would enable the economy to operate without serious dislocation. One would be for wages to rise somewhat more than productivity; this would involve mild inflation. Another would be long-term stability of prices, the general levels of money and real wages rising at about the same rate as increases in productivity, while with a third, prices would fall as productivity increased, the general level of money wages remaining stable but real wages rising as productivity increased. Of these the second has distinct advantages, though the first would be acceptable provided the average rate of inflation did not exceed about 2% annually.

Such long-term trends would be disturbed by temporary dislocations of economic progress, such as the Korean War or adverse movements in the terms of trade, which might cause a short-period rise in the cost of living through shortages of goods, and provoke demands for higher money wages. It would, however, be neither practicable nor desirable to introduce price-control and rationing in peace-time to deal with such temporary increases in prices. In such a period of temporary shortage of goods the consequent rise in prices might enable workers in a few industries to secure increases in money wages, but, because of time lag, workers in many other industries in a less favourable bargaining position would not succeed in securing higher wages. When the temporary dislocation ended prices would fall again, though not quite to the former level, because of the effects on prices of the higher wages in the few industries which had gained them. The remaining rise in prices would, however, be small, and any subsequent upward movement of the general level of wages, whether on the basis of cost of living or wage-differential claims, would be slight.[2]

[1] It is recognised that in certain circumstances a drastic general reduction of wage-rates could aggravate unemployment by curtailing purchasing power at home, but reductions of earnings because of loss of markets by export industries, which form so substantial a part of Britain's economy, would seriously lower purchasing power at home.

[2] Frequently claims based on wage differentials are more powerful when directed to wage margins between occupations within an industry than to relative wages between different industries.

Most money wage claims are based on changes in the cost of living, on comparisons with the wages of other workers and on the profits earned by employers. It is easy to exaggerate the effectiveness of social factors in tending to reduce wage differentials and establish greater wage equality. In periods of rapidly rising prices resulting from serious shortages of consumers' goods, as in war-time, differentials are reduced because to a greater or less extent siege methods are applied by one means or another in distributing the limited supplies. In such inflationary conditions there is wide recognition that a fall in real wages is more serious for the lower than the higher wage groups, and that the former have a stronger case for a cost-of-living bonus. This process narrows the differentials or margins for skilled workers.[1] In peace-time, however, apart from dislocations causing temporary shortages, there is some tendency based largely on demand and supply for wage differentials to be widened again. The important factors are economic and technological rather than social. The persistent reduction of differentials is not trade-union policy. Technological factors, particularly the ever more extensive use of semi-automatic machinery and processes, have reduced and are continuing to reduce differentials in many industries. One cause of reductions of wage inequalities is that many of the unskilled labourers of a generation ago have been succeeded, because of technological changes, by workers operating machines in mass-production industries. The unskilled workers of yesterday have become the semi-skilled workers of to-day. Some skilled jobs have been taken over by semi-automatic machinery or have been split up so that they can be done by semi-skilled workers, and although custom or historical factors may be strong enough to retard relative lowering of the wages paid for the formerly skilled jobs, in the long run the proper (economic) rate will be established. The forces operating to do this are as strong as those which prevented the Luddites from halting the march of mechanisation. These technological changes have reduced wage inequalities, but they, and scientific progress, labour-saving methods and higher standards of living, have increased the demand for technicians, managers, teachers and professional people, so that the children of many of the skilled artisans of a generation ago have been up-graded into these categories, with a maintenance, in new forms, of differentials for skill, training and responsibility.

Differentials which were originally appropriate tend to persist by inertia or custom, and, if relative wages in a skilled occupation remain unchanged after alterations in the work have lessened the skill formerly required, then such wages are above the economic level, and maximum efficiency is not secured. It follows that a "squeezing" of differentials, which is often a

[1] Differentials are not only a problem between skilled and unskilled workers, they apply also between industries, and between wage-earners and other groups in the community. For example, in conditions of inflation, it should not be overlooked that workers, both skilled and unskilled alike in the more prosperous industries, where they are in a strong bargaining position, make much greater gains, even though the margin between the wages of their skilled and unskilled workers may be narrowed, than workers in industries in a weak bargaining position. Thus differentials are widened between these two groups of industries, and the burden of the shortages of goods is borne much more by the latter than the former.

feature of cost-of-living inflation, would have some economic value. This is true where differentials are too wide. But differentials may be too narrow, and there would be economic advantage in widening them. In such circumstances an inflationary squeeze which narrowed them still more would be economically harmful, and could result in serious shortages of skilled labour. Also, it can be too readily assumed that reductions in differentials and the establishment of greater equality are always socially desirable. There would be social as well as economic disadvantages if express locomotives, railway signal boxes, aircraft and aircraft-maintenance workshops were manned by work-people who were not paid enough to ensure the recruiting and training of men with the necessary ability and responsibility to guarantee high standards of safety for the travelling public. More generally, quality of workmanship may be more important, both socially and economically, than greater equality of wages. Distributive justice does not involve sacrificing essential standards of efficiency and quality.

Full employment in private industry can be maintained only if the selling prices of its products are sufficient to yield attractive rates of profits to the undertakings. The existence of such profits gives the trade unions the opportunity to press for higher wages, yet it is sometimes argued that the unions have learned by experience not to relate claims for higher wages directly to profits because the employers would be able to reverse the claim in conditions of declining prosperity.[1] It would be closer to reality to say that profits are always in the minds of trade-union negotiators as a major factor when making their claims. The timing and the amount of claims for higher wages are often determined by profits, and when profits are known to be low, claims are restrained or postponed. Other grounds for demanding higher wages are, of course, often included along with profits.

The main difficulty which trade unions encounter in trying to secure higher wages from profits is the variation in the levels of profit from firm to firm within an industry. In Britain the trade unions, in negotiating industry-wide collective agreements in which uniform rates of wages are fixed without variation from firm to firm, must take account of firms with low profits, which might have to dismiss work-people if wage-rates were raised beyond their capacity to pay. This system of agreed standard rates of wages leaves to the more prosperous firms opportunities to earn substantial profits. Only if such firms pay wages above the agreed rates do the workers secure part of those higher profits. In the United States, where agreements are more frequently negotiated between unions and individual firms, account is taken by the unions of the profits of each firm, but this method of negotiation has little

[1] Professor Hicks has said the trade unions have learned by experience that "a direct claim for higher wages on the grounds of the profits that are being made by employers is a dangerous claim to make. It can so easily be turned the other way up" (ECONOMIC JOURNAL, September 1955, p. 401). Endorsement of a labour standard would imply that money rates of wages would not be reduced in a period of falling profits, but this is inconsistent with the argument that it is dangerous for trade unions to claim higher wages on grounds of high profits because such claims could be reversed in periods of falling profits.

application in British industry.[1] Nevertheless, the capacity of an industry to pay, which is mainly measured by its productivity and profits, is an essential basis for determining wage levels and wage changes in British industry. At the present time the industries with the highest wages, including aircraft manufacture and electrical engineering, pay these wages because the trade unions are able to insist on benefiting from their profits and prosperity. They are the leaders in the upward movement of wages. In other industries where profits are less the unions emphasise cost of living, standards of living and relative wages or differentials in order to enable them to secure some increases and not lag too far behind the leaders. Also the higher wages and employment opportunities of the more prosperous industries attract work-people from industries which are less prosperous and where wages have lagged behind. This tends to put a brake on wage increases in the more prosperous industries and to facilitate some increase in the less prosperous ones. Thus differentials are prevented from becoming unduly wide.[2]

The opinion is sometimes expressed that, as already noted, an important cause of the rapid rise in money wages, especially since 1951, has been the effects on the cost of living of the removal of price controls, rationing and food subsidies, and that once these influences are out of the way, wages will become relatively stable. Also, there has been upward pressure in the efforts to restore wage differentials for skill after the dislocations of the War. An example of this was the " leap-frog " manœuvres of the National Union of Railwaymen and the Associated Society of Locomotive Engineers and Firemen when the drivers and firemen insisted on higher differentials. These factors will play a smaller part in the future, but they have not been the main causes of rising wages.

Maintenance of a high stable level of employment is one of the desirable objectives of Government policy.[3] There are, however, other important economic objectives, including maintenance of reasonably stable prices, balance of payments and stable exchange rates. The Government is responsible for promoting the best economic interests of the country, and in view of such interests it should not neglect these other objectives in favour of full employment. It cannot acquiesce in the trade-union movement or any other voluntary body exercising power in ways which would prevent the attainment of these objectives. A Government guarantee of full employment cannot be unconditional. Where policies are in conflict

[1] This is, no doubt, one of the reasons why work-people and unions in the United States favour companies making big profits. By bargaining mainly with individual companies the link between wages and profits is somewhat closer and more direct than in Britain. It is also a reason why work-people and unions in the United States put fewer restrictions on methods of increasing productivity.

[2] The high yields of taxation from the prosperous industries are available for community purposes, and tend to reduce differentials in standards of living between people in industries with different profit levels.

[3] A high stable level of employment does not imply full employment or over-employment, but a level which ensures redeployment of labour so that work-people are attracted by better wages and employment opportunities away from industries which are declining to those which are expanding and where their value to the economy is greater.

the Government must aim to secure the most satisfactory compromise. If money wages are determined mainly by pressure of separate unions and are fixed at levels likely to cause serious inflation and successive devaluations of the currency it would be sound policy for the Government to curb the excessive demand for labour which made such wage levels possible. This would be in the interest of the workers themselves, by avoiding dislocations of the economy which would cause unemployment and endanger improvements in their standards of living. An unsound wage policy could make the maintenance of full employment impracticable. The Government could not be expected to provide resources of sufficient magnitude to prevent unemployment if this resulted in a wage policy which it did not control and which was contrary to the economic interests of the country.

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INPUT-OUTPUT ANALYSIS: AN APPLICATION

THE purpose of this paper is, simply, to demonstrate some of the properties of an input-output table and to report the results of an exercise using data for certain inter-war years. It is interesting to find that in the United States, where much time and effort have been devoted to this type of analysis, very few applications of the method have been carried out. Those empirical studies that have been made, based largely on the work of Leontief at Harvard and of Evans and Hoffenberg at the Bureau of Labor Statistics, appear to suggest that projections of output, industry by industry, can be made with more accuracy by input-output techniques than by some particularly naïve methods, but with results inferior to those obtained from regressions of the total output of each industry on time and gross national product.[1] In the United Kingdom, where input-output analysis is still very much in its infancy, evaluation and criticism of the method have been confined, so far as we know, to the theoretical level. We hope that this exercise may help to promote an understanding of some empirical aspects.

I. THE INPUT-OUTPUT SYSTEM

Before presenting the calculations themselves, it may be useful to have a brief description of the rationale of input-output analysis. The method can be regarded as either of two things, each deserving criticism on its distinctive merits. In plan view, so to speak, the construction of an input-output table is an extension of social accounting designed to emphasise, not the division of the economy between production, consumption and asset formation, but the commodity transactions between industries. Each transaction appears in the table as an output or sale and simultaneously as an input or purchase, and when factor incomes are included as inputs, then the sum of the outputs from each industry is observed to balance, in an accounting sense, with the sum of inputs. For ease of presentation the outputs are set out in rows, the inputs in columns, so that each industry has attributed to it a row and a column making a balanced account. The table which can be drawn up by classifying production in some suitable way into an array of these rows and columns can be valuable in itself as a chart of the productive structure during a chosen period. Furthermore, to give ourselves a summary, we may deduce for each industry the proportion which each input bears to the total output. These proportions, which may be reduced to percentages, are designated technical or input coefficients, and can be presented in a square table, or matrix, corresponding to the table of transactions.

To " elevate " the plan view of the economy's structure into a model, the

[1] C. F. Christ, " A Review of Input-Output Analysis," *Input-Output Analysis: An Appraisal* Princeton: National Bureau of Economic Research, 1955).

following working assumptions have usually been made : (*a*) that there are constant returns to scale, and (*b*) that the combination of inputs, observed accounting-wise in the input-output table, will remain in constant proportions whatever the level of output, that is, there can be no substitution between different materials or fuels, and no technological progress within the context of any single table. The bold simplicity of such a theory of production would make it seem likely that any predictions of output levels based upon it would be progressively less accurate the further the projections from the base year for which the coefficients were observed.

There are two types of model, however. In the earlier " closed " version the proportional relationships just mentioned were assumed to extend beyond the purely industrial sectors of the economy, so that what we normally term final consumption, by households, by government or by foreign countries, became *inputs* to those sectors, giving rise to labour services, " administration " and imports in a proportionally related manner. These " outputs " then became in their turn " inputs " to industrial sectors, giving the system a completely circular and interdependent structure of input-output relationships.

Since each output, in this version, is made up of a unique combination of inputs, then the only dimension that is free to alter is the scale or level of activity at which the system is to be in equilibrium. Some writers have pointed the analogy between this feature of the Leontief model and the possibility of equilibrium at levels below full employment which is so distinctive a part of the Keynesian theory. If we represent this Leontief model in symbolic but familiar terms, then the matrix of coefficients, usually denoted by A, and the column vector of n total outputs, y, are related by the equation

$$y = Ay$$

every " industry's " output, in this system, being the sum of its inputs into all the other " industries." It follows that

$$y - Ay = 0$$

or

$$(1 - A)y = 0$$

which is soluble when A and any single element in the vector, y, are known.

The version which is used in this exercise is much less rigid and naïve in form, and consequently offers more hope of becoming useful in practice. Instead of regarding the activities of households, government, capital formation and foreign trade as " processes " for which there are proportionally related inputs and outputs, these expenditures are regarded as taking place outside the system, while labour and other factor incomes are looked upon as " primary " or original inputs in common with goods and services imported from outside the system. The model is thus " open-ended." If the final demands—*i.e.*, private and public current consumption, exports and additions to capital—are calculated or estimated in advance, then the theory of production permits the estimation of output levels necessary to satisfy all

the demands, final and intermediate. In algebraic language if the set o final demands, x, and the matrix A are given, then

$$Ay + x = y$$

Therefore, the vector of outputs

$$y = (1 - A)^{-1}x$$
$$= (1 + A + A^2 + A^3 \ldots)x$$

and so, by means of this inversion or expansion, we can obtain industry by industry the outputs which will satisfy the assumed or estimated demands from outside the system and, simultaneously, the indirect or intermediate requirements arising within the interdependent set of industries. The potentialities and limitations of the method can be demonstrated if the estimates of output obtained by this sort of calculation can be checked, industry by industry, with what are generally regarded as firm estimates obtained, for example, from a Census of Production. It is, in fact, just such a comparison that we shall proceed to make. But first there is one further technical point that requires some explanation.

The proportionality assumptions which we are using are thought of, usually, as referring to proportions by quantity and we shall follow this practice here. The coefficients in A might be calculated as explicit quantity ratios, bushels of wheat per hundredweight of flour and so forth, but as usual in economic measurement it is more practical to apply the yardstick of money and express the quantities in terms of value at a stated set of prices. If the inter-industry transactions are recorded at their current values, then the coefficients will relate to quantities valued at the prices of the year to which the table relates, the base year. If comparison is to be made with other years, the quantities of final demands and total outputs in those other years will have to be given in the same units, namely values at the base-year prices.

In practice, this requirement is not a burden, since economic time series in this form are becoming available in continually increasing scope and detail. We shall have to face many of the usual index-number problems, but they have been so extensively discussed that they need no rehearsal here. There is, however, one problem which occurs with extra force in this context of input–output analysis. With indexes one frequently has to accept some practical definitions of value and quantity, such as those given by market transactions, although one has an ulterior interest in, say, food values or utilities. Here, too, we must accept market valuations, although we are particularly interested in technical properties. Where, because of market imperfections, the technical properties are not fully reflected, our measures may show changing proportions when the strict technical proportions are unchanged. For instance, if the market grading of coal does not fully reflect its capacities for generating gas, a constant input of coal to the industry in gas-generating terms might appear as a fluctuating series at market values; sometimes the gas industry could obtain good gas coal in a low grade, but at other times it would have to buy a higher grade. If the difference is not

reflected in prices we cannot allow for it, but one should be on the look-out for its effects.

Recapitulating, we wish to emphasise that the whole input–output approach has two distinct aspects. Its more pedestrian property is to demonstrate by means of a consistent accounting framework, the input–output table, the interdependence between sectors of the economy for the period to which the data relate. The other, more complex property is that by way of a drastically simplified theory of production the method offers a means of predicting output levels. The predictions are, however, conditional upon independent knowledge of the so-called *final* demands. In our equations, y, the output by industries, is shown as a function of x, the final demands. In more familiar, Keynesian, terms, this is showing O as a function of $C + I$, but with this difference that O is expanded, as it were, to show the inter-industry transactions, which are hidden from view in the consolidation of aggregative national-income analysis. It is in fact from these *intermediate* sales and purchases between industrial sectors that the input–output coefficients are derived.

II. The System Applied

We require, in order to experiment with the technique, reasonably accurate and sufficiently detailed figures of final expenditures, preferably for a series of years but at constant prices. If we must formulate estimates of *future* expenditures, and these turn out to contain errors, then the estimates of outputs based on them may contain errors not only due to the technique in which we are interested, but also due to the assumptions made about final demands, which we wish to exclude from consideration. To get nearer to isolating cause and effect we can try out the technique using *past* expenditures, and then compare the resulting estimates of outputs with independent production indices. In so far as the final demands or expenditures are correct and consistent with the output indices, then discrepancies between these outputs and the outputs calculated from the final demands by the input–output technique should in principle be attributable to shortcomings of the technique, and therefore constitute a test of its powers.

There is available for the United Kingdom only one input–output table as yet that lends itself to this sort of exercise. It is the work of Dr. Barna, and it relates to 1935.[1] Although suitably classified final expenditures and industrial outputs are available for several post-war years, beginning with 1948, the technological changes of 1935–45 make it imperative that we confine a trial of an inter-war "model" to inter-war years. We are in fact limited to five years, 1924, 1930, 1933, 1934 and 1935, for which Census of Production indices are ready to hand for evaluating our calculations. Most of the information we require on final expenditures at constant prices is available in the national-income estimates appearing under the editorship

[1] T. Barna, "The Interdependence of the British Economy," *Journal of the Royal Statistical Society*, Vol. CXV (Series A), Pt. I, 1952.

of Richard Stone.[1] In addition, expenditures on goods and services by central and local government have been calculated separately, using the Appropriation Accounts as a guide, and exports for the five years in question have been re-classified for our purpose and re-valued at 1935 prices.[2] In terms of our earlier equations, we now have estimates of x. To calculate y, the series of outputs by industries, we require the inverse of A, the set of input or technical coefficients, and this we obtain from the 1935 input–output table.[3] To evaluate the answers which the method yields for y, we have the comparable output totals by industries given in the Fifth Census of Production.[4]

There are, however, one or two particular problems involved in re-classifying the various data and in setting up the calculation, which we ought to mention briefly. First of all, the method whereby the output indices were set up so as to be comparable, industry by industry, with the headings or sectors of the input–output table, thirty-six in number, deserves a few words of explanation. It consisted of applying volume indices taken from the Fifth Census of Production to the base year (1935) total output of each sector in the input–output table. This could be done quite simply when there was only one index number series per sector as, for example, in the case of Coal-mining. Where the output of the sector had been obtained by aggregating the products of more than one trade as shown in the Censuses, for example, Mechanical or Electrical Engineering, then the individual trades' outputs in 1935 were taken as weights in calculating an aggregate index. This ensured that for 1935, the base year of our exercise, there would be no discrepancies between the independent outputs in the Census and those that could be calculated by multiplying the set of coefficients by the final demands for that year. In principle, the two sets of estimates must be identical for the base year.

Several important adjustments had to be made to the estimates of final demand in order to bring them as nearly as practicable into line with the definitions and valuations used in the 1935 input–output table. As with the total outputs, the final " bill of goods " had to be cast under the thirty-six headings of the input–output table. This meant, for example, that estimates of consumers' expenditure on all foodstuffs had to be divided between the first of Dr. Barna's headings—Agriculture, Forestry and Fishing—and the twenty-sixth—Food Processing. To complete the re-classification, two further steps were necessary, because (*a*) direct consumption of imports, and (*b*) transport and distributive margins had both to be separated from the original estimates of consumption. The reasons for these adjustments were that changes in the direct consumption of imported goods manifestly do not require changes in domestic production and are " routed "

[1] Richard Stone, *The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920–1938*, Vol. 1 (Cambridge: National Institute of Economic and Social Research and Department of Applied Economics, 1954).

[2] For invaluable and extensive help in these calculations, we wish to thank Dr. K. Maywald and Messrs. F. E. A. Briggs, G. D. Garton and D. A. Rowe.

[3] The complex task of inverting the 1935 matrix has been performed by Messrs. Ferranti Ltd., to whom the Department of Applied Economics owes a debt of gratitude.

[4] Board of Trade, *The Fifth Census of Production, 1935, Final Report* (H.M.S.O., 1939).

separately in Dr. Barna's table, and secondly that this input–output table records transactions at producers' prices so that final buyers are shown as purchasing a " bill of goods " not at retail prices but at ex-factory prices (approximately), and, separately the residual sum of all distributive services which account for the difference between ex-factory and " delivered " valuations. Dr. Barna himself very kindly helped us over this computational hurdle by sending us a reconciliation between his 1935 " bill of goods " valued at producers' and at purchasers' prices. This enabled us to link the consumption data—consumers' expenditure, government expenditure, exports and capital formation—for 1934, 1933, 1930 and 1924, as well as for 1935, sufficiently closely with the figures he himself obtained for the input–output table relating to 1935.

It must be emphasised, however, that there are inevitably imperfections in some of the data relating to this period, and in view of this we decided that they did not justify more than a summary treatment. The various series have in fact been taken pretty much as they stood. Some are ill-suited to our purpose, for besides presenting in some instances discrepant estimates of the same variable, there are often artificial agreements where consumption series have been partially or wholly derived from data contained in censuses of production. These peculiarities and snags are, however, typical of those which any exercise such as this must expect to meet in practice.

We have mentioned four components of the " bill of goods," but there is in Dr. Barna's table a fifth column, literally and metaphorically. This column has two elements: first, it contains all stock changes (the capital formation column covering only fixed capital) and, secondly, it contains the residual part of each industry's total output which could not be allocated to any user. These items inevitably appear in input–output work in some form, and they are a headache when the system is to be applied to other years; a headache made the worse here because the two items are lumped together.

With practically no information available on stock changes in each of our five years, some sweeping assumption had to be made. The choice seemed to be between assuming the stock change to be the same or the same proportion of total output in each industry in all years as in the base year, or assuming stock changes to be zero in all years outside the base year. Since the unallocated item could not be separated from stocks, the same assumption had to be made for both items, and, although it would be reasonable to move the unallocated item alone by total output, the problem of stocks made us plump for the assumption that the two together be set at zero. The results which are presented in the tables that follow must be interpreted very carefully in the light of this drastic assumption.

Briefly, then, with final demands built up in this way the total outputs of all thirty-six industries could be estimated. However, it is only worthwhile estimating the output for those industries where the Censuses provide a comparison. These number 33 or 34 in the years of the full Censuses and 20 or 21 in the years covered by Import Duty Act Enquiries; the relevant number for each set of figures is given in the tables.

TABLE I

Comparison of Total Outputs

£(1935)m.

	Industry.	1924. A.	1924. B.	1924. Bd.	1924. Bi.	1930. A.	1930. B.	1930. Bd.	1930. Bi.	1933. A.	1933. B.	1933. Bd.	1933. Bi.	1934. A.	1934. B.	1934. Bd.	1934. Bi.	1935. A and B.	1935. Bd.	1935. Bi.	
1	Agriculture, Forestry and Fishing	241	261	208	53	—	—	—	—	—	—	—	—	—	—	—	—	294	231	63	1
2	Coal-mining	176	147	80	68	161	149	76	73	—	—	—	—	—	—	—	—	146	65	81	2
3	Other Mining	18	17	2	15	21	19	2	17	—	—	—	—	—	—	—	—	22	3	19	3
4	Building Materials	37	44	8	36	49	55	10	45	45	26	12	14	58	50	8	42	62	15	47	4
5	China and Glass	25	30	15	15	26	29	14	15	27	12	3	9	30	13	3	16	32	14	18	5
6	Coke Ovens	17	13	4	10	17	14	3	10	14	12	3	9	17	13	3	10	17	5	12	6
7	Chemicals	62	74	37	37	65	80	41	39	76	79	42	37	85	83	44	39	93	48	45	7
8	Soap and Polishes	31	31	28	3	31	33	30	3	35	34	31	3	37	35	32	3	39	35	4	8
9	Oils and Paints	64	58	14	44	70	68	18	50	67	64	17	47	70	64	20	44	82	26	56	9
10	Iron and Steel Manufacture	173	163	40	123	156	167	35	133	144	137	24	113	176	156	27	129	193	40	153	10
11	Non-ferrous Metals	40	40	11	30	44	43	10	33	40	41	11	30	50	45	12	34	57	16	41	11
12	Shipbuilding	71	60	55	5	68	77	71	6	—	—	—	—	—	—	—	—	47	39	8	12
13	Mechanical Engineering	166	166	113	53	171	183	121	62	133	119	76	43	161	153	103	50	187	128	59	13
14	Electrical Engineering	60	65	37	27	74	81	47	34	77	75	47	28	94	87	55	32	110	51	59	14
15	Motor and Cycle	72	83	53	30	105	109	72	36	—	—	—	—	142	139	96	43	172	121	51	15
16	Aircraft	4	4	4	0	10	11	10	1	7	9	9	1	9	10	9	1	14	13	1	16
17	Railway Rolling Stock	54	47	22	25	48	46	20	27	—	—	—	—	—	—	—	—	45	17	28	17
18	Metal Goods n.e.s.	122	117	65	53	131	122	63	59	146	132	78	54	164	144	82	62	173	105	68	18
19	Cotton and Silk	224	258	120	138	167	206	84	122	202	198	79	119	206	202	80	122	211	83	128	19
20	Woollen and Worsted	131	141	60	81	100	118	42	76	134	123	46	77	134	130	50	80	142	55	87	20
21	Hosiery and Lace	36	41	36	5	35	41	36	5	44	46	41	5	46	47	42	5	48	43	5	21
22	Other Textiles	57	56	25	31	52	56	25	32	54	51	21	30	60	55	23	32	61	26	35	22
23	Textile Finishing	36	36	—	36	27	30	—	30	30	29	—	29	31	30	—	30	32	—	32	23
24	Leather and Fur	41	42	16	26	39	41	15	27	41	42	15	26	43	42	15	27	47	18	29	24
25	Clothing	192	205	192	13	205	216	202	14	—	—	—	—	—	—	—	—	222	208	14	25
26	Food Processing	281	337	250	87	327	372	277	95	—	—	—	—	—	—	—	—	406	304	102	26
27	Drink and Tobacco	337	326	276	50	353	340	290	50	—	—	—	—	—	—	—	—	361	299	62	27
28	Wood Manufactures	68	62	28	34	85	80	42	39	—	—	—	—	—	—	—	—	99	57	42	28
29	Paper	43	56	13	43	55	62	15	47	—	—	—	—	—	—	—	—	75	21	54	29
30	Printing and Publishing	125	112	47	65	141	122	54	68	—	—	—	—	—	—	—	—	146	70	76	30
31	Rubber	11	15	7	8	21	21	13	9	24	23	14	9	27	24	14	10	28	16	12	31
32	Miscellaneous Manufactures	17	17	15	2	19	18	15	3	22	18	16	2	23	20	17	2	24	20	4	32
33	Building	330	366	239	127	417	429	289	139	—	—	—	—	—	—	—	—	471	322	149	33
34	Gas, Water and Electricity	130	175	100	75	179	204	125	79	—	—	—	—	—	—	—	—	243	153	90	34
	TOTAL	3,491	3,666	2,219	1,446	3,467	3,641	2,166	1,476	1,366	1,303	588	715	1,662	1,558	745	813	4,401	2,667	1,734	

A = Total Output from Census. B = Total Output from Final Demands, of which Bd is Final Demand component and Bi is Indirect Demand component.

TABLE II

Discrepancies between Census and Input–Output Estimates of Total Outputs by Industries

(Discrepancy as percentage of Census estimate.)

	Industry.	1924.	1930.	1933.	1934.
1	Agriculture, Forestry and Fishing	+ 8·4	—	—	—
2	Coal-mining	−16·3	− 7·6	—	—
3	Other Mining	− 4·0	− 4·8	—	—
4	Building Materials	+18·2	+11·5	− 8·2	−13·7
5	China and Glass	+19·6	+13·8	− 3·9	− 5·8
6	Coke Ovens	−19·8	−17·8	−13·1	−23·3
7	Chemicals	+20·2	+22·9	+ 3·7	− 2·1
8	Soap and Polishes	− 0·2	+ 5·7	− 3·1	− 4·2
9	Oils and Paints	− 9·7	− 3·9	− 5·0	− 9·2
10	Iron and Steel Manufacture	− 6·1	+ 7·1	− 4·5	−11·7
11	Non-ferrous Metals	+ 1·2	− 2·6	+ 1·0	− 9·5
12	Shipbuilding	−15·3	+13·3	—	—
13	Mechanical Engineering	+ 0·1	+ 7·2	−10·0	− 5·0
14	Electrical Engineering	+ 7·2	+10·5	− 2·5	− 7·6
15	Motor and Cycle	+14·9	+ 4·0	—	− 2·4
16	Aircraft	+10·0	+15·1	+27·6	+17·1
17	Railway Rolling Stock	−12·6	− 3·9	—	—
18	Metal Goods, n.e.s.	− 4·0	− 6·6	− 9·6	−12·4
19	Cotton and Silk	+15·4	+23·3	− 1·9	− 1·7
20	Woollen and Worsted	+ 7·8	+18·6	− 7·9	− 2·8
21	Hosiery and Lace	+11·7	+17·9	+ 3·6	+ 2·3
22	Other Textiles	− 2·1	+ 8·5	− 4·8	− 7·3
23	Textile Finishing	+ 1·3	+ 9·0	− 2·6	− 2·7
24	Leather and Fur	+ 2·6	+ 5·0	+ 0·9	− 1·0
25	Clothing	+ 6·5	+ 5·4	—	—
26	Food Processing	+21·7	+12·0	—	—
27	Drink and Tobacco	− 3·4	− 3·9	—	—
28	Wood Manufactures	− 8·0	− 5·9	—	—
29	Paper	+32·4	+12·8	—	—
30	Printing and Publishing	−10·7	−13·3	—	—
31	Rubber	+35·2	+ 2·9	− 5·6	− 9·6
32	Miscellaneous Manufactures	+ 0·2	− 3·6	−17·3	−14·3
33	Building	+10·9	+ 2·7	—	—
34	Gas, Water and Electricity	+34·6	+14·0	—	—

III. RESULTS

(i) *Output*

The main result of the exercise is presented in Table I. For each of the thirty-four industrial sectors we have obtained, as already indicated, estimates of final demands denoted by Bd in Table I. The outputs calculated by multiplying these expenditures by the set of production coefficients appear for each of the years in the columns headed B. The outputs derived from independent production indices, with which we are comparing the calculated outputs, are given in the columns headed A. It will be noted that for 1935, the base year, columns A and B are identical. The columns labelled Bi are the intermediate or inter-industry demands, being the differences between total outputs, B, and outputs required to satisfy final demands, Bd.

The principal object of the exercise is to observe how closely the calculated outputs and the Census outputs agree in the years, 1924, 1930, 1933 and 1934. A straightforward comparison of the two sets of outputs, *A* and *B*, seems to

us to afford some assessment of the input–output method's potentialities, either as a predictive device or as a tool for dissecting the past, for seeing more clearly how, for example, technological changes or substitutions between materials have been operating.

Table II is derived from the previous table by expressing each difference between the Census and input–output estimates as a percentage of the former, *i.e.*, $\frac{B-A}{A} \times 100$. It will be observed that for most industries these percentage discrepancies fluctuate over the four years but tend on the whole to diminish towards the base year. This is to be expected, and is demonstrated more succinctly in Table III by means of frequency distributions. Lest it be objected that, in comparing thirty-four sectors in 1924 and thirty-three in 1930 with only two-thirds that number in the later two years, we have introduced an obvious bias, we have set in parentheses alongside the full-scale distribution the percentages that obtain when the minimum of twenty sectors are compared throughout.

TABLE III

Frequency Distribution of Discrepancies

(Cumulative frequency per cent.)

	1924.	1930.	1933.	1934.
No. of industries	34 (20)	33 (20)	20 (20)	21 (20)
Sum of discrepancies (£m.)	175 (58)	174 (115)	−63 (−63)	−104 (−101)
-5%	29 (40)	30 (25)	55 (55)	43 (40)
-10%	50 (60)	58 (55)	80 (80)	72 (75)
-15%	68 (70)	82 (65)	90 (90)	91 (90)
-20%	88 (90)	94 (90)	95 (95)	95 (95)
-25%	91 (95)	100 (100)	95 (95)	100 (100)
-30%	91 (95)	—	100 (100)	—
-40%	100 (100)	—	—	—

It can readily be seen that, broadly speaking, the fit improves towards 935, but that the 1934 figures do not represent a clear improvement on those r 1933. It is perhaps worth noting, in passing, that the sums of the discrepancies between Column A and B in Table I are positive for 1924 and 30, while in 1933 and 1934 the sum is negative. In other words, the projections give " too high " an estimate of output on the average for 1924 and 30, but " too low " a figure for 1933 and 1934. The most likely among a st of possible explanations of this movement in the discrepancies would that for all years in question the main source of errors could be traced to inherently weak assumption that stock changes were zero in 1924, 1930, 33 and 1934. This would imply that stocks were falling in 1930 and increasing in 1933 and 1934.[1]

Besides this possibility, there are two causes of discrepancy peculiar to the hnique we have been trying out. The first of these we may call *technical*

[1] This implication is borne out by calculations made by Barna. See T. Barna, " Value of ks and the National Income," *Economica* (new Series), Vol. IX, No. 36, November 1942.

developments or *secular changes* in an industry, changes in fact in the coefficients, which help to explain the differences between the estimates of output for such sectors as Coal-mining, Chemicals, Electrical Engineering, and Gas, Water and Electricity. It will be seen that, on the 1935 coefficients, the tendency is to underestimate the output level in an earlier year for an industry upon whose output other sectors have economised The converse applies particularly to Chemicals, Electricity Supply and Electrical Engineering. The same could also be said of Paper and Rubber, for whose outputs the inter-industrial demands increased throughout this eleven-year span.

The second, and on the whole more potent, cause is the *substitution* of domestic supplies for imported industrial materials and certain foodstuffs during and immediately after the Great Depression. It is perhaps surprising that so drastic a change of British trade policy as took place between 1931 and 1934 does not create bigger discrepancies than can, for example, be observed in the Food Processing and Textile sectors, since most forecasting models lean heavily on the assumption that no drastic reversals of policy will take place during their currency. It should be noted, on the other hand, that Table VI, on the volume of imports, shows up quite clearly the limitations imposed by the assumption that the proportional composition of inputs into any sector shall remain fixed. Substitution may also have taken the form of changes in the product composition as a sector.

It may be thought that the results could be evaluated better if compared with other projections, even if these were quite naïve. Two comparisons are given in Table IV. The first alternative projection is made by assuming that

TABLE IV

Comparison of Projections of Output

(Discrepancies from Census estimates; cumulative frequency percentage of thirty-three industries analysed.)

Discrepancy (%). / Projection by:	1924.			1930.		
	Input–output.	Total industrial output.	Final demands.	Input–output.	Total industrial output.	Final demands.
0–5	30	18	9	30	15	25
0–10	48	30	34	58	51	47
0–15	67	50	59	82	70	67
0–20	87	65	69	94	80	81
0–25	91	65	78	100	88	94
0–30	91	70	84	—	93	100
0–50	100	91	97	—	100	—
0–100	—	100	100	—	—	—

all the industries have the same movement, and this movement is given by the series for the total output of the thirty-three industries as found from the Census. The second alternative assumes that each industry's total output moves proportionally to the final demand on that industry, allowing no interaction between industries. (Textile Finishing, which has no final

output, is moved on the total final demand from all textile industries.) These are, of course, very similar to the comparisons that have been made for the American economy, to which we have referred earlier.

The comparison is self-explanatory, indicating mainly that projecting outputs by input–output techniques does offer some improvement over cruder methods.

(ii) *Employment and Imports*

Let us now turn aside for a moment to consider two auxiliary exercises. It has been suggested that input–output techniques can be used to project employment industry by industry, and also that some idea of the import content of output can usefully be deduced in a similar way. Taking 1924 and 1930 as suitable years for these experiments, we projected employment figures from 1935 totals, first by applying the labour coefficients obtained from the input–output table, and secondly, by assuming that numbers employed in each of the thirty-four industries moved exactly as did total output in these industries, the figures for total output for the three years being those recorded in the Census of Production for 1935. Both results are compared industry by industry with estimates of the actual numbers employed, as given in the Census of Production, and the discrepancies are shown in Table V, once again using frequency distributions.

TABLE V

Comparison of Projections of Employment

(Numbers of Sectors.)

Discrepancy (%). / Projection by:	1924.		1930.	
	Input–output.	Production Index.	Input–output.	Production Index.
0–5	7	4	8	5
0–10	11	7	21	10
0–15	17	13	24	19
0–20	21	21	26	26
0–25	23	26	28	29
0–30	26	30	32	32
0–50	32	32	33	33
0–100	33	33	—	—

It seems from this comparison that neither method has any distinct advantage, and the exercise must be considered inconclusive. However it will be worth repeating this exercise when better, post-war, data become available.

There is no unique way in which an input–output table should be drawn up, and the treatment of imports provides several possibilities. Where imports are substitutes for home production the relative quantities of imports and home supplies used will depend mostly on trade policy and relative-price conditions and not on techniques. Here the proportionality assumption is very likely to break down. An alternative treatment to Dr. Barna's

is to treat the competitive imports as negative exports of the industry providing the goods at home, the industry then showing as output going to other users both its own production and the imports. The amount imported is then determined *a priori*, along with the final bill of goods, and not by the input–output relationships. In our application such a system would greatly have reduced the discrepancies because the sharp discontinuities introduced by the import duties of the early thirties would have been taken outside the scheme of proportional relations.

Coefficients of the total import content for each class of commodity can be found by multiplying the row of direct import coefficients (direct input of imports into each industry per unit of industry output) into the inverse matrix, $(1 - A)^{-1}$. The import contents of total output were calculated for 1930 and 1924 by applying these import-content coefficients for 1935 to the final demands for those years, covering all thirty-six sectors in the 1935 input–output table. The import content thus estimated remained very stable for all the three years, 1924, 1930 and 1935, at $8\frac{1}{2}\%$; this shows that relative changes between the industry classes in final demand had no influence on the total volume of imports going to industry. The estimated movement in the volume of imports and the movement shown by the official indexes are compared in Table VI. This suggests that for information on imports the input–output method will be of little or no use when there are large changes in price structure, as between 1930 and 1935, but can be helpful when relative prices are steadier, as between 1924 and 1930.

TABLE VI

Volume of Imports

(1935 = 100.)

	Estimate.	Board of Trade Index.
1924	83	97
1930	87	103
1935	100	100

Note: Board of Trade Index adjusted to exclude imports going direct to final demand.

IV. CONCLUSION

First of all, we must emphasise that owing to the imperfections of inter-war data we have not been able to weigh input–output analysis precisely in the scales of acceptability as a means of predicting such variables as output, employment and imports. But we have tried to demonstrate what are the approximate limitations of the method when applied to these problems over a period roughly coinciding with the inter-war trade cycle. That the estimates of output which the method yields for 1924 and 1930 are on the average 5% different from the estimate of industrial output afforded in the Census of Production does not seem sufficient grounds for dismissing the technique as being devoid of practical usefulness.

Against this it can be argued that until a proper test, based on estimates of *future* demand, is carried out, any answers provided by exercises such as ours give at best only grounds for hope. In comparing the projections of outputs which the input–output technique has yielded with the firmer estimates derived from the Census, we have attempted to show how strong, or weak, the grounds for hope may be. We have pointed out one or two important reasons for the discrepancies which emerge. There remains, however, a difficulty in this kind of work which we ought to emphasise in conclusion.

If one is interested in predicting future levels of output, then it is important to remember that the successful use of an open-ended input–output model puts a special premium on being able to prepare consistent and accurate estimates of final demands. In obtaining preliminary series we discovered that for one or two sectors the data on final demand were significantly in excess of the total outputs given in the Census relating to the same year. When this sort of inconsistency comes to the surface it can be removed in an exercise of this kind, but it is not at all certain how far and to what extent it may pervade the other sectors where supply seems, in the base year, to accord well with demand. In short, one must ensure consistency, and an acceptable standard of accuracy in the prediction of final expenditures, before one can apply the method.

To suggest a criterion by which to measure the usefulness of the approach is beyond the scope of this article. It may well be that other uses besides prediction will suggest themselves, and we would contend that in general standards of accuracy are for the user to decide. We have attempted to show what results can be expected when the technique is tried out using past data. It may well be that some will find the errors small enough to render the approach sufficiently accurate for their purposes, while others may agree with the view of Professor Carter and Mr. Roy that "In principle, the forecasting of real product could be done in a more scientific and detailed way if there were available for the United Kingdom more input–output studies; but this form of research is still in its infancy here, and many of its problems, both theoretical and practical, have still to be solved."

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INNOVATIONS AND EQUILIBRIUM GROWTH

The central proposition of the theory of economic growth originated by Mr. Harrod arises from the recognition that investment is capacity-increasing as well as income-generating. Thus if the new capacity is to be utilised, the equivalent new demand must be generated. Equilibrium growth is then defined as the constant achieving of the optimum relation between the stock of capital and the rate of output. Given a constant ratio between saving and income—s—and a constant capital–output ratio—k—it is evident that capacity will grow at a percentage rate s/k, and equilibrium requires that income grow at the same rate. If this rate is also the rate that prevents involuntary unemployment, then there would be equilibrium growth at full employment.

If labour and capital are growing at the same percentage rate the maintenance of equilibrium is the problem of equating a growing aggregative supply with a growing aggregative demand at a constant level of *per capita* income. If labour and capital are growing at different percentage rates the problem is more complex, as some adjustment in the productive process is likely to result from the changing relative supplies of inputs. It becomes necessary, then, to examine the consequences of such adjustments on the rate of growth of income and on the maintenance of equilibrium. Our problem here is limited to the case where capital is growing more rapidly than labour, with the obvious result that the ratio of capital to labour must rise steadily if the capital is to be utilised. This is a necessary condition for the growth of *per capita* income (assuming no reserve of unemployed labour and no innovation), and for this reason seems to be somewhat more interesting than the opposite case.[1]

We proceed within the framework of the Harrod model except for the arbitrary assumption made at the outset that capital is growing more rapidly than labour, and consequently *per capita* income is rising. We also assume a production function with only two inputs, capital and labour, and our analysis is therefore subject to all the shortcomings that such an assumption imposes.[2] To simplify further we assume that the rate of growth of population is zero, and any increase in capital represents an increase in the capital–labour ratio.[3]

[1] Harold Pilvin, "Full Capacity *vs.* Full Employment Growth," *Quarterly Journal of Economics*, November 1953, considers a model in which capital and labour are growing at different percentage rates, and adjustment by way of changed input combination occurs immediately. See the comments of R. F. Harrod and Evsey Domar appended to Pilvin's article and D. Hamberg's comments in the same journal, November 1954.

[2] Joan Robinson has recently discussed some of the difficulties and hazards involved in the use of such a production function in "The Production Function and the Theory of Capital," *Review of Economic Studies*, Vol. XXI (2), 1953–54.

[3] This assumption may be misleading, since an increasing labour supply frequently leads to economies of scale by way of further division of labour. An increasing population certainly has an effect on the composition of demand also. These problems are, however, beyond the scope of the present discussion.

I

Consider first the problem in a society in which no innovations are occurring, but capital is growing at a constant percentage rate *r*. To use the increasing relative supply of capital, firms must be assumed to adopt methods of production that require relatively more capital that have been known but not previously used.[1] The production function remains the same, and the effect on the capacity of the system is determined by introducing the increasing capital input with a constant labour input into an unchanging production function. But if the new input combinations were known and not used, they can be assumed to be put into effect by entrepreneurs only by virtue of changes in the relative costs of inputs. In our case here it is required that capital costs fall steadily compared to labour costs.

In less complicated days the rate of interest would be presumed to fall as capital accumulated, and this would have provided the necessary incentive for entrepreneurs to alter their productive processes in such a manner that production became increasingly roundabout. In an advanced economy capital costs other than interest are so much influenced by wages that it is difficult for these non-interest capital costs to vary independently of labour costs. Therefore the whole burden of adjustment falls on the rate of interest.[2]

Convincing arguments may be offered as to why the rate of interest is unlikely to be a sufficiently strong weapon for the job. Mr. Harrod has discussed such arguments in detail,[3] and we need mention but two which are of special relevance to our problem. The rate of interest in most advanced countries is very low and has little room to vary. It is virtually impossible therefore for the rate of interest to be falling steadily over long periods of time. The second reason for not putting much confidence in the rate of interest as a device to bring about a more roundabout method of production is that in most advanced countries interest rates are so low that the productive process is dominated by technological considerations. And in an economy that is experiencing a high rate of technological change the uncertainty introduced thereby will surely swamp any effect the rate of interest might have. If we rule out the rate of interest on these grounds, then we are forced to introduce innovations as a source of adjustment to a growing capital–labour ratio.[4]

[1] It seems quite unrealistic to assume a smooth text-book type of isoquant map and the firm moving back and forth along a given curve as input prices change. More realistic is the assumption that as capital costs become lower relative to labour costs *more firms* use capital, and therefore the economy as a whole becomes more capital intensive. The chief difference between the production process in capital-rich countries and capital-poor countries is not to be found in terms of different degrees of " roundaboutness " with respect to all firms. Rather it is found in terms of the fact that a large percentage of the firms in capital-poor countries use virtually no capital, while practically all activity in capital-rich countries makes use of capital. See also footnote 1 on p. 457.

[2] Changes in the composition of output may aid in the adjustment process. However, there seems little reason to assume that the changes in the composition of output act in other than a random fashion with respect to the quantity of capital used in their production.

[3] *Op. cit.*, pp. 556–7.

[4] Hamberg, *op. cit.*, considers the case where wage-rates are falling and the possibility of this resulting in an increase in the capital–labour ratio.

The situation may not be the same in the less-developed countries. In such countries available evidence suggests that the rate of interest is much higher than in the higher-income countries. Changes may therefore be expected to have a greater effect on entrepreneurial decisions with respect to the productive process selected than in countries where the rate of interest hovers around a very low level. In addition, there are other reasons to believe that changes in factor prices may provide the necessary incentive to change the productive process used in low-income countries. The costs of skilled labour and entrepreneurial talent required to produce capital equipment may decline relative to other labour costs as an economy develops. For example, the effects of increasing education accompanying economic development would suggest that skills of all sorts become relatively more abundant, and may therefore decline in price compared to the less-skilled labour. If this occurs, then there is justification in believing that as a country proceeds from a stationary, low-income situation to a situation where income is rising, a direct substitution of capital for labour may be effected by changes in factor prices alone, with no need for innovations.[1] This may continue until the economy becomes well developed, at which point, as noted above, evidence is against factor-price changes doing the job.

However, even if the changing productive process is effected through factor-price changes, it is evident that at some point the capital–ouptut ratio will begin to rise, and the rate of growth of output obtainable with a given saving–income ratio decline. As the capital–labour ratio rises the elasticity of substitution between capital and labour must at some point decline, and will eventually fall below unity. As it falls below unity the elasticity of productivity of capital [2]—ϵ—will also begin to fall, and this must result in a rising capital–output ratio.[3]

Therefore even though a necessary condition for *per capita* output to be rising is that the percentage rate of growth of capital exceed the percentage rate of growth of labour, this condition will itself lead to a situation which will result in a decline in that rate of growth. This is true even though input prices change in such a way that entrepreneurs are induced to effect the necessary alteration in the productive process, and make use of the increasing

[1] This situation is reflected—as we expect from the argument in footnote 1 on p. 456—in capital-poor countries by the existence of highly capitalised firms alongside firms that use the most primitive techniques.

[2] This is defined as $\frac{\partial 0}{\partial k}\frac{K}{0} = \epsilon$. It is evidently the share of output going to capital as well. The assumption that the elasticity of substitution must fall as the capital–labour ratio rises seems well established. See, for example, A. P. Lerner's *Economics of Control* (New York, The Macmillan Co., 1946), Chapter 13.

[3] Evidently all that is necessary for the capital–output ratio to fall is for ϵ to be less than unity, and ϵ is less than unity by the assumption of a two-input production function. But unless ϵ is declining as the capital–labour ratio increases it is conceivable that, if the elasticity of substitution between capital and labour were high enough, something called the marginal ϵ might be unity, and then k would remain constant. A more direct approach, and probably as realistic, is to assume a production function such that

$$\frac{\partial \epsilon}{\partial k}\frac{K}{\epsilon} < 0.$$

supply of capital. Under these conditions we may say that the rate of growth of *per capita* output is declining because the technical relationships governing the system reduce capital's productivity as it increases relative to labour. In order to prevent the decline in the rate of growth of *per capita* income it is necessary to accumulate capital *more* rapidly, *i.e.*, raise the saving–income ratio.[1]

This set of arguments is unlikely to be especially relevant for many underdeveloped countries at the moment. Many such countries are well supplied with underemployed labour on which to draw to complement newly created capital, and those that do not are so capital poor that the economies of scale and external economies that accompany the early increases in capital stock may be expected to outweigh the negative effects on capital's productivity outlined above. However, it is to be emphasised that since s has a ceiling well below unity, the effectiveness of capital accumulation without innovation in raising *per capita* income is limited.[2]

II

We have argued that it is necessary to introduce innovations into the model for two reasons: one, to effect the change in the productive technique necessary to utilise the changing relative supplies of factors. And two, it is necessary to introduce innovations to prevent the growth of *per capita* income from falling.

A further difficulty presents itself at this point. If we rule out factor prices as the determinant of the optimum k, what is the criterion of optimum that we substitute? It is not appropriate to say that the capital–output ratio is now uniquely determined by technology, as this would require an assumption of completely fixed input coefficients, and this assumption we are unwilling to make. But unless some criterion is set up, k becomes indeterminate within the values allowed by technology. We suggest the following solution as both realistic and useful analytically.

We assume that firms seek to earn a given profit rate, Πe, on their capital. The absolute value of the equilibrium rate of return may vary from firm to firm and from industry to industry, but we may assume that potential investors have in mind some rate that they feel is sufficient to justify their outlay. We may say then that if the producers and entrepreneurs are earning Πe they are "content with what they are doing."[3] If the actual profit rate, Πa, is less than this equilibrium rate there is an incentive to reduce investment outlays, and if $\Pi a > \Pi e$ there is an incentive to step up outlays.

[1] *Cf.* H. D. Dickinson, "A Note on Dynamic Economics," *The Review of Economic Studies*, Vol. XXII (3), 1954–55, pp. 173–5.

[2] *Ibid.*, p. 175. At some point capital would presumably become a free good, and the problems of capitalism would be at an end.

[3] This is the way Mr. Harrod defines his warranted rate of growth in *Towards a Dynamic Economics* (London, Macmillan and Co., Ltd., 1948), p. 81.

Now the rate of return on capital is equal to ϵ/k.[1] Thus the firm uses the k which tends to give the rate of return that is deemed equilibrium. If that rate is larger than Πe, then the firm may be expected to seek to increase capital accumulation until k rises and Πa falls to about Πe. And the opposite result would be expected if $\Pi a < \Pi e$, or the firm will seek to introduce a technique that will tend to raise Πa.[2]

With no innovations output is rising at a percentage rate determined by the rate of increase in capital stock and the rate of increase in the labour supply (which we have assumed zero) given the behaviour of the elasticity of productivity, ϵ. We may define the rate of innovations as the rate of growth of output with no change in inputs of capital and/or labour. Therefore if innovations occur, the rate of growth of output depends not only on the rate of growth of inputs, but also on the rate of innovations. But innovations affect not only output, but also the production function itself, and so also the elasticity of substitution, the elasticity of productivity and the profit rate. The net result, as reflected in the behaviour of the rate of growth of output, depends therefore upon the rate of innovations, and the effect of the innovations on the production function in relation to the changes in the supply of capital. And equilibrium growth depends upon the constant achievement of that rate of return on capital that keeps entrepreneurs and producers "contented."

For the moment we assume that the rate of innovations—n—is a given constant. Following customary procedure, we may classify innovations as capital using, capital saving and neutral. We consider each of these types of innovations.

The relationship between the capital–labour ratio and output is indicated by the following diagram.[3] The slope of the curve 1 at F is the elasticity of productivity of capital at this point. Since we have assumed that ϵ declines

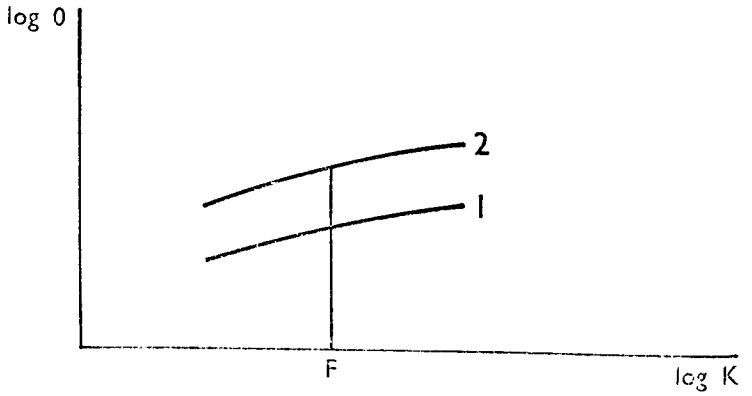
[1] The rate of return on capital is Q/K, where Q is the total return to capital and K is the total stock of capital. Divide the numerator by Y and we get Q/Y, which is the share of total income going to capital, *i.e.*, ϵ. Divide the denominator by Y, and evidently that is the capital–output ratio. The capital–output ratio and ϵ are not independent of each other, but, of course, they may vary in such a way that ϵ/k may change. Evidently in all cases here we must think of capital in terms of the value of congealed labour and waiting, and not in terms of the present value of a discounted stream of outputs. On the problems of capital measurements see the Joan Robinson paper cited in note 2 on p. 455.

[2] The introduction of the profit rate into the model as the determinant of changes in the rate of investment relieves the necessity of relying exclusively on the accelerator. The accelerator has been criticised by many, and surely quite justly in most cases. However, the fact that the rate of output is related to the stock of capital is an important truth, and if the accelerator is used only to indicate that relationship, then much of the criticism of it falls to the ground. The above argument makes investment primarily a function of the profit rate. Decisions to accumulate capital stem from changes in the yield on capital, and the effect on output of the new capital then is determined by the productivity of that capital which is the accelerator or preferably the capital–output ratio. It seems evident that a mere increase in output will not lead to an increase in investment if the profit rate is not being maintained or has not reached that level which entrepreneurs feel is an equilibrium rate. And the profit rate, as we said, depends on the capital–output ratio and the distribution of the total product.

[3] The diagram and classification scheme follow that in Joan Robinson, *op. cit.*, pp. 100–3. *Cf.* also Pilvin, *op. cit.*

as the capital–labour ratio increases, the slope of the curve must decline from left to right.

The innovation raises the whole curve by an amount determined by the rate of innovations, n, up to curve 2. If the curve is raised iso-elastically at each point we may call the innovation neutral as it leaves the share of capital unchanged, and, of course, the share of labour also remains the same. Assuming the labour supply constant, the rate of growth of output at F is $r\epsilon$ (where r is the percentage rate of growth of capital), and if we include innovations it is $r\epsilon + n$. Since by hypothesis ϵ at F_1 is the same as ϵ at F_2, the



behaviour of the profit rate depends upon what happens to k. As ϵ is unchanged by the innovations, so k must remain constant. Therefore F_2 is on the equilibrium-growth path only if $n = r - r\epsilon$; *i.e.*, if

$$(1)\quad n/r = (1 - \epsilon)$$

If $n/r > (1 - \epsilon)$, then k will decline and $\Pi a > \Pi e$. Entrepreneurs will seek to increase the capital stock relative to output, and as Mr. Harrod has described, the system will tend to explode. Of if $n/r < (1 - \epsilon)$ the capital–output ratio will rise, and the downward spiral will begin.[1]

If n is of exactly the right size, k and the profit rate will remain at those values which will tend to keep the system in equilibrium. Under these conditions it is evident that the rate of growth of income will remain constant, *i.e.*, the innovation will exactly cancel the negative effect of the increasing capital–labour ratio on the rate of growth of income.

If the curve is raised so that ϵ at F_2 exceeds ϵ at F_1, then we may speak of a capital-using innovation. In this event the innovation has a twofold effect. In the first place it increases the rate of output by n, and in the second place it increases the elasticity of productivity of capital, thereby raising the share of total product going to capital. The second consequence of the innovations has significant effects on the equilibrium rate of growth.

[1] As we are concerned primarily with the conditions for equilibrium growth, we do not investigate the behaviour of the system once equilibrium has been disturbed except for a brief paragraph in Section IV.

With a higher ϵ the rise in k accompanying a given increase in the capital–labour ratio is less, and therefore the negative effect on the profit rate of the changing k is less. In order to maintain equilibrium in the system it is necessary for ϵ and k to change in exactly the same proportion. In the case of the neutral innovation this meant that the increase in output, n, must make up the entire difference between $r\epsilon$ and r, and k therefore remained constant. Here ϵ rises, and this requires that k also be allowed to rise until $\Pi a = \Pi e$. Since

$$\frac{dO}{dt}\frac{1}{O} = r\epsilon + rd\epsilon + n$$

for $\Pi a = \Pi e$ to obtain it is necessary for

$$\frac{dK}{dt}\frac{1}{K} - \frac{dO}{dt}\frac{1}{O} = \frac{d\epsilon}{dt}\frac{1}{\epsilon}$$

Equilibrium growth then requires the equality $\epsilon' = r - (r\epsilon + rd\epsilon + n)$ (where ϵ' is the percentage rate of increase in ϵ). The equilibrium equation is now

$$(2)\quad \frac{\epsilon' + n}{r} = 1 - \epsilon - d\epsilon$$

Since by hypothesis $\epsilon' > 0$, it is evident that k is rising, and therefore the rate of growth of *per capita* income is declining. Thus if innovations are on balance capital using, the maintenance of equilibrium requires a declining rate of growth of *per capita* income as the capital accumulation process continues. The decline is greater, the greater is ϵ'. If the effect on the output stream of the rate of innovation, *i.e.*, n, is such as to make k constant and maintain the rate of growth of income, it also results in the system being knocked off its equilibrium path in an upward direction. It is clear, then, that n in the case of capital-using innovations must be less than n in the case of neutral innovations.

The analysis of capital-saving innovations is simply the reverse of the capital-using case. Curve 1 is moved up in such a way that each point on curve 2 has a lower elasticity than the corresponding point on the old curve. Now in order to maintain $\Pi a = \Pi e$, the results of the innovation and capital-accumulating process must be such as bring about a constant reduction in the capital–output ratio to match the falling ϵ.

So now, since the rate of growth of income is equal to $r\epsilon - rd\epsilon + n$, the equilibrium equation becomes

$$(3)\quad \frac{n - \epsilon'}{r} = 1 - \epsilon + d\epsilon$$

Since $\epsilon' < 0$, by hypothesis, the equilibrium k is declining, and therefore the rate of growth of *per capita* output is rising. With a falling ϵ, k is rising, and therefore to maintain equilibrium the value of n must be large enough to reduce the k to the extent necessary to maintain the equilibrium profit rate. Thus n must be larger here than in the case of neutral innovations.

It is evident that expression (2) or (3) may be used as a general expression

for the maintenance of equilibrium in all three cases. Thus expression (2) degenerates into expression (1) when ϵ' and $d\epsilon$ are zero, and it becomes expression (3) if ϵ' and $d\epsilon$ are negative. We may regard the constant achieving of the equality indicated by these expressions as supplementary to those conditions laid down by Mr. Harrod and other users of his model, and therefore they add to the difficulties involved in the maintenance of equilibrium growth.[1] More importantly they direct attention to the behaviour of the rate of growth of *per capita* output, and show that a changing rate of growth of *per capita* income is consistent with equilibrium.

The preceding paragraphs assumed r constant and established the equilibrium values of $n + \epsilon'$ and the effect of these values on the rate of growth of output. But evidently r is not independent of the rate of innovations, and especially if innovations are occurring at a fairly steady rate, it is reasonable to assume that firms will make some effort to adjust their investment programs to meet new technological needs. Also a decline in innovations may mean that capital accumulation will be less than if innovations were occurring.

Assume that $n + \epsilon'$ is constant at other than its equilibrium value, but equilibrium is maintained by virtue of adjustments in r. Such an assumption may be justified by supposing that firms foresee the innovations and act in such a way as to maintain the equality $I_a = I_e$ by changing r.

Evidently if $\frac{n + \epsilon'}{r} > 1 - \epsilon - d\epsilon$ and the system is tending to explode upward, a rise in r will serve to restore equilibrium, and will also serve to raise the rate of growth of *per capita* income. If $\frac{n + \epsilon'}{r} < 1 - \epsilon - d\epsilon$, then r must decline to achieve equilibrium, and this will contribute to a reduction in the rate of growth of income. In both cases the equilibrating movement of r is such as to accentuate the effect of n on the rate of growth of income.

But it is as unrealistic to assume complete equilibration by means of adjustment in r as it is to assume no adjustment in r. We know very little about the determinants of capital accumulation, however, it is clear that there is an upper limit on r and it cannot vary without limitation. And there is little empirical evidence to support the hypothesis that r is adjusted in either direction by entrepreneurs merely for purposes of equilibrating the system. We may conclude that if $n + \epsilon'$ is not of equilibrium value, given r, r will tend to adjust, but not sufficiently to restore and maintain equilibrium. If this is correct, then it means that we need to give further attention to the behaviour of n and ϵ'.

III

The analysis in the preceding section was limited to comparing positions F_1 and F_2, and since the movement along the capital axis was assumed to be very small, we could ignore changes in ϵ due to changes in the capital–labour

[1] Under our assumptions mere neutrality of innovations is *not* a sufficient condition for equilibrium as Mr. Harrod implies that it is under his assumptions.

ratio. Over a long period of time, however, it is necessary to introduce a declining ϵ due to the rising capital–labour ratio into our analysis. Now if ϵ is declining through time for maintenance k must also decline, and this would mean that n must be rising. It will need to rise less rapidly if innovations are capital using than if they are neutral, and more rapidly if innovations are capital saving than if they are neutral.

However, it seems clear that in a relatively uncontrolled economy ϵ has a lower limit considerably above zero, and cannot be presumed to fall indefinitely. Similarly, the assumption that innovations are becoming increasingly effective—that is n rising continuously—does not stand up under historical evidence.[1] If we accept either or both of these propositions about the real world, we may then argue that innovations must on balance be capital using through time in order to counter the decline due to a rising capital–labour ratio. If innovations are not sufficiently capital using, then the system will eventually break down.[2] It is to be noted and emphasised that despite the fact that innovations are capital using, income distribution is relatively unaffected, as the upward effect on ϵ is cancelled by the opposite effect due to the rising capital–labour ratio.[3]

The question we must now consider briefly is whether or not there are reasons to believe that an economy may produce the necessary behaviour of inventions and innovations.

IV

We have shown that for *per capita* income to continue to grow we must introduce innovations into the model. And for the system to continue to function indefinitely the innovations must be of a particular pattern. It is therefore evident that a theory of economic growth must contain, as an endogenous variable, technological change. This we propose to accomplish by introducing invention and innovations into the maximising scheme of the individual firm.

There seems ample justification for doing this. There is substantial evidence that in the advanced countries of the world the innovational process is as much a part of the economic process as is adjustment to a given technology. Entrepreneurs, managers and engineers are learning all the time, and are continuously putting into effect the results of their newly acquired knowledge.[4] Many large firms maintain research and develop-

[1] We know very little about the processes of invention and innovation, and we are, of course, unable to say that anything is *impossible* once we allow innovations in the analysis.

[2] If we allow a falling equilibrium profit rate this will tend to reduce the immediacy of the problem, but it will not eliminate it.

[3] Cf. Mrs. Robinson, *op. cit.*, p. 103, where she concludes that if technical progress is neutral and accumulation goes on at just the rate to keep k constant, the model is free from "internal contradictions."

[4] Professor William J. Fellner, in *Monetary Policies and Full Employment* (Berkeley, University of California Press, 1947), pp. 115–16, suggests that for rapidly growing industries the distinction between movements along a given production function and the setting up of a new function shade into each other. In such circumstances the concept of a "constant state of technology" becomes exceedingly unrealistic. Other writers (*e.g.*, Mrs. Robinson and James Duesenberry) have argued similarly.

ment departments whose very purpose is to provide a constant stream of inventions eligible to be turned into innovations by the policy makers. Not only are many modern firms equipped to direct resources into finding new products and new ways of doing things, but many changes are to a considerable degree foreseen. The policy maker is able to do two things. First, he is able to make decisions as to current behaviour on the basis of information with respect to inventions and innovations that are in the wind. And secondly, he is able to consider his technology a variable, and therefore he may adjust it as well as his quantity of output, the price of his product or the rate of his expansion. Even in firms that have no formal research section, leaders are in general aware of the direction and approximate pace of changes in technical knowledge through trade associations and trade journals.

These facts contribute to the possibility of smooth adaptation to a changing technical environment. This adaptation process is reflected not only with respect to saving rates as noted above, but with respect to other adjustments as well. In particular the disruption and other problems imposed by the specificity of capital equipment may be minimised, and an appropriate depreciation and obsolescence policy becomes more nearly achievable.[1]

We may conclude therefore that inventions and innovations should be looked upon as part of the normal routine of business operation. It follows, then, they are subject to the maximisation scheme that governs the firm's policy decisions. Indeed, in many instances expenditure on research is treated as an outlay which results in revenue just as any other outlay made by the firm is assumed to do.[2]

Inventions are thus the result of a conscious policy decision to allocate resources to inventive activity, and innovations made possible by these inventions will presumably occur when they can be effected in such a way as to increase profits. More clearly we may say that an innovation in the form of a new product will be made if the yield on the capital required to turn out the product equals Πe. And if the innovation is in the form of cost reduction in the production of old products, it will be made if it serves to prevent ϵ/k from declining. If it results in a rise in ϵ/k, then investment will be forthcoming until the profit rate is restored to its equilibrium value.

This set of ideas suggests the following implications. Innovations are necessary for Harrodian equilibrium. Firms in a modern advanced society consider invention and innovation as an essential part of the routine of operation. Since some foresight of technical change is possible, adjustment may be smooth enough to provide no disturbance to the equilibrating process. However, despite the fact that inventing and innovating are part of

[1] For similar and fuller discussion of this argument see Gordon F. Bloom, " Wage Pressure and Technological Discovery," *American Economic Review*, September 1951; W. Rupert Maclaurin, " Technical Progress in Some American Industries," *American Economic Review Papers and Proceedings*, May 1954; Carolyn Shaw Solo, " Innovation in the Capitalistic Process: A Critique of the Schumpeterian Process," *Quarterly Journal of Economics*, August 1951; A. P. Usher's *History of Mechanical Inventions*, Revised Edition (Cambridge, Harvard University Press, 1954), *passim*; and *Technological Trends and National Policy*, United States National Resources Committee, Washington, 1937, *passim*. [2] Solo, *op. cit.*

the routine, they also are not subject to complete control. More than other aspects of business decisions, decisions to invest in " inventions " are accompanied by a large random component, and therefore may supply the shock necessary to knock the system off the equilibrium path. This shock is even more likely when it is recalled how rigorous the equilibrium requirements are. But once the system has been knocked off its equilibrium path by an innovational mistake, and the destabilising factors discussed by Mr. Harrod begin to be effective, innovations will tend to act in a stabilising manner.

If the innovation is in an upward direction from the equilibrium path, entrepreneurs are having difficulty accumulating capital at a rate that would equate the equilibrium profit rate with the actual profit rate. Under these conditions we may expect firms to seek ways of utilising their capital stock more effectively. This is to say they seek capital-saving innovations, which will enable a larger output to be achieved with a given capital stock. This means that a given rate of capital accumulation will result in a greater increase in the rate of output, and will therefore serve to reduce the upward spiral. When the system is knocked off the equilibrium path in a downward direction the actual profit rate is less than the equilibrium profit rate. Given the elasticity of productivity the capital–output ratio is too high.[1] The pressure on innovations will be of a kind that tends to increase the use of capital in the productive process.[2]

In addition to the short-run effect of the role of innovations in the growth process, the question may also be asked as to whether or not inventions are likely to be forthcoming at the required rate and in the required direction over an indefinite period of time. Despite the efforts of entrepreneurs, managers and engineers to discover new products and new ways of making old products, there is no necessity that such efforts will be rewarded. The literature has little to say on this subject in a formal, analytical way, and revealing data are hard to come by.[3]

There does seem evidence, however, to support the view that the rate of inventions and innovations is higher in new industries than in old, and innovations are likely to be capital using in new industries and capital saving in old-established industries. Such an hypothesis may be supported in several ways. We may indeed say that one of the reasons why new industries and new firms come into being is due to a belief on the part of investors that the

[1] It may be worth noting explicitly that innovations may be depressive as well as stimulating. In terms of the maintenance of short-run equilibrium there seems no more reason to assume them to be of one kind rather than the other.

[2] We do not argue that the turning points of the cycle should be explained in terms of the behaviour of innovations, although it is a simple matter to construct a model where this is the case.

[3] This is not to say that economists have not considered the effects of inventions and innovations on the economic process. Innovations, of course, are considered in detail by Schumpeter, and others have used them to account for stagnation in mature economies. We regard inventions as the source of innovations, and therefore their behaviour of more importance in the long run than that of innovations. Economics at the moment offers no *theory* of inventions in the sense of an explanatory system accounting for the pattern and rate of changes in technical knowledge. Presumably many economists are willing to assume the problem beyond the limits of the discipline. As we have indicated in the text, this is a position we are unwilling to accept.

productivity curve of their new firm is higher and more steeply sloped than those of existing firms.

New firms are much more interested in finding a place in the market as opposed to maintaining the *status quo*. Thus the incentive to seek new inventions and put them into effect immediately may be greater in new enterprises than in old. Furthermore, capital requirements are likely to be greater with respect to those innovations that are made in the period when the industry is new and catching up with the economy than when its growth is determined by the growth of the total economy. We may also expect that business leaders of new industries are optimistic as to the future growth of their enterprises,[1] and willing to assume the responsibilities that commitments involve. And perhaps most important of all, one may argue that the possibilities for technical progress in a single productive activity are limited. The more improvements that are made in the technical aspect of a given process, the less scope there may be for further improvement, and therefore we may expect the rate of technical progress in old industries to taper off.[2]

These conjectures as to the degree of success in the inventive and innovational activities of firms suggest the importance of new industries and new products to the satisfactory functioning of a highly capitalised economy. If new industries are not forthcoming, then we suggest that the problems following from the analysis in Sections II and III may become severe enough that the economy has chronic difficulty maintaining *per capita* growth and equilibrium. If this kind of reasoning is correct, then among the other policy aims of such an economy would be that of maintaining a market structure that permitted ease of entry of new firms with new blood and new ideas into old industries, and that of simplifying the development and exploitation of new products.

V

We have shown that inventions and innovations are crucial to the growth process. They are a necessary condition for equilibrium growth (in the Harrod sense of equilibrium), they also contain a likely source of disturbance to the system, and also provide a source of equilibrating pressure once the system has been knocked off its equilibrium path. Over the long run we have shown that a particular pattern as well as rate of innovations is essential to the internal consistency of an economy. Finally, we suggested a way of introducing inventive and innovational activity as an endogenous variable into the economic argument, and offered a few hypotheses as to the likelihood of the necessary behaviour of innovations being accomplished.

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[1] Nicholas Kaldor, "The Relation of Economic Growth and Cyclical Fluctuations," ECONOMIC JOURNAL, March 1954, attaches a great deal of importance to "optimism" among entrepreneurs as a factor explaining economic growth.

[2] Great emphasis is given to this point by Arthur F. Burns (*Production Trends in the United States since 1870* (New York, National Bureau of Economic Research, 1934), p. 141) in explaining why individual industries seem to experience retardation in their rates of growth.

THE REGIONAL LOCATION OF INDUSTRY: AN EMPIRICAL STUDY BASED ON THE REGIONAL TABLES OF THE 1948 CENSUS OF PRODUCTION

1. INTRODUCTION

THE policy of regional industrial diversification exemplified by the Government's treatment of Development Areas has been extensively discussed in the past few years and has its staunch supporters and severe critics. The critics have, for the most part, argued that the policy involves the development of industry in areas which are not necessarily the most suitable ones and is, therefore, bound to have an adverse effect on the national income. This view is strongly held by Mr. A. C. Hobson,[1] who stresses the economies of location in the great industrial belt of the midlands and argues that "if our aim is to put every new factory in its most economic location there is every indication that most of them will be situated within or near the great belt."[2] The danger of Development Area policy is, then, that it is likely to lead to a "serious loss of efficiency."[3] This broad conclusion is unsupported by any empirical evidence on the efficiency of industrial location in different areas, and, indeed, much of the discussion of this important subject has been similarly hampered by lack of hard facts. The purpose of the present article is to see what light on the problem is shed by the regional data of the 1948 Census of Production.

It must be admitted that the data which these regional tables (Table 5 in the Final Reports) contain are not wholly adequate for the present purpose. Ideally what is required are data relating to the costs of establishing *new* factories in different locations and to the efficiency of such establishments in those different locations, *i.e.*, to certain *marginal* costs and *marginal* productivities. The Census tables refer to the production of *all* establishments in a region, and all that can be obtained from aggregated figures of this type are various *averages*. Such data will give information on industrial structure as it has developed in the past, but only the most tentative conclusions may be drawn regarding development in the future. However, since these data are the most comprehensive available relating to the regional location of different trades in Great Britain, it seems worthwhile to examine them to see what information they can provide on the suitability of different regions for industrial development.

2. BASIC DATA AND MEASUREMENTS

The regional tables of the Census of Production show for each trade the number of establishments, the value of output, cost of raw materials and wages and salaries paid. Data are given separately for the eleven standard

[1] A. C. Hobson, "The Great Industrial Belt," ECONOMIC JOURNAL, Vol. LXI, No. 243, September 1951, pp. 562 *et seq.* [2] Hobson, *op. cit.*, p. 574. [3] Hobson, *loc. cit.*

regions.[1] These regions, which have been defined for administrative purposes, cover large geographical areas and have the disadvantage that they do not coincide with natural economic regions or industrial belts. Further, in the Census tables it has occasionally been necessary to combine the data for two or more regions in order to avoid disclosure of information relating to individual producers, and it is not possible to make a detailed study of the regional location of the trades affected.[2]

The difficulty of obtaining from such data any measurement which will adequately reflect regional advantages or disadvantages for industrial development is considerable. Size of establishments and capital expenditure, which would be expected to affect efficiency, are not analysed by regions, nor is it possible to obtain on a regional basis " unit costs " of particular outputs. The only way of estimating a " rate of reward " is by relating value figures to the labour force. This method has been used in the following discussion and the relative profitability of different trades is measured by the *net margin per head.* The excess of gross value of output of each trade over the cost of raw materials and amounts paid in wages and salaries may be called the net margin, and this excess divided by the total number of persons employed gives the net margin per head. When using this measure the following two considerations must be borne in mind: first, the net margin includes besides profits a number of costs such as rents, rates, maintenance and depreciation, and other overheads which, though they might vary from region to region, cannot be eliminated from the net margin. Second, the composition of the labour force (*i.e.*, combination of men and women of different ages and skills) differs widely between trades and, possibly, though to a lesser extent, in the same trade in different regions; the measurement of net margin per head requires, however, that all members of the labour force in different trades and in different regions be considered as equal " labour units." The net margin per head is, therefore, only a very rough estimate of the average return from employing labour in different trades or regions, but it is the best measure which can be obtained from the data.

In order to classify the Census trades according to their regional concentration or dispersion use will be made of *location coefficients* of a type devised by Professor Sargant Florence.[3] To calculate these coefficients the " location standard " taken was the proportionate distribution by standard regions of the population of Great Britain aged fifteen years and over in 1951.[4] This distribution is given in percentage form in the first

[1] The eleven standard regions of Great Britain and the abbreviations which will be used for them in the tables which follow are: England; Northern (N.), East and West Ridings of Yorkshire (E. & W. Rid.), North Midland (N.M). Eastern (E.), London and South-eastern (Lond. & S.E.), Southern (S.), South-western (S.W.), Midland (M.), and North-western (N.W.). Wales and Scotland (Scot.) each constitute separate regions.

[2] These are, for the most part, very small trades or trades in which the bulk of production is concentrated in one or two regions.

[3] P. Sargant Florence, *Investment, Location, and Size of Plant*, p. 34.

[4] Taken from the 1% sample tables of the 1951 Census of Population.

line of Table I (below). From the Census of Production tables the proportionate regional distribution of employment in each trade can be obtained. The algebraic sum of the deviations of " trade proportions " minus " population proportions " is necessarily zero. The sum of the *positive* deviations is taken as the location coefficient.[1] For a trade distributed in the same way as the population the coefficient is zero, and it has an upper limit of unity.

In the following sections net margins per head and location coefficients will be used to investigate the characteristics of trades in different location groups and to find whether there is any systematic regional pattern in the variations in net margins per head of the Census trades.

3. General Location Considerations

The 1948 Census of Production covers 156 separate trades. The analysis which follows will be concerned only with the 139 of them classified as manufacturing trades and which account for 75% of the total net output and 72% of the total employment of all trades covered by the Census. The regional distribution of employment in manufacturing trades and that of the population aged fifteen years and over (used as the location standard) is given in Table I.

TABLE I

Regional Distribution of Population and Employment in Manufacturing Trades

	Standard regions.										
	N.	E. & W. Rid.	N.M.	E.	Lond. & S.E.	S.	S.W.	M.	N.W.	Wales.	Scot.
(*a*) Distribution of persons aged 15 years and over, % . .	6·3	8·4	6·8	6·4	22·8	5.5	6·3	8·9	13·2	5·3	10·2
(*b*) Distribution of employment in manufacturing trades, % .	5·3	10·8	7·8	4·4	18·8	3·3	4·0	14·1	18·4	3·3	9·9
(*c*) (*b*) as % of (*a*) . . .	84	129	115	69	83	60	64	158	139	62	97

Sources: (*a*) Census of Population 1951: 1% sample tables.
(*b*) Census of Production 1948.

It can be seen that the two distributions are closely similar. The percentages in the last line may be regarded as an index of the regional concentration of manufacturing industry; [2] this shows that the East and West Ridings of Yorkshire, North Midlands, Midlands and North-west are relatively manufacturing intensive regions and that, at the other end of the scale, manufacturing industry in the Eastern, Southern and South-western

[1] The only difference between these coefficients and those of Sargant Florence is that Sargant Florence (*op. cit.*) uses as his location standard the distribution of all employment covered by the 1935 Census of Production (all his calculations are from the 1935 Census). Since discussion on industrial diversification is customarily conducted in terms of employment, it seemed more satisfactory for the present purpose to take as the location standard the distribution of the labour force available for employment, and the population aged fifteen years and over was chosen for this purpose. Effectively there is very little difference between the two standards.

[2] See Section 5 below.

regions and Wales is not so heavily concentrated. There are, however, quite considerable industrial pockets in these latter regions—particularly in Wales.

Location coefficients have been calculated for all manufacturing trades where sufficient data were given in the Census. Of the eighteen trades for which the data were inadequate five have been assigned the coefficients obtained by Professor Sargant Florence from the 1935 Census of Production. For comparative purposes six " location groups " were distinguished and the location coefficients of the trades within these groups are given in col. 2 of the Appendix.

It might be expected on *a priori* grounds that trades which, in the past, have been profitably developed in a large number of different locations would figure largely in Development Area policy or in a programme of regional industrial diversification. Such trades would, necessarily, have low location coefficients and for the present purpose they may be limited to those listed in the first three location groups in the Appendix, *i.e.*, to trades with location coefficients less than 0·4. These groups contain most of the food trades, chemical trades, engineering and electrical trades, plastics and artificial fibres. In order to find what part is played by such trades in post-war regional industrial development in Great Britain reference may be made to a number of special articles devoted to this subject which have appeared in various issues of the *Board of Trade Journal*.[1] The information which they contain is not always as useful as might at first sight appear because the articles do not list all the separate trades newly developed in the various regions and because in some instances *portmanteau* references are made which cannot be directly related to the individual trades defined in the Census. But it will be clear from the following examples that in those regions where systematic industrial diversification is taking place the trades of a type just enumerated are of great importance.

The Development Areas.[2] Among the trades introduced to these Areas since the end of the war are: *Merseyside:* Food trades; British Celanese (synthetic fibres); plastic products; synthetic resin; light engineering and constructional engineering. *South Wales Valley:* British nylon spinners; chemicals and basic plastics; radio and television.[3] *North-east Coast:* Chemicals; pharmaceutical products; nylon and rayon fabrics; electrical equipment; light engineering goods and plastics. *West Cumberland:* Synthetic detergents; scientific instruments; precision engineering equipment, and processed foods.

[1] Articles describing progress in the Development Areas were published during December 1950 and January 1951 in various issues of the *B[oard] of T[rade] J[ournal]*. The first of the series dealing with industrial developments in the standard regions appeared in the *B. of T.J.*, December 1, 1951. Up to November 27, 1954, twenty-two articles had been published.

[2] Details in this paragraph have been taken from *B. of T.J.*, December 2 and 9, 1950.

[3] A more detailed list of thirty-two trades introduced into this area since the end of the War is given in the *B. of T.J.*, December 30, 1950, p. 1,102. Over twenty of these trades have location coefficients less than 0·4.

Southern Region. The post-war developments in this region (which, as shown in Table I, has the lowest regional index of industrial concentration) is described in the following terms: " Firms associated with the vehicle, engineering or chemical industries represent a high proportion of all the post-war movement of new industry into the region. Moreover it is these industries which have shown the biggest relative and absolute expansion in the regional economy." [1]

North-west Region.[2] The general post-war trend is towards greater diversification. Established industries having shown considerable post-war expansion are textile and electrical engineering; glass; metals; chemicals; and those concerned with the manufacture of commercial vehicles, locomotives and aircraft. The electrical machinery industry has emerged as the largest single branch of engineering. Among newer industries plastics and the evolution of artificial fibres are of growing importance.

Midlands Region.[3] The greatest post-war expansion has been in engineering, including light engineering trades; electrical gear; and motor-car and allied industries.

North Midlands Region.[4] Among the expanding industries in this region are certain textile trades using synthetic fibres; engineering; chemical industries and plastics.

Eastern Region.[5] In this region the development of wireless and television and certain food trades is important.

These examples are by no means exhaustive, and it must not be inferred that trades of the above type account for all the post-war industrial expansion taking place in the various regions; there are also instances of the development of basic, highly localised trades, *e.g.*, trades in the woollen industry in the East and West Ridings of Yorkshire.[6] But the examples give clear evidence of the present importance of trades with low location coefficients in the Development Areas and in general industrial diversification, and provide a background to which the following discussion can be related.

Returning to the Census material, some of the characteristics of these trades may be examined. First, the relative importance of the trades in the six location groups can be seen from Table II, which shows the concentration of employment and net output in each of the groups.

By either criteria the first three groups, those trades with moderately low location coefficients (*i.e.*, less than 0·4), are the most important in the economy, accounting for approximately 70% of employment and net output in manufacturing industries. Thus it is clear that the bulk of manufacturing activity is in trades which are fairly well dispersed over Great Britain.

[1] *B. of T.J.*, April 4, 1953, p. 665.

[2] *Ibid.*, December 1 and 8, 1951.

[3] *Ibid.*, May 31, June 7 and 14, 1952.

[4] *Ibid.*, November 29, December 13 and 27, 1953.

[5] *Ibid.*, January 2 and 9, 1954.

[6] *Ibid.*, December 15 and 29, 1951.

The figures in cols. 3 and 4 in the Appendix show that the sizes of the trades in each group vary considerably. The average trade size in

TABLE II

Employment and Net Output in Manufacturing Trades by Location Groups

	Location coefficients.						
	Less than 0·2	0·2–0·3.	0·3–0·4.	0·4–0·5.	0·5–0·6.	0·6 +.	Unknown.
Percentage of total employment in group . .	18·6	29·7	21·7	8·9	7·6	12·6	0·9
Percentage of total net output in group . .	19·9	27·8	22·6	9·5	7·6	11·5	1·1

each group has been calculated by dividing the proportion of total employment and total net output in each group by the number of trades in the group. The results are given here in ratio form for ease in comparison.

TABLE III

Average Trade Size by Location Group

(Size in group with location coefficients less than 0·2 = 100)

	Location coefficients.					
	Less than 0·2.	0·2–0·3.	0·3–0·4.	0·4–0·5.	0·5–0·6.	0·6 +.
Average size ratio based on employment	100	100	73	42	41	60
Average size ratio based on net output	100	88	72	43	38	52

The figures show clearly that, measured either in terms of employment or net output, the most widely dispersed trades are also, in general, the largest ones. Excepting the most highly localised trades, average trade size falls off fairly sharply as location of the trades becomes more concentrated.

The average size of establishment for each trade has been obtained by dividing the numbers employed by the number of establishments in the trade. The results are given in col. 5 of the Appendix. It can be seen that the average establishment sizes in each location group vary over a fairly wide range. For comparative purposes a "representative" measure may be obtained by taking the median of the average establishment sizes for each group.

One should not read too much into such rough representative measures, but the results do suggest that, for the first four groups, there is a positive association between average establishment size and the degree of location. Professor Sargant Florence, who has made a much more detailed examination of the relationship between location and size of plant from the 1935

Census of Production, reaches a similar conclusion; he writes that, "among the not highly localized industries, the smaller the industry's size of plant, the less its localization." [1]

TABLE IV

"Representative" Establishment Size of Trades by Location Groups

	Location coefficients.					
	Less than 0·2.	0·2–0·3.	0·3–0·4.	0·4–0·5.	0·5–0·6.	0·6 +.
Medians of establishment sizes, persons	60	91	126	130	124	134

The results obtained from this general survey are as follows: The bulk of employment in Great Britain is in trades which, geographically, are fairly well dispersed (*i.e.*, trades with location coefficients less than 0·4). Apart from their importance as a group, they are, by and large, the largest individual trades and are associated with the smallest establishment sizes. Not surprisingly, therefore, the policy of industrial diversification in Great Britain relies heavily on such trades. Since their widespread location has proved profitable in the past, it may be suggested, provisionally, that there are unlikely to be significant differences in the suitability of the various regions for the location of these trades, and unlikely, therefore, that regional industrial diversification and Development Area policy will necessarily depress the size of the real national income. This view will be examined more closely in the following sections.

4. Net Margins per Head

The figures in col. 6 of the Appendix show great variation between the net margins per head in different trades. They range from virtually zero in Flax Processing, £107 in Motor Vehicles and Cycles (Repairing) and £115 in Small Arms to £801 in Cement, £940 in Brewing and Malting and £1,174 in Spirit Rectifying and Compounding. The money value of the net margin per head necessarily reflects special characteristics of individual trades (*e.g.*, the degree of capitalisation, the nature of the market, etc.) and variations in net margins per head must be explained in terms of these different characteristics. From the available data only one characteristic can be isolated, namely the degree of concentration or dispersion of location as measured by the location coefficient. Using net margin per head as an index of profitability it is important to find if there is any systematic relationship between the net margins per head of different trades and their location coefficients. This procedure will indicate whether there is any systematic inducement to develop those trades which are broadly spread over the country or whether those in which strong location factors operate seem to be the most attractive.

Data relating to 129 manufacturing trades were plotted on a graph

[1] P. Sargant Florence, *Investment, Location, and Size of Plant*, p. 39.

having net margins per head and location coefficients as co-ordinates. It was quite clear on inspection of the scatter diagram that, taking all trades together, there was no systematic association between the variables. The same data were examined by industrial groups of trades (*e.g.*, chemical trades, food trades, engineering trades, etc.[1]) but even within these relatively homogeneous groups there was no indication of systematic relationship between the variables. Finally, the averages of the net margins per head and location coefficients of each industrial group were calculated as giving " typical " group measurements, and the relationship between these averages was examined. Again the scatter of points seemed quite random.

It may be concluded with some certainty that there is no systematic association between net margins per head and trade location coefficients either between trades in the same industrial group or between industrial groups. Thus, if net margins per head are used as indicators to the most profitable lines of industrial development there is no expectation that choice will be restricted to trades in any one of the location groups. Turning the argument round it follows that, to the extent that regional industrial diversification involves the development of trades of a type with low location coefficients, there is no evidence that trades will be developed in which the reward for employing labour has, in the past, been shown to be systematically low.

Apart from variations in net margins per head between trades the data disclose considerable variations in regional net margins per head in the same trade. These regional variations can only be examined for trades which are located in several regions and for which separate regional data can be obtained. The first consideration eliminates highly localised trades (such as cotton spinning), and the second eliminates a number of small trades for which data for several regions have been combined in the Census tables. In what follows attention has been confined to trades for which adequate regional data could be obtained for at least five regions. For convenience these will be referred to as *ubiquitous* trades.[2] Ninety-four out of the 139 manufacturing trades (*i.e.*, approximately two-thirds of them) rate as ubiquitous, and their importance is revealed by the fact that between them they account for 91% of all employment in manufacturing trades. As would be expected, they are trades with low location coefficients; seventy-five out of the ninety-four having coefficients less than 0·5. It will be appreciated that conclusions can only be related to trades which, through time, have developed as widely located ones. Nothing can be said of the effect of extending the regional development of trades at present highly concentrated in a few regions.

An attempt was made to investigate whether the degree of variation in regional net margins per head of the separate trades was associated with

[1] Nine groups were distinguished, but the number of trades in each group differed considerably. Some groups were represented by only a few trades.

[2] This convenient expression has been borrowed from Sargant Florence (*op. cit.*, p. 41), but the definition of ubiquitous trades in the above discussion is not that used by him.

their regional concentration or dispersion. The former variable was measured by the coefficient of variation of the regional net margins per head in each trade.[1] A scatter diagram of points having as co-ordinates the coefficients of variation of the regional net margins per head and the location coefficients of the ubiquitous trades revealed a broad positive association between the variables. There was a number of outlying points, but, in general, the picture was that trades for which the coefficient of variation of regional net margins per head was low were associated with lower location coefficients (*i.e.*, more widely dispersed trades) than those for which it was high. The relationship between the variables was also examined for several industrial groups of trades. The positive association just noted was disclosed by the food and drink trades, engineering trades, certain metal trades and the textile trades; it was also suggested by certain other smaller groups, but these comprised so few ubiquitous trades that no firm conclusions could be drawn. The group of chemical trades was the most important one for which the association was not shown.

It might have been expected on *a priori* grounds that those trades which, through time, it has been found profitable to develop in a number of widely dispersed regions would also be those trades for which specific regional advantages or disadvantages are of least importance. The empirical results—tentative though they must be on this sort of data—are consistent with this view. The conclusion is an extremely important one in connection with a policy of industrial diversification. It means that the trades which have been shown to be most suitable for such a policy are also those for which the average rate of reward from employing labour (measured by the net margin per head) varies least from region to region. Thus the loss to the national income—if, indeed, there should be any loss at all—incurred by encouraging the location of trades in certain regions is likely to be less for these trades than for others.

5. Regional Concentration

The data in the regional tables of the Census are not sufficient to make possible any comprehensive explanation of the variations in regional net margins per head. It is, however, interesting to see what light they shed on the view that areal differences in location are important in terms of external economics accruing from concentration. The measurement of the variables presents serious obstacles, and it must be freely admitted that it is not possible to derive a wholly satisfactory measure of regional industrial concentration from Census material. But rather than abandon the attempt the percentages in the third line of Table I (above) may be used as an index of regional concentration of manufacturing industry. The second variable was obtained by expressing, for each trade, the net margin per head in the regions as a percentage of the national net margin per head for the trade. For convenience these last measurements may be referred to as " regional

[1] The coefficients of variation are given in col. 7 of the Appendix.

net margin percentages." Five main groups of manufacturing trades were considered, food, chemicals, engineering, certain metal trades and textiles, and for each of these groups the " regional net margin percentages " of the individual trades were plotted against the index of regional concentration of manufacturing industry. In none of the five groups was there any systematic association between the variables.

Next, the effect of the regional concentration of individual trades was considered. For each trade " regional trade concentration percentages " were obtained by expressing the regional percentage of employment in each trade as a proportion of the regional percentage of the total population aged fifteen years and over.[1] For each trade in the five industrial groups noted above the relationship between " regional net margin percentages " and " regional trade concentration percentages " was examined. The five scatter diagrams each suggested that the two variables were independent. There was no indication that a lightly concentrated trade in any region was systematically associated with a lower net margin per head than the same trade in other regions where it was relatively more heavily concentrated.[2]

The implication of these results is that variations in regional net margins per head cannot be explained in terms of regional concentration of manufacturing industry in general or in terms of differential regional concentration of individual trades. The logical extension of the argument would be to conclude that regional differences in concentration are not sufficiently great markedly to affect regional suitability for industrial development. However, this view is suggested by somewhat fragile evidence because industrial belts and major industrial concentrations are not necessarily coincident with the standard regions; indeed, there may be several small belts in any one region. But, on the evidence available and given the methods employed to measure regional concentration, the advantages or otherwise of industrial belts within regions do not seem great enough to determine the pattern of regional variations in net margins per head of different trades.

6. Regional " Comparative Advantages "

To conclude this examination of the Census of Production data the net margins per head of trades in individual regions will be considered in order to find whether net margins per head are systematically high or low in particular regions, *i.e.*, whether variations in net margins per head suggest that any regions are at a systematic disadvantage as regards industrial location. The variation in net margin per head of different trades is so great that regional net margins per head may only be compared in the same trade. In order to obtain a fair basis for comparison the following discussion has been restricted to the ninety-four ubiquitous trades referred

[1] *E.g.*, the Northern region has 6·3% of the population of Great Britain aged fifteen years and over (see Table I above). The region also has 7·2% of the total employment in Grain Milling. The regional concentration percentage for this trade is given by $(7{\cdot}2/6{\cdot}3) \times 100 = 114$.

[2] It is the efficiency of the " establishment " rather than the " industry " or " trade " which matters; even in thinly industrialised areas the scale of development of a trade may be enough to make for efficient establishments.

to in Section 4 (above), *i.e.*, those trades for which reliable data could be obtained for at least five regions.

In each trade the net margin per head of each region was compared with the arithmetic average of the net margins per head in all regions. In this way it was possible to classify the ubiquitous trades in each region into those with net margins per head greater than and those with net margins per head less than the trade average. An analysis of employment in these trades was made, and the results are summarised in Table V.

TABLE V

Summary Data relating to Ubiquitous Trades in the Standard Regions

	Standard regions.										
	N.	E. & W. Rid.	N.M.	E.	Lond. & S.E.	S.	S.W.	M.	N.W.	Wales.	Scot.
(*a*) No. of ubiquitous trades	77	79	79	73	86	68	68	76	90	67	89
(*b*) No. of ubiquitous trades with n.m.p/h [1] above average	30	40	39	43	60	35	29	38	45	15	28
(*c*) (*b*) as % of (*a*)	39·0	50·6	49·4	58·9	69·8	51·5	42·7	50·0	50·0	22·4	31·5
(*d*) Employt.[2] in ubiquitous trades with n.m.p/h [1] above average as % employt.[2] in all ubiquitous trades in region	16·6	75·9	70·4	63·8	66·8	58·0	42·6	65·2	60·1	19·3	28·0
(*e*) Employt.[2] in all ubiquitous trades as % of total employt.[2] in all manufacturing trades in region	95·2	91·7	87·5	92·1	92·0	93·4	87·2	92·2	81·2	72·9	86·4

[1] Net margin per head. [2] Employment.

The figures in line *a* show that there is a fair diversity of ubiquitous trades in all of the regions. With the exception of the North-western region and Wales, these trades account for approximately 90% of all regional employment in manufacturing trades (line *e*).[1]

On a comparative approach it would be advantageous to the national income to develop in the separate regions those trades for which the regions possessed relative advantages. Identifying such trades with those for which regional net margins per head are greater than the average, the extent to which they have been developed in the regions can be measured by the percentage which employment in the " above-average " trades forms of all regional employment in the ubiquitous trades (line *d*). On this basis it can be seen that the East and West Ridings, North Midlands, Eastern, London and South-eastern, Midland, and North-western regions show the most satisfactory patterns of regional industrial development. In these regions over 60% of employment in the ubiquitous trades is in those for which regional net margins per head are greater than the average. On the other hand, Wales, Scotland and the Northern region have less than 30% of employment in such trades. The relevant percentages for these three regions

[1] In the North-western region the percentage is low because of the importance of some highly localised textile trades. In Wales there are more ubiquitous trades than those shown in the table, but in the Census details have been combined with other regions, and the trades had, therefore, to be omitted.

in line *d* are less than the corresponding percentages in line *c*, indicating that the industries for which the regions possess a relative advantage are, on the average, among the smallest employers of labour. For all other regions (excepting London and the South-east) the percentages in line *d* are equal to or greater than those in line *c*. It is particularly interesting to note that Wales, Scotland and the Northern region are the three regions in which the most important Development Areas are sited. The results show that, apart from the heavier incidence of unemployment in these regions associated with the Development Areas, the basic structure of industry is less satisfactory from the viewpoint of the national income than that of the other regions.

Regional diversification of industry implies, *inter alia*, the introduction of new industries to regions, as well as the development of some of the existing ones. Hence detailed recommendations for such a policy cannot be made from Census data, which is, in effect, a summary of developments which have taken place in the past. Nevertheless, Table V shows (line *b*) that there is a number of ubiquitous trades in each region for which the regional net margins per head are greater than the average. A detailed study of such trades might well give some pointer to the sort of new trades which might profitably be developed in particular regions.

7. Conclusions

It has been shown that the most important trades at present associated with regional industrial diversification and Development Area policy are trades which, in the past, have been suitable for widespread development throughout Great Britain. No association was found between the net margin per head of trades and their regional concentration or dispersion, but regional variations of net margins per head within trades seemed to be least for the widely located trades. With regard to location factors, there was no evidence that differential industrial concentration in the regions could explain regional variations in net margins per head. Nor was there any evidence—and this is important—that any regions were in all cases at a systematic disadvantage for industrial location: in all regions there were some trades in which the net margin per head was greater than the average and, therefore, in all regions scope for the profitable development of industry.

The importance to be attached to these conclusions must be governed by the quality of the data from which they have been drawn. Nevertheless, a pattern has emerged, and it is at variance with Mr. Hobson's view that " If new factories are located far away from the (industrial) belt they are likely to lose in efficiency, and, consequently there will be a lowering of the standard of living." [1] On the contrary, the evidence lends support to Development Area and industrial diversification policy and indicates that it is proceeding on right lines.

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[1] Hobson, *op. cit.*, p. 574.

Appendix

Manufacturing Trades Classified According to their Location Coefficients

(1) Trade.[1]	(2) Location coefficient.	(3) % of total employment.[2]	(4) % of total net output.[3]	(5) Average number employed per establishment.	(6) Net margin per head, £.	(7) Coefficient of variation.
Trades with Location Coefficients Less than 0·2						
Bacon Curing, etc.	0·16	0·195	0·223	52	343	20·2
Bread & Flour Confectionery	0·13	1·172	1·265	58	304	8·2
Brewing & Malting	0·12	0·763	1·803	102	940	16·2
Building Materials	0·09	0·618	0·688	60	259	13·4
Canvas Goods	0·18	0·126	0·108	49	233	18·2
Coal-tar Products	0·18	0·066	0·096	78	443	24·5
Glue, Gum & Paste	0·13	0·054	0·073	80	384	19·8
Grain Milling	0·17	0·312	0·485	86	501	22·6
Mechanical Engineering, general	0·14	4·934	5·088	166	220	11·9
Mechanical Engineering, repairing	0·09	0·320	0·278	36	151	20·0
Milk Products	0·16	0·481	0·505	77	275	14·2
Motor Vehicles, etc., repairing	0·08	0·769	0·602	55	107	17·1
Preserved Fruit	0·15	0·473	0·486	138	320	22·2
Printing & Publishing	0·17	1·804	1·830	67	221	11·9
Soft Drinks	0·11	0·219	0·292	39	449	24·3
Soft Furnishings	0·18	0·145	0·132	50	232	20·8
Timber	0·09	0·973	0·928	49	214	9·7
		13·424	14·882			
Trades with Location Coefficients 0·2–0·3						
Aircraft Manufacturing	0·23	1·439	1·344	687	136	49·2
Biscuit	0·26	0·322	0·307	263	258	38·8
Brick & Fireclay	0·23	0·772	0·720	71	173	19·4
Brushes & Brooms	0·25	0·153	0·140	58	253	33·8
Cardboard Box, etc.	0·22	0·425	0·405	95	261	34·9
Cattle, Dog Food, etc.	0·29	0·129	0·159	68	340	39·9
Cocoa, Chocolate, etc.	0·26	0·578	0·596	172	292	7·5
Constructional Engineering	0·25	0·636	0·691	162	232	14·4
Drugs, etc.	0·29	0·507	0·707	158	474	48·2
Electrical Engineering	0·27	2·776	2·545	290	188	31·6
Fertilisers, etc.	0·27	0·164	0·214	89	375	26·8
Furniture & Upholstery	0·21	0·832	0·773	63	176	24·9
Hair, Fibre, etc.	0·21	0·053	0·070	57	458	28·4
Hardware, Hollow-ware, etc.	0·27	1·878	1·742	90	208	17·7
Manufactured Stationery, etc.	0·28	0·455	0·521	110	349	22·7
Mechanical Handling Equipment	0·29	0·313	0·323	180	232	22·9
Miscellaneous Preserved Food	0·22	0·281	0·396	95	478	34·5
Newspapers, etc.	0·27	0·905	1·418	156	421	15·8
Paint & Varnish	0·21	0·353	0·611	91	567	23·4
Paper & Board	0·23	0·710	0·864	240	335	39·1
Plastic Goods, etc.	0·27	0·370	0·297	73	165	23·2
Radio & Telecommunications	0·29	2·159	1·836	478	157	21·9
Railway Carriages	0·29	0·964	0·795	119	161	32·5
Sports Requisites	0·21	0·089	0·068	63	153	40·0
Tailoring, etc.	0·22	3·594	2·499	65	146	21·2
Wholesale Bottling	0·25	0·282	0·505	52	694	45·1
Wooden Containers, etc.	0·22	0·242	0·224	47	222	44·0
		21·381	20·770			

[1] Abbreviated forms of the full titles of trades used in the Census.
[2] Percentage of total employment in *all* Census trades.
[3] Percentage of total net output in *all* Census trades.

APPENDIX—*continued*

(1) Trade.	(2) Location coefficient.	(3) % of total employment.	(4) % of total net output.	(5) Average number employed per establishment.	(6) Net margin per head, £.	(7) Coefficient of variation.
Trades with Location Coefficients 0·3–0·4						
Carts, Perambulators, etc.	0·34	0·078	0·065	73	186	—
Cement	0·39 [1]	0·109	0·240	232	801	—
Chemicals, general	0·33	1·079	1·485	197	369	23·8
Electric Lighting, etc.	0·32	0·177	0·160	109	218	43·5
Glass, other than containers	0·35	0·408	0·418	140	235	29·7
Ice-cream	0·33	0·023	0·044	58	781	—
Iron Foundries	0·35	1·275	1·327	137	216	17·3
Leather Goods	0·34	0·162	0·122	46	170	25·4
Leather, Tanning, etc.	0·31	0·363	0·634	74	603	20·0
Machine Tools	0·37	0·821	0·848	124	220	14·3
Margarine	0·35	0·059	0·094	184	548	—
Motor Vehicles, etc., manufacturing	0·35	3·393	3·547	309	199	26·3
Oils & Grease	0·34	0·101	0·169	55	517	20·1
Polish	0·32	0·063	0·102	74	580	55·8
Printing & Bookbinding Machinery	0·35	0·161	0·171	144	234	15·4
Railway Locomotive Shops	0·34	0·944	0·731	223	162	41·4
Rayon, Nylon, etc.	0·34	0·843	0·892	220	291	21·9
Rope, Twine & Net	0·34	0·144	0·122	82	238	17·6
Rubber	0·33	0·935	1·057	267	291	26·4
Scientific Instruments, etc.	0·38	0·716	0·656	101	192	23·9
Shipbuilding, etc.	0·37	2·483	2·289	341	141	48·7
Shop & Office Fittings	0·31	0·152	0·167	73	242	40·7
Tobacco	0·36 [1]	0·481	0·906	435	727	—
Toys & Games	0·31	0·222	0·177	96	188	20·7
Umbrellas & Walking-sticks	0·30	0·028	0·021	50	156	22·1
Wallpaper	0·37	0·042	0·059	131	455	—
Wire & Wire Manufactures	0·37	0·375	0·429	126	296	11·7
		15·637	16·930			
Trades with Location Coefficients 0·4–0·5						
Asbestos	0·42	0·155	0·220	241	445	—
Brass Manufactures	0·45	0·553	0·569	84	252	29·5
Electric Wires & Cables	0·48	0·684	0·783	758	316	26·8
Explosives & Fireworks	0·40	0·267	0·220	508	129	—
Fellmongery	0·41	0·017	0·020	35	325	40·6
Flock & Rag	0·48	0·071	0·079	37	332	26·9
Fur	0·47	0·082	0·079	36	184	28·5
Glass Containers	0·43	0·257	0·234	342	175	—
Glove	0·44	0·110	0·086	51	214	32·3
Hats, Caps, etc.	0·40	0·179	0·134	62	155	—
Ink	0·47	0·039	0·067	67	547	—
Iron & Steel, melting & rolling	0·44	2·149	2·358	503	212	26·4
Misc. Stationers' Goods	0·45	0·113	0·119	94	311	16·8
Non-Ferrous Metals	0·40	1·120	1·386	220	303	26·6
Roofing Felts	0·42	0·017	0·037	73	788	—
Seed Crushing	0·45	0·105	0·119	223	255	—
Soap, Candles & Glycerine	0·41	0·224	0·291	130	389	14·1
Starch	0·43 [1]	0·027	0·028	134	231	—
Sugar & Glucose	0·42 [1]	0·194	0·273	354	399	—
		6·363	7·102			

[1] Location coefficients obtained by Sargant Florence (*op. cit.*).

APPENDIX—*continued*

(1) Trade.	(2) Location coefficient.	(3) % of total employment.	(4) % of total net output.	(5) Average number employed per establishment.	(6) Net margin per head, £.	(7) Coefficient of variation.
Trades with Location Coefficients 0·5–0·6						
Abrasives	0·50	0·071	0·108	178	456	—
Blast Furnaces	0·55	0·293	0·376	534	306	17·2
Boot & Shoe	0·50	1·197	1·070	119	219	16·6
Carpets	0·50	0·245	0·254	184	307	21·4
Chain, Nail, etc.	0·52	0·839	0·850	122	247	26·4
Cinemetograph Film, production	0·50	0·110	0·230	144	361	—
Dyes & Dyestuffs	0·59 [1]	0·185	0·352	443	602	—
Fish Curing	0·55	0·084	0·065	31	170	21·7
Flax Processing	0·51	0·017	0·007	140	nil	—
Manufactured Fuel	0·55	0·015	0·022	50	388	17·6
Marine Engineering	0·57	0·578	0·490	555	135	40·7
Musical Instruments	0·58	0·068	0·092	65	396	39·2
Narrow Fabrics	0·53	0·195	0·166	87	236	25·3
Textile Finishing	0·55	0·791	0·700	124	188	31·6
Toilet Preparations, etc.	0·59	0·102	0·179	114	664	—
Tool & Implement	0·52	0·309	0·285	86	205	36·8
Wrought Iron & Steel Tubes	0·51	0·406	0·442	295	251	—
		5·505	5·688			
Trades with Location Coefficients 0·6 +						
China & Earthenware	0·77	0·710	0·540	199	158	44·7
Cinemetograph Film, printing	0·77	0·025	0·037	102	372	—
Coke Ovens	0·60	0·198	0·277	209	397	20·4
Cotton Spinning & Doubling	0·74	1·657	1·318	211	192	—
Cotton Weaving	0·70	1·120	0·959	134	222	25·4
Cutlery	0·61	0·139	0·171	75	368	—
Hosiery, etc.	0·61	1·017	0·891	100	243	25·2
Jewellery & Plate	0·60	0·217	0·201	58	201	45·8
Jute	0·89	0·185	0·126	239	165	—
Lace	0·66	0·132	0·152	46	378	—
Linen & Soft Hemp	0·79	0·120	0·085	149	184	—
Linoleum, Leathercloth, etc.	0·64	0·131	0·170	434	371	—
Made-up Household Textiles	0·68	0·044	0·044	40	341	—
Needles, Pins, etc.	0·62	0·227	0·190	117	199	31·4
Steel Sheets	0·61	0·214	0·250	570	247	—
Textile Machinery	0·60	0·725	0·691	160	194	43·7
Textile Packing	0·78	0·027	0·023	40	197	—
Tinplate	0·88	0·178	0·202	403	262	—
Woollen & Worsted	0·70	1·969	2·284	126	365	26·2
		9·035	8·611			
Trades for which Location Coefficients Could not Be Calculated						
Batteries & Accumulators	—	0·171	0·178	270	272	—
Ice	—	0·007	0·011	42	538	—
Incandescent Mantles	—	0·010	0·007	102	201	—
Match	—	0·041	0·040	104	276	—
Mineral Oil Refining	—	0·083	0·142	486	543	—
Precious Metal Refining	—	0·051	0·072	150	400	—
Preserved Meat	—	0·031	0·042	264	427	—
Small Arms	—	0·064	0·054	283	115	—
Spirit Distilling	—	0·049	0·101	48	781	—
Spirit Rectifying & Compounding	—	0·015	0·060	102	1,730	—
Vinegar, etc.	—	0·023	0·038	68	576	—
Watch & Clock	—	0·096	0·083	104	163	—
Wholesale Slaughtering	—	0·011	0·016	2	431	—
		0·652	0·844			

[1] Location coefficients obtained by Sargant Florence (*op. cit.*).

KEYNES AND SUPPLY FUNCTIONS

SIR DENNIS ROBERTSON in the ECONOMIC JOURNAL for September 1955 (pp. 474–5), challenges my statement that Keynes dispensed with the "familiar" supply function, and he quotes Keynes himself as describing his function (Z or D') as "simply the age-old supply function." In my Note in the ECONOMIC JOURNAL for December 1954 (p. 837) I remarked that it "does not differ materially from the 'familiar' supply function in terms of price," because "the relation of the wage-level to the price-level is implicit in Keynes' use of wage-units."

His use of wage-units he explained in Chapter 4. That chapter ends with a passage (pp. 44–5) in which price is equated to the ratio of Z (proceeds) to O (output), and this equation is described as "the ordinary supply curve." Here, I think, Keynes wrote hastily. The ratio of proceeds to output is not a "function" with any causal significance; it is merely a formula for calculating an index number of prices. Whatever influence the price-level has on output is felt equally in numerator and denominator and cancels out.

Keynes disliked the use of an index number, on the ground of the vagueness of "the concept of the general price-level" (p. 39), and objected that an aggregate of outputs of heterogeneous commodities is not a numerical quantity (p. 45). He conceded that for a single homogeneous commodity his formula had a definite meaning. Still it does not express a supply function.

The "ordinary supply curve" for a single commodity would express output as a function of price (in wage-units). That is to say O would be a function of $\frac{Z}{O}$. A transformation would make O a function of Z, and, since O is a function of N, a further transformation would make Z a function of N.

The ordinary supply curve applies to the case of a homogeneous commodity, supplied by a single industry, or to a group of commodities and industries, so long as the demand for the commodities is not materially affected by variations in that portion of the demand which emanates from the income of the group itself. While that condition is fulfilled, equilibrium can be defined as the intersection of the supply curve with the demand curve. The equilibrium can be specified in terms either of output and price or of employment and proceeds.

But when the demand and supply extend to the entire community, demand and supply are no longer independent of one another. Demand induces supply, supply generates incomes and incomes are the source of demand.

Keynes' aggregate supply function and aggregate demand function are statical concepts, representing equilibrium conditions. To every value of Z in wage-units, there corresponds a value of N which will allow a normal margin of profit and will therefore be consistent with equilibrium. Equilibrium then requires that demand, D, = income, Z (or Y). Thus, given equilibrium conditions, the demand curve and the supply curve are *one and the same.*

When Sir Dennis Robertson asks, "How are we to represent the intersection of D and Z on a two-dimensional diagram?" (p. 475), he no doubt has in mind the passage on p. 35 of the *General Theory*: "The volume of employment is given by the point of intersection between the aggregate demand function and the aggregate supply function." The answer to his question is that, D and Z being one and the same, there can be no intersection, and accordingly, Mr. H. G. Johnson's mathematical appendix is full of concavity and convexity, but is quite empty of intersection.

This conclusion does not depend on Keynes' identification of income with expenditure: it holds no less when the equality of D and Y is merely an equilibrium condition.

Mr. de Jong, in his Rejoinder (ECONOMIC JOURNAL, December 1954, p. 841), questioned my assumption that Keynes identified investment and saving. Surely there has never been any doubt on the subject. Their identity is unequivocally stated in Chapter 6 (pp. 61–5), and the point is driven home in Chapter 7 (pp. 74–85). In his article on "Alternative Theories of the Rate of Interest" (ECONOMIC JOURNAL for June 1937, p. 249), Keynes wrote that they "are necessarily equal in the same way in which the aggregate purchases of anything on the market are equal to the aggregate sales." That the identity of saving and investment entails the identity of income and expenditure (consumption, *plus* investment) is explicitly shown on p. 63.

Nor was this a new view on Keynes' part. In the *Treatise on Money* he supposed a difference between saving and investment to be possible, but only in virtue of his special definition of income. He defined income to include only so much profit as is the normal remuneration of entrepreneurs. With actual profit included in conformity with ordinary usage, he made income and expenditure identical in amount (*Treatise*, pp. 123–5). It is curious that this principle, that expenditure is necessarily equal to income, is formally indistinguishable from Say's *loi des débouchés*, that "supply creates its own demand," which (pp. 25–6) "must mean that $f(N)$ and $\phi(N)$ [that is, D and Z] are equal for all values of N." "That is to say," he proceeds, "effective demand, instead of having a unique equilibrium value, is an infinite range of values all equally admissible; and the amount of employment is indeterminate except in so far as the marginal disutility of labour sets an upper limit."

Keynes' identification of saving with investment, and therefore of income with expenditure, likewise makes the amount of employment indeterminate, and, to determine it, he brings in the rate of interest. The function of the rate of interest is to determine the *flow of money*, in its twofold form of income and expenditure. Investment is relevant, because he maintains that only through investment can the flow of money be regulated (Chapter 15). But it is equally true of the classical theory that the flow of money is the determining factor. The classical theory presupposed a metallic standard, which would determine the flow of money in accordance with the quantity theory. The common ground of Keynes and the classical economists is that fluctuations of employment are a purely monetary phenomenon. Keynes' asser-

tion on p. 26, that Say's law " is equivalent to the proposition that there is no obstacle to full employment," is true only if the monetary obstacle be assumed absent. The monetary system may determine Z at such a level that the existing wage-level is inconsistent with full employment. Unemployment will then prevail unless and until either the monetary system allows Z to expand or the wage-level is reduced. I suppose that according to the classical view the proper remedy would be a reduction of wages, for an expansion of the flow of money could only be fortuitous, so long as a metallic standard was faithfully adhered to. A devaluation was as repugnant to the classical economists as a reduction of wages was to Keynes.

The classical economists, however, can hardly be supposed to have regarded a condition of under-employment as one of equilibrium, for they would hold not only that a fall of wages would be the proper remedy, but that, under pressure of competition, the fall would actually occur. But if the level of wages in money be supposed to resist reduction, and if the monetary system be supposed to prevent any expansion in the flow of money, there would be equilibrium in a state of continuing underemployment.

For Keynes, on the other hand, the identity of income and expenditure made any position a fixture unless investment expanded. Income being tied down by the multiplier to the limit allowed by the volume of investment, the flow of money could be increased only if the relation between the rate of interest and the marginal efficiency of capital were such as to cause an increase of investment.

Keynes, it is true, admitted the possibility of a difference between D, effective demand, and Y, actual income, since the former was the demand expected by entrepreneurs. The passage on p. 78 of the *General Theory* referred to by Sir Dennis Robertson is not actually the only one in which this difference is mentioned. It is recurred to on p. 299.

The entrepreneurs' expectations may differ from the actual demand, and presumably the production they undertake, and the prices at which they offer it, will correspond to their expectations. The discrepancy will take effect in an excess or deficiency of sales. But, in virtue of Keynes' definition of investment, a deficiency of sales is investment, and an excess of sales is disinvestment. So, even if the entrepreneurs make a miscalculation, there is no divergence between demand and output. The distinction between expected and actual demand is, therefore, not material to Keynes' analysis. And, when he comes to define his " employment function " as the inverse of the aggregate supply function defined in terms of the wage-unit (p. 280), he actually formulates it not as $N = F(Z)$ but as $N = F(D)$. At that stage Z and D have become interchangeable. It is of interest to observe that, in the early draft of the *General Theory* (that in which D' appears instead of Z), Keynes introduced the employment function with the words, " we prefer to substitute for the well-known Supply Function an alternative which we call the *Employment Function*." He did not define it as the inverse of the Supply Function, and did not mention D' (or Z).

London. R. G. HAWTREY

KEYNES AND SUPPLY FUNCTIONS

I (*Professor Hawtrey*)

I FIND myself in the unwonted position of defending against attack certain features of Keynes's central apparatus, confusing as I personally find it.

(i) At the bottom of p. 44 of the *General Theory* Keynes is *not* asserting a functional relation between price and the ratio of sales proceeds to output. The equation there set out is surely to be read as follows: " Price being defined as sales proceeds divided by output, the supply price of a given output can be regarded as depending partly on the amount of employment necessary to produce that output and partly on the price necessary to induce that amount of employment." I see no reason to object to this statement. But the first $=$ in the equation had perhaps better have been written $\equiv$.

(ii) From the premise that, in Keynes's equilibrium, the *values* of the functions D and Z are equal, Professor Hawtrey seems to leap straight to the conclusion that the functions themselves are identical. This is surely a surprising kind of leap, which, if generally taken, would reduce all supply and demand analysis to futility! Mr. Johnson assures me that the curves representing his functions are perfectly capable of meaningful intersection.

Nevertheless, as I have said in my note, I think Hawtrey's Leap is defensible in this connection *on one assumption*, namely that entrepreneurs believe Say's Law. Now Keynes, while prone to believe that all economists except himself believed Say's Law, seems normally to have believed that entrepreneurs did not believe it, so that expected sales proceeds (" effective demand ") could differ from actual production costs (including associated profits), though a position in which they did so would not be one of equilibrium. But I have suggested that he suffered from schizophrenia about this, and sometimes wrote as though entrepreneurs *did* (mistakenly) believe Say's Law, in which case the difference between D and Z *would* vanish, and disequilibrium would have to be represented as due not to a difference between the value of D and the value of Z but to a difference between the value of D or Z and the value of Y (actual sales proceeds).[1] I am grateful to Professor Hawtrey for pointing out two additional instances of this schizophrenia, viz., the brief and incidental clause half-way down *General Theory*, p. 299, and the notation of Ch. 20, where the function substituted for " the ordinary supply curve " (p. 281, line 1) is most surprisingly labelled not Z_W or even D'_W but plain D_W.

[1] The early draft of the *General Theory*, and my comments thereon, which I supposed to be no longer extant (this JOURNAL, September 1955, p. 476), have now come to light. My memory turns out to have been at fault in one respect; it was not in the chapter under discussion but in a later chapter that, in a passage subsequently removed, Y was introduced and distinguished from D.

II (*Professor de Jong*)

Section 1

The numbers refer to Professor de Jong's numbered sub-sections.

1. There seems to be some misunderstanding about the use of the word " profits." Marshall, Keynes, Hansen and I are all using it to denote the *whole* of entrepreneurial income, whatever the activity in return for which it may be supposed to be being received. De Jong apparently excludes certain elements of entrepreneurial income from " profits " and includes them in " factor costs."

With my (the usual) terminology, it is clear that Hansen, on his pp. 28 and 30, *does* recognise the need to include " profits " in Z, though I cannot agree to describing the profits to be included as " normal profits." They are the profits necessarily associated with a given output on Keynes's assumption that the curve of short-period marginal cost is a rising one, and that output is being carried to the point at which marginal cost equals price. In the kind of short period in which Keynes is mainly interested, namely one in which demand is depressed and unemployment rife, such profits will be *smaller* than normal profits as defined by Marshall.

3. (i) De Jong kindly confirms that in line 4 " an increasing " is a slip for " a decreasing " (see Johnson's Appendix, Section 3).

(ii) I think his reluctance to attach importance to the exceptional cases very properly listed by Johnson is very reasonable, but I do not think he draws the right inference. The right inference is surely that, under ordinary conditions, with methods (i) (*a*) and (iii) (*a*), the Z curve is definitely convex, and with method (iii) (*b*) definitely concave, to the X axis.

(iii) Hansen's curve belongs to the category (iii) (*a*), and should therefore have been drawn as a (probably) convex curve, not as a 45° straight line. To justify the latter procedure the quantity measured along the Y axis would have had to be not Z as defined by Hansen, but, as de Jong says, Z divided by something. But the divisor would have had to be not, as he suggests, W, but the *average* value product of labour, which is a different thing.

The objection to any such procedure is the same as that to the various other diagrams employing the 45° line, namely that they are quite uninformative, the analysis of the " supply side " of the determination of " output as a whole " having taken place *outside* the diagram.

4. I have long been willing to accept an " income-behind-expenditure " as well as an " expenditure-behind-income " lag. Neither Metzler nor others seem to have noticed that this refinement was long ago made by Pigou (*Theory of Employment*, 1933, p. 197). The reason for my original neglect of it was that I was concentrating on the simplest possible case—that of a society of small producer-consumers buying directly from one another—and was concerned to show that even in such a society, where there is no room for the second lag, a sequence analysis is necessary in order to elucidate an inflationary or deflationary process. So I do not like dropping " my " lag altogether, as de Jong does in his equations (1) and (2), in which the money sticks for a time in the hands of the *firm* and is " disposed of " as soon as it reaches the hands of the consumer.

5. Well, let such analyses be called neo-Keynesian if anybody likes! But, of course, both my " step-by-step " analysis and the Swedish " expectational " one were *pre*-Keynesian in the sense of being anterior to the *General Theory*.

6. My rejection of the notion of an upward-sloping supply curve of labour is confined to that element of the supply of labour which is alone relevant to unemployment as ordinarily conceived,—namely the number of individuals seeking work. I have no quarrel with what de Jong says about the *hours* of work, but it does not seem to me to be directly relevant to the discussion of Keynes's definition.

Professor Hansen kindly permits me to state that he now thinks that the first part of his re-formulation of Keynes's " second classical postulate " could better be re-worded as follows: " unemployment is due to the fact that unemployed workers refuse to accept employment at lower real wage rates than are currently being paid." This seems to me to be an acceptable account of the classical position, provided that by B being " due to " A is meant, not necessarily that A is the initiating cause of the occurrence of B, but simply that the removal of A would effect the removal of B.

Section 2

(i) Say's Law, in the sense in which it is untrue, was, I believe, though I have never looked into it, withdrawn by Say himself. It was quietly rejected by Marshall some seventy-five years ago in the simple sentence: " But though men have the power to purchase they may not choose to use it."

(ii) It is not possible to form a considered judgment on Professor Koopmans's system on the basis of the brief summary given by de Jong. But on the face of it, if C is money received by the sale of consumption goods and I money received by the sale of investment goods in any period, then surely it is not " spendings out of income " (whatever that may mean in a totally unlagged system) but *total* spendings on final output in that period, whatever their source, which are equal to $C + I$, *i.e.*, to income received in that period.

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KEYNES AND SUPPLY FUNCTIONS: THIRD REJOINDER AND FINAL OBSERVATIONS

I. Rejoinder to Professor Robertson

Section 1

1. Apparently, Robertson and I have been arguing at cross-purposes. Let me therefore try to reformulate my point against Hansen by making use, where possible, of the formulations suggested by Robertson.

Hansen explicitly subsumes "normal profits" under "costs." As Robertson has pointed out, Marshall, Keynes and Hansen (and Sir Dennis himself) all use the concept of "profits" to denote the *whole* of entrepreneurial income, whatever the activity may be in return for which it is supposed to be received. In my terminology, however, managers' salaries, managers' rents and managers' interests are excluded from "profits." These elements are included in "factor costs," and are therefore automatically included in Z; while genuine "profits" are taken as a residual income (as was done, for instance, in 1921 by F. H. Knight in his *Risk, Uncertainty and Profit*). My point is that even profits in this genuine sense should be included in Z. In the Marshallian terminology it is indeed clear—as Robertson states—that Hansen *does* recognise to include "profits" in Z, but Hansen is mistaken in describing the profits so included as "normal." Marshall writes on pp. 618–19 of the eighth edition of his *Principles*: "Thus the whole of *normal* profits enter into true or long-period supply price" (italics added). Under pure competition and a stationary state, Marshallian "*normal* profits" can therefore represent *only* the sum total of managers' salaries, managers' rents and managers' interests, *i.e.*, the entrepreneurs' personal opportunity costs, since under these circumstances "genuine profits" in the long run must be zero. The Keynesian concept of Z, however, includes these "normal profits" PLUS genuine profits (plus non-extrepreneurial factor cost). Under pure competition and a stationary state, genuine profits are zero. In the kind of short period in which Keynes was mainly interested, namely one in which demand is depressed and unemployment rife, genuine profits will be *negative* (that is, firms will make losses, in the proper sense of this word); this means, as Robertson points out, that "profits" in the broader sense (*i.e.*, the whole of entrepreneurial income) will be smaller than normal profits as defined by Marshall.

3. I agree.

4. It should be obvious that my definitions of "disposable" and "earned income" (Y_H and Y_F) are not Robertson's; the analogy with Robertson's method is confined to defining the disposable income of any period as being equal to the income earned in the previous period. Robertson is not willing to accept my construction, since he believes that I drop

"his" lag altogether in my equations $Y_H \equiv C + S$ and $C + I \equiv Y_F$, in which, according to him, money sticks for a time in the hands of the *firms* and is disposed of as soon as it reaches the hands of the consumers. Personally, I do *not* think that I have dropped the Robertsonian lag (*i.e.*, the consumption lag); it is included in the income-propagation period together with the other two Metzlerian lags. In my construction it is perfectly possible for the money to stick for a time in the hands of the consumers. As this time grows longer, the entire income-propagation period, of course, grows equally longer if the income-expenditure period with the firms, *i.e.*, the sum total of the other two Metzlerian lags, remains constant. My construction is analogous to that of F. Machlup, according to which the disposable income (in Machlup's tables: "Past ΔY") is identically equal to the earned income (Machlup's "Current ΔY") of the previous income-propagation period (Machlup's "Period E").[1]

5. When I suggested to read "Post-Keynesian," I had in mind to define this concept as follows: Post-Keynesian economics is that type of modern economic theory which derives from a synthesis of classical (pre-Keynesian) and Keynesian economics. Incidentally, "pre-Keynesian economics" is a wider concept than "classical economics": it involves, of course, also "pre-Keynesianism" in the sense of "Keynesianism *avant la lettre*."

6. I agree. But in *some* cases it may *become* relevant to allow for the hours of work, namely, when the number of "desired hours" deviates from the actual number of hours a day during which labourers are employed.

Section 2

(i) I agree; see also *General Theory*, p. 19 n., and Hansen, *A Guide to Keynes*, p. 13, who both quote the same passage from Marshall. It is well known that the older underconsumptionists (for instance, Marx) also rejected Say's Law. My point was only that Koopmans made a relatively early "impressive" attack upon Say's Law, to use Hansen's expression. Koopmans was the first to give an elaborate and consistent *theory* based on the refutation of Say's Law.

(ii) Robertson is right in reading "*total* spendings on final output" for my faulty expression: "spendings out of income." I also agree that, owing to pressure of space, my summary of Koopmans' theory was too brief to supply an opportunity for a mature judgment of Koopmans' theory of

[1] F. Machlup: "Period Analysis and Multiplier Theory," *Quarterly Journal of Economics*, LIV (1939), pp. 1–27, reprinted in the volume *Readings in Business Cycle Theory*, Philadelphia and Toronto, 1944, pp. 203–34, esp. pp. 210–15; see also his: *International Trade and the National Income Multiplier*, Philadelphia, 1943. On p. 211 of the reprint of his 1939 article, Machlup writes: "The time interval between the first and the second increase in income [that is, the income-propagation period] was determined by the number of persons through whose hands the money had to pass, and by their particular transaction periods C [that is, their income-expenditure periods], in addition to the income period C of our road workers [that is, *of the households*]." (Words in square brackets are added). Machlup shows here the point of dividing time into periods even if the component parts of the "lag" (*i.e.*, the income-propagation period) are distributed among different economic units.

monetary equilibrium. Since I feel that it is a pity that this theory is not known by most English-speaking economists, I shall elsewhere give a more comprehensive exposition of it.[1]

II. Final Observations

Now that the long discussion of my article on "Supply Functions in Keynesian Economics" [2] is to be concluded, it may be of some use to strike its balance, that is, to supply a summary of the discussion in so far as it has not drifted away from my central theme. I will do so by answering the following question: "If I were now to rewrite my article, which passages would I then formulate differently from the way I did in 1954?"

There are five such passages. In order to keep this summary as brief as possible, I shall follow the admittedly less-elegant method of referring, where possible, to passages which have already been published elsewhere in this JOURNAL. Italicised page numbers refer to my original article.

(i) *P. 9, Fig. 5.* Both curves, D and Z, should be drawn *convex* to the N-axis.

(ii) *P. 9, last line; I should now like to add a footnote to "Fig. 5":* In Dillard's diagram, the D-curve is drawn concave to the N-axis and the Z-curve is approximately linear. Professors D. H. Robertson and H. G. Johnson have pointed out that Dillard's curves do not represent very probable cases. (See the issue for September 1955 of this JOURNAL on pp. 475 and 477–8.)

(iii) *P. 17, line 2 from the bottom; I would now insert a footnote to "p. 28."* To begin with, I would now say what I have already stated above in Section I (Rejoinder to Professor Robertson) under number 1, about the problem of "profits." Then, I would quote what Robertson has said about Hansen's diagram in Section II, number 3 (iii) of his Comment, published in the present issue.

(iv) *On p. 19, the two paragraphs below Proposition X, down to "There can be equilibrium only . . .", should read as follows:*

The intercept between the 45°-line and the curve of aggregate factor costs, $F_r(Y_r)$, in Fig. 7, indicates the profits $P^{\max.}{}_r(Y_r)$ which, if they *were* expected, would suffice to elicit that volume of output.[3] The latter function shows the volume of Y_r—and thereby the volume of employment—which entrepreneurs will supply at any value of $P^{\max.}{}_r$.

The function $D_r(Y_r)$ shows consumption expenditures *plus* investment

[1] See my forthcoming paper on "The Concept of Monetary Equilibrium, and Its Relation to Post-Keynesian Economics," which will probably appear in the issue for September 1956 of the *Weltwirtschaftliches Archiv* (in English). A summary of a recent discussion of the topic in the Netherlands, also from a statistical angle, is given in my article "Méthodes statistiques d'analyse de la situation monétaire" in the issues for March and April 1956 of the *Bulletin d'Information et de Documentation*, published by the National Bank of Belgium (in French; also published in Dutch).

[2] Pp. 3–24 of the issue for March 1954 of this JOURNAL.

[3] I am indebted to Professor Robertson for this formulation. See the September 1955 issue of this JOURNAL, p. 475.

expenditures expected at any value of Y_r, *i.e.*, the proceeds which entrepreneurs actually expect to make at any value of Y_r. The intercept between the D_r-curve and the F_r-curve shows therefore the profits P_r which entrepreneurs will actually expect to make at any value of Y_r. There can be equilibrium only . . . (etc.)

(v) *Insertion on p. 20, between lines 7 and 8 from top:* [1]

Let me make two remarks at this point. First, as has correctly been concluded by Soper,[2] in this process of transformation, the supply aspects of the curve are lost. Soper points out that there is not one but many aggregate supply curves (ZN), each corresponding to a different series of price sets, and they all transform to the same 45°-line. My point is exactly that, for a proper understanding of the *economic* meaning of the 45°-line, it is necessary to consider the model of Fig. 5 together with it.

Secondly, Robertson has directed my attention to the fact that Keynes, on pp. 25 and 29 of the *General Theory*, defines D as *expected* proceeds, whereas on p. 30, he defines it as what entrepreneurs *can* expect, *i.e.*, presumably what they ought to expect because this is what in fact will happen; or, we might as well say that Keynes defines D on his p. 30 as "actual proceeds." (I would then quote the essence of what Robertson has written on p. 476, third paragraph, of the September 1955 issue; and after that, p. 480, line 12 from the bottom of the main text down to the end of Section 4 on p. 482 of my Second Rejoinder in the same issue; I would also insert a footnote containing Section 4 of the Third Rejoinder, published in the present issue. After all this, I would proceed as follows:)

It is now possible to add a caution on the issue of the equilibrium conditions included in the simplified models of Figs. 1 and 5.

In the case of Fig. 1, the equilibrium condition reads:

$$S_r = Y_r \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.4)$$

However, it is certain that Keynes himself treated the equality of saving and investment as an identity:[3]

$$S_r \equiv I_r$$

Are not these two views incompatible?

The crucial point is that Keynes chose to define the concepts of saving and investment entirely *ex post*; that this is so (although Keynes did not use the terms "*ex ante*" and "*ex post*" in his *General Theory*) appears from his argument on pp. 75–6, where he rejects Professor Hawtrey's suggestion that "investment" should be defined to exclude undesigned increments in the stock of unsold goods. Neither did Keynes define "saving" to exclude undesigned saving. It is because Keynes deliberately included undesigned components in his definitions that, in his argument, the relation between saving and investment must be written $S_r \equiv I_r$.

[1] If I were to rewrite the article, I would give this insertion in small print.

[2] C. S. Soper: "The Supply Curve in Keynesian Economics," *South African Journal of Economics*, XXIV (1956), pp. 1–8, esp. p. 8.

[3] *General Theory*, pp. 61–5 and 74–85.

The difficulty is here that no conclusive equilibrium theory can be built up by means of such an *ex post* identity. To obtain a conclusive theory, all magnitudes in the behaviour equations must be defined *ex ante*, that is, as purely " designed " magnitudes.[1] In my equation (1.4), S_r and I_r are taken as *ex ante* magnitudes. This equation is apparently not a " Keynesian " but a " Post-Keynesian " equation.

I feel, however, that it is possible to detect the equilibrium condition of *ex ante* $S_r = I_r$ also in Keynes' own work, be it only in an *indirect* or *implicit* formulation. In the model of Fig. 5, the equilibrium condition reads:

$$D = Z^2 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (5.3)$$

In this equation, Z, *i.e.*, macro-economic aggregate supply price or income actually received, denotes the sum total of micro-economic aggregate factor cost plus the sum total of micro-economic (genuine) profits. Therefore, Z is exactly the same concept as " disposable income " (Y_{II}) as defined in this paper. Further, D, which stands for proceeds, whether expected or actual during the current period (or effective demand, or expected income) coincides with the concept of " earned income " (Y_F) as defined in this paper. It is therefore legitimate to reformulate Keynes' equilibrium condition (5.3) as:

$$Y_F = Y_{II} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (5.3\ bis)$$

Subtracting:

$$C \equiv C$$

we obtain:

$$I = S \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (\sim(1.4))$$

where I and S are taken *ex ante*.[3]

It appears that the equilibrium condition (1.4), which was explicitly rejected by Keynes, is none the less implicit in his own exposition.

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[1] Much confusion exists about the problem of how to define the concepts of " *ex ante* " and " *ex post* " in a consistent way. I will try to formulate such definitions in my forthcoming paper in the *Weltwirtschaftliches Archiv*.

[2] *General Theory*, p. 25. It is evident that Keynes treats this equation as an equilibrium condition and that any components included in D and Z must therefore be *ex ante* magnitudes.

[3] Only of *ex post* values of income Z (so that *ex post* $Z \equiv D$) it can be said that the *curves* D and Z will entirely coincide even when entrepreneurs do not believe in Say's Law. I feel that this is the solution of the difficulty raised by Hawtrey in his Comment, published in the present issue of this Journal, where he writes: " Thus, given equilibrium conditions, the demand curve and the supply curve are *one and the same*." But Keynes thought in terms of *ex ante* Z, and then these curves represent behaviour equations which do *not* coincide. I agree with Robertson in his Rejoinder to Hawtrey that Hawtrey's " leap " is a surprising kind of leap.

THE GROWTH OF BRITISH INDUSTRY[1]

The recent interest in long-term economic growth and in the process of industrialisation at all its stages has put a premium on the quantitative records of economic history. Many of these records are grossly inadequate to the purposes for which we should like to use them, but they exist in considerable volume, and their exploitation has been long overdue. Professor Hoffmann's attempts to measure the secular trends in Britain's total industrial output over a period of two and a half centuries are an important and substantial contribution to a neglected field of research.

Professor Hoffmann's work in this field is already well known of course. The original edition of his book was published in German more than fifteen years ago.[2] It has been commonly quoted and used by English-speaking economists for at least ten years. But the barrier of language is surprisingly powerful. Many of those who have been exposed to the original text have never had the temerity to use the final results, and those who have made use of the famous index have often criticised it without attempting to improve upon it.

It must be admitted also that the composition and basis of the index are far from clearly defined, even when there are no problems of language to be overcome. The author expects his readers to take a great deal on trust. We are given the final indices, all converted to a 1913 base, with none of the original quantity series and with none of the basic estimates of value from which the various systems of weights are derived. We are told what proportion of the total industrial output of the United Kingdom is thought to be reflected in the index, but we never learn what has been left out, or how in practical or in theoretical terms the author defines total industrial output. Those who use Professor Hoffmann's results must wear blinkers unless they are prepared to go back to the original sources in full detail. They may be forgiven if they take refuge in a vague scepticism.

This is an unfortunate state of affairs, for Professor Hoffmann has produced an index (or rather a set of indices) which is unique in its temporal and industrial coverage. He has done more than any of his predecessors in this field to compile and analyse the records of British industrial growth. If his data are not always strong enough to support his conclusions, it is important to know the areas of their weakness and their strength. It may be a long time before the Hoffmann index is replaced throughout its length and breadth by a better one. The need for a thorough assessment of its reliability will be felt by all who are interested in the character and causes of British economic growth.

[1] A Review of *British Industry 1700–1950*, by Walther G. Hoffmann. Translated by W. O. Henderson and W. H. Chaloner. (Oxford: Basil Blackwell, 1955. Pp. xxiii + 338. Price 35*s*.)

[2] *Wachtsum und Wachstumsformen der Englishen Industriewirtschaft von 1700 bis zur Gegenwart*. (Jena, 1940.)

It is the object of this note to attempt to evaluate the Hoffmann ind in terms of its underlying data. Unfortunately it cannot claim to be mc than a first attempt at such an evaluation. Partly because Professor Hc mann has been so tantalisingly obscure about the intermediate stages of l estimates, but largely because he has covered such a wide area that only thc who have attempted the same gargantuan task can be familiar with all l original series, it is likely that more than one review of his work will required before we have sufficiently definite and complete assessment.

Methods of Measurement and their Results

The Hoffmann index of total industrial production is a weighted avera of output indices calculated for different branches of industry. Thc are seven weighting periods, for each of which the author has calculated t net output of all industry and the net outputs of those industries for whi he could find indicators of the year-to-year change in physical output. T value estimates are not given, but it would appear that for the first fo weighting periods (*i.e.*, up to 1860) they were derived mainly if not entirc from contemporary estimates of gross output.[1] The conversion from gr to net was made " on the basis of a number of calculations concerni industrial output in various countries at various times—particularly t early statistics of output in the United States as well as isolated figures frc British sources." For the three weighting periods which covered the l ninety years of the index, the estimates of net output seem to have be made by applying estimates of average earnings to Census of Populati occupational data and (in the twentieth century) on the basis of Censu of Production.

The component indices for different industries are based on actu production statistics wherever possible and on " representative " or " su stitute " statistics where there are no direct indicators of output. Actua until the second half of the nineteenth century few of the production ser are direct indicators, for they either cover the output of limited geographic areas only or are unlikely for other reasons to be comprehensive. Few of t excise series, for example, were complete in all respects for the whole of t United Kingdom, even if we discount the possibility of evasion varying wi the level of tax. However, " representative " or " substitute " indic were often reasonably satisfactory indicators of long-term trends. Ra cotton imports are probably as good a reflection of the growth in the man facture of cotton yarn and cloth, for example, as one could hope to obta when direct data are non-existent.

[1] P. 17. A footnote on this page states that " Statistics of the value of gross output certain industries are available for the years 1783, 1812 and 1850." For 1783 the source is p sumably the estimate quoted (but very sceptically) by D. Macpherson on p. 15 of Volume IV of *Annals of Commerce*; for 1812 it is probably Patrick Colquhoun's table of new property crea annually in his *Treatise on the Wealth, etc., of the British Empire* (although these are estimates of output rather than of gross output); and for 1850 it is possibly Braithwaite Poole's *Statistics British Commerce*, which claimed to estimate the " total weight and value of everything movea except Passengers . . . on the railways." For the 1740 estimates of net output the only clue are given is that they are based on " other contemporary evidence."

In combining his indices Professor Hoffmann has distinguished consumer-goods industries and producer-goods industries. He has calculated an index of total industrial production inclusive of building as well as exclusive of building. Finally, he has compiled a number of non-industrial indices which are designed to sketch in part of the general background against which his production indices should be set: these include indices of railway traffic, shipping clearances, letter post, patents, bankruptcies, quotations of stocks and shares, and population.

To these various indices Professor Hoffmann has applied various measures of growth and trend. His preferred measure of growth is a " mean coefficient of expansion " which is an arithmetic mean of annual percentages of expansion of output calculated by the method of Least Squares.[1] He distinguishes this from a " mean rate of growth " which is a geometric mean of year-to-year output relatives. He has further analysed his data by means of a double ten-year moving geometric average designed to show changes in the average growth of output taken over a fairly long period of time.[2]

The mean coefficient of expansion derived from Professor Hoffmann's total industrial output index works out at 0·9 for the period 1700–80, 2·8 for 1781–1913, 2·6 for 1819–1913, 2·0 for 1855–1913 and 0·9 for 1923–35. Actually he inclined to the view that the industries forming the basis of his index for the period 1700–80 expanded faster than the national average and that the coefficient for this period " might reasonably be estimated at 0·7 or 0·8 rather than at 0·9." [3] He deduced from his data that the main turning point in the industrialisation of the United Kingdom occurred about the year 1780, and that it initiated a period of very rapid industrialisation which was temporarily checked by the Revolutionary and Napoleonic wars, but which was resumed after about 1817 and continued until about 1855. After that the rate of industrial growth began to decline. In terms of the annual percentage rate of growth, Britain's industrial output (including building) increased by less than 2% in the eighteenth century and after 1876; by between 3 and 4% in 1780–92 and again in 1818–55; and between 2 and 3% during the Revolutionary and Napoleonic wars and in the period of transition which he has ascribed to 1856–76.

By further analysis, variations in the patterns of growth as between industries have been illuminated, and the author has made his own attempt to explain them. The " typical " pattern of evolution of British industry has involved three stages—a stage characterised by a rising rate of growth of output, a stage where absolute output is still rising but the rate of growth is declining, and a stage where there is an absolute decline of output. Most British industries, according to Professor Hoffmann, " have now reached the phase of retarded expansion in the growth of their rates of output." [4]

[1] The equation is $\log b = \frac{\Sigma x \log y}{\Sigma x^2}$, where b is the mean coefficient of expansion. Pp. 65–7.

[2] This gives him his " annual percentage rate of growth " or " mean rate of growth." Pp. 117–20.

[3] P. 34.

[4] P. 191.

Eighteen of the forty-five industries examined by him appear to have reached the stage of absolutely declining output. In discussing the reasons for the decline in British industries Professor Hoffmann has laid most stress on the growth of competition in home and overseas markets. He has pointed to the Free Trade policy of the mid-nineteenth century as the significant factor in checking the current rate of expansion of important British industries.

Finally, Professor Hoffmann has drawn attention to the existence of a long wave in Britain's industrial output. In most cases the long wave has been found to last twenty years. " These fluctuations are obviously different from the approximately ten-year trade cycle which economists have often described in the past." [1] On the basis of a comparison of his pre-1800 data and post-1800 data he had concluded that the average duration of the long wave tended to increase as Britain became more industrialised. By a comparison of various pairs of industries which satisfy joint or similar demands or are associated in some ways during the process of production, he has produced some suggestive conclusions concerning the correspondence between their long waves.

This very brief account of Professor Hoffmann's methods, results and conclusions does not attempt to do justice to the wealth of statistical material and analysis which is crammed into the covers of this one volume. It is hoped, however, that by summarising the process and uses to which the author has submitted his material it has set the stage for a discussion of the basic strength of the index in the light of the burdens which have been placed on it.

The Basis of the Indices

It is obvious that the reliability of the index and of its various component indices will vary with the quality of the underlying series and their coverage in relation to the industry or industries whose trends they are designed to reflect. Since quality and coverage both vary through time, it is convenient to consider the composition of the Hoffmann index at its different weighting periods.

The weights at each period and the relative weight of the selected industries as a whole are set out in full.[2] Not all the indicators for the selected industries were available for the whole of the weighting period in which they were absorbed into the index, and the table of weights does not give a complete picture of the coverage of the index at particular points of time. This is particularly true for the eighteenth century, when the number and importance of the new series absorbed in the course of each weighting were both high. For the period 1700–60 the selected industries are given a weight of 47% of total British industrial output. But the main constituent of this 47% is the woollen industry with a weight of 32%, which does not

[1] P. 134.

[2] Pp. 18–19. It would have been very much easier to assess the value of Professor Hoffmann's index if he had given us the net output estimates which form the basis of his calculation of total industrial output and of the industrial output of the selected industries at each weighting period.

enter into the index until 1739. So for the first four decades of the century the index covers only 15% of his estimated value, and of this more than 60% is attributable to coal shipments into the port of London and malt charged to excise in England and Wales. It is seriously open to question whether the trend in coal shipments into London was a good reflection of the trend in total output of coal, and even more open to question whether this coal can be regarded as primarily a producer good. The malt series is obviously not a simple one. Although it moves in broad sympathy with the excise series for the output of strong beer during the first half of the century, it behaves very independently at the end. By the last decade of the century, for example, when the average annual output of strong beer charged to excise was running at a level which was nearly 50% above that of the first decade, the corresponding increase for malt was under 10%.[1]

The series underlying the index for the woollen and worsted industry, which appears in the index in 1739, is a series for woollen cloth produced in the West Riding of Yorkshire. According to contemporary estimates Yorkshire accounted for about 42% of the total value of the industry's output in 1774,[2] and although it would be unwise to assume that the industry grew at the same rate in other parts of the country, the series probably reflects the trend for an important proportion of the total output. However, when this series first became available it was available in terms of pieces rather than of yards, and, since the yardage per piece varied substantially, the record of pieces is no reflection of the trend in output.[3] It was presumably for this reason that from 1769 onwards the record began to be given in yards, and the corresponding record of pieces shows that the variation in length continued. Hence for the first seven decades of the eighteenth century the index is almost entirely based on London consumption of coal, a malt series that requires a good deal of explanation and a series for woollen textiles which is certainly a distorted reflection of the output it directly records.

The second weighting period runs from 1761–1800, but most of the new series absorbed during this period were not included until after 1780. The cotton industry was given an increased weight, and from 1760 onwards the series for the imports of raw cotton accounted for a growing proportion of the movement in the index. But the re-weighting reflected a growth in several industries not included in the index (or not included until after 1785), and it happens that around the year 1780, which Professor Hoffmann has identified as a turning point in the rate of British industrial growth, the coverage of the selected industries was only 43% according to his

[1] The excise series for malt and for beer (which is not included in the Hoffmann index until the end of the century) are given by T. S. Ashton in *An Economic History of England: The 18th Century*, 1955, pp. 241–2. Professor Ashton also reprints a number of other series for the eighteenth century, some of which have been used by Professor Hoffmann and some of which have not.

[2] Estimates of the Committee of 1774 quoted by Herbert Heaton, *The Yorkshire Woollen and Worsted Industries*, p. 280.

[3] According to a contemporary, the average length of a piece of broadcloth doubled between 1727 and 1757. Joseph Massie, *Ways and Means of Raising the Extraordinary Supplies, etc.*, 1757.

estimates, nearly two-thirds of which was attributable to London's receipts of coal and the West Riding woollens, and a further 15% to imports of raw cotton. It is difficult to see how this flimsy evidence could be so convincing as to establish that " the change in the rate of production which occurred about 1780 was so definite that it clearly marks an epoch in the evolution of Britain's economy," [1] or to justify conclusions concerning a lengthening of the long wave for British industry.[2]

This is not to deny that in the last two or three decades of the eighteenth century the crucial turning point did occur. Almost certainly it did. But Professor Hoffmann's claim to have dated the turn—more or less precisely—is not substantiated by his evidence: nor is his claim to have measured the extent of the change in the rate of output at this point. It is possible—even probable—that the rate of growth in the decades before 1780 was higher than the data on London coal consumption and West Riding woollens would suggest. Equally it is probable that the series which were absorbed into the index after 1785 had entered on their stage of rapid expansion several decades earlier.

In sum the index for the eighteenth century is of very doubtful value. It seems likely that the import and export statistics have a better claim to be regarded as an index of the long-term trend in the volume of industrial production than a combination of this limited selection of doubtfully representative production series.

At the turn of the century, however, the index is in a much more healthy state. The weights for the weighting period 1801–30 have the benefit of some well-considered output estimates made by Eden and Colquhoun.[3] The number of series included is considerably expanded both by the addition of new excise series and by a variety of commodity import and export data. For this period and the succeeding one the author has estimated that his selected industries cover more than three-quarters of the total industrial output of the United Kingdom including building. It is a question whether they can be held to cover as much as this of the industrial output of Ireland (which then accounted for about a third of the population of the United Kingdom), but as Britain's industrialisation gathered momentum the importance of Ireland's share in industrial output declined. It is also doubtful whether the distinction between producer goods and consumer goods is very rewarding at this stage. The series for producer goods are very indirect or very incomplete, and it is not until around the middle of the next weighting period (1831–60) that they become strong enough to stand alone. For manufactured consumers' goods, on the other hand, there is a fairly wide selection of series by the beginning of the century.

In effect, therefore, for the early years of the nineteenth century the Hoffman index summarises a great deal of valuable evidence, is unique of its

[1] P. 32. [2] P. 134.

[3] A calculation by Sir Frederick Eden of the output of most British industries for about 1800 is quoted by Macpherson, *op. cit.*, Volume IV. Colquhoun's estimates, *op. cit.*, are based on a considerable range of contemporary estimates, and are given in elaborate and rewarding detail.

kind [1] and merits serious consideration as a reflection of the broad trends in Britain's industrial output at that period.

The strength of the underlying estimates and of the individual series certainly increases as we move on through the nineteenth century. There are many more direct and relatively reliable production series. The Census of Population occupational returns and the growing wealth of wage data provide additional buttresses to the output estimates and, beginning in 1907, we have the first of the Censuses of Production.

It is interesting to note, however, that in terms of its industrial coverage the index seems to have reached its peak in the 1861–90 weighting period, when it was estimated to account for over 80% of total industrial production including building. From then on, presumably as new industries increased in number or size, the coverage of the index declined, so that in the first thirty years or so of the twentieth century it was estimated to account for about 72 or 73% of total industrial production, which was rather less than had been claimed for it during the early decades of the nineteenth century. Now it may be that when the Censuses of Production were available the author was in a better position to estimate the size of the universe within which his selected industries lay, and that in earlier periods he had overestimated the coverage of the index. It is, however, a plausible assumption that the expanding economy of the late nineteenth and early twentieth centuries was responsible for an increase in the number and size of industries which lay outside the index. If we assume, however, that the excluded industries were largely new industries and that the effective index was therefore heavily weighted with old industries the probability is that Professor Hoffmann has underestimated the rate of growth in his last two weighting periods—that is between 1891 and 1935.[2]

In sum therefore I would argue that for the eighteenth century Professor Hoffmann's index is too inadequately based to throw much light on the history of British industrial growth at this crucial period and that it adds nothing to the evidence already available in published trade and excise statistics. For the nineteenth century and (probably to a lesser extent) for the twentieth century, on the other hand, it is a highly significant contribution to the basic material for an analysis of economic growth. It will

[1] Lord Beveridge published an index of industrial activity in two articles published in *Oxford Economic Papers*, 1940. They were " The Trade Cycle in Britain before 1850 " and " The Trade Cycle in Britain before 1850: A Postscript." The index is based partly but not entirely on the series which Professor Hoffmann used, and it would be interesting to compare the two indices. Unfortunately Lord Beveridge, like most trade-cycle enthusiasts, has deliberately and effectively eliminated the trend.

[2] Cf. the criticism made by Professor W. Arthur Lewis in the Statistical Appendix to his article on " World Production Prices and Trade, 1870–1960," *Manchester School*, Volume XX, 1952, No. 2, p. 135. Professor Lewis writes of the Hoffmann index that: " The downward bias of this index is such that when comparison is made with the Censuses of Production of 1907 and 1924 Hoffmann's index is seen to underestimate the increase of postwar production by at least 20 per cent." It should be noted that Professor Hoffmann, on being informed of this criticism, did not feel that the available statistics were sufficient to justify a revision of the index (footnote p. 208).

be appreciated, however, that there is a considerable subjective element in this assessment. Others may find that Professor Hoffmann's small selection of eighteenth-century series provides a more convincing reflection of industrial trends at that period than has been suggested here. Certainly those who are familiar with the details of his nineteenth-century series, and with the economic history of industries which have been omitted from the twentieth-century index, will have a great deal more than the present reviewer to say about the composition and quality of the index in more recent periods. The value of Professor Hoffmann's researches in this field, however, is such that his results would well repay further scrutiny and analysis.

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REVIEWS

An Economic History of England. The Eighteenth Century. By T. S. ASHTON. (London: Methuen, 1955. Pp. 257. 18*s*.)

IN the fifty years since Mantoux published his classic account of the " Industrial Revolution in the Eighteenth Century " a steady flow of monographs and articles has changed many of the older views and made a new work on that century imperative. That Professor Ashton should now have undertaken this task is particularly fortunate, for his own contributions to the study of this period have been so massive. And he has again in this book broken new ground in many places. The fresh evidence of the output of certain commodities and the tables of exchange rates which he so modestly relegates to an appendix constitute a major step towards the building of a quantitative framework for the study of eighteenth-century trade and industry. The result is a work which will remain a standard reference for years to come. It exhibits once more those qualities that lend such distinction to Professor Ashton's work, the discrimination and integrity in the handling of evidence, the taut but readable economy of words, and the apt illustrations and distilled reflections that only a life-time of study can command.

The book opens with an introductory survey of the people of England, their occupations and their wealth, their habits of economic calculation as well as their love of gambling. By laying alongside one another two parallel sketches, one which emphasises elements of mobility, both geographical and vertical, in the population, and the other which shows the cheapness and increasing mobility of capital, Professor Ashton neatly sets out many of the pre-requisites of economic advance.

How that advance was achieved, in all its local variety, is the central theme of the chapters on agriculture, industry, transport, finance and labour. These essays are too rich for summary and comment. All that a reviewer can do is to mention some of the major features. For agriculture there is an up-to-date account in which the increasing size of farms and the specialisation of crops are given full weight in addition to enclosure and improvement, which so often are solely invoked to explain increasing output. A major new contribution is the description of those industries, and they were many, which were largely dependent upon agriculture for their raw materials, whose prosperity or depression waited upon the harvest or upon the health of livestock. In the discussion of industrial change, better management, the use of local coal, timber or water supplies, all receive attention, but at the centre of the process called the industrial revolution lies " the speeding up of production and distribution by the new machines and new means of transport, [which] made it possible to transmute circulating into fixed capital " (p. 112). The chapter on labour, which should be read in conjunction with

that on industry, reveals the insecurity of life and irregularity of work under those industrial arrangements whose variety and whose impersonal nature lies concealed under the headings of outwork or domestic " systems." Professor Ashton shows how, gradually, with more regular supplies of raw material, and with better organisation, a section of the labour force came to be employed more continuously and more efficiently. Over living standards he is cautious, but gives a general impression of upward movement in " the progressive state." In all these chapters the aim is to supplement existing accounts, and emphasis is placed upon continuity of development; for the story of technological advance students can easily go elsewhere. Even here, however, Professor Ashton has firmly revised the chronology of industrial change; it was in the late 1780s rather than in the 1760s that there occurred the sharp upward movement of industrial output which we think of as revolutionary.

Professor Ashton's mastery is time and again revealed, and it is at the risk of appearing arbitrary that the following comments are offered upon the core of the book. On the recently re-opened problem of the rise in English population Professor Ashton has some excellent pages. His suggestion that the growth of numbers in the first half of the century was limited by disease and harvest failure is important. Equally his discussion of the limitation on the total number of marriages due to the disproportion in the balance of the sexes within the narrow areas from which people took their marriage partners should be set alongside Professor Habakkuk's emphasis on the age of marriage in limiting births in a pre-industrial society.

Secondly, one must register a note of caution about Professor Ashton's emphasis on short-run changes in interest rates, which in the present volume are closely linked with fluctuations in investment. He now regards interest rates as indicators of the ease of borrowing, of the willingness of lenders to lend, and tends to restrict the positive stimulus of low interest rates to the constructional industries—building, turnpikes and canals. There are difficulties in weighing the evidence in support of this view. First, the use of the Funds as indicators may reflect primarily credit conditions in London; there is still some way to go before we can be sure how far London and provincial lending and borrowing facilities were linked. Secondly, while speculative building seems to reflect changes in the cheapness and availability of credit, I should like to see more detailed proof of the concern of canal and turnpike builders about interest as an element in costs, compared with say materials or labour.

An outstanding virtue of Professor Ashton's writing is its candid preference for revealing to the student what we do not know, rather than papering over the cracks of historical research. Lack of records prevents us from reconstructing the lives and work of " those rural craftsmen who must have outnumbered the workers in several of the more highly organised industries " (p. 91). Elsewhere we are reminded of our ignorance of the history of building in a great age of construction, of shipbuilding in a maritime power, even of shopkeeping in the nation of shopkeepers. In this way

the book will act as a starting point for further research, because its candour and comprehensive sweep deepen our sense of the unevenness of recent investigations. The excellences of our industrial history are largely the product of the Manchester school; we are at present less well informed about some of the London industries, and of those in the South that either declined or stagnated. As their archives are explored the economic activities of landowners may need a greater or a different emphasis—what proportion of their income or how much borrowing was devoted to building the Georgian country houses, not to mention the architectural extravagances of the great? Nor will a firm judgment on the social conditions in the new industrial towns be possible until, as Professor Ashton notes (p. 18), we have more histories, both of the older and the newer creations. His remarks about the standards of administration shown in the canals and turnpike trusts suggest further inquiries about the social history of the early professional groups who helped both to run this society and to improve it: the schoolmasters and parsons, as well as the Dissenting Academies, that raised its level of literacy; the local attorneys who arranged so much of its business and helped widen the market for capital; the estate stewards who were in a strategic position to encourage agricultural improvement.

To a large extent such considerations affect the chapter on foreign trade, which I found the least satisfying. The difficulty of handling the statistical evidence, and the relative paucity of mercantile records so far discovered, make such a chapter difficult to write. There are few lives of the merchants to set against the lives of the engineers, and there are serious gaps in our knowledge of the commercial history of such ports as Bristol, Glasgow, Hull, even London. The upshot is a chapter which tends to be rather too descriptive and too static. There is less of the sense of the rivalry of Englishmen and Dutchmen, of the slow triumph of London over Amsterdam than one could wish for. And when all allowances are made for the dangers and defects inherent in the trade statistics, the decision to print Mrs. Schumpeter's table poses major questions about the growth of foreign trade upon which a somewhat more extended comment with Professor Ashton's acuteness would have been invaluable. How far were foreign trade and contacts uniquely significant in stimulating economic change? The export trades were often highly competitive, while the imports of cotton piece goods had helped create new fashions for Lancashire to supply, and imports of tea, coffee and sugar, were a major factor in the expansion of the potteries. Elsewhere Professor Ashton writes of the clear grasp shown by Arkwright of the link between industrial progress and changing habits of consumption. Such an analysis might be extended to foreign trade, with all its attendant stimuli to curiosity, comparison and the borrowing of foreign techniques.

It would seem captious to end by asking for more, because we hope there is more to come. Two topics, the history of fluctuations and the discussion of war and economic change, have been omitted and reserved for separate treatment elsewhere. And with his discussion of the government's war policy it would be admirable if we could be given Professor Ashton's con-

sidered verdict on the effects of government economic policy more generally. George Unwin emphasised that economic advance came from the spontaneous and voluntary activities of individuals rather than from the State, yet one needs to know how far such activities were affected or distorted by government action in this, the age of Adam Smith. Too modestly, Professor Ashton refers to his as a narrow window, but from it he has surveyed the eighteenth-century economic landscape more searchingly than any other historian, and this, his latest work, will both act as a landmark in the development of the subject and provide ample guidance for further exploration.

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The Economics of Location. By A. LÖSCH. Translated from the second revised edition by W. H. WOGLOM with the assistance of W. F. STOLPER. (New Haven, Connecticut: Yale University Press, 1954 (London: Geoffrey Cumberlege, 1955). Pp. vii + 520. 60*s.*)

FOR one reason or another, the theory of location is almost entirely neglected in the Anglo-Saxon literature. There is the work of Hotelling, Lewis and Chamberlin and a few others, a number of empirical studies and that seems to be all. While we often hear of the importance of time to an understanding of economic events, the significance of space is rarely mentioned. Ohlin's *Interregional Trade* seems to be the only book in English which at least poses some of the more important questions of location. Palander's *Beiträge zur Standort'stheorie* (1935) is untranslated and rarely quoted, while Weber is probably largely unread. Moreover, even most of the German works date from the thirties.

There is thus a very real gap in our analysis which this book does a great deal to fill. It must be said at once, however, that *The Economics of Location* is not only a very long but also an extremely difficult work. Lösch, cultivating virgin ground, had to invent so many new concepts and to take up such a variety of novel points of view that he seems to have had little energy or inclination left for the task of communicating his ideas to others. His untimely death is also no doubt responsible for the lack of clarity. It would, however, be a great pity if this shortcoming were to mean the neglect of what, undoubtedly, is a book of the first importance.

The volume is divided into four parts: Location, Economic Regions, Trade and Examples. Of those, the part entitled Economic Regions is the most important. It is here that on the basis of a number of simplifying assumptions a quite remarkable general theory of market areas is developed. Starting with the production of a single good and the assumption of Chamberlinian tangency and an evenly distributed population, we are led through the familiar hexagonal-market-area analysis to a picture of interrelated market areas (economic landscape), with many goods, the location of towns

and ideal transportation networks. Modifications are then introduced to take account of the complexities of real life, and while this inevitably reduces the precision and generality of the argument, sufficient remains to make the results both interesting and practically important. The discussion of the effect of imposing relatively arbitrary political frontiers on an economic region is admirable and very instructive.

There is one complaint. The hexagonal market area is deduced from the assumption of zero profit (tangency). When this assumption is abandoned (as Lösch does only very rarely when discussing price discrimination and base-point pricing) it makes a great deal of difference to the analysis, and one would have liked to have this examined in greater detail. There is also the curious fact that in discussing the case of a discontinuously distributed population, gaps are allowed to appear between the hexagons, when the *raison d'être* of these is that they constitute one of three geometric forms which allow the filling of a space without corners and gaps. The argument here is far too compressed for comfort.

The part on location is also extremely interesting, although less original. It is here that Weber's theory is subjected to a searching criticism and Palander's work extended. The method of analysis in a number of cases is more familiar, since it has obvious contacts with linear programming. The chapter on town settlements is masterly, as are the chapters on agricultural and industrial location. The former should be carefully read by those interested in the theory of agricultural rents. The only really unsatisfactory chapter is the one on General Equilibrium Analysis. It is not that there is any objection to counting equations; it is rather the quite unexplained and fortuitous nature of the assumptions, for example that "the locations must be so numerous that the entire space is occupied" (p. 95). The functions used in setting up the equations are also insufficiently specified.

The part entitled Trade consists of an analysis of Interregional and International Trade in the light of location theory. Again it is quite impossible to summarise the many new and interesting propositions which appear here. But the spatial multiplier analysis deserves special mention, as does the criticism of the doctrine of comparative costs as applied to countries. The final part gives numerous examples lending some support to Lösch's theory of location and show what an extraordinarily wide knowledge of the facts he combined with high theoretical ability.

It is to be hoped that this book will stimulate further work in the theory of location. It would also be of great help if someone would write a companion volume elucidating the many obscurities and amplifying and explaining the numerous elliptic passages.

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International Economic Papers, No. 5. Translations prepared for the INTERNATIONAL ECONOMIC ASSOCIATION. (London: Macmillan (New York: The Macmillan Company), 1955. Pp. 199. 15*s.*)

FOR the fifth number of *International Economic Papers*, the editors have chosen to pay a tribute to the golden age of Italian economics, the twenty years from 1890 to 1910. Three-quarters of the volume is devoted to contributions of that period—and chastening reading it is for anyone brought up in the Anglo-centric view that contemporary economics began sometime in the 1930s. The remainder of the volume consists of recent articles from a variety of languages, all of which are relevant to current English-language discussions.

The Italian papers are introduced by Luigi Einaudi's *Reminiscences* of fifty years of Italian thought—an affectionate ramble through the great names of Italian economics, distinguished by the author's deep understanding of what economics is about. Professor Einaudi lays great stress on the influence of Croce (" Don't think—calculate ") in turning Italian economics from historical generalisation to pure theory. His description of the failure to complete the next step after the elaboration of general equilibrium theory (successive approximation to reality) and his emphasis on elegance as the characteristic of subsequent work, suggest an intriguing parallel with the position of much contemporary economic theory, while the wealth of outstanding figures whose work is mentioned is an implicit rebuke to the Anglo-American habit of summarising Italian economics in the name " Pareto."

The golden age is represented by contributions from four of the great Italian economists, selected, most appropriately, by Professor Einaudi himself. Pantaleoni's " Some Phenomena of Economic Dynamics " (1910), which begins with an excellent description of economic dynamics in the narrow modern sense, is a suggestive discussion of four examples of historical change; the most interesting is " expansion and contraction of the area of economic activity," which comprises a detailed analysis of the ethic of the just price and remarks on the methodological implications of a restricted area of economic freedom. (Pantaleoni's attempt to demonstrate that expansion of the firm necessarily involves absorption of direct costs into overheads, however, rests on a subtle fallacy.) Pareto's encyclopædia article on " Mathematical Economics " (1911) is a masterly exposition, though its extreme compression makes it difficult to read; the footnotes, which alternate between references to " what V. Pareto has done," icy critiques of other mathematical economists and disdainful remarks about " literary economists " explain a certain coolness noticeable in Professor Einaudi's attitude towards him. Jannaccone's " Dumping and Price Discrimination " (1914) is a brilliant precursor of imperfect competition theory; its main argument, directed against Cabiati, is that dumping usually requires cartelisation or protection and is not dependent on decreasing costs, but the theoretical development includes a general analysis of price discrimination, in which product differentiation is viewed as a special case, and a clear statement of the relation between marginal and average cost. Barone's " Related Costs in the Economics of Transport " (1921) is a neat geometrical–mathematical examination of equilibrium under competition and various types of monopoly when alternative outputs are subject to a linear capacity constraint—though it could have been sharpened by use of the elasticity concept.

Of the recent articles translated, Dag Hammarskjöld's " The Swedish Discussion on the Aims of Monetary Policy " (1944) traces the successive arguments which have been used to defend Davidson's proposition that the price level should fall as productivity increases. Börje Kragh's " The Meaning and Use of Liquidity Curves in Keynesian Interest Theory " (1951) is a useful disaggregation of Keynes' curve into cash- and bond-holders' and public and banking system behaviour, together with an analysis of the different effects of different kinds of changes in the money and bonds to be held by the market. Kurt Rothschild's " The Effects of Devaluation on the Terms of Trade " (1954) seeks to revive the presumption that devaluation will turn the terms of trade against a country by appealing to the asymmetrical effects of certain aspects of imperfect competition—sales resistance which can be overcome only by large price cuts, selling at domestic list prices, negotiation of " reasonable " prices with large individual buyers—and the automatic worsening of terms on tourist trade. The argument is fairly convincing, though in parts it is asymmetrical or reversible, and dependent on the assumption that exports are a relatively small part of the firm's production. J. Tinbergen and D. B. J. Schouten's " National Income Accounts as a Means of Currency Analysis " is largely a discussion of purposes, concepts and methods, illustrated by application to the Netherlands economy 1951–53. H. Theil's " Who Forecasts Best? " (1954) develops a method of measurement and applies it to five European planning staffs. Not unexpectedly, the Netherlands comes out best, though Dr. Theil is sufficiently humble about the limitations of his method to refrain from bragging. The United Kingdom comes second, partly through forecasting fewer magnitudes—a ploy which has now been carried to its logical conclusion.

The ten articles together make a well-rounded and interesting volume, all in keeping with the standard and functions which the editors have set themselves.

HARRY G. JOHNSON

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Economic Change. Selected Essays in Business Cycles, National Income, and Economic Growth. By S. KUZNETS. (London: Heinemann, 1954. Pp. viii + 333. 15*s.*)

Theory of Economic Dynamics. An Essay on Cyclical and Long-run Changes in Capitalist Economy. By M. KALECKI. (London: Allen & Unwin, 1954. Pp. 175. 18*s.*)

THESE two books by outstanding economists have much in common. Both reprint material largely but not entirely published previously. Both authors have made somewhat the same spiritual pilgrimage, beginning with

business cycles, then advancing to growth theory and on to the problem of underdeveloped economies. Indeed, this might almost be declared to be archetypical for the contemporary economist, so frequently has it happened.

But there, on the level of superficialities, the similarity ends. Where could one find two more violently contrasting intellectual temperaments? Mr. Kalecki optimistically erects the most vast and beautifully airy structures, and only afterward does he begin to worry about the solidity of the underpinnings. Professor Kuznets sinks his piles deep in the spongy morass of economic fact; he weaves great rafts to float the massive abutments which he painstakingly builds up bit by bit. And then, just when we long to see what great construction he will build on it all, he leaves it to go and sink another pile. Is it because he still does not trust his foundations, or possibly is it that he is ill at ease with any theoretical structure?

It works out as a division of labour. Professor Kuznets lays the foundations, others can (and have done so with much gusto) build a variety of structures on it. This evidently is not, however, the view of Professor Kuznets. He is distrustful of theories claiming to have statistical foundation; what, one wonders, would he have to say about Mr. Kalecki's rather impressionistic use of statistics? His review essay on "Schumpeter' Business Cycles" gives a hint: "The theoretical model . . . does not yield a serviceable statistical approach. The three-cycle schema . . . cannot be considered, on the basis of the evidence submitted, even tolerably valid; . . ." Schumpeter, like Kalecki, once constructed an ingenious cycle theory, and he also tried to show that his theory explains the known facts. The chill reception of that monumental labour was a personal tragedy to Schumpeter, but more than that it may be taken as symbolic for the substantial failure of the bulk of econometric work to date.

Most economists associate the name of Kuznets with national-income research, but they have only to read some of the essays in this book to see the distinction he has brought to work in quite different topics. Thus "Retardation of Industrial Growth" is a summary of his basic work on the growth pattern of particular industries. He found strong evidence for a common behaviour to all new products, similar to that of a new biological species introduced into a favourable milieu. There is first the accelerating growth and then retardation leading to a saturation level according with the logistic curve of population theory. That empiricism, just as well as pure theory, can lead us into error, can be seen from the fact that the Kuznets logistic for steel output in the United States predicted saturation at around 40 million tons, whereas it is now over 100 million tons and the end is not (or is it?) in sight.

Perhaps the essay most to be recommended is the "Relation between Capital Goods and Finished Products in the Business Cycle," a superior piece of work written over twenty years ago. There is perhaps still no better critical exposition of the accelerator with treatment of its inadequacies

desirable complications and failure to conform to the known facts. A thorough analysis of railway data is given to show that though equipment leads, it does not lead by a quarter cycle, and though its amplitude is magnified, it is not magnified as much as the theory would lead us to expect. Therefore "This relation is inadequate as a self-sufficient theory of cyclical fluctuations." But this had already been shown on narrowly theoretical grounds by Professor Frisch and is now known to everyone as the Harrod growth theory. Worse still, even if we accept all the criticisms made by Professor Kuznets, the amended theory can still be made the basis of a cycle theory.

There is much else of interest in these essays on statics and dynamics, equilibrium, trend and cycles, the meaning of national income in backward areas, international comparisons of income levels, national income and welfare, present economic tendencies and the impact of foreign economic relations on the United States economy. Some of this is dull indeed, but most of it is good, and some very good. The essay on welfare is a splendid performance and interesting, especially, because Professor Kuznets is recoiling from the vulgar empiricism of the hosts of national-income computers that he helped to create. He comes down firmly on the side of the angels by declaring roundly that net national-income data have no meaning separated from the welfare theory that begot them.

The *Theory of Economic Dynamics* consists essentially of Mr. Kalecki's two previous books, which have become justly famous and need no particular notice here. The title is pretentious, since there is no attempt to cover systematically the subject indicated. Some parts have been rewritten, and the statistical foundations (*pace* Professor Kuznets) have been widened even if not deepened. In fact, Mr. Kalecki disarms his potential statistical enemies before battle can be joined by stating that his only purpose is "to obtain first approximations for illustrative purposes."

On two important issues substantial new material is included. The original Kalecki Model T assumed the coefficients to be such as to give an undamped cycle, on the grounds that in fact cycles do not disappear. This simple error in logic was so severely criticised by Professor Frisch that the model has never been seen again. Now Mr. Kalecki accepts the criticisms and incorporates in his model Slutsky's famous result: that random shocks will give rise to continuing and irregular cycles in an auto-regressive model, and that these cycles look very much like the same sort of thing as trade cycles. This, of course, does not establish that they are trade cycles. There are in fact two ways of explaining the maintenance of oscillation—shocks and non-linearities.

The second new element is a section on long-run economic development. This follows conventional lines by assuming steady growth in certain "constants"—the consumption outlay of capitalists, the total value of salaries, and indirect taxes. Since his system is linear, this gives rise to a trend; this trend is separable from the cycle, and we have the kind of model which will generate a time series which may appropriately be decomposed

into trend and cycle. These elements are surely not the deeper springs o economic growth, but they may be useful manifestations of growth tendencies, how useful will require a lot more statistical work to reveal.

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Capital and its Structure. By L. M. LACHMANN. (London: Bell, for the London School of Economics and Political Science, 1956. Pp. 130 15*s.*)

CAPITAL has structure because stocks of capital instruments can be distinguished from one another in several ways. Types of instruments differ according to method of construction, mode of operation and age; while between stocks, the proportions of types differ. A convenient and traditional classification of differences in structure is under the three heads—quantities of inputs, techniques and age distribution. Capital theory attempts to describe capital structure, and explain why a particular structure is chosen or exists under certain circumstances. Theory also attempts to relate the structure to the distribution of incomes and to changes in aggregate income. In some economic situations the capital structure may be considered unimportant—in the sense of being uninfluential and uninfluenced—and consequently the analysis of those situations will not be based upon any capital theory. An example is the Keynesian short-run trade-cycle analysis. But there is always the possibility that the omission of capital structure and its more important relationships will weaken an analysis.

The propositions of capital theory—made mainly by the Austrian school—have always been in dispute. Böhm-Bawerk attempted to describe summarily the state of technique by an interval of time called the period of production (the more advanced or "roundabout" the technique, the longer the period) and proposed an inverse relationship between the rate of interest or profit and the period of production. Wicksell proposed a direct relationship between the real wage-rate and the period of production, thus systematising Ricardo's famous proposition. This latter aspect of the theory was developed by Professor Hayek, Mr. Kaldor and others, who examined the necessary financial, managerial and market settings within which the analysis was true. Hayek has critically examined the premises of capital theory, and it would seem that his rejection of the older, simple theories on the grounds of a lack of both logical perfection and generality, in favour of a general equilibrium approach which permits no useful, if approximate generalisations, condemned capital theory to its recent sterile decade and a half. The success of the Keynesian analysis of depression and inflation, and the lack of interest shown by its users in the capital structure, reinforced the condemnation.

As attention turns once again to economic growth, and as more refined and realistic cyclical models are developed, interest in the theory of the

capital structure has revived. There are statistical studies of the ratio of capital to output; Mrs. Robinson has revived the problem of the definition of capital; several productivity studies have pointed to varieties of automation being induced by prevailing or expected cost structures.

Professor Lachmann's study is thus timely. He re-emphasises the facts that capital goods are heterogeneous and have different uses, and that different instruments are usually complementary. Investment is concerned with changes in the composition of the capital stock. Into this framework expectations are introduced. Decisions are based upon expectations, and outcomes and revisions of expectations lead to revisions of plans and changing structures. Unexpected change necessitates frequent change in the capital structure. Professor Lachmann argues that changes in money balances, new investment and idle capacity must be interpreted as the incidental results of the process of failure or success of expectations. He revives a Hayekian world when he says that plans are co-ordinated and structural maladjustment prevented by stabilisers, of which the foremost is the flexible price system, particularly forward markets and the stock exchange.

Dealing with accumulation, Professor Lachmann is both specific and stimulating. Accumulation allows a higher degree of division of capital (similar to division of labour), the specialisation of capital taking the form of an increasing number of processing stages and a changing composition of the raw material flow. New indivisible resources can be used which account for increasing returns to capital, and these increasing returns are what is meant by the higher productivity of roundabout methods of production. As a structure becomes more complex it becomes more vulnerable, and the achievement of stability will be an unlikely feat. Thus a regularly progressive economy is unlikely for several reasons. On the subject of the trade cycle, Professor Lachmann discusses the part played by structural maladjustment in a strong boom. Lack of effective demand may be confused with a lack of complementary factors arising from sub-ceilings, particularly in the production of raw materials. It appears to your reviewer that this type of analysis is useful in studying post-war United States fluctuations, which have been of the strong boom, sub-ceiling type, the recessions being taken up with a rapidly achieved adjustment of capital structure, partly in the form of a reduction of working capital.

Professor Lachmann is consciously reviving the controversies of the 1930s, and some of his views, for example, on the influence of the price structure upon the incentive to invest (p. 50), and the stabilising effect of the price system (Chapter IV), appear naïve and polemical. The weaknesses of the book are that, despite the lengthy treatment, there is always vagueness about the description of structure; the chapter on (financial) asset structure is superficial and really unnecessary; and no attempt has been made—except in very general "non-operative" terms—to relate the choice of a capital structure to real wage-rates (or real input prices) and interest rate. In following Hayek so faithfully, Professor Lachmann has

discarded some of the few, useful tools of any capital theory, and the uninitiated will be left with a barrage of airy words (of which those like " morphology of the forms " and " multiple specificity " are hardly appealing). However, there are some sections of the book which are worth reflecting upon—that on the strong boom (Chapter VII), and that on economic progress (Chapter V). There, in fields where is it unusual to say anything fresh and sensible, Professor Lachmann is stimulating.

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Deux Essais sur le Marxisme. By JEAN MARCHAL. (Paris: Éditions Génin, 1955. Pp. 261. 750 frs.)

THIS book consists of two long essays: the first, " Marxism as a general conception of Man and of the World "; the second, " Marxism as an instrument of analysis applied to the division of the national income." In France there is a number of economists and sociologists, among whom M. Jean Marchal is a leading figure, who neither reject Marxism as something unclean nor embrace it in its totality with blind and uncritical zeal. They try to find out what contribution it can make to our understanding of man and of society.

The first essay consists of two parts. In the first the author expounds, without criticism, the main outlines of the Marxist system—philosophical, historical and socio-economic. This he does very clearly and fairly. In the second part he selects what he considers to be its valid parts. He accepts (with qualifications) both the labour theory of value and the theory of surplus-value. Concerning the former he makes the point that it is a valid macro-economic theory as applied to the relative value of large aggregates of commodities (*e.g.*, consumer goods as compared with capital goods, wage goods and luxury goods, export goods and home-market goods), thus by-passing Böhm-Bawerk's criticism that to aggregate values over the *whole* economy reduces the theory to a meaningless tautology.

The second essay is much more substantial. In it M. Marchal first expounds the Marxian theory of income-division in modern society, and then attempts to establish what parts of it can be used to-day as a valid instrument of analysis. In the first, expository, part, the author gives a very clear and accurate account of Marxian theory, but he adds little that is new. He emphasises three aspects of the Marxian theory. It is macro-economic, dealing with large aggregates, able to transcend the limits of the individual or the firm, and hence to take into account tendencies affecting *all* individuals and firms and also such phenomena as state-imposed modifications of the income-scheme through taxes, subsidies and pensions. It operates with a very long time-perspective (longer than Marshall's " long run "). It is sociological; in the matter of income-division it makes use of sociological categories (classes) rather than analytical ones, such as factors of production.

These characteristics, he considers, make the theory a suitable instrument for the analysis of income-division in modern society. In the second part he examines more closely the strength and weakness of the Marxian theory; he proposes to retain these three above-mentioned characteristics, while modifying (or abandoning) some of its content, as originally expounded by Marx and as accepted by Marxians.

For instance, Marx makes the primary sociological division between wage-earners and the rest (comprising the capitalists and their associates and hangers-on). M. Marchal sees in modern industry not two but three clearly marked groups: wage-earners, capitalists and salaried staff (" cadres "). He gives the following definition of a " cadre ":

> " He is an individual who, because he has had a reserve of money or property, or more generally, *because social institutions have allowed him to*, has enjoyed the possibility of not selling his labour at once on the market, of adopting, in Böhm-Bawerk's sense of the word, a *roundabout* use of his time in acquiring knowledge, and, consequently, of conferring a higher efficiency and scarcity upon the labour he supplies afterwards, and of thus enabling him to sell this labour for a higher remuneration." (Author's italics.)

Outside industry he distinguishes at least *one* other group of great social significance and two or three other less important groups. The first is that of working proprietors in agriculture (French peasants, American farmers), whose fundamental conflict with *all* the urban groups is reflected in the relation between agricultural prices, on the one hand, and all industrial wages, salaries and profits, on the other. The minor groups are lenders of money (rentiers), non-working proprietors (landlords) and small business-men. None of these, he thinks, can be just lumped together as " dependants of the capitalist class " or as " decaying remnants of an earlier social order." The task of an adequate theory of income-division is to explain the mode of formation and the magnitude of the shares of these four major and three minor sections of the community.

With respect to the first major group, the industrial wage-earners, M. Marchal gets into heavy weather because he tries to hold fast by the Marxian concept of wages as a subsistence minimum. He does not deny that in modern industrial societies wages are far above the *physiological* subsistence minimum. But he argues in favour of a *sociological* subsistence minimum, determined by custom and expectation. Nevertheless, he is perfectly aware of the reciprocal relation between actual wages and the customary standard of life. (Are real wages high because the worker's customary standard includes prime steak and a T.V. set; or does the customary standard include prime steak and T.V. because real wages are high?) Singularly enough, in spite of the impressive work of Colin Clark and of Paul Douglas and his associates, M. Marchal denies that there is any relation between productivity and wages in the case of labour as a whole, although he admits the possibility of such a relation (a short-run, micro-economic one) in the case of particular occupational groups.

". . . Productivity may quite well explain differences in wag between one man and another or between one kind of work an another, without exercising any effect upon the general scheme.

For our part, we do not believe that it has ever been seriously estab lished that in the economy as a whole (*à l'échelle globale*) the productivit of labour has had any influence on either the absolute or the relativ share of the working-class in the national income. This influence i possible, it has not been proved. Certain facts seem even to lead to denial of it. It will be noted particularly that the French working class received, in 1951, an aggregate real wage that was not perceptibl higher than that of 1938, while between these two dates its number ha increased slightly, the effective working week had been increased fror 40 to 45 hours, and, finally, average productivity had increased."

M. Marchal also draws attention to the problems of subdivision of incom between the lesser sections of the main groups. For the subdivision of profi between various kinds of capitalists—industrial, commercial, money lending, etc.—Marx has left some important suggestions. These need to b supplemented by modern studies, in view of the growth of capitalist monopol which introduces a new source of divergence between prices and value Marx made no contribution to the equally important problem of the wage received by different kinds of wage-earners. M. Marchal suggests that th omission was deliberate, since Marx was concerned, for political reasons, t emphasise the unity of the working-class, and may well have thought that discussion of the differences between skilled and unskilled labour, urba and rural workers, etc., might be damaging to working-class solidarity.

In a general discussion of Marx's theory of the "laws of motion c capitalist society," M. Marchal rejects the Marxian concept of laws of socia evolution and proposes to replace them by tendencies and "lines of slope."

In the space of this review it has been impossible to deal adequately wit the whole range and richness of M. Marchal's thought; but it must be sai that this is a very stimulating book, containing many ideas that, in th reviewer's opinion, can very usefully be applied in economic analysis.

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David Hume: Writings on Economics. Edited by E. ROTWEIN. (Edin burgh: Thomas Nelson, 1955. Pp. 224. 30*s.*)

THE economic essays of David Hume have never suffered from neglect This has no doubt been due in part to Hume's eminence as a philosopher, i part to the intrinsic merit of the essays themselves. Not always as origina as is often claimed, they nevertheless command attention by virtue of thei scope, lucidity, forcefulness and good sense. It is well that they have bee collected and reprinted in one volume, along with a few letters on economi topics written by Hume or written to him by Oswald, Tucker and Turgot.

It is a pity that Dr. Rotwein's introduction, comprising almost exactl one-half of the book, should stand, like Wordsworth's Michael, "somethin

betwixt a hindrance and a help." It betrays more than a few traces of its origin as a Ph.D. thesis, and is written in an English style which is at best a sad contrast with Hume's own and which is occasionally nothing short of deplorable. Dr. Rotwein expresses the opinion that Hume is "deserving of special distinction" in "the general quality and breadth of [his] analysis" (pp. cv–cvi). But the introduction is not a general review of Hume's economic writings, nor is it an assessment of his place in the history of economic thought. Instead, it is devoted to an attempt to show that all Hume's work, both economic and philosophical, is unified and dominated by his conception of human nature—his "psychology"—and by his interest in historical change. Although building on rather inextensive foundations, Dr. Rotwein provides a stimulating appraisal of Hume's views on the motives to economic activity, and is able to utilise his account so as to illumine what Hume says about the rate of interest. The attempt to prove Hume's concern with "well-defined historical laws of behaviour" (p. xxiii) is rather overdone, but attention is drawn to an interesting discussion in the letters about the consequences of economic development for international trade. Unfortunately, Dr. Rotwein is so concerned to establish connections between the *Treatise of Human Nature* and the essays that he relegates to footnotes almost all mention of the work of other economists, thereby making Hume's ideas seem much more peculiarly his own than they were. Also he is inclined to distort Hume's thought by re-wording and by over-insistence on the degree to which Hume anticipated some modern discussion. We are told, for example, that in the essay "Of Money" Hume "makes explicit his initial assumption of less than full employment and . . . his analysis contains a relatively detailed and highly lucid account of the multiplier process" (p. lxviii). Whatever justification there may be for comment of this kind—and usually there is not much—it appears to rest on the cardinal error that writers of the past deserve a good mark when they can be represented as in agreement with the latest ideas and the up-to-the-minute approach. Usually, the advantage of studying them is that they cannot be so represented—or misrepresented.

Most readers of this book—certainly those coming to Hume's essays for the first time—would be well advised to read Hume first and Dr. Rotwein afterwards.

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Readings in Fiscal Policy. Edited by A. SMITHIES and J. K. BUTTERS for the American Economic Association. (London: Allen & Unwin, 1956. Pp. 596. 30*s.*)

THIS volume follows the familiar pattern of the A.E.A. *Readings* series with a wide selection of articles covering various aspects of fiscal policy such as the control of inflation, the maintenance of stability and the effects

on the national debt. Many of the articles are classics in their own right for example, Keynes' open letter to Roosevelt of 1933, Myrdal's 1939 arti on fiscal policy in the business cycle, Haavelmo's contribution on multipl effects of a balanced budget and so on. The editors have on this occasi not restricted themselves to articles, and extracts are given from Keyn " How to Pay for the War " (misquoted, however, as published in 194 Schumpeter and Hansen. There is a useful thirty-page bibliography at t end of the volume.

Students of economics will undoubtedly find this volume a useful a convenient guide to the literature on the subject. One wonders, howev whether it quite lives up to the standards set by its companion volumes in t series. The trouble is, I think, partly that fiscal policy in any distinct ser of the phrase is not a subject meriting a whole volume of readings to the sa degree as, say, price theory or international trade, more especially as (acco ing to the editors) a volume on Public Finance is envisaged in the seri The attempt to blow the subject up to full size results in the inclusion of so material which is mainly of interest to the historian of economic thoug the invasion of what I should have thought was certainly the field of mor tary rather than fiscal theory (for example Tobin's " Liquidity Preference a Monetary Policy ") and a positive rash of articles duplicating one anot on the different fiscal routes to full employment.

Quite apart from the definition of the subject the selection of artic does not seem entirely happy. No two pairs of editors would ever agr in their choice, but presumably the main principles of selection must be th articles should be included either for their inaccessibility, the necessity cover a particular part of the field or the originality or importance of t contribution to some topic. On the inaccessibility criterion, it is a lit strange to find that, in a volume primarily designed for American reade out of thirty-four contributions, only three were published outside t United States: the two by Keynes mentioned above and Colm's 19 *Public Finance* article. To give good coverage of the subject one wou have thought that one of the articles (by Milton Friedman or A. W. Phillip dealing with the possibilities of Government fiscal intervention being d stabilising rather than stabilising should have been included. Nor, for th matter, is anything included on the more practical problems of planni public works, devising agricultural support programmes and the lik Indeed, the heavy concentration of articles written between 1942 and 19 and dealing with war or immediate post-war problems, to the exclusion some other subjects, gives a curiously dated air to the whole volum Finally, there is the criterion of the importance or originality of a contrib tion. It is a little hard for a British reviewer to cavil at the selection on th score without being accused of intellectual chauvinism. But on a grounds parts of Kingsley Wood's 1941 Budget Speech and the accompanyi National Income White Paper (both partly drafted by Keynes) have ve special claims for inclusion in a volume of this sort. And it may not unreasonable to point out that the British *Employment Policy* White Paper

1944 and Beveridge's *Full Employment*, with its well-known Appendix C by Kaldor, preceded the contributions on these topics selected for this volume.

As a record of how Americans, economists and others, were gradually converted to Keynesian ways of thought in the fiscal sphere this volume is full of interest. But this is not quite the qualification needed to recommend it to British readers as a synoptic view of the territory, despite the excellence of many of the individual contributions.

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British Incomes and Savings. By H. F. LYDALL. (Oxford: Basil Blackwell, 1955. Pp. 274. 32*s.* 6*d.*)

THE Oxford University Institute of Statistics has now carried out four large-scale annual surveys of income and savings in British households, and readers of the Institute's *Bulletin* will already have seen a number of papers on their results by Mr. Lydall and his colleagues. Mr. Lydall has brought together those describing the first (1952) survey in a " more permanent and convenient form." The data, which relate to the financial year 1951–52, were obtained by interview from some 2,600 people in sixty-nine town and country areas, chosen with the intention of forming a representative cross-section of the 22 million " income units " in the private households of Great Britain. That the Oxford samples, and most of the subsequent analyses, are based on " income units " (single persons of eighteen or over and married couples, together with their dependants) rather than on households (defined usually as groups of people sharing a common table or contributing to a common pool of expenses) is in itself a novel feature in this country, and one well adapted to the main purposes of the inquiry. The present report contains a detailed description of these income units in respect, broadly, of their sources and distribution of income, of their ownership of assets, and of their personal savings and total consumption. As an aid to those who wish to compare the findings with those of other British studies, a substantial chapter discusses the distribution of incomes, rent and rates in terms of the household as a unit. And of course we may agree with Mr. Lydall that here " there is a rich mine of data on a wide variety of problems. It can be used to answer such questions as: Who are the poor? What are the incomes and occupations of people living in council houses? How are rents related to incomes? What sort of people belong to national savings groups? " and so on.

But what is the general picture which emerges from this work, judged as a study of personal savings? Alas for those who may hope to gain a facile insight, to see a simple and pure form of the savings function emerge from the foam of data! As we leave the arid shores of aggregative analysis we must take arms against a sea of new troubles. Influences which in aggregate we can ignore because they cancel each other or because their net

effect is roughly constant over long periods become important when we study individual cases, and mingle with others which may shift substantially and rapidly as the economic climate changes. For example, the comparison of savings with income results in what is now a familiar pattern in such cross-section studies:

> "The groups whose [gross] incomes range from £200 to £800 embrace more than two-thirds of the population and receive more than two-thirds of total income; and their net saving is practically nil. Real leverage is exercised, on the negative side, by 24 per cent of income units whose gross incomes are less than £200—and who receive 7 per cent of total income—and, on the positive side, by 7 per cent of income units with incomes of £800 or over—who receive 25 per cent of total income."

But what sort of persons do we find at these two extremes of the income distribution? In the lowest group we find mainly old, retired persons and widows who are running down assets accumulated during working life; and in the highest mainly earners between the ages of thirty-five and fifty-five (with their dependants) who are saving not only because their high incomes make it possible but also in preparation for old age. To find a net relation between income and saving we must therefore take account of the age of the head of the income unit; and not only of age, for Mr. Lydall has also given tables showing the influence of the sex and occupation of the head, of the number of persons in the unit, its geographical location, housing tenure and so on. These tables will repay careful study, though, as they usually show only the gross influence of each factor taken separately, it is not possible to push analysis much farther than Lydall himself has done in the text.

Altogether this is a welcome addition to the reference library of economists and statisticians, and should stimulate much further research. May I, however, be permitted a personal cavil at the use of Pareto-type charts to display income distributions which do not in fact follow Pareto's law? Because the points plotted on these charts do not represent independent observations their interpretation is not always unambiguous; this price is not worth paying if the Pareto transformation is not justified *ex post*.

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Economic Control. By M. P. FOGARTY. (London: Routledge & Kegan Paul, 1955. Pp. 324. 21*s*.)

THE British economy is not completely planned like the Russian; it is certainly not completely competitive. But merely to call it "mixed" does not tell us much about its functioning. What in fact makes it tick? What determines how its resources are devoted to various ends; what decides its rate of investment or its distribution of consumers' incomes and

so on? Professor Fogarty's theme is that the economy is controlled partly by direction, partly by competition, largely by "consultation." He examines the working of these three instruments of control in the fields of consumption and savings; investment and research; physical and mental health; population; and of trade and investment, both international and inter-regional. He concludes with some general reflections upon the relation between economics and the other social sciences and upon the pattern of the economy itself.

To set out the scope of the book in this way—even though the description follows closely the author's own table of contents—is to give a somewhat false impression. The reader need not look here for a completely integrated, schematically perfect theory of the economics of the Welfare State. He will find rather a series of animadversions upon the rapidly changing scene of to-day, strung somewhat loosely together, but none the less possessing a certain unity, which derives from Professor Fogarty's own ethical approach to economics. At times the book seems to be All About Everything; and the reader will need a good deal of knowledge of the economic, social and administrative background of our day if he is not to be put off by the writer's allusive style. Yet it is worth while persisting; for Professor Fogarty's is an able and original mind which illuminates our numerous institutions as it darts about among them.

There are some very shrewd comments upon the possible extent and the inevitable limitations of "direction" in the economy. Professor Fogarty feels that the obvious fact that direction "is likely to prove useful only where it is already known what changes in the social structure are required, and by what means these changes, or routine activities within a given social structure are to be carried out" has been neglected both by industrial managers and by the State. But direction often fails as a means of control, not only because an attempt is made to apply it where it cannot succeed, but quite simply because of the inability of the directors "to grasp and sort out the issues involved quickly enough to keep pace with the events." The limit is set by the amount of work they can handle in the day. State economic direction "can control *this* service or *that* service or *the other* service as efficiently as could be done with any other sanction or mechanism. But if State direction were used for *all three*, the pressure on administrators would be such that none of them would be operated as speedily or as precisely as citizens or consumers desire." Some economic purposes can be achieved as well by direction as through competition; "but, allowing for all possibilities of delegation and scientific management the *total* number of things which can be done well by State direction is limited . . . the case for limiting the field of State management rests, not on the dangers of a strong State, but precisely on the need to allow the State to do with greater power those things which no other agency can do so well."

Professor Fogarty does not believe that the State will so learn by experience to effect more and more complicated control that it will be able gradually to extend and perfect the power of direction over wider and wider

fields. " There was a liberal age. There has been, recently ended, a socialist age. And an age now seems to be opening which might best be called federalist." The hall-mark of the latter age is " consultation," which we see already at work within firms which adopt modern management practice; in trade associations and trade unions; in the National Joint Advisory Council and the National Production Advisory Council for Industry; in the International Labour Organisation and in many similar institutions. (Incidentally, it seems to me that he overestimates the significance of Development Councils and greatly underestimates that of the N.J.A.C.) If someone were to make a study—based perhaps upon an analysis of their desk diaries—of how industrial tycoons spend their time, a picture very different from that of the classical " entrepreneur " would emerge. As Professor Fogarty puts it: " the socialist age has largely socialised the business man, along with everyone else." He has become acutely aware of the problems of group relationships, while the great majority of wage-earners and small salary earners have become " middle class " in social status, and tend to become increasingly so in outlook.

The interaction of these changes in the nature of " control " with the development of the economy is discussed and illustrated with frequent resort to tables, and there is a bibliography of fifteen pages. It is a book well worth reading by both economists and administrators.

H. A. MARQUAND

London.

The Federal Antitrust Policy. Origination of an American tradition. By H. B. THORELLI. (London: Allen & Unwin, 1954. Pp. v + 658. 60*s.*)

DR. THORELLI has not attempted to provide another description or economic appraisal of Federal anti-trust policy in action. Indeed, his book is not to be regarded as a technical economic study at all, for his purpose has been far more ambitious. He has been concerned, first, to disclose the springs of action that produced the Sherman Act in 1890 and, secondly, to explain the emergence during the next thirteen years of anti-trust as a permanent constituent of American economic policy. This has required him to embark upon a detailed study of legal doctrines and practices, constitutional theory, political institutions, administrative policy, industrial organisation and economic thought, both professional and popular. In spite of the wide scope of his inquiry, he has not relied merely on secondary sources, but has undertaken a substantial amount of original research which has been very fruitful. Having been trained in law, economics and political science, he is well equipped to provide the kind of synthesis for which social scientists usually seek in vain. Since this account of the origins and development of what has long been established American economic policy comes at a critical moment in the evolution of British monopoly policy, the book can claim the close attention of readers in this country.

The work is divided into three parts. The first deals with the common-

law background, the economic, social, political conditions and ideas in which the policy was rooted, and finally the enactment and provisions of the Sherman Act itself. Part Two, entitled " From Form to Substance," covers the period from 1890 to 1903 and traces " the interaction between economic and political trends, administrative policy, and court decisions prior to the establishment of the Anti-trust Division and the Bureau of Corporations in 1903." In Part Three (" Antitrust Institutionalized ") the author gives a summary of his arguments and conclusions.

Dr. Thorelli provides an informative discussion of the complex factors which produced the Act. In the background there was the common law, hostile towards combinations in restraint of trade, although itself never an effective means of curbing monopoly or encouraging competition. There was also the strong American sentiment in favour of individualism and " economic egalitarianism," a sentiment that was offended by the industrial developments after the Civil War and outraged by the discriminatory and predatory practices of the railway concerns. After 1880 antagonism to these practices was directed towards those of monopolies in general. Dr. Thorelli gives much attention to the controversial question whether or not the Act really came in response to an " irresistible tide of public opinion," but in the end he suspends judgment. He is able, however, to reach more definite conclusions about the influence exerted by economists. On the whole, the academic economists before 1890 showed indifference to anti-trust. This was partly because they were wedded to *laissez-faire* doctrine, and partly because they believed that the competitive forces in the economy were too strong to permit monopoly to survive. Those who realised the significance of the trend towards large combinations and the incompatibility of such structures with competition as understood in classical economics, were disposed to argue that there would always be sufficient *potential* competition to prevent abuse of a dominating market position, while others laid stress on the economies to be derived from large-scale organisation. Even Ely opposed attempts at regulation. Where combinations proved to be dangerous to the public interest, he thought, the conclusion was that they were suitable for public management. Support for anti-trust measures came rather from the popular writers on economics and from publicists.

The Sherman Act, though preceded by much state anti-trust legislation, did not lead immediately to effective action. Dr. Thorelli does not take the view that the courts were mainly responsible for this weakness. He shows that Congress did not at first realise the necessity for continuous, official regulation and trusted in the " capacity for self-enforcement of the law." Moreover, the law officers of the nineties were former corporation lawyers with no great love for the anti-trust policy, and the administration in general was lukewarm. With the formation of the great industrial consolidations of the later nineties, it appeared for a time that the Sherman Act was powerless to stem the trend towards monopoly. Yet by 1903 the convergence of several streams of influence had firmly established anti-trust as an American institution. This came about partly as a result of various court decisions,

and partly through public reactions against the movement towards industrial concentration which left " many of its boastful promises unfulfilled." But the most important factor was the recognition during the Roosevelt presidency that effective anti-trust action required the continuous attention of the administration, and that the executive must supply the initiative in enforcement. Consequently, in 1903 a special division for anti-trust enforcement was created in the Department of Justice, and for the first time Congress earmarked funds for enforcement. The author traces the evolution of this policy in much interesting detail.

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Beyond Nationalization. The labor problems of British coal. By G. B. BALDWIN. (Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 1955. Pp. 324. 35*s*.)

ONE of the main arguments used to justify the nationalisation of industry was that it would bring a new standard of industrial relations. Since men and management would no longer be influenced by the profit motive, the old conflicts, it was argued, would give way to a common endeavour to reach public-welfare goals. Whatever doubts there might have been about the general validity of this argument among non-socialists, there was, even in the sceptical section of the community, a feeling that so far as the coal industry was concerned nationalisation was probably the only answer to the bitter hatred that had long marred relations between workers and employers.

It may well be that had nationalisation not taken place, industrial relations would have gone from bad to worse. This, however, we shall never know, but we do have the experience that nationalisation has not of itself provided the key to harmonious industrial relations. This book, which is the most thorough study of industrial relations in a nationalised industry yet made, clearly establishes that the difficulties experienced in the coal industry transcend the issue of ownership. Such problems as absenteeism, recruitment, wastage, methods of wage payment, unofficial strikes, the transfer of labour, rival unionism, joint consultation have, the author shows, " an existence of their own which is largely independent of the form of industrial ownership."

Nationalisation may, in fact, have made the solution of some of these problems more difficult, not because the mines are now publicly owned, but because public ownership has made possible technical and institutional changes in the interests of efficiency, which have provoked frustration, antagonism and irresponsibility. Nationalisation has, for example, necessarily involved the creation of a massive structure of administration; the vast capital-development programme has led to growth in the size of pits and an increase in the scale of production units. From a purely technical point of view these changes can be amply justified, but size—as Professor Revans has convincingly demonstrated in his pamphlet for the Acton Society Trust, *Size and Morale*—is intimately linked with morale in the mines. It is generally true to say that the bigger the scale of coal production, the more likely will it be that strikes will occur, absenteeism rise and accidents happen. Mr. Baldwin has not investigated the influence of size, though he is aware of the problem, but he has paid considerable attention to the effect of other technological factors on industrial relations.

The influence that is exerted by the technical conditions of production is extremely important, but has been largely neglected in studies of industrial relations. It is the great merit of Mr. Baldwin's book that he has brought out the special significance of the technical factors in the mining industry. He indicates how they shape the pattern of collective bargaining, determine the structure of wages and condition the attitude of men and managers towards each other. In a foreword Professor John Dunlop, in my opinion, rightly suggests that comparative international studies of other industries would show that the technical conditions of production are pervasive factors moulding industrial relations. Miners, for example, everywhere exhibit roughly similar behaviour patterns, so, too, do dockers, railway, textile, printing and building workers, as has been shown by Clark Kerr and Siegel in their study " The Interindustry Propensity to Strike—An International Comparison " (included in *Industrial Conflict*, Ed. Kounhauser, Dubin and Ross, New York, 1954).

Mr. Baldwin thinks that the changes in mining technology that are coming about through intensive effort to find new ways of mining coal, will in the long run produce effects that will make for better industrial relations. " The promise is one of small groups . . . it is one of day rates instead of piecework; it is one of varied individual tasks rather than rigid specialisation; and it is one of operating flexibility." The significance of these advantages has, Mr. Baldwin thinks, just begun to be appreciated in the industry, and he concludes his book with the hopeful opinion that in the next decade an increasingly conscious effort will be made to attain them. Unfortunately traditional practices probably take longer to die in mining than in any other industry. The miner, whatever the colour of his politics, tends to be deeply conservative. It will not be easy, for example, to change over from a system of piece-rates and allowances, even though it is perfectly obvious that they positively stimulate aggression and conflicts, to one of day rates. The problem would be very much easier if the National Union of Mineworkers were able to give a clear and definite lead to its members; unfortunately the union has not been able to rise to its opportunities. The great mass of mineworkers have little contact with their union, and they often behave as if they have little confidence in its leadership.

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The Rebecca Riots. A study in agrarian discontent. By D. WILLIAMS. (Cardiff University of Wales Press, 1955. Pp. 377. 25*s.*)

PROFESSOR WILLIAMS has already given us, in his *John Frost*, an authoritative account and interpretation of the Chartist rising and march on Newport in 1839. In that same year, six months before, in Pembrokeshire, the first toll gate was destroyed by rioters, some of whom wore women's clothes. The Rebecca Riots were contemporary with Chartism; they were the result of grievances which arose in part from the same general causes; and some active spirits took part in both movements. But Professor Williams makes it clear that they were definitely not a Chartist movement. They were a revolt of tenant farmers, not of farm labourers or industrial workers.

Professor Williams' research into contemporary accounts in newspapers, Welsh and English, national and local, into documents in the Carmarthen County Museum and the National Library of Wales, but above all in the Public Record Office, has been so thorough that his references (wisely kept separate from the main text) occupy sixty-five pages of small print. Yet his account of the events is delightfully easy to read, and the events themselves are so skilfully interpreted that we never lose sight of the wood for the trees.

Perhaps it is not quite so romantic a story as folklore would have it; but it is as lively a bit of history as any in Britain since the Young Pretender sailed back to Europe. Some years before the destruction of toll gates began, discontent found an outlet in disorders at night outside the houses of unpopular persons, such as a farmer who intended to take on another farm as well as his own. In these affairs effigies of the victim were carried on a pole or *ceffyl pren* (wooden horse). Many men in the mobs blackened their faces or wore women's clothes so as to avoid recognition. The methods of the later rioters were thus derived from ancient tradition and folk custom. It is therefore not so surprising as at first might be supposed that neither the contemporary magistrates or government agents, nor later historians, have been able to discover any master director of the series of highly successful raids, in which the military forces brought in to prevent them were again and again outwitted.

The book opens with a careful study of the system of land ownership in West Wales and of the control of political power, both in local government and in Parliamentary representation, which went with it at the opening of the nineteenth century. At the time of the Reform Bill there were differences of opinion among the gentry which gave some opportunity to radical and Nonconformist sentiment to gain expression. By 1842, however, when the major riots occurred, the great Lords Cawdor and Dynevor were in "Holy Alliance" and dominated the scene. "The growing forces of democracy had little opportunity to express themselves. The framework of government had not been altered to correspond to changes in the social structure and the sense of frustration caused by this contributed much to the uneasiness which prevailed in the countryside." Not only did landlords exer

great influence over Parliamentary representation, parson and squire dominated town corporations and controlled the benches of magistrates which administered justice and were largely responsible for local government in the countryside. When their grievances became too heavy to bear there was no outlet for the tenantry but resort to force.

The new roads were built to provide better access to and from England, to enable lime to be brought to the farms and coal to the ports, and to link the market towns together. Clearly these are purposes beneficial to farmers; yet it was farmers who destroyed the toll gates from which came the revenue which made possible the building of the roads. Professor Williams analyses this apparent paradox with great skill.

At first, Rebecca attacked only gates which were considered "unjust": those which were placed close to others, involving double or treble charges on the same flow of traffic; or gates operated by toll-farmers who had paid for their privilege and had to recoup themselves by permitting no infringement or relaxation of the rules. There were accusations of favouritism to the gentry and distrust of magistrates who were turnpike trustees and yet acted as judges in their own cases. But none of these and other abuses would by themselves have caused the movement to have gained such wide support or to have become so extensive and violent as eventually it did.

Professor Williams shows clearly that the underlying cause was the pressure of population upon resources. He estimates that the population of Cardiganshire, Pembrokeshire and Carmarthenshire doubled itself between 1750 and 1851. Despite the enclosure and increased cultivation of uplands, there were insufficient outlets for all the would-be tenant farmers; the numbers of labourers increased; and rents rose. When a temporary depression occurred in industry, the backwash of population to the countryside made discontent well-nigh intolerable. The Rebecca Riots occurred just before the potato famine; for the situation in West Wales, though not so desperate, was very similar to that in Ireland. Fortunately for the forces of law and order, the great expansion of industry in Wales itself, in England and in the United States soon drew away the younger people of both Ireland and Wales to the mines and steelworks. Fifty years later these became in their turn the centres of social protest.

H. A. MARQUAND

London.

William Thompson, 1775–1833. By R. K. P. PANKHURST. (London: Watts, 1954. Pp. xi + 228. 15*s.*)

"Do we really deserve our democrats?" asks Mr. H. L. Beales in the foreword to this book, sadly listing the British reformers, radicals and early socialists who have never found a biographer or whose lives are interred in Ph.D. typescripts. We are beginning to deserve them. Dr. Pankhurst's lucid and admirable account of William Thompson, whom he rightly calls "the most important theoretician among the early Socialists"—the British

ones that is—joins Halévy's *Hodgskin*, which has at last been translated, the lives of Ernest Jones and William Morris, Dr. Meek's researches into the economic controversies of the first half of the nineteenth century and Professor Cole's *History of Socialist Thought*, all of them published within the past few years. It was high time. The neglect of our native group of socialist pioneers has been quite scandalous. Though none were in the highest flight as theorists, as a group and as individuals they made a most original contribution to economic and social thought and occupy a key place in the history of the international socialist and labour movement.

The specialist tends to welcome any addition to our knowledge of these men. The non-specialist will be chiefly interested in assessing their contribution to the development of the ideas and causes they had at heart and to economic theory in general. Unfortunately, since Foxwell if not from an earlier date, the discussion of the " labour economists " has been largely that of their contribution to the formation of Marxism and of the extent of Marx' debt to them. The questions are legitimate, and Dr. Pankhurst asks them, while avoiding the excess of Halévy, whose *Hodgskin* is too heavily involved for Hodgskin's safety in the controversies about Marx' originality and validity. Dr. Pankhurst gives a balanced account of the problem and therefore an open answer. He has a somewhat stronger case for his man than Halévy, for Marx had definitely read Thompson by 1846, and Thompson cannot, as Halévy seems to have thought, be regarded as " Hodgskin's disciple." Moreover, the range of Thompson's writings is far wider than Hodgskin's, and if we are looking for parallels with Marx (leaving aside the question of indebtedness) we find them not only in the field of economic analysis, but also in that of politics—Thompson was one of the rare " utopian socialists " who paid considerable attention to political activity—and in the general field of socialist ideals, about which he wrote much, being with Owen the most systematic designer of co-operative communities in our literature. However, these questions of intellectual pedigree are not very important. Most of the socialist pioneers thought along parallel lines and borrowed from one another. Marx and Engels were indebted to them in various ways, and have acknowledged their debt fairly handsomely. Further details may be safely left to the specialist.

Dr. Pankhurst gives a succinct account of Thompson's life, that of an Irish landowner which appears to have been wholly admirable and disinterested, of his practical activities, mainly in the Co-operative movement to which he rightly attaches considerable importance, and of his chief writings: the *Inquiry into the Principles of the Distribution of Wealth* (1824), the *Appeal of One Half of the Human Race, Women* (1825), *Labour Rewarded* (1827) and the *Practical Directions for the Speedy and Economical Establishment of Communities* (1830). He draws attention not merely to the ideas and theories which Thompson shared with numerous other contemporaries on the left, though they were not always expressed in the same theoretical framework, but to those which he was the first, or one of the first, to propound. *Labour Rewarded* was one of the first works to regard the trade cycle as an inevitable

concomitant of capitalism, though not arguing for any particular periodicity; the *Inquiry*, one of the first to suggest that foreign expansion was a means of preventing the lowering of the rate of interest due to the accumulation of capital at home. Thompson may also have a place in the history of debates about the national income by his insistence (as against Hodgskin) on classifying none but manual workers as " productive," since the inclusion of " *mental* labourers, *literati*, men of science " and others might open the way to capitalists and landlords claiming that they, too, were productive on the grounds of their entrepreneurial functions. He insisted strongly that economic theories—at least those of capitalist economists—were rationalisations of class interests. His chief theoretical peculiarity appears to have been a rigorous egalitarianism, for he believed that the factors on which a wage schedule would have to depend under socialism were too complex for measurement and too subject to constant change to make any but a simple egalitarian system practicable. Perhaps in this departure from what was even then an accepted view among socialists, he was moved not only by empirical considerations, but by that clear moral idealism which makes him so pleasant a man to read about. In brief, Thompson is not to be neglected as a theorist, and in so far as modern socialism still discusses its ideal society in much the same terms as those suggested by the first generation of " utopians "—and this is so even in the U.S.S.R.—he may for socialists be worth consulting for other than historical reasons.

Dr. Pankhurst attempts to assess both his theoretical and practical legacy: his established influence on J. S. Mill as well as the problem of his influence on Marx, his place in the movement for popular education, women's emancipation and birth control (he was no Malthusian, however), his influence on the trade unionist, Chartist and co-operative movements and on rationalism. But perhaps the most impressive tribute to him is the fact that even to-day " his kindness and eccentricities are still current talk among the old folk of Glandore and Rosscarbery, who learnt of him from their parents or grandparents as their friend and protector, the best of all landlords and employers." It is just that he should have a book to himself.

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The History of a Soviet Collective Farm. By F. BELOV. (New York: F. A. Praeger, for the Research Programme on the U.S.S.R., 1955. Pp. 237. $6.00.)

A CONSIDERABLE number of Western agriculturists have visited Russia during the past two years, and have had opportunities to visit both state and collective farms—probably, indeed, farms a good deal better than a random sample. The general impression is that, while technical efficiency—as judged by the yields of crops and quality of livestock—is often high, labour productivity is extremely low. Professor D. S. Hendrie, for example,

says, " it seems safe to say that farm labour productivity is not more than 25 per cent of that of the United Kingdom." This estimate makes full allowance for the very high proportion of married women in the total farm labour force. Labour efficiency appears to be considerably higher on the state farms than on the collectives, no doubt because the former has its own mechanical equipment while the collective has to rely on its machine-tractor station for mechanical cultivation, harvesting and other operations; and partly because, as the Soviet authorities continue to complain, the members of the collectives spend an inordinate amount of their time in the production and marketing of the eggs, vegetables and other produce from their minute private plots.

The author of the book was born, shortly after the revolution, in the Ukrainian village which is the scene of his narrative. The village lands extended to some 10,000 acres, and the population was some 3,000 souls. The " attack on the Kulaks " reached the village in 1928, and the process of " dekulakisation " proceeded fast. The author served in the Army, was discharged with the rank of captain in 1947 and, with reluctance, accepted the office of chairman of the collective.

He claims that, by comparison with his neighbours, he achieved a high level of output; did much to repair the devastation of the German occupation and created tolerable housing conditions and other amenities; and that he was rewarded by the emergence of something like a team spirit among his workers. But he came to be regarded by his superiors as a troublesome fellow. When he exceeded his quotas of deliveries, he was told that these had been set too low and must be raised. He was driven to resort to bribery in order to procure essential supplies and services, and suffered more and more frustration as time went on. In 1950 he was sent back to the Army; in 1951 he escaped to Western Germany and now lives in the United States.

The impression left on many readers of the book will be that the picture which Mr. Belov paints—of the gross inefficiency and corruption on the part of state officials—is altogether too bad to be true. Yet if one studies the diagrams of the Organisation of the Kolkhoz (p. 39) or that of the Organisations and Institutions in constant contact with the Kolkhoz (p. 63)—and bears in mind the probability that the higher personnel have been chosen for their political orthodoxy rather than for competence in husbandry or administration—it would not be surprising if the machinery had ground and jolted. Lower down the scale, the men most likely to have given efficient service as brigade leaders and head stockmen were probably members of the Kulak class.

The book—whether or not the picture it paints is seriously distorted—will certainly help towards a judgment of the Soviet experiment on the land.

J. A. SCOTT WATSON

London.

NOTES AND MEMORANDA

INDUSTRIAL PRODUCTION AND PROFITS IN THE UNITED KINGDOM AND THE UNITED STATES: SOME COMMENTS

IN his interesting statistical study of the relation between aggregate net profits and industrial production (this JOURNAL, September 1955), Dr. Stern noted differences of the regression coefficients (the slope or "amplitude") and the regression constants not only for the two countries under consideration, but also for the various subperiods which he examined separately. In explaining these differences, not sufficient attention was paid: (1) to the different conditions under which production and profits changed in these periods, and (2) to the influence of the price level on these coefficients. We shall first discuss the second factor.

Dr. Stern has correlated indexes of the *physical* volume of production with indexes of the (undeflated) *money* value of the profits: it stands to reason that a rise in output by 1% would, in a period of high prices, cause a larger increase in profits than in a period of low prices. The hypothesis that money profits (y_i) are a linear function of the money value of production (in current prices) (p_iq_i) reads (disregarding in this stage the influence of price on the regression constants and of taxes):

$$(1)\quad y_i = bSp_iq_i + c$$

where S is the summation sign and i the given year). Transforming into index form and using zero as base year:

$$(2)\quad y_i/y_o = (bSp_iq_i/y_o)\ (Sp_iq_i/Sp_iq_o) + c/y_o$$

The term in the second parenthesis is a Paasche index of production; the term in the first parenthesis is Dr. Stern's regression coefficient,[1] which is here shown to depend on p_i; the correlation between the physical volume of production and the money value of profits will be approximately equal to that between the money value of production and profits if p_i is approximately constant during the period of observation (as for 1921–23 and again for 1931–40) or highly correlated with production (as in the post-war period and in the years 1919–20). A change in the base period will affect the regression if $Sp_iq_o/Sp_iq_t \neq y_o/y_t$ (where t is the new base period).

These considerations make clear that the regression coefficients for different countries can be compared only if: (1) the base period is the same, and (2) the form and composition of the production indexes are the same.

[1] A similar result is obtained if the production index is of the Laspeyres form.

The increase of the regression coefficients during the three periods after the First World War can then be explained as follows [1]:

(1) During the twenties the increase in profits was primarily determined by the *growth* of an economy which, except for 1920, maintained a relatively constant level of utilisation—a very high one, indeed, in the U.S.A.—and which since 1921 enjoyed a relatively stable price level.

(2) The price fall in the thirties, together with a reduction in the gross profit margin,[2] could be expected to reduce the regression coefficient. This tendency was more than offset by the influence on profits of the sharp fluctuations in the degree of utilisation of capacity. Clearly short-run fluctuations in output due to changes in the degree of utilisation of a given stock of capital will affect profits more strongly than secular changes in output arising from changes in an always "fully" utilised stock of capital (positive or negative growth).

(3) The increase of the regression coefficient in the post-war period is primarily a price phenomenon (compared with the thirties prices more than doubled). In addition, the rate of growth exceeded somewhat the rate in the twenties, and profit margins probably exceeded those of the thirties, offsetting the negative influence on the regression coefficient of a constantly high degree of utilisation.

A similar discussion of the changes in the regression *constants* would be of doubtful value, since the linear relationship between profits and production cannot be supposed to hold at the zero level of production. A study of the break-even or zero profit levels is less objectionable, the less so since in the United States this point was actually reached during the second period. There is the further advantage that changes in the fixed costs due to growth and to price changes that are correlated with changes in production, will not affect the regression *constant*, but the regression *coefficient*, and hence also appear as shift of the break-even level.[3]

In the present case, the ordering of the break-even levels happens to be the same as that of the regression constants (absolute values), lowest in the twenties, higher in the thirties, highest in the post-war period.[4]

[1] We disregard the influence of tax changes which is adequately explained by Dr. Stern. Furthermore, we do not offer an explanation for the period before 1914 because we do not have one. For the three periods examined we use the correlations of series with the common base period 1935.

[2] Independent changes of the gross profit per unit of output would, of course, destroy the correlation between profits and production. It seems, however, that 1923–29 in the United States at least, the gross profit margin, if not constant, showed an upward trend, *i.e.*, was correlated with production; for 1933–39 it showed a downward trend, *i.e.*, except for 1938 it was negatively correlated with production; and that in the post-war period the margin, though higher than in the thirties, was relatively stable.

[3] Dr. Stern uses the term "shift" with reference to the regression lines, without specifying the parameters by which the shift is to be measured. He considers the British line to shift "again to the left" (p. 490 bottom) in the post-war period, though both the absolute value of the negative constant and the break-even level *increase*. True, the lowest point on the post-war line is to the left of the highest point on the line of the thirties, but the position of a curve cannot be determined by reference to one end point. For the United States all points on the post-war line lie to the right of all points on the line of the thirties.

[4] We again refrain from commenting on the period before 1914.

The very sharp increase in the break-even levels is at the first glance surprising, especially from the first to the second period. Granted a relative increase in fixed costs (in terms of constant prices) and some decline in the profit margin (see footnote 2 on p. 530), some counter-effect should have been exercised by the price fall, even if we take into account the very slow adjustment of depreciation allowances to price changes; in any case the increase in the break-even level by far exceeds the possible increase in fixed costs.

The solution of the puzzle lies in the different nature of the regression lines in the various periods. As pointed out above, the regression line of the twenties largely reflects a growing economy with a constant degree of utilisation; extrapolating this line downwards implies a reduction of capacity almost commensurate with the reduction of output; if the former were fully proportionate to the latter the break-even point would be at the zero-production level (fixed costs would have vanished), to which it is, indeed, close in the British statistics. In the thirties, on the other hand, the regression lines primarily reflect fluctuations in utilisation, and the statistical break-even point indicates zero profits for not greatly changed capacity—far to the right of the break-even points of the twenties.

This explanation, satisfactory as it is for the relation of the second to the first period, makes, of course, trouble for the increase from the second to the third period (from 25·6 index points to 71·8 in the United Kingdom, and from 80·1 to 140 in the United States). We may comfort ourselves with the observation that already the United States line for the twenties did not pass through the origin as appropriate to "pure" growth; utilisation is never completely constant and the break-even level as statistically indicated is always a mixture of short-run and secular levels. Theoretically the secular increase in profit from growth when the production level rises from x_1 to x_2 should be smaller than the short-run decline when underutilisation reduces this level from x_2 to x_1, yet the downward movement from 1948 to 1949 was, in the United States, on the same line as the upward movement from 1946 over 1947 to 1948. We had better not extrapolate too far downward.

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INDUSTRIAL PRODUCTION AND PROFITS IN THE UNITED KINGDOM AND THE UNITED STATES—A REJOINDER

IN his note Hans Neisser makes, *inter alia*, these points:

(*a*) the differences in the regression coefficients from sub-period to sub-period in the United States "depend" on the changes in the price level, the regression coefficients tending to be the larger, the higher the price level;

(*b*) they also depend on the degree of utilisation of capacity, the regression coefficients tending to be the smaller, the higher that degree.

He goes on to explain why from the 1920s to the 1930s the regression coefficient increased, in the latter period the fall in the degree of utilisation proving itself to be a stronger influence than the fall in the price level, and why in the post-war period at a fairly persistently high degree of utilisation of capacity the increased price level led to another increase of the regression coefficient. Unfortunately, Neisser used for these elaborations the series of correlations with the common base of 1935. It was already explained in my article that on this basis the regression coefficients in a correlation of profits to the volume of production can hardly help increasing as time goes on, because with increasing capacities absolute fixed costs (even at constant prices) increase too. This was one of the reasons for the splitting-up of the whole into several sub-periods with mid-period bases in the first part of my article. If Neisser had referred to the sub-periods with mid-period bases (graph A and B of my article), he would have been faced with the phenomenon that in the United States the regression coefficient increased from the 1920s to the 1930s, but declined from the 1930s to the post-war period, and did so decline despite the very substantial rise in the price level. And these fluctuations of the regression coefficient in the United States sample differ from the three-step rise in the United Kingdom sample, another phenomenon for which I offered some tentative, though not conclusive, explanations.

Obviously, the regression coefficient does not "depend" on the price level in the sense that the latter is the dominant influence. As a matter of fact, Neisser's equation (2) shows that the change in the price level (the ratio of p_1 to p_0) is one of several factors entering into the regression coefficient, but it cannot show the relative weight of this particular factor. As will be seen presently, its weight is probably small, unless, of course, a severe and rapid inflation deprives profit comparisons of any meaning. In the January 1956 issue of the U.S. Department of Commerce *Survey of Current Business*, Harlow D. Osborn and Joseph B. Epstein have published an article on "Corporate Profits since World War II." The data provided in this article permit us to correlate profits and the value of production for the United States, the latter represented by profits, employee compensation and net interest, called in that article "income originating." Their sample differs from that used in my article in certain respects: it includes agriculture, trade, transport and public utilities, finance, insurance, real estate, overseas activities and services, in addition to manufacturing, mining and construction; its profits are before taxation and inventory valuation adjustments, those in my sample after both; it embraces all the years 1922–55, as compared with 1919–40 and 1946–50 (53) in my sample; it includes the profits and production of all corporations, instead of an assumedly representative selection; lastly, their article gives the data for some of the years in the form of graphs, from which I have tried to reconstruct the original figures, probably not always exactly. Nevertheless, here is an opportunity to correlate profits and the value of production in the United States.

Doing so for the whole period, but excluding the war years 1941–45, I found a very close linear correlation, and a break of trend from the 1920s to the 1930s and from the latter to the post-war period. Moreover, I found regression coefficients (b) changing in the same direction as in the volume samples, if the latter are based on mid-period bases, as follows:

value sample:
$b(1922\text{–}29) = 0{\cdot}357$; $b(1930\text{–}40) = 0{\cdot}409$; $b(1946\text{–}55) = 0{\cdot}230$
volume sample:
$b(1919\text{–}29) = 2{\cdot}02$; $b(1930\text{–}40) = 4{\cdot}02$; $b(1946\text{–}50) = 2{\cdot}52$

Despite the substantial rise of the price level from the 1930s to the post-war period, the regression coefficient declined, and despite a fall in the price level from the 1920s to the 1930s, the regression coefficient increased, though by only a little in the value sample. Apparently the change in price levels is overshadowed by other factors, as, *e.g.*, by the change in the degree of utilisation of capacity. As pointed out in Part I of my article, the regression coefficient is a composite of many elements, of which changes in prices and degree of utilisation of capacity are only a selection.

Neisser's hypothesis of profits being a linear function of the value of production is borne out by the data in the value series. Such is, however, in a market economy, the effect of the never-ceasing adjustments brought about by changing prices, wages, interest rates, profit margins, inventory valuation adjustments, taxation and what else, that the volume of production, *i.e.*, growth and the degree of utilisation of capacity, emerge as the dominant factor in the fluctuations of entrepreneurial profits unless severe and rapid inflation deprives profit comparison of its meaning.

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SEQUENCE ANALYSIS AND THE THEORY OF THE RATE OF INTEREST

IN his article in the December 1955 issue of this JOURNAL,[1] Mr. Wright begins with a set of six equations (p. 628) representing a version of the Keynesian system, with time lags introduced. The six equations are as follows, though I list them in an order different from that in which Mr. Wright presents them:

$$Y_t = E_t + K_t \qquad \text{(i)}$$
$$E_t = c_L\,(Y_{(t-1)}) \qquad \text{(ii)}$$
$$K_t = k\,(i_t) \qquad \text{(iii)}$$
$$K_t = S_t \qquad \text{(iv)}$$
$$S_t = s_L\,(Y_{(t-1)}) \qquad \text{(v)}$$
$$i_t = L_L\,(Y_{(t-1)},\ M_{(t-1)}) \qquad \text{(vi)}$$

[1] A. Ll. Wright, "Sequence Analysis and the Theory of the Rate of Interest."

Mr. Wright is worried because there are here six equations, in his view independent ones, but only five dependent variables, E_t, S_t, K_t, Y_t and i_t. The rest of his article comprises mainly a search for a sixth dependent variable, without introducing a seventh equation. Eventually he gets his extra variable by having two interest rates (the i_t and r_t on p. 634) instead of only one, but he avoids a seventh equation only by ignoring an obvious relationship between the two rates, which he himself refers to on p. 639.[1]

Before proceeding to comment on Mr. Wright's system, I would like to simplify it by consolidating his six equations into three.

The first three of his equations in my list tell the following story: the national income in any period (Y_t) is generated by consumption expenditure (E_t) plus investment expenditure (K_t), the former depending on income in the previous period, the latter on the rate of interest. Thus we could write:

$$Y_t = c_L\,(Y_{(t-1)}) + k\,(i_t) \quad . \quad . \quad . \quad . \quad . \quad (a)$$

This gives Y_t in terms of i_t.

Equation (iii), taken in conjunction with equations (iv) and (v), also tells us about the demand for, and supply of, investible funds. The demand for investible funds in any period is taken to be the same as investment in that period (and therefore depends on the rate of interest): this demand is equated to the supply of investible funds, which depends on income in the preceding period. Thus:

$$k\,(i_t) = s_L\,(Y_{(t-1)}) \quad . \quad . \quad . \quad . \quad . \quad . \quad (b)$$

This second equation, however, makes sense (as Mr. Wright would certainly agree) only if the right-hand side is interpreted as meaning something other than "the supply of savings out of last period's income," for if it were such it would always be equal to:

$$Y_{(t-1)} - c_L\,(Y_{(t-1)})$$

and the substitution of the latter expression in the right-hand side of equation (b) would give us:

$$k\,(i_t) = Y_{(t-1)} - c_L\,(Y_{(t-1)})$$

or, transposing:

$$Y_{(t-1)} = c_L\,(Y_{(t-1)}) + k(i_t)$$

i.e., the expression for *last* period's national income would be precisely the same as that given, in equation (a), for *this* period's national income.

No, we must not put an interpretation on the right-hand side of equation (b) such that we are led to the conclusion that the national income is invariable! This conclusion would, however, be avoided if we could allow $s_L\,(Y_{(t-1)})$ to take into account some flow which must be added to (or subtracted from) the flow of savings. Such an additional flow does indeed

[1] "The effect of, say, a rise in the short rate is to force individuals to sell long-term securities; the market values of these securities fall and the long rate rises; and vice versa in the case of a fall in the short rate."

exist: it is (as Mr. Wright points out) the flow of dishoarded funds (or, in the opposite sense, the flow of funds into hoards). Thus if we interpret $s_L\,(Y_{(t-1)})$ as Mr. Wright invites us to, the story told by equations (a) and (b), considered together, is that "this period's national income may differ from last period's on account of hoarding or dishoarding, the explanation of which is subsumed in the expression $s_L\,(Y_{(t-1)})$."

What, however, Mr. Wright seems not to have realised is that his remaining equation,

$$i_t = L_L\,(Y_{(t-1)},\, M_{(t-1)}) \quad . \quad . \quad . \quad . \quad . \quad . \quad (vi)$$

is *also* a story about hoarding. For this equation is (as Mr. Wright tells us [1]) Professor Hicks' $M = L\,(Y, i)$ with time lags introduced (the *wrong* time lags, in my opinion [2]), and Professor Hicks' equation is in turn derived from Keynes'

$$M = M_1 + M_2 = L_1(Y) + L_2(i)$$

which is essentially a theory of hoarding.[3] Mr. Wright apparently thinks otherwise, for he alleges (p. 631) that "most Keynesians" believe that total hoarding (or dishoarding) is invariably *nil*: [4] nevertheless, it seems to me that the Keynesian equation could be translated into English in something like the following terms:

> "The amount of money hoarded at any date (M_2) depends on considerations of demand and of supply. The demand for money to hoard depends inversely on the rate of interest. The supply of money available for hoarding depends, given the total amount of money in existence (M), on the amount of money the public keeps in circulation, this amount depending in turn on the rate of income-generating expenditure that the public chooses to maintain."

If this translation be reasonably accurate, then Keynes' equation, and with it Mr. Wright's equation (vi), is essentially a story about hoarding.

Hence in Mr. Wright's system of equations the hoarding story appears twice, in two different versions. This, it seems to me, is the true reason why the system suffers from a surfeit of equations. Mr. Wright's journey in search of an additional variable turns out not to have been really necessary.

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[1] Pp. 627–8.

[2] My interpretation (given below) of equation (vi) is that the rate of interest is affected by the supply of money available for hoarding, and that this supply comprises the *present* total amount of money in existence (M_t, not $M_{(t-1)}$), minus that portion of the total which the public intends to spend in the near future (which would serve to generate income in the future, not in the past).

[3] Keynes' equation appears in the *General Theory*, p. 199. His own symbol for the rate of interest is r, not i.

[4] What *is* invariably *nil*, given the amount of money in existence, is the net total of all changes (in any period) in the money holdings of individual members of the public. However, not all money held is money hoarded.

PRODUCTIVITY IN TWO DOMINIONS: A REJOINDER

IT is always a pleasant surprise to discover that one's old articles are being read, however critical the reader. Mr. Maddison [1] has found several flaws in mine,[2] and some of his criticisms are accepted. I remain unconvinced, however, by what I take to be his answer to my only critical reference to his earlier work.[3]

I had maintained that conceptually it was incorrect to obtain physical output figures from deflated national product (value) data, without adjusting the latter first for changes in the terms of trade. I mentioned "the appreciable effects (which) the terms of trade can have in countries in which foreign trade is as important a component of foreign trade as in New Zealand or in Canada." [4]

Mr. Maddison's answer is neither theoretically nor factually convincing. He justifies his procedure by two arguments; firstly, that "Between 1931 and 1941 the Canadian terms of trade were unchanged and over the period 1931–49 the small improvement in the terms of trade probably raised real income by under 2%, whilst real G.N.P. more than doubled." [5] His second argument is that "In New Zealand foreign trade is more important than in Canada. . . . It seems therefore quite appropriate that Mr. Lerdau should use a different technique in dealing with the New Zealand economy." [6]

For the following reasons this completely fails to persuade me:

(1) I do not know what index Mr. Maddison uses to find that the terms of trade did not change for Canada between 1931 and 1941. According to the *Statistical Yearbook of the United Nations* they did change. Import prices rose from 92 to 112, or 22%, and export prices rose from 84 to 97 or 15%. For the longer period, contrary to Mr. Maddison's assertion, *according to this index at least*, the terms of trade changed by less than over the shorter period.

(2) In 1939, according to the *Canadian Yearbook*, exports were 26% of Gross National Expenditure, and in 1946 27%. The corresponding figures for New Zealand were 26 and 22%. While it is admitted that it may be possible that the choice of different years might have changed the results slightly, the order of magnitude of these figures shows that the differences between the two dominions are not significant in this respect.

(3) Even if the New Zealand figures had been much higher, I fail to see how this would justify a different *technique* for Canada. All that Mr. Maddison is really arguing is that the size of the bias introduced in Canada by neglecting the terms of trade would be smaller. And even this is put into question, as far as the importance of foreign trade is concerned.

(4) If either of Mr. Maddison's two arguments were factually correct, the other one would be redundant. But in his original article he did not make reference to either, and unless he can adduce evidence for his present assertions, I see no reason to doubt that his original figures would have been improved by using for Canada the method with which "(Lerdau) is mistaken to suggest (Maddison) would disagree (for New Zealand)."

That my partition formula "ignores the problem of structural shifts" is admitted, and I never thought it did anything else. I *did* think that this was too evident to mention, but I may have been in error on this.

Since Bray's index is not yearly, my choice of the 1936–41 rate of growth to apply to the period 1938–43 was a counsel of expediency. Mr. Maddison is right when he says that this introduces an error. I did, however, state explicitly what I was doing.

I would like to take this opportunity to correct what is to my mind the most serious mistake of my paper, although Mr. Maddison does not mention it. I stated that "the fact that in 1947 the labour force was 20% above 1943 and the output per man hour slightly above that of 1943, while that of persons actively engaged was practically the same, makes it plausible to argue that for the economy as a whole increasing or at least constant returns to labor still exist." This was based on the incorrect unstated major premise that no appreciable net new investment had occurred in the period.

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[1] A. Maddison, "Economic Growth in Two Dominions," ECONOMIC JOURNAL, December 1955.
[2] E. Lerdau, "Changing Productivity in the New Zealand Economy," ECONOMIC JOURNAL, March 1954.
[3] A. Maddison, "Productivity in an Expanding Economy," ECONOMIC JOURNAL, September 1952.
[4] *Op. cit.*, pp. 185–6. [5] *Op. cit.*, p. 717. [6] *Op. cit.*, p. 717.

REJOINDER TO PROFESSOR NURKSE

ON the second page of my paper "External Economies and the Doctrine of Balanced Growth" (ECONOMIC JOURNAL, June 1955, p. 242) I mentioned that both Professor Nurkse and Professor Rosenstein-Rodan, by speaking in terms of the "inducement to invest," were implicitly assuming some elasticity in the supply of capital, and on p. 248 I stated—rather belatedly, I admit—that Rosenstein-Rodan was explicitly assuming an elastic supply of labour.

It is true that from p. 245 onwards, in my critical examination of the balanced-growth doctrine culled from the views of these authors, I treated the doctrine as not in itself entailing any particular assumption about factor supply. I regret that the reader was not reminded sufficiently often that the authors of the doctrine had in fact put it forward under more restrictive assumptions. I regret even more having confused the issue by initially (on

regret, however, is having discussed the doctrine in the unrestricted form in which "it was never put forward," as this was the most convenient way to conduct a systematic examination of the role of factor-supply conditions in determining its validity. Such an examination seemed, and seems, to me desirable because: (*a*) the vital importance of this role had not been made clear in the literature, and (*b*) different assumptions about factor supply had in fact been made by Rosenstein-Rodan and Nurkse.

In these circumstances it would not be surprising if unwary adherents of the "doctrine" should seek to apply it in conditions in which it was not properly applicable.

I question whether the bearing of factor-supply conditions on the validity of the doctrine is quite so self-obvious as Nurkse indicates. It is not, for example, "intuitively obvious," nor is it indeed the case,[1] that a technically progressive but unprofitable innovation involving an expansion of *output* in a particular industry—which is what I was arguing about—will *necessarily* involve an increased use of factors and hence, in an economy with fixed factor supply, hurt instead of helping the profitability of other industries. Still less is it obvious, or even true, that it will necessarily involve a departure from optimal allocation.

But if Nurkse is a little too hard on the doctrine of balanced growth in conditions of fixed factor supply, he is a good deal too sanguine about it on his implied assumption of elastic capital supply. Even a perfectly elastic supply of capital is *not* sufficient, nor did I grant it to be sufficient,[2] to ensure that investments in different home-market industries will tend to render each other more profitable. In particular, it may make a great deal of difference, as I pointed out, whether the capital is assumed to be raised at home or abroad.

Nurkse makes great play with my "static assumptions," but I am not clear in which respect these are thought to render my argument misleading. The main practical relevance of the balanced-growth doctrine is its bearing on the results of alternative government policies or alternative courses of entrepreneurial action. For example, what difference will it make to the real income of a country if the government (*a*) takes steps, (*b*) does not take steps, to encourage the introduction of technically efficient plants involving output expansion in a wide range of industries in circumstances in which the introduction of any such plant in any single industry would be unprofitable? Ideally, this calls for a comparative process analysis covering a period starting at the moment of decision and extending indefinitely into the future. Not only, however, would such a comparative dynamic analysis be excessively complicated, but the characteristic contribution of the "balanced-growth doctrine" to the analysis seems to relate, not to the transitional period when the supply of labour or capital is in process of expanding or of being re-distributed in response to the decision referred to at (*a*) above, but to a stabler post-transitional period. Since the static character of my assumptions largely consists in my ignoring this transitional period, I do not think that my conclusions are thereby invalidated.

[1] As I pointed out (ECONOMIC JOURNAL, June 1955, p. 246, footnote 1).
[2] See ECONOMIC JOURNAL, June 1955, pp. 252–3.

Allyn Young, in his ECONOMIC JOURNAL article of December 1928, was discussing a somewhat different sort of question, involving a comparison, not of alternative processes relating to the same time periods, but rather of states of affairs in *different time periods*, *i.e.*, periods preceding and following significant changes in factor supply. In discussing this sort of "simple dynamic" or historical question some of my factor-supply schedule analysis may have less relevance than to the "comparative dynamic" question that I was actually discussing. This is why I treated him as a precursor rather than a proponent of the doctrine I was examining.

MARCUS FLEMING

Washington D.C.

CURRENT TOPICS

THE Annual Meeting of the Royal Economic Society was held on Wednesday, June 27, 1956. Sir Alexander Carr-Saunders was elected to the office of President in succession to Professor L. C. Robbins, who was elected Vice-President. With these exceptions the Council and Officers were elected without change for 1956–57. The formal business was followed by a discussion on "How Should We Control Monopoly?" The discussion was opened by Professor E. A. G. Robinson, Mr. J. Downie, of the Oxford University Institute of Statistics, and Professor J. L. Montrose, Dean of the Faculty of Law in the University of Belfast.

THE Secretary reported on the membership and finances as follows:

	1955.	1954.	1939.	1914.
New Fellows and Library Members elected . . .	517	367	490	50
Fellows lost by death, resignation or default . . .	482	297	496	33
Number of Fellows and Library Members on December 31	6391	6356	4572	694
Total Compounders included in above total . . .	2139	2129	1155	159
Surplus of Income over Expenditure, together with receipts from Compounders	£844	429	329	278

MR. A. T. PEACOCK, Reader in Public Finance at the London School of Economics, has been appointed to succeed Sir Alexander Gray as Professor of Political Economy in the University of Edinburgh.

We regret to report the death on June 29th of Feodora Stone, Secretary of the National Institute of Economic and Social Research and wife of Professor J. R. N. Stone of Cambridge University. We offer both to the latter and to the National Institute our sincerest sympathies.

The following have been admitted to life fellowship of the Society:

Eastwood, T. Enthoven, Dr. A. C. Stewart, M. D.

The following have been admitted to fellowship of the Society:

Allen, G. R.
Barango, A. B.
Bates, Pilot Officer M. R.
Bialieux, S.
Bo, Lt. Col. Z. K. H.
Burton, H.
Carr, J. D.
Castillo, C.
Chew, L. R.
Chiu, I. H.
Cohen, Professor J. B.
Cooper, J. R. H.
Davis, M. P.
Etoe, O. M.
Ewelukwa, D. I.
Fawzi, Professor S.
Field, A. J.
Frowen, S. F.
Graham, K.
Gupte, A. D.
Harish, D. M.
Hodson, K. G.
Jenkins, W. E.
Kejawa, A. I.
Kitchker, J. W.
Lamb, R. S.
Luther, R. F.
Ma, D. V.
Maas, W. A.
Manning, Professor J. R.
Martin, C. J.
McCarty, J. W.
McLeish, Dr. A. C.
McWhirter, D. J. L.
Merchant, H. F.
Murugamalai, R.
Nancarrow, C. J.
Obayan, E. O.
Okoroji, I. U.
Osborn, E.
Patel, J. U.
Povall, K.
Rai, K. L. B.
Ramesh, D. M.
Ramzanalli, S.
Rodwell, K.
Roy, S. K.
Ryan, J. M.
Saraiya, O. M.
Scott, A. M.
Shah, R. D.
Thakkar, K. A.
Thakkar, N. N.
The, T. S.
Velusamy, K. S.
Wilson, Mrs. E. A.
Wilson, J. B.
Wu, Fei Yang
Yang, Mrs. L. T.

The following have been admitted to Library membership of the Society:

Messrs. Hepworth & Grandage, Ltd., Bradford.
Industrial Development Bank of Turkey, Istanbul.
King's College Economics Society, Newcastle-upon-Tyne.
Mahatma Gandhi Memorial College, Udipi, S. India.
Ministerio de Industria de la Nacion, Buenos Aires.
Unione Industriale, Biellese Biella, Italy.

RECENT PERIODICALS AND NEW BOOKS

Journal of the Royal Statistical Society

Vol. 119, Part 1, 1956. *The Statistician and the Planning of Field Experiments:* D. J. Finney. *Causal Inference from Observational Data:* H. Wold. *Some Aspects of the Structure of Indian Industry:* V. Anstey and R. J. Taraporevala. *The Principles of Factor Analysis:* M. G. Kendall and D. N. Lawley.

Economica

Vol. XXIII, No. 90, May 1956. *Some Notes on the Estimation of Time-forms of Reactions in Interdependent Dynamic Systems:* A. W. Phillips. *A Study in Price Policy:* I. F. Pearce. *Tariffs, Balance of Payments, and the Terms of Trade:* S. A. Ozga. *The Abolition of Derating: An Exercise in Differential Incidence:* A. Williams. *The Origins of the Synthetic Alkali Industry in Britain:* T. C. Barker, R. Dickinson and D. W. F. Hardie. *A Letter from David Ricardo:* L. C. Robbins.

Oxford Economic Papers

Vol. 8, No. 2, June 1956. *Demand and Supply Reconsidered:* G. B. Richardson. *Argentina and the Baring Crisis of 1890:* A. G. Ford. *A Note on Mr. Kaldor's Trade Cycle Model:* J. Black. *Wages in Coal-mining since Nationalization:* K. J. W. Alexander. *The Genesis of the Multiplier Theory:* A. Ll. Wright. *The Commercial Crisis of 1857:* J. R. T. Hughes. *Economic Expansion and International Trade: A Geometric Approach:* W. M. Corden.

Bulletin of the Oxford University Institute of Statistics

Vol. 18, No. 1, February 1956. *Consumer's Net Worth: the 1953 Savings Survey:* K. H. Straw. *Gross National Product of Wales, 1950:* E. Nevin. *Has the Distribution of Income Become More Unequal?:* D. Seers. *A "Human Needs" Diet: Autumn 1955:* T. Schultz.

The Manchester School of Economic and Social Studies

Vol. XXIV, No. 2, May 1956. *Wages: Industry Rates, Workplace Rates and the Wage-drift:* H. A. Turner. *Exports and the British Trade Cycle: 1929:* D. C. Corner. *Patterns of Development in Newly Settled Regions:* R. E. Baldwin. *The Element of "Accident" in the National Salary Structure:* H. R. Kahn. *Econometric Models and the Evidence of Time Series Analysis:* L. R. Klein.

Scottish Journal of Political Economy

Vol. III, No. 2, June 1956. *Economic Progress in Underdeveloped Areas:* T. A. F. Noble. *Lord Lauderdale and His "Inquiry":* A. V. Cole. *The Distinction between Wages and Salaries:* H. R. Kahn. *Economic Choice as a Philosophic Theory:* A. L. Macfie.

Yorkshire Bulletin of Economic and Social Research

Vol. 8, No. 1, June 1956. *Wool Buying in the Nineteenth Century: A Case History:* A. Barnard. *Monopoly, Technical Progress, and Public Policy:* J. Wiseman. *Hansen on Keynes:* W. T. Newlyn. *General Consistent Aggregation in Leontief Models:* M. McManus. *Labour Turnover and Daily Travel to Work in the Leeds Clothing Industry:* R. Hutt.

Journal of Agricultural Economics

Vol. XII, No. 1, June 1956. *Productivity and Costs in Australia and New Zealand:* Colin Clark. *A Reconsideration of the Theory of Agricultural Credit:* R. H. Tuck. *Beef Supplies in the United Kingdom—Retrospect and Prospect:* R. A. Mackness. *The "Capital Profile" as an Aid in Decision Making in Farm Management:* A. Harrison. *A Study of Economic Costs of Production: An Analysis of Horse and Tractor Costs:* K. Dexter. *The Demand for Frozen Beef in the United Kingdom, 1880–1940:* R. Duncan. *Selected List of the Writings of Arthur W. Ashby:* J. F. Duncan and J. H. Smith.

The Farm Economist

Vol. VII, No. 5, 1956. *Production Functions for Dairy Farming and their Applications:* S. R. Wragg and T. E. Godsell. *The Influence of Higher Rents on Farming Systems and Methods:* J. H. Smith. *Testing Agricultural Machinery:* R. N. Dixey. *The Productivity of Major Factors in British Farming: II:* J. O. Jones.

Accounting Research

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VOL. IX, No. 1, MARCH 1956. *O mercado monetário em Portugal no periodo de 1931–1955:* O. R. PEREIRA.

Revista de Ciencias Económicas

VOL. XLIII, No. 56, NOVEMBER–DECEMBER 1955. *Plan de pagos de deudas impositivas y condonación de multas:* L. SAPOLSKY. *La productividad y los factores psicofisiológicos de los trabajadores:* J. M. CUTO. *Soluciones para la escasez de dólares en el Brasil:* Y. BROZEN. *La futura prosperidad de las Américas:* J. P. WERNETTE.

Osaka Economic Papers

VOL. IV, No. 2, SEPTEMBER 1955. *Power and Stagnation:* Y. TAKATA; *Reply to Professor Takata:* F. MACHLUP. *Depreciation Allowances and Growth:* K. KIUCHI. *Latent Unemployment and Agriculture of Peasantry:* C. NAKAJIMA. *On the Determination of the Optimal Operating Level in a Textile Manufacturing Factory:* Y. OSAWA. *The Maximum Expansion of Bank Credit and the Theory of Games:* K. MIDUTANI.

Voprosy Ekonomiki (Russian text)

No. 3, 1956. *Under the Banner of Marxism–Leninism. Economic Competition between Socialism and Capitalism:* V. ALIKIMOV and YA. KOTHOVSKY. *The Cost of Production as an Economic Concept of Socialism:* M. SAKOV. *Socialist Agriculture in the Sixth Five-year Plan:* T. KOVAL. *Problems in the Development of Food Output:* V. ZOTOV. *The Significance for the Economy as a Whole of Accelerating Freights:* T. KHACHATUROV. *Some Questions on Crop Yield Statistics:* V. MANYAKIN. *New Works of Marx in Russian on Agrarian Relations in Russia:* A. TUSHUNOV. *Bourgeois Economics and the Development of Underdeveloped Countries:* V. KOLLONTAI. *Some Trends in the Economic Development of the Federal Republic of Germany:* E. KHMELNITSKAYA. *Building Socialist Economies in the European People's Democracies:* I. SEMENOV and N. SOKOLOVA. *The Economic Situation in Capitalist Countries in 1955. The Annual Meeting of the Economics, Philosophy and Law Sections of the Academy of Sciences:* A. BAKUMENKO.
No. 4, 1956. *The Lenin Plan for Building Communism in Action:* A. KORYAGIN. *The Leninist Principles of the Peaceful Coexistence of States with Different Social Systems:* G. DEBORIN. *Lenin's Theories on the Fluctuating Nature of Capitalist Development and the Intensification of Contradictions between Imperialist States Since the War:* V. CHEPRAKOV. *Lenin's Agrarian Programme in the First Russian Revolution:* E. KARNAUKHOVA. *Problems of Technical Progress and the Location of Industry in the U.S.S.R.:* YA. FEYGIN. *On the Problem of Measuring Production Costs on Collective Farms:* M. TERENTEV. *The New Planning Regulations and the Long-term Plans of Collective Farms:* A. KARAVAEV. *The Disintegration of the Colonial System of Imperialism:* V. VASILEVA. *The Uninterrupted Increase of the Productivity of Social Labour—An Economic Law of Socialism:* G. EVSTAFEV. *A Scientific Conference on the Economic History of the Baltic Republics:* E. BRANDT.

Planovoe Khozyaistvo (Russian text)

No. 1, 1956. *The Great Tasks of the Sixth Five-year Plan. The 1956 State Budget:* A. ZVEREV. *The Long-term Planning of the U.S.S.R. Economy:* G. SOROKIN. *Science and Technical Progress in the Economy:* I. ARTOBOLEVSKY. *Tasks for the Improvement of Industrial Supplies:* A. SAVKIN. *Reserves for Increasing Cement Production:* P. PLYASUNKOV *Problems in the Further Development of the Fishing Industry:* P. MAKSIMOV. *Planning Dwellings and Local Public Utilities:* A. NIKOLAEV.

Ekonomista (Polish text, English and Russian summaries)

No. 1, 1956. *The Balance Sheet of the National Economy:* B. MINC. *Agrarianism in the Social and Economic Programme of the Rural Bourgeoisie:* S. IGNAR. *The Definition of Productive Capacity and the Degree of Its Utilization:* S. CHAJTMAN. *Economic Relations between State Machine-tractor Stations and Co-operative Farms:* W. HERER. *Some Current Aspects of International Economic Relations between Capitalist Countries:* T. ŁYCHOWSKI. *The "Economic Miracle" in West Germany:* S. BIALER and A. SZEWORSKI (under the direction of M. KALECKI). *Concerning the Interpretation of the Economic Ideas of Copernicus:* E. LIPIŃSKI.

Gospodarka Planowa (Polish text)

No. 3, 1956. *The Realization of the 1956 Plan—A Further Step in the Development of Our Nationa Economy. Agriculture on the Eve of the Five-year Plan. An Important Step towards the Realization of Communism in the U.S.S.R. Some Remarks on the Problem of Incentives under Socialism:* B. MINC. *Incentives and the Introduction of More Detailed Planning on Collective Farms:* W. MISIUNA. *The Tasks of Local Government Councils in the Full Utilization of Local Resources:* W. KAWALEC. *Some Problems of Methodology in Economic Planning at the National Level:* I. CHODAK. *Some Remarks on Planning in Light Industry for Monthly and Quarterly*

Periods: J. RAWLUK. *Some Problems Concerning the Methods Used in Determining the Location of Rural Shops:* S. NELKEN. *The Development of the Electric Power Industry in the People's Democracies:* J. WERNER. *An Opinion on Planned Contracts:* J. S.

No. 4, 1956. *The National Building Conference. Polish–Soviet Commercial Agreements:* J. KOBRYNER. *Some Problems of Co-operation and Specialization in Engineering:* M. ROGOIŃSKI and J. KOŚCIUCH. *Some Problems in the Expansion of the Cement Industry:* J. BOLKOWSKI. *Current Problems in the Building Industry:* G. GOŁEBIOWSKI. *The Main Trends in the Development of the Gdańsk Voivodship in the Local Five-year Plan:* L. WISZNIEWSKI. *Remarks on the Problem of Economic Incentives (on the Possibilities of Granting Bonuses out of Profits):* B. GLIŃSKI, A. NOWICKI and T. MARZANTOWICZ. *Directives or Contracts:* L. HOROWITZ.

Plánovane Hospodářství (Czech text)

No. 2, 1956. *The Soviet Sixth Five-year Plan. Some Problems Arising in the Construction of Communal Buildings in Co-operative Farms:* J. MATOUŠEK. *The Economy of the Federative People's Republic of Yugoslavia:* V. FEDOROV and A. FEOKTISTOV. *Some Problems in the Organization of Machine and Equipment Repairs in the U.S.S.R. Economy:* A. OMAROVSKY.

No. 3, 1956. *The Economics of Energy Programmes in Czechoslovakia:* V. VĚRTELÁŘ. *Ensure Adequate Manpower to the Building Industry:* M. PICK. *Correctly Ascertain the Material Requirements of the Population:* O. TUREK and J. TOMAN. *For a Complete Solution of the Housing Problem:* K. JANU. *Diminish the Use of Foodstuffs as Raw Materials for Technical Processes:* K. DVOŘÁK. *Agriculture in the German Federal Republic:* G. HELLINGOVÁ.

No. 4, 1956. *On Plans for Raising Living Standards:* M. NEDĚLKA and K. RYBNIKÁŘ. *A General Revision of Wholesale Prices in the Economy:* V. JANZA. *Problems in the Economics and Productivity of Railway Electrification:* F. GOTTMAN. *Some Questions of U.S. Agriculture:* G. WHEELER. *The Long-term Planning of the U.S.S.R. Economy:* G. SOROKIN.

Planovo Stopanstvo (Bulgarian text)

No. 1, 1956. *The Tenth Anniversary of this Journal. Towards New Victories in Our Socialist Construction:* A. BELINSKY. *The Systematic Reduction of Retail Prices—the Basis of our Price Policy:* G. FILIAPOV. *The Improvement of the Piece-rate System for Workers and Technicians in Industry:* L. PETROV. *Some Problems of Wage Payments in the Elprom Factory:* Ts. KANTARDZHIEVA. *Railway Electrification in Bulgaria:* I. ANGELOV. *Some Questions on Industrial Services in Local and Co-operative Concerns:* N. RANGELOV. *Planning Labour Productivity in Industry:* K. POPOV. *The Economic Situation in Yugoslavia:* G. POPISAKOV.

No. 2, 1956. *A Grandiose Plan for a Mighty New Upsurge of the Soviet State. For Tighter Discipline in the State Economic Plan:* P. TOPCHIEV. *The Expansion of Agricultural Raw Material Supplies for Industry:* I. VRANCHEV. *The Utilization of Capacity and the Rate of Profits in the Textile Industry:* V. VUTOV. *The Uninterrupted Rise of Labour Productivity is an Important National Economic Task:* P. KOLAROV. *Model Plans—An Important Factor in Lowering Building Costs:* S. MILADINOV and I. PANAYOTOV. *Planning the Organization and Technology of an Industrial Enterprise:* G. KRUMOV and S. RADEV. *Long-term Planning on Collective Farms:* G. KONSTADINOV. *The Economic Situation of Egypt:* K. SIMEONOV.

Izvestia na Ikonomicheskia Institut (Bulgarian text, French and Russian summaries)

Nos. 1–2, 1955. *Towards Further Progress in Agriculture. The Basic Economic Law of Socialism in Bulgaria:* ZH. NATAN. *Research and Analytical Methods in Statistics:* P. KIRANOV. *The Location of Industry in Our Economy:* D. BRADISTILOV. *Short-term Credit and Control by the Lev of the Activity of State Industrial Enterprises:* I. KATINCHAROV. *The Economic Development of Poland 1945–1954:* O. LANGE. *Bulgarian Public Finance:* K. LAZAROV. *Some Economic Problems of Feudal Land Holding under the Turks:* G. GALABOV. *A Study of Capitalist Monopolies in Bulgaria:* KH. BAKALOV.

Izvestia na Vishia Finansovo-Stopanski Institut (Bulgarian text, German and Russian summaries)

VOL. VIII, No. 4. *Saving and Insurances:* V. GAVRIYSKI. *An Analysis of Labour Intensity on Collective Farms:* S. STANEV and T. TOTEV. *Ways to Lower Production Costs in the Canning Industry:* V. RANKOV. *The Accounting of Packing in Trade:* D. SPASOV. *Foreign Investment in Bulgaria:* A. ALEKSIEV. *The Chinese People's Republic in the Ascendant:* S. SLAVEV.

Kozgazdásagi Szemie (Hungarian text, English and Russian summaries)

No. 4, 1956. *Lenin on the Law of the Preferential Development of Producers' Goods:* P. ERDÖS. *Some Problems Connected with the Continuous Increase of Labour Productivity in the Soviet Sixth Five-year Plan:* J. SZABÓ. *The Application of Lenin's Principle of Incentives:* I. BENKE. *Methodological Problems of Costing and Profitability in Producers' Co-operatives. The Improvement of Planning and Costing on State Farms:* S. KAPÁTSY. *Benjamin Franklin's Economic Theories:* A. MÁTYÁS. *A Year's Work in the Institute of Economics. The Scientific Conference Held by the Institute of Economics of the German Academy of Sciences:* I. HALÁSZ. *Economic Problems of Western Germany:* J. KORNAI. *Achievements and Shortcomings of the Quality Standard Wage System in Metallurgy:* G. ENGEL and I. SZILÁGYI. *The Way to Solve the World's Energy Problem—the Peaceful Use of Atomic Energy:* T. KEPES.

Statisztikai Szemle (Hungarian text, English and Russian summaries)

MARCH 1956. *The XX Congress of the Communist Party of the Soviet Union. The Execution of the June 1955 Party Decision (on Agriculture):* J. MOHOS. *The Trend of Coal Production Costs in 1955:* A. RADÓ. *The Trend of Marriage Rates in Hungary:* A. KLINGER and E. SZABADY. *Refined Statistical Methods of Road Traffic Conditions:* T. MURÁNYI.

APRIL 1956. *The XX Congress of the Communist Party of the Soviet Union and Some Tasks for Statisticians:* A. MÓD. *The Preparation and the Economic and Technical Planning of Investments:* F. DEÁK. *Household Plots on Co-operative Farms:* J. FARKAS. *The Bourgeois Computation of the National Income in Hungary:* R. HORVÁTH. *A Comment:* I. HETÉNYI.

Probleme Economice (Rumanian text, French and Russian summaries)

No. 2, 1956. *For the Construction of a Unified Socialist Economy. The Problems of Introducing New Technology into Engineering:* A. IVANCENKO. *Economize Metals Better during the Second Five-year Plan:* R. MICLEA and L. APA. *Labour Productivity in Collective Farms:* V. TOPOR and E. JOIȚA. *The Ploughing of Virgin Lands—an Important Potential for Grain Growing in the U.S.S.R.:* S. DOVARI. *The Economic Ideas of M. Kogălniceanu:* V. IONESCU.

No. 3, 1956. *The Spreading of Advanced Experience in Industry. Some Problems in the National Income of Rumania:* A. ROSEN. *Problems of the Socialist Electrification of Rumania:* V. ȘANDRU. *The Development of the Chemicals Industry in the First Five-year Plan:* A. GLÜCK. *The Importance of Anti-erosion Measures for the Expansion of Agricultural Output:* M. MOTOC. *The Progress of Chinese Agriculture through Collectivization:* P. ANTIM. *Prospects for East–West Trade and the Normalization of International Relations:* S. VERONA. *Conclusions of the Conference on the Methodology of Computing Industrial Labour Productivity.*

No. 4, 1956. *The Increase of Labour Productivity—a Key Factor in the Realization of the Second Five-year Plan. V. I. Lenin on Labour Productivity under Socialism:* D. MARIN. *Some Aspects of the Correlation between Productivity Increments and Wages:* E. BALAȘ. *Some Problems of Piece-rate Fixing in Rumania:* P. COPPELOVICI. *The Role of Advanced Technology in Raising Productivity in Engineering:* H. STERIAN. *The Effect of Reducing Time Spent on Ancillary and Servicing Operations in Raising Productivity in the Clothing Industry:* S. TEICH. *A New Stage in the Socialist Transformation of Industry and Commerce in the Chinese People's Republic:* SIUI DI SIN. *The Problem of National Differences in the Correlation of Salaries, Productivity, the Structure of Capital and the Rate of Profit in the History of Capitalism:* J. KUCZINSKI. *The Economic Development of India:* F. DUCA. *Over-production Crises:* Z. BRÎNCU.

NEW BOOKS

British

BEER (S. H.). Treasury Control. The co-ordination of financial and economic olicy in Great Britain. London: Oxford University Press, 1956. 7½″. Pp. v + 138. 5*s*.

[To be reviewed.]

BELLERBY (J. R.) and Others. Agriculture and Industry, Relative Income. London: lacmillan, 1956. 9″. Pp. 369. 30*s*.

[To be reviewed.]

BUCKLEY (K.). Capital Formation in Canada, 1896–1930. Canadian Studies in conomics, No. 2. Toronto: University of Toronto Press (London: Geoffrey Cumberge), 1955. 10″. Pp. 163. 26*s*.

[The main purpose of this substantial piece of research is to present statistical estimates of ifferent classes of investment in Canada during the period stated, thereby linking up with the ficial figures which begin in 1926. The book also contains a fairly detailed historical survey and

analysis of the course of capital formation as revealed by the statistics. The central thesis underlying this survey is that the production of wheat on the Canadian prairie was the main dynamic force in the economy and was ultimately responsible for the investment induced in other sectors, notwithstanding that this investment much exceeded in amount that carried out at the agricultural frontier itself.]

BUTLIN (N. G.) and DE MEEL (H.). Public Capital Formation in Australia. Estimates 1860–1900. Australian National University Social Science Monographs, No. 2. Canberra: Department of Economics, Australian National University, 1954. 10″. Pp. 226.

BUTLIN (N. G.). Private Capital Formation in Australia. Estimates 1861–1900. Australian National University Social Science Monographs, No. 5. Canberra: Department of Economics, Australian National University, 1955. 10″. Pp. 166.

[These two monographs contain part of the statistical material being collected for an investigation into the relation between capital formation and economic change in Australia since 1860. Data are given by type of investment and by state, and an attempt is made throughout to give measures of investment in both gross and net terms. The amount of statistical information available turns out to be surprisingly extensive. Little work has previously been done in this field, so Mr. Butlin and his collaborators have made an important addition to knowledge. Full documentation is included on concepts, methods and sources. Analysis of results is postponed to later publications, but a brief discussion of some of the issues raised by the figures is included in the volume on Private Capital Formation. The three leading classes of investment, in order of importance, are found to be residential construction, pastoral and agricultural investment, and railway construction. Public investment and private investment were of roughly the same order of magnitude, and curiously enough had a certain tendency to move inversely to each other in the short period. Mr. Butlin suggests possible explanations for this. In the longer period private and public investment both follow the same broad pattern: absence of growth in the 1860s, rapid increase in the 1870s and 1880s, and then steep decline into the great Australian depression of the 1890s.]

COLE (M.). Servant of the County. London: Dennis Dobson, 1956. 9″. Pp. 200. 15*s*.

[This is a book about the work of the L.C.C. as it appears to an individual member of the council. Mrs. Cole has not set out to write a systematic text-book on local government or the government of London. She has endeavoured rather to give the "feel" of local government work, particularly in the educational field, in a way that the text-books cannot do. In this she has succeeded admirably, though some readers would perhaps have been helped by a more explicit treatment of the scope and limitations of the Council's authority. The best parts of the book are those describing the relations, formal and informal, between the various groups of people engaged in the work of local governments: the councillors, the chairmen of committees and sub-committees, the officers and other paid staff, the voluntary assistants, and the members of the general public. The book is notably well written, in a style that contrives to be informal without being slipshod.]

Cost Reduction. London: Institute of Cost and Works Accountants, 1956. (Distributed by Gee & Co., 27 Basinghall Street, London, E.C.2.) 9½″. Pp. 49. 6*s*.

[This summarises findings of research which has been organised by the Institute of Cost and Works Accountants over the last few years. After an introductory chapter on ways of planning a programme of cost reduction, the report analyses means of reducing costs under four headings, design of the product, factory organisation and methods, marketing, and finance. The authors suggest that the greatest scope for cost reduction is probably in the sphere of product design, since cost at all stages is affected by decisions made on this point.]

CROOME (H.). Introduction to Money. London: Methuen, 1956. 7½″. Pp. vii + 209. 10*s*. 6*d*.

[To be reviewed.]

DEGRAS (J.) (Ed.). The Communist International, 1919–1943, Documents. Volume I, 1919–1922. London: Oxford University Press for the Royal Institute of International Affairs, 1956. 10″. Pp. 463. 55*s*.

[The period covered by this volume ends with the last world congress of the Communist International that was attended by Lenin. This congress was also, as Mrs. Degras explains, the last one at which discussion was fairly uninhibited. The documents given include most of the general programmatic and theoretical statements of the Communist International, together with a smaller selection of statements on current events, letters to and resolutions on national communist parties, and documents relating to the internal organisation of the Communist International. The editor provides introductory comments on each of the documents quoted so as to place them in their context and relate them to other statements made by communist leaders on the subjects in question.]

FAY (C. R.). Adam Smith and the Scotland of his Day. Department of Social and Economic Research, Glasgow University, Social and Economic Studies, III. London: Cambridge University Press, 1956. 9″. Pp. 174. 25*s*.

[To be reviewed.]

GALLETTI (R.), BALDWIN (K. D. S.) and DINA (I. O.). Nigerian Cocoa Farmers. An economic survey of Yoruba cocoa farming families. London: Oxford University Press for the Nigeria Cocoa Marketing Board, 1956. 9½″. Pp. v + 744. 105*s*.

[To be reviewed.]

HANSON (A. H.). Financing Local Government. Fabian Research Series, No. 178. London: Fabian Society, 1956. 8½″. Pp. 37. 2*s*. 6*d*.

[The author describes the ways in which local government in this country is financed at present and suggests various reforms. The most fundamental reform required in his view is to broaden the basis of local taxation. The abolition of de-rating would contribute to this, but serious consideration should also be given to the possibility of forms of local taxation other than rates. Britain is almost alone in Western Europe in relying entirely for local revenue on taxes on real estate. Mr. Hanson also proposes certain changes in the method of administering grants-in-aid. He suggests finally that the Labour Party should incorporate again in its election programme a Local Authorities Enabling Act, to permit local authorities to carry on a wide range of business activities if they wish to without having to obtain a private Act of Parliament. This was proposed originally in 1927, but has since been dropped from the Labour Party's programme.]

HICKS (J. R.). A Revision of Demand Theory. London: Oxford University Press, 1956. 7½″. Pp. 196. 18*s*.

[To be reviewed.]

JAQUES (E.). Measurement of Responsibility. A study of work, payment and individual capacity. London: Tavistock Publications, 1956. 9″. Pp. ix + 143. 15*s*.

[To be reviewed.]

DE KOCK (G.). A History of the South African Reserve Bank, 1920–52. Pretoria: J. L. Van Schaik, 1954. 9″. Pp. vii + 376. 32*s*. 6*d*.

[This is not an official history of the South African Reserve Bank, but the author, whose father is the present Governor of the Bank, has been furnished by the Bank with unpublished documents and information to assist him in his researches. The Bank was set up by the Currency and Banking Act of 1920, and Dr. Kock traces its history chronologically from then up till the present day. Three main topics run through the study: the gradual extension of the Bank's statutory powers; its gold and exchange policies and operations; and its credit policy. Treatment of these topics naturally involves the author in a good deal of more general discussion of the monetary and other economic problems of the Union.]

KOSMINSKY (E. A.). Studies in the Agrarian History of England in the Thirteenth Century. Edited by R. H. HILTON and translated from the Russian by R. KISCH. Oxford: Basil Blackwell, 1956. 9″. Pp. v + 370. 37*s*. 6*d*.

[To be reviewed.]

LASLETT (P.) (Ed.). Philosophy, Politics and Society. Oxford: Basil Blackwell, 1956. 9″. Pp. vii + 184. 18*s*.

[To be reviewed.]

MAIN (O. W.). The Canadian Nickel Industry. A study in market control and public policy. Canadian Studies in Economics, No. 4. Toronto: University of Toronto Press, 1955 (London: Geoffrey Cumberlege, 1956). 10″. Pp. 168. 26*s*.

[This monograph traces the development of the Canadian nickel industry chronologically since its beginnings in the 1880s. The author disclaims any intention to write a general history of the industry, however, and his purpose is rather to provide a case-study in entrepreneurial behaviour. Canadian nickel has always been substantially a monopoly, and the problems of establishing and maintaining this position occupy a central place in the story. Because of continuing threats of competition from outside, pressure of public opinion and fluctuations in demand the industry has not been able to enjoy freedom from anxiety, and in the face of such challenges monopolistic control has not prevented rapid expansion in the industry and may well have fostered it.]

MEEK (R. L.). Studies in the Labour Theory of Value. London: Lawrence & Wishart, 1956. 9″. Pp. 310. 30*s*.

[To be reviewed.]

Monetary and Fiscal Policy in New Zealand. Submissions to the Royal Commission on Monetary, Banking and Credit Systems 1955 by the Reserve Bank of New Zealand, Associated Banks in New Zealand and the New Zealand Treasury. Wellington: Reserve Bank of New Zealand, 1955. 9″. Pp. 252.

[The contents of this book first appeared as statements to a Royal Commission on Monetary, Credit and Banking Systems, which sat in 1955. There are several statements from the Reserve Bank of New Zealand and from the Treasury, and one from the Associated Banks of New Zealand. The subjects discussed include the structure of New Zealand's monetary system, recent economic developments and their relation to fiscal and monetary policy, and New Zealand's position *vis-à-vis* the International Monetary Fund and the International Bank. Taken together, these statements provide a fairly comprehensive treatment of New Zealand's monetary institutions as well as a presentation of official views about monetary problems and policies.]

National Institute of Economic and Social Research. Classified List of Large Companies Engaged in British Industry. London: National Institute of Economic and Social Research (2 Dean Trench Street, Smith Square, S.W.1), 1955. 11″. Pp. 39. 5*s*.

[This useful work of reference has been compiled as a by-product of an inquiry into the sources and uses of funds of public companies. The list gives net assets and incomes in 1953/54 and 1954/55 of all British public companies, whose net assets in 1953/54 exceeded £2·5 million, excluding companies operating primarily overseas and certain other classes of companies. The companies given are classified by asset size and by industry, and there is also an alphabetical index.]

Perry (J. H.). Taxes, Tariffs, and Subsidies. A history of Canadian fiscal development. In two volumes. Toronto: Toronto University Press (London: Geoffrey Cumberlege), 1955. 9½″. Vol. I: pp. 324; Vol. II: pp. 435. 200*s*.

[The chief aim of the author has been to provide a really comprehensive survey of the way in which fiscal arrangements in Canada have developed. It is primarily a factual and descriptive study, and the author explains that less interpretation has been included than was orginally intended, so as to make room for a fuller record of the facts. One of the main issues in the field of public finance in Canada has been the proper financial relations between the federal government and the provinces, and Mr. Perry devotes much attention to explaining the present arrangements and their antecedents.]

Robinson (Joan). The Accumulation of Capital. London: Macmillan, 1956. 9″. Pp. v + 440. 28*s*.

[To be reviewed.]

Scott (K. J.) (Ed.). Welfare in New Zealand. Studies in Public Administration, No. 3. Wellington: New Zealand Institute of Public Administration 1955 (London: Geoffrey Cumberlege 1956). 9″. Pp. 130. 16*s*.

[The six papers contained in this volume were first delivered at the Convention of the New Zealand Institute of Public Administration in May 1955. Three of them are concerned with administrative problems of the social services, while the others discuss the development of the social services, particularly in New Zealand, in relation to more general trends in economic structure and political thought.]

Stone (L.). An Elizabethan: Sir Horatio Palavicino. London: Oxford University Press, 1956. 9″. Pp. 345. 45*s*.

[To be reviewed.]

Wallace (C.). How to Retire Successfully. London: Evans, 1956. 8″. Pp. 160. 10*s*. 6*d*.

[This book covers every aspect of retirement from the finance of one's old age to the problems of occupation, of health and of where to live.]

Wheatcroft (S.). The Economics of European Air Transport. Manchester: Manchester University Press, 1956. 9″. Pp. v + 358. 35*s*.

[To be reviewed.]

Wijnholds (H. W. J.). International Trade and Payments. An introduction to the theory of international trade, commercial policy and other international economic relations. Pretoria: The Academic Press, 1955. 9″. Pp. 181.

[This is designed as a short introduction to international trade, preparing the student for the reading of more elaborate works on the subject. Its two parts deal respectively with Theory and Commercial Policy. It is very clearly written, and some parts of the ground are covered extremely well in the short space available—for example, the question of what actually maintained equilibrium in the balance of payments under the gold standard in the nineteenth century. However, both the choice of topics for inclusion and the treatment of them at some points have rather an old-fashioned ring, and this prevents the book from being an entirely satisfactory introduction for the student who wishes to get to grips with present-day problems. Examples of important topics which receive little or no attention are elasticities of demand and supply in foreign trade and the effects on the terms of trade of alternative means of correcting an adverse balance of payments.]

Willan (T. S.). The Early History of the Russia Company, 1553–1603. Manchester: Manchester University Press, 1956. 9″. Pp. 295. 30*s*.

[To be reviewed.]

Willey (F. T.). Plan for Shipbuilding. Fabian Tract 299. London: Fabian Society, 1956. 8½″. Pp. 24. 1*s*. 6*d*.

[The author briefly surveys the experience of the shipbuilding industry between the wars and since 1945. He presents evidence for the view that as a combined result of the great additions to tonnage made in recent years and of the growth of foreign competition, especially from Germany, some contraction in British production is probable in a few years time. He suggests that despite the rather disappointing history of development councils in other industries, the formation of such a council for shipbuilding might help both to increase efficiency and to facilitate the process of adjustment if contraction does turn out to be unavoidable.]

Indian

Datta Gupta (A. K.). State Financing of Private Enterprise in Post-war India. Calcutta: Modern Book Agency, 1955. 9″. Pp. 188. Rs. 9/-.

[After three introductory chapters on the general problems of finance of industry in India, the author surveys in turn the various ways in which the state has assisted in the finance of industry since the War. He welcomes the extension of the scope of this assistance in recent times. But he believes that it is still not nearly adequate, and he suggests, moreover, that there has been a lack of co-ordination between and even within the various agencies and systems involved.]

Gadgil (D. R.) and Dandekar (V. M.). Primary Education in Satara District. Reports of two investigations. Gokhale Institute of Politics and Economics, Publication No. 32. Poona: Gokhale Institute of Politics and Economics, 1955. 9½″. Pp. 172. Rs. 6/-.

[This contains two separate papers on related subjects. "Report of Investigation into the Problem of Lapse into Illiteracy in the Satara District," by D. R. Gadgil, analyses the causes and extent of such lapse, and finds that while the quality of the school attended seems to make little difference, much greater significance attaches to the length of stay at school and to the opportunities to make use of literacy in the years immediately after leaving school. The other paper is "Report of Investigation into Wastage and Stagnation in Primary Education in the Satara district," by V. M. Dandekar. The term "wastage" refers to pupils who leave school prematurely and "stagnation" to those who fail to make normal progress at school.]

Mark (J.). The Modern Idolatry, being an analysis of usury and the pathology of debt. Bombay: Libertarian Social Institute (Ayra Bhuvan, Sandhurst Road, Bombay 4). 9″. Pp. 230. Rs. 12/-.

[This is an attack on modern financial and monetary institutions, based on the doctrines that interest is immoral and the only obstacle to a world of plenty, and that the structure of credit as it exists is fictitious and illusory. No date of publication is given, but the book appears to have been written before the War.]

Sapre (N. B.). The Technique of Planning in India. Poona: published by the author (855 Shivajinagar, Poona 4), 1955. 8½″. Pp. 171. Rs. 3/8.

[Mr. Sapre complains of the lack of an adequate literature of the techniques of economic planning and sets out to fill the gap, always with the needs and methods of India rather particularly in mind. He begins with the assumptions and the form of planning, and the establishment of a central organisation. He then proceeds to the laying down of objectives, the determination of priorities, and the assumptions and estimates that must lie behind them. Mr. Sapre stresses hardly sufficiently the importance of adequate and really competent national-income forecasts; he states, for example, the assumed growth of 11–12% in national income in India between 1948–49 and 1955–56, but he does not discuss how far this figure was realistic and what assumptions it made, or should have made, about progress with the reduction of unemployment. Equally he does not make it clear what is the relation of the determination of priorities to forecasts of the expenditure of income; unless one can enforce priorities one must take account of the priorities likely to be set by the market. From

these questions Mr. Sapre goes on to more comprehensive planning, to dynamic considerations, the discussion of the plan and to certain final conclusions about techniques of planning. This b raises questions of great interest and importance. It may be wondered whether Mr. Sapre, des his continuing emphasis on the differences of techniques in different countries, quite sufficier stresses the intimate relation between the techniques of planning and the more basic decisions to one's readiness or lack of readiness to use certain powerful weapons of rationing and cont to limit and direct personal consumption and to enforce personal saving.]

SINGH (BALJIT). A Report on Unemployment in the City of Lucknow. Luckno Lucknow University, 1955. 10″. Pp. 151.

[A roneo-ed study of unemployment in Lucknow, its dimensions, period and causes, based o sample survey. The average period of unemployment of those previously employed in indus was found to be as high as 24·09 months, and unemployment of new entrants had an average peri of 23·34 months. While the causes of unemployment are analysed under the normal heads new entrants (36% of all unemployment), retrenchment (over 10%), dismissals (10%), illn (9%), slump (6½%), premature retirement (5½%), with resignation and migration accounting still smaller proportions, it seems clear that lack of effective demand to absorb the unemployed a contributory factor in keeping the proportion of unemployment as high as it was: over 10% the sample investigated.]

American

BEAL (G. M.) and BAKKEN (H. H.). Fluid Milk Marketing. Madison, Wisconsi Mimir, 1956. 9½″. Pp. 556. $7.50.

[This is designed as a text-book on dairy marketing in the United States. It describes prese methods of transporting, distributing and processing milk. Much attention is given to altern tive methods of milk pricing that have been or might be adopted.]

BECKMAN (M.), MCGUIRE (C. B.) and WINSTEN (C. B.). Studies in the Economi of Transportation. New Haven, Conn.: Yale University Press for the Cowles Con mission for Research in Economics (London: Geoffrey Cumberlege), 1956. 9½″. P xi + 232. 32*s*.

[To be reviewed.]

Capital Formation and Economic Growth. A Conference of the Universities-Nation Bureau Committee for Economic Research. Princeton, New Jersey: Princeton Universit Press for the National Bureau of Economic Research, 1955 (London: Geoffrey Cumberleg 1956). 9½″. Pp. 677. 96*s*.

[To be reviewed.]

CARLSON (A. S.) (Ed.). Economic Geography of Industrial Materials. New York Reinhold Publishing Corporation (London: Chapman & Hall), 1956. 10½″. Pp. 49 100*s*.

[This is a reference book in which methods and location of production of the chief industri materials are described by experts in the fields in question. The coverage is worldwide, but heav emphasis is placed on the United States.]

CREAMER (D.). Personal Income During Business Cycles. Princeton, New Jersey Princeton University Press for the National Bureau of Economic Research (London Geoffrey Cumberlege), 1956. 9½″. Pp. ix + 166. 32*s*.

[The greater part of this monograph comprises an analysis of the relative timing and amplitud of cyclical fluctuations in different classes of personal income in the United States since 190 Income is taken before tax but including transfer payments. The incomes of independent pro prietors are found to fluctuate more than wages and salaries, and wages and salaries fluctuat more than income from property. The cyclical behaviour of subdivisions of these three mai classes of income is also analysed in a good deal of detail. Certain conclusions follow about th cyclical movements of relative shares. These conclusions relate to shares in total personal income not the more commonly discussed shares in national income, and they are for that reason sometime rather unexpected—for example the conclusion that the share of property income varies inversel with the level of business activity. Further chapters deal with cyclical movements in the size-grou distribution of income and with the quantitative significance of built-in stabilisers of persona income provided by federal government policies. There is also an interesting introductory chapte on long-term shifts in distribution. The share of labour income in total personal income is show to have risen substantially, at the expense both of income accruing to independent proprietors and o income from property, especially rent.]

DAVIES (M. G.) The Enforcement of English Apprenticeship, 1563–1642. A study in applied mercantilism. Harvard Economic Studies, Vol. XCVII. Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 1956. 8½″. Pp. v + 319. 48*s*.

[This monograph is based on extensive research in the records of court proceedings. It is divided into two parts: enforcement by private interests (informers), and enforcement by public agencies. Of these the first is found to have been very much the more effective. The author analyses the ways in which this reliance on private interests for enforcement of the apprenticeship requirements laid down by the Statute of 1563 affected the working of the Act and hence influenced the development of industry and trade in Elizabethan and Stuart England. Some valuable incidental sidelights on the structure of the economy in the period are cast by the extensive detail which the author furnishes on the regional and chronological distribution of prosecutions. One of the most interesting conclusions is that the law relating to apprenticeship was more actively enforced in times of depression than in times of good trade, presumably because the incentive to restrict competition was stronger when trade was depressed.]

DERBER (M.). Labor–Management Relations at the Plant Level under Industry-wide Bargaining. A study of the engineering (metal-working) industry in Birmingham, England. Champaign, Illinois: University of Illinois Institute of Labor and Industrial Relations, 1956. 9½″. Pp. 130. $2.50.

[The question whether collective bargaining is best conducted on an industry-wide basis or at a lower level has been the subject of much controversy in the United States. The present study of certain aspects of this question is based on material collected by Mr. Derber during a six-months stay in England. He begins with a fairly extended treatment of the national framework of collective bargaining in the engineering industry in this country, and then proceeds to analyse the working of the system at the local level in Birmingham. He finds that the commonly-stated aim of industry-wide bargaining, to "take labour out of competition," was not by any means fully achieved; for although certain important conditions of employment, such as the length of the basic working week, were standardised between firms, the same was not true of wage-rates. This is chiefly because the rates set by national agreements are no more than minima and are usually exceeded. Mr. Derber also gives a good deal of attention to the degree of local discretion which the system allows to representatives of workers and employers. He found very general agreement on both sides that the present system of industry-wide bargaining on major issues is better than a system of plant-by-plant bargaining would be. In relating his findings to the corresponding problems in America, the author concludes that industry-wide bargaining is not nearly so inflexible as is commonly alleged. He emphasises also the importance of separating clearly the different aspects of the question that have often been confused in the American discussions.]

DUE (J. F.). Intermediate Economic Analysis. Third Edition. Homewood, Illinois: Richard D. Irwin, 1956. 9½″. Pp. 588. $7.20.

[The first edition was published in 1947. The book aims to provide a treatment of economic theory "at a level intermediate between the beginning principles courses and graduate courses in economic theory." The stress is on value and distribution, and this branch of theory is dealt with fairly rigorously. Macro-economics is much more briefly treated.]

EINAUDI (M.), BYÉ (M.) and ROSSI (E.). Nationalization in France and Italy. Ithaca, New York: Cornell University Press (London: Geoffrey Cumberlege), 1955. 9″. Pp. 260. 28*s*.

[This consists of three separate essays, by Maurice Byé on Nationalisation in France, by Ernesto Rossi on Nationalisation in Italy, and A Comparative Study of Nationalisation Policies, by Mario Einaudi. The origins of nationalisation were very different in the two countries. In Italy, state ownership of industry arose chiefly from public agencies taking over the assets of distressed banks, especially in the depression of the 1930s. In France, on the other hand, the main nationalisation measures were taken in the period of left-wing enthusiasm after the liberation. These differences in origin are reflected in the many differences between the nationalised sectors in the two countries as they have subsequently evolved.]

EISNER (R.). Determinants of Capital Expenditures. An interview study. Bureau of Economic and Business Research, University of Illinois, Studies in Business Expectations and Planning, No. 2. Urbana, Illinois: University of Illinois, 1956. 9″. Pp. 100. $1.50.

[This is based on extensive interviews conducted by the author with the officers of fourteen large manufacturing firms. Professor Eisner recognises that the interpretation of interview data is bound to contain a large subjective element, so in addition to analysing the findings in overall terms he also reproduces at some length the information he received from the individual businesses. Many interesting and suggestive points emerge from what he says. Expansion of demand for the firms' products was found to be a paramount consideration in planning capital expenditures, thus broadly confirming the acceleration principle. But a good deal of stress was also laid in the

interviews on the need to be sure that the increase in demand was not of a merely transit character. Financial considerations tended in general to be played down, but the interpretation of this is more than usually subject to the difficulties inherent in the interview method—difficulties which Professor Eisner discusses in a very penetrating fashion in an introductory chapter. The various cost and earnings criteria applied by the firms to contemplated capital expenditures proved rather elusive and in some cases even internally inconsistent. Professor Eisner gives an algebraical analysis of the biases inherent in some of them. But in any case these criteria appear as a rule to be used chiefly as minimum requirements that have to satisfied in order to qualify a project for consideration, the ultimate decision being based on broader and less exactly formulated grounds. Other points discussed include the treatment of replacement investment, the machinery for arriving at investment decisions, the influence of taxation, flexibility and time-lags in planning and carrying out inve[illegible] and the accuracy of firms' estimates of their own future capital expenditures.]

Fossati (E.). Essays in Dynamics and Econometrics. Chapel Hill, North C[illegible] School of Business Administration, University of North Carolina, 1955. 9″. Pp.[illegible]

[This contains three lectures delivered at the University of North Carolina. The first lecture, "From Statics to Dynamics," is on the methodology of economic theory and recapitulates certain views put forward by Professor Fossati twenty years ago. The second lecture is entitled "Vilfredo Pareto and John Maynard Keynes, One Economic System or Two?" In the third lecture, "Some Remarks about the Real Meaning of Econometric Inquiries from the point of view of an Economist," Professor Fossati pleads for a clearer distinction to be drawn between the methodological or purely theoretical branch of econometrics and its application.]

Galbraith (J. K.) and Holton (R. H.). Marketing Efficiency in Puerto Rico. Cambridge, Mass.: Harvard University Press, 1955 (London: Geoffrey Cumberlege, 1956). 9½″. Pp. 204. 36*s*.

[This contains a very comprehensive survey of present retailing and wholesaling practices in Puerto Rico and an assessment of the scope for possible reductions in cost in this field. The book falls into four main parts: a description of the retailing and wholesaling of food in Puerto Rico at present; a comparison of this with a hypothetical model system of food distribution; a description of the marketing of non-food products; and finally, a set of recommendations. Distribution is more important in Puerto Rico than in most backward countries, because the island's economy is based on exporting, and a very large proportion of the food consumed is imported. The main characteristics of the system of distribution are fairly easily understood, and stem from the general economic conditions in the island, especially the chronic labour surplus: numerous very small enterprises (particularly in food retailing) with small turnover and high margins, a heavy reliance on credit at all stages of the chain of distribution, and a "live and let live" attitude among traders, whose ambitions to expand their businesses are usually very limited and who regard as unethical any active attempts to increase their share of total sales by price competition. The amount of labour employed in distribution is obviously much greater than it needs to be, and the high costs of the system are reflected in the prices paid by consumers. But any proposals for increasing efficiency come up against the basic difficulty that so long as a general surplus of labour persists, a reduction in the amount of labour employed in distribution is unlikely to bring about much increase in total production and real income in the island. As the authors put it, the excessive absorption of labour in distribution serves some of the functions of a system of unemployment relief; if a reduction in the man-power engaged in distribution led to a corresponding increase in unemployment, the result would be, at best, merely to shift the burden of supporting these people from consumers to some other possibly better source of finance. Having made this point in their first chapter, the authors appear rather to lose sight of it in the rest of the book. The chief aim laid down there is the reduction of the money cost of distribution; but if the real opportunity cost of using labour is little or nothing, the money cost is a very misleading criterion for policy. This being so, it is difficult to regard the improvement of marketing efficiency as deserving such a high priority as the authors appear to give it. No doubt it would be a desirable thing to bring about so long as it did not involve excessive social disruption; but so long as a surplus of labour persists, it is surely far more important to create employment opportunities that will enable real output to be increased than to raise productivity in a sector of the economy, namely distribution, where real output must be regarded as more or less fixed. Some of the authors' policy recommendations seem rather questionable for this reason, for example, their suggestion that the Development Bank should give up its present practice of confining to industrial purposes only the loans made from its limited resources and instead allow lending to efficient firms engaged in distribution.]

Harris (S. E.). New England Textiles and the New England Economy. Report to the Conference of New England Governors. Providence, Rhode Island: Conference of New England Governors, 1956. 11″. Pp. 197.

[This is a report of the New England Governors' Textile Committee, of which Professor Harris is Chairman. It is made up largely of statements which Professor Harris has prepared for various purposes in the course of the past year on different aspects of the problem of New England's textile industries. The basic contention running through the report is that the development of alternative employment opportunities to take the place of the declining textile industries is bound to be slow

and difficult, that every effort should be made in the meanwhile to keep New England's textile industries viable. A number of suggestions are made of ways in which federal policy might be made to militate less against the interests of New England than it is alleged to do at the present time.]

Hauser (P. M) and. Leonard (W. R.) (Eds.). Government Statistics for Business Use. Second edition. New York: John Wiley (London: Chapman & Hall), 1956. 9″. Pp. v + 440. 68*s*.

[The first edition of this book was published in 1946. Each of the fifteen chapters is written by an expert in the particular branch of United States official statistics concerned. The purpose of the volume is to describe the scope of the statistical information made available by the federal government, with particular reference to the needs of management in production and marketing.]

[illegible]man (C. A.) and Kuhn (M. H.). Individuals, Groups, and Economic Behavior. N[illegible]k: The Dryden Press, 1956. 8½″. Pp. vii + 266. $4.75.

[To be reviewed.]

Hogenson (P. T.). The Economics of Group Banking. Washington, D.C.: Public Affairs Press, 1955. 9½″. Pp. 199. $5.

[Group banking is defined as "the ownership and control of a group of individual banks by a corporate holding company, control of bank shares by a trustee or a group of trustees, or control through a majority ownership of bank shares for investment purposes." It is thus one form, though not the only form, of multiple unit banking in the United States. The usual practice is for the holding company or trustees to acquire practically all of the shares, leaving an insignificant minority interest to enable local men to hold the shares needed to qualify them as directors. The control is nominally in the hands of the directors, so that the bank can be made to appear a local concern, but the directors' freedom of action naturally does not extend in practice to major issues of policy. The system spread a great deal during the late 1920s, and since then it has tended to become less common rather than more so. It remains important, however. Dr. Hogenson describes its development and the way it works. A large part of his book is occupied by a thorough enumeration of the individual group banking systems in existence in different parts of the United States.]

Kindleberger (C. P.). The Terms of Trade. A European case study. New York: John Wiley, and the Technology Press of Massachusetts Institute of Technology (London: Chapman & Hall), 1956. 9½″. Pp. v + 382. 72*s*.

[To be reviewed.]

Levitt (T.). The Twilight of the Profit Motive. Washington, D.C.: Public Affairs Press, 1955. 9″. Pp. 15. $1.00.

["There seems to be an inverse relationship between business size and the pervasiveness of the profit motive." This is the central theme of Dr. Levitt's trenchant essay. With the growth in the size of the business unit, salary, not profit, becomes the pecuniary aim of most of those engaged in business. At the same time as the personal interests of business leaders have become transformed in this way, the giant corporations have become obliged to defend their power against hostile criticisms by playing down profits and shifting the emphasis to notions of public service. Other influences lead the same way: the desire to avoid the strains of competition, the fear of stimulating wage demands, the high level of business taxation, all these contribute to weaken the profit motive. The change in practice leads to a change in ethical values, and the all-out pursuit of profit ceases to carry the hallmark of respectability. Dr. Levitt concludes by asking whether this change in values —a change in a direction that has often been sought by social reformers—will or will not destroy the vital impulse of capitalism. He does not give any hint to his own view about the answer to this question.]

Murad (A.). Private Credit and Public Debt. Washington, D.C.: Public Affairs Press, 1956. 9½″. Pp. 195. $3.75.

[To be reviewed.]

National Bureau of Economic Research. Basic Research and the Analysis of Current Business Conditions, by S. Fabricant. 36th Annual Report. New York: National Bureau of Economic Research, 1956. 10½″. Pp. 87.

[In his introductory paper Mr. Fabricant illustrates from various aspects of the National Bureau's work the ways in which its established policy of concentrating on research of a basic and general character contributes at the same time to the analysis of current business conditions. The remainder of the report contains the usual full account of the National Bureau's current activities. Much of it is taken up by the extremely useful brief reports from staff members in which they summarise the findings of their investigations to date.]

PATINKIN (D.). Money, Interest and Prices. An integration of monetary and value theory. Evanston, Illinois: Row, Peterson and Co., 1956. 9″. Pp. 510. $7.00.

[To be reviewed.]

Policies to Combat Inflation. A Conference of the Universities-National Bureau Committee for Economic Research. Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Geoffrey Cumberlege), 1956. 9½″. Pp. 417. 68*s*.

[To be reviewed.]

POWELL (J. R.). The Mexican Petroleum Industry, 1938–1950. Berkeley and Los Angeles, California: University of California Press (London: Cambridge University Press), 1956. 9½″. Pp. 269. 30*s*.

[The purpose of this book is to examine the objectives of the Mexican Government in expropriating the foreign oil companies in 1938 and to assess the extent to which these objectives had been attained by 1953. The author maintains that the events that led to expropriation can be understood properly only in the light of much earlier history—in particular, the extremely favourable policy towards foreign capital that was adopted under the dictatorship of Porfirio Diaz at the beginning of the present century. Until about 1945 it appeared that the political benefits of expropriation had been achieved at a considerable economic cost. Professor Powell describes the difficulties faced by Pemex—the government agency controlling the oil industry—during this period: the boycott imposed by foreign oil companies, the lack of managerial personnel, and the unreasonable demands of the oil workers, among whom syndicalist tendencies have been strong. Since 1945 a good deal of progress has been made, and by 1950 the position of the industry compared reasonably well with what it had been at the time of expropriation.]

REYNOLDS (L. G.) and TAFT (C. H.). The Evolution of Wage Structure. New Haven, Connecticut: Yale University Press (London: Geoffrey Cumberlege), 1956. 9½″. Pp. 398. 40*s*.

[To be reviewed.]

ROSS (W. D.). Financing Highway Improvements in Louisiana. A financial analysis for the Louisiana Legislative Council. Baton Rouge, Louisiana: College of Commerce, Louisiana State University, 1955. 11½″. Pp. 236.

[The author describes the present system of highway finance in Louisiana and makes proposals about the best ways of raising the funds required to carry out the improvements that are considered necessary. These recommendations formed the basis of legislation enacted in Louisiana last year. The section of the report that has the most general interest is Part Three, in which the author discusses how highway costs may be allocated between the general public and different classes of highway users and how highway-user revenues may be allocated between road systems.]

ROUCEK (J. S.) and associates. Social Control. Second edition. Princeton, New Jersey: Van Nostrand (London: Macmillan), 1956. 9½″. Pp. 603. 50*s*.

[The first edition of this introductory text-book was published in 1947. It is a work of collaboration by twenty-seven American sociologists, each of whom contributes one or more chapters. Social control is defined as a collective term for " those processes, planned or unplanned, by which individuals are taught, persuaded, or compelled to conform to the usages and life-values of groups." It thus effectively embraces the whole of sociology, viewed from a particular angle.]

SCHOEFFLER (S.). The Failures of Economics: a Diagnostic Study. Cambridge, Mass.: Harvard University Press, 1955 (London: Geoffrey Cumberlege, 1956). 8½″. Pp. 254. 38*s*.

[To be reviewed.]

SMITH (E. L.). When to Hold Common Stocks and when to Reduce Holdings. Darien, Connecticut: reproduced for private distribution by the author, 1955. 11″. Pp. 138.

[This is a group of related studies dealing with different aspects of the connection found by the author between stock prices and the weather. The underlying thesis—in itself not an absurd one—is that the weather influences stock prices by its effect on people's state of mind, particularly through its influence on the alkalinity of the blood. A great mass of material relating to stock prices over the last century and a half is adduced in support of this. One of the most novel findings is that weather conditions, and hence stock prices, tend to repeat themselves at intervals of approximately 89½ years. The purpose of these calculations is strictly practical, and the author courageously gives explicit directions about how to use his findings as a guide to investment policy.]

ULMAN (L.). The Rise of the National Trade Union. The development and significance of its structure, governing institutions, and economic policies. Cambridge, Mass.: Harvard University Press, 1955 (London: Geoffrey Cumberlege, 1956). 9½″. Pp. xv + 639. 76*s*.

[To be reviewed.]

United States Agriculture: Perspectives and Prospects. Research reports and background papers prepared for the use of participants in the Seventh American Assembly, Columbia University, New York, May 1955. New York: Graduate School of Business, Columbia University, 1955. 11″. Pp. 124.

[The American Assembly was founded by General Eisenhower when he was president of Columbia University. It is a programme of continuing conferences, supported by a large number of organisations and individuals. The subject of the seventh meeting, held in New York in May 1955, was American Agriculture. The papers in the present volume were prepared as discussion guides for that occasion. They are: " The American Farmer in a Changing World," by Walter W. Wilcox; " Agriculture's Technological Revolution," by Glenn L. Johnson; " The Role of Farm Prices in Agricultural Production," by D. Gale Johnson; " Farm Price and Income Instability," by Harold G. Halcrow; " Surplus Disposal and Domestic Market Expansion," by Geoffrey S. Shepherd; " American Agriculture and Foreign Economic Policy," by O. B. Jesness; " The Low-income Problem in American Agriculture," by W. E. Hendrix; " Improving Rural Community Services," by Wayland J. Hayes; and " Conservation of Agricultural Resources," by Raymond J. Penn and C. W. Loomer.]

French

BOBROWSKI (C.). La Yougoslavie Socialiste. Paris: Armand Colin, 1956. 9½″. Pp. 237. 750 frs.

[This is a sympathetic account of the social and economic development of Yugoslavia since the War. It is preceded by a comparatively lengthy survey of the rise of the present régime during and after the War, and of the famous dispute with Stalin. There follows a discussion of economic policy from the initial ambitious programme of industrialisation to what the author describes as a more balanced policy, in which agriculture plays a highly significant part.]

FOHLEN (C.). Une Affaire de Famille au XIXe Siècle: Méquillet-Noblot. Paris: Armand Colin, 1955. 9½″. Pp. 140. 500 frs.

[M. Fohlen has examined the history of the cotton firm of Méquillet-Noblot from its establishment in 1802 until 1897. The firm, which is a family enterprise, is still in existence. Studies of individual firms are useful for the light which they may cast on the development of the industry as a whole, *e.g.*, the changing specialisation in Méquillet-Noblot reflecting technical and commercial changes. They are useful, also, because they enable the process of business growth to be examined within a comparatively well-defined compass. In the analysis of a family concern, moreover, M. Fohlen has been able to devote considerable attention to the influence of a coherent group of persons.]

JACQUIN (F.). Les Cadres de l'Industrie et du Commerce en France. Paris: Armand Colin, 1955. 10″. Pp. 258. 900 frs.

[M. Jacquin defines " cadre " as " the salaried person responsible for appreciating and setting in operation the whole or part of the policy of the enterprise." This general definition covers something rather more than a mere technician, something less than top management. The author examines, with statistical support and some comparative study of other countries, the background and training of this group in French industry and trade. At the same time, he is concerned to discuss their bargaining problems in the economy. These problems arise, it appears, from the rather special position which the " cadres " occupy between more homogeneous groups.]

German

ERLER (C.). Grundprobleme des Internationalen Wirtschaftsrechts. Gottingen: Otto Schwartz, 1956. 9″. Pp. 215. DM. 19.80.

[The growth in recent years of international economic organisations, such as G.A.T.T. and O.E.E.C., has naturally been accompanied by problems in international law that have little in common with pre-war experience. This work examines these problems against the general background of international mercantile law, and suggests the directions in which future developments may lie.]

Swiss

HEUSS (E.). Wirtschaftssysteme und internationaler Handel. Zurich: Polygraphischer, 1955. 9½″. Pp. 224. S. Frs. 21.85.

[The book deals with international trade for five different economic systems, three of the "free" type (competitive, competitive with currency management and monopolistic); and two of the Socialist type (Socialist "market" economy, where consumer demand is the final criterion of production, and the fully planned type). Much space is devoted to a highly abstract discussion of the characteristics of these systems, and the treatment of international trade under the respective conditions, mostly diagrammatic, is elementary and quite general. Relatively little is said about the interesting problem of free and planned economies as trading partners.]

LADEMANN (J.). Probleme des auswärtigen Realaustauschvertraltnisses. Zurich: Polygraphischer, 1956. 8½″. Pp. 277.

[This thesis examines the relation between the gains from international trade and the terms on which it can be conducted. The modern theoretical discussions are carefully surveyed and appraised; there are also two interesting schematic tables showing: (*a*) the historical development of the theory of international trade, and (*b*) the many algebraic conditions on the stability of international exchange that have been put forward by various writers.]

LUTZ (F. A.). Zinstheorie. Zürich: Polygraphischer (Tübigen: J. C. B. Mohr), 1956. 9″. Pp. 195. S. Frs. 19.15.

[To be reviewed.]

Austrian

DAMMER (D.). Vom heterogenen Familieneinkommen zum Familienlohn. Vienna: Springer, 1955. 9½″. Pp. 179. 17*s*.

[This volume argues that economists ought to have a systematic view of the role of the family in the economic system; if child rearing, for example, is an economic burden, the state should introduce compensatory measures according to an explicit plan. Family allowances, tax relief, reduced rents and fares are all examined here from this general point of view.]

Danish

RASMUSSEN (P. N.). Studies in Inter-sectoral Relations. Copenhagen: Einar Harcks; Amsterdam: North Holland Publishing Company, 1956. 10½″. Pp. 217.

[To be reviewed.]

Finnish

WAHLBECK (L.). Om Inkomstnivåns Geografi i Finland år 1950. (The geography of the income level in Finland in 1950.) In two volumes. Helsingfors: Söderströms, 1955. 10″. Pp. 615.

[This is an elaborate statistical analysis of regional differences in income in Finland and the effect upon them of public finance. Volume I contains text, Volume II maps and statistical tables. There is an English summary, and the chapter titles and the headings of the maps and tables are also given in English. The main source is a 10% sample survey of income conducted by the Finnish Central Statistical Office in 1950. This material is examined from a variety of standpoints. The author analyses the relation between regional income differentials and occupational distribution, geographical conditions, the terms of trade between different products, comparative rates of growth of productivity in different sectors, and a number of other factors. Account is taken of regional differences in price levels, but the unavoidable neglect of unpaid domestic work and a number of other complications prevent relative standards of living from being inferred with confidence from the figures of relative incomes.]

Nepali

PANT (Y. T.). Nepal's Economic Development on International Basis. Kathmandu: Nepal Council of Asian Relations and World Affairs, 1956. 9″. Pp. 24. Nepali pice 75.

[This is an able statement of Nepal's current economic problems and prospects. The economy of Nepal depends almost entirely on agriculture. The country does not suffer from undue population pressure, but the level of output per acre is exceptionally low. The inadequacy of transport facilities is a major obstacle to economic improvement. The author argues that while foreign capital and technical aid are the obvious means of developing the economy, the import of foreign capital should be at the government level and should be carefully integrated with the Government's overall economic plans.]

Official

BRITISH

CENTRAL STATISTICAL OFFICE. National Income Statistics. Sources and methods. Studies in Official Statistics, No. 3. London: H.M. Stationery Office, 1956. 10″. Pp. 387. 25*s*.

[To be reviewed.]

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH. Automation. A report on the technical trends and their impact on management and labour. London: H.M. Stationery Office, 1956. 9½″. Pp. 106. 6*s*.

[For those who want information, examples and, indeed, illustrations of the new processes which have so unnecessarily and belatedly been christened two centuries late by the unattractive name of "automation" this popular account will be of value. It contains useful accounts of the main present trends in automatic machining, automatic process control and automatic processing of data. It also contains chapters which throw some light on the effects of automation on management and employment. The discussion of the economic problems of the rate of introduction of substantially more automated processes than those which are already to be found widespread throughout industry must frankly be described as naïve. There is clearly room for a great deal more study of the probable costs, of the economies of substituting new automated plant on any considerable scale within the life of existing machinery, of the probable implications on prices, profits and company savings available for investment, and finally on the demands for funds to finance fixed capital investment.]

DEPARTMENT OF AGRICULTURE, STATES OF JERSEY. Milk Production Costs in Jersey, 1954–5. Agricultural Costing Survey, Report No. 8. St. Helier: Department of Agriculture, 1955.

[This is the eighth of an annual series. Extremely detailed particulars are provided on the basis of a sample survey. Some difficulty has been experienced in persuading farmers to complete the returns necessary for the survey. It is hoped, however, that there will soon be an improvement in this respect, since the transfer of responsibility for marketing milk to a new authority has made farmers more willing to believe that the provision of adequate costing data will help to ensure the payment of remunerative prices.]

MORGAN REES (A. M.) and HOWARD (R. H.). An Economic Survey of Commercial African Farming among the Sala of the Mumbwa District of Northern Rhodesia. Department of Agriculture, Northern Rhodesia, Agricultural Bulletin No. 10. Lusaka: Government Printer, 1955. 9″. Pp. 68. 5*s*.

[This is based on the replies received from a sample of African farmers to an elaborate oral questionnaire. The information obtained relates, amongst other things, to the size of the family and the farm labour force, cropping and yields, capital investment, gross output, receipts, and farm and household expenses. Maize is the staple crop in the region, and farming is on a commercial rather than a subsistence basis. Under the African Improved Farming Scheme farmers are eligible for subsidies based on the acreage of improved land, if they fulfil certain conditions about methods of cultivation. Average income for all the farms in the sample is found to be relatively high by African standards, and the average amount of capital investment per farm is quite surprisingly high—£466 on the Improved farms and £326 on the Unimproved ones. The authors suggest that in these circumstances the present system of land tenure may need alteration, since it was not designed for a situation where much capital is sunk in farming. The results of the Improved Farming Scheme, as emerging from the survey, are very disappointing. Improved farms had a higher income than Unimproved ones, but this was due chiefly to the subsidy, and the maize yield per acre was actually higher on the Unimproved farms. The main reason for this appears to have been that Improved farmers attempted to grow too large an acreage of maize in relation to their resources. The authors accordingly suggest that there is a case for prohibiting the cultivation of more than a certain maximum acreage by any farmer in receipt of a subsidy under the Improved Farming Scheme.]

CANADIAN

RESTRICTIVE TRADE PRACTICES COMMISSION, DEPARTMENT OF JUSTICE, OTTAWA. Report Concerning the Retail Distribution and Sale of Coal in Winnipeg. Ottawa: Department of Justice, 1956. 9½″. Pp. 116.

[The business which is the subject of this report is one that has suffered a contraction in recent years on account of the increased use of oil for heating purposes. The Commission concludes that if coal dealers are to retain a substantial share of the market, it will be necessary for them to compete more actively with one another than they have done hitherto.]

IRAQI

SALTER (LORD). The Development of Iraq. A plan of action. Baghdad: Iraq Development Board, 1955. 8½″. Pp. 252. 29*s*. including postage.

[The difficulties of drawing up an economic development plan for Iraq are, at least on paper, a good deal less formidable than for most underdeveloped countries. Iraq possesses large areas of potentially fertile soil, there is at present no population problem, and, above all, oil royalties provide a source of capital and of foreign exchange. The purpose of the report that Lord Salter was invited to make is to outline an immediate programme rather than to survey the economic problems of the country in broad long-range terms. Much of the report is therefore taken up with matters of detail. On the general problem of the desirable shape of the national economy, Lord Salter shares the view put forward previously by the World Bank Mission and by Professor Iversen that in the present circumstances the improvement of agriculture (including improved use and control of water supply) is much more urgent and practicable than the development of industry. He attaches great importance to improving the standard of administration and to increasing the supply of skilled and professional man-power. A fair number of the author's recommendations are not new, but, as he explains, the Iraqi authorities have hitherto been more ready to seek the advice of foreign experts than to act upon it. Many proposals put forward in the past therefore still remain to be implemented.]

INTERNATIONAL

BANK FOR INTERNATIONAL SETTLEMENTS. Twenty-sixth Annual Report. Basle: Bank for International Settlements, 1956. 12″. Pp. 230.

[In addition to its usual survey of economic developments during the year, the present issue of this report contains a long special chapter on the scope of monetary policy as illustrated by recent experience. The Bank for International Settlements is well known as a champion of monetary policy, and the report finds much to support this attitude in the events of the last few years. It is admitted, however, that monetary policy is not adequate by itself to control inflation and that it needs to be supported not merely by the appropriate fiscal policy but also by a sense of responsibility among business and trade-union leaders.]

COUNCIL OF EUROPE. Focus on East–West Relations. A policy for Europe. Strasbourg: Council of Europe, 1956. 10½″. Pp. 252.

[This contains a verbatim record of the policy debates of the Consultative Assembly of the Council of Europe held in July and October 1955. The related working papers are also included.]

EUROPEAN PAYMENTS UNION. Fifth Annual Report of the Managing Board, for the Financial Year, 1954–55. Paris: Organisation for European Economic Co-operation, 1956. 9½″. Pp. 73, and annexes. 6*s*.

[In addition to describing the activities of the E.P.U. during the year and the plans made for the year ending June 30, 1956, this report contains a survey chapter describing the evolution of the payments system between European countries since the War.]

ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION. 7th Report. Economic Expansion and its Problems. Paris: Organisation for European Economic Co-operation, 1956. 9½″. Pp. 298. 7*s*.

[Part I surveys the present economic situation and problems of Europe in general terms. Part II, which occupies the bulk of the report, describes developments in individual countries.]

UNITED NATIONS. Yearbook of the United Nations, 1954. New York: United Nations, 1955. 10″. Pp. 656. 70*s*.

[This work of reference describes the activities of the United Nations and its specialised agencies in the course of the year. It is made up largely of brief accounts of the public deliberations of the bodies concerned and summaries of the United Nations publications connected with them.]

UNITED NATIONS. Demographic Yearbook 1955. Seventh issue. New York: United Nations, 1956. 11½″. Pp. 781. 50*s*.

[In accordance with the established practice of featuring one special class of demographic statistics in each year's issue, the present edition of this yearbook is largely devoted to the results of national population censuses taken between 1945 and 1954. About a third of the volume is taken up with data on the size of population in different countries, regions and towns, and a further substantial section deals with age and sex distribution. Tables relating to economic characteristics of populations occupy another hundred or so pages. In addition to this material derived from censuses, the yearbook also gives up-to-date figures of births, deaths, marriages, divorces and life tables.]

UNITED NATIONS. Statistical Yearbook 1955. Prepared by the Statistical Office of the United Nations Department of Economic and Social Affairs. New York: United Nations, 1955. 11½″. Pp. 644. 40*s*.

[The scope and arrangement of the seventh issue of this *Yearbook* are similar to former years, but the greater availability of information has led to a substantial enlargement in size and coverage. The government of the U.S.S.R. has for the first time collaborated by furnishing data.]

UNITED NATIONS FOOD AND AGRICULTURE ORGANISATION. Agriculture in the World Economy. Rome: F.A.O., 1956. 9″. Pp. 76. 5*s*.

[This is a general survey in fairly elementary terms of the present state of world agriculture. Well-designed charts show the leading statistics. The authors emphasise the need to expand agricultural production to keep pace with the growth of population, and they attach importance also to raising agricultural income per head so that it no longer falls below income in other sectors in the way it regularly does at present.]

UNITED NATIONS FOOD AND AGRICULTURE ORGANISATION. Functions of a World Food Reserve—Scope and Limitations. F.A.O. Commodity Policy Studies, No. 10. Rome: F.A.O., 1956. 11″. Pp. 77. 5*s*.

[Part I of this report is a general review of the functions of a world food reserve. Three main functions are considered: famine and other emergency relief, price stabilisation, and the establishment of a world food capital fund to assist in the economic development of backward countries. It is pointed out that the latter two functions, while by no means inconsistent with each other, are of a very different character and could probably not both be conveniently exercised by the same authority. Part II provides a chronological survey of relevant inter-governmental consultations and actions in recent years. The author of the report is Dr. Gerda Blau.]

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THE ECONOMIC JOURNAL

DECEMBER 1956

HOW SHOULD WE CONTROL MONOPOLY? : I[1]

ANYONE who was himself a student of monopoly and the regulation of monopoly in the public interest before the war and who now returns to the subject after an interval cannot but be impressed by the immense addition to knowledge that has come from the work of what has hitherto been known since 1948 as the Monopolies and Restrictive Practices Commission. In the 1930s many of us were not only worried by the lack of protection against monopoly, and by what seemed to an economist, and sometimes, I think, even to a lawyer, as a progressive whittling away, through the various decisions of the courts, of the general principle that contracts in restraint of trade were unenforceable. We were also worried by the lack of knowledge of what restrictive practices existed, and what effects they had on the industry in which they operated and on the economy as a whole. Anyone who has read the eleven reports of the Commission must feel infinitely grateful to the Commission for the extraordinary thoroughness of their work and for the searching inquiries they have made into all the effects, good and bad, of the ways in which the industries referred to them have been operated. It has been said that the work of the Commission has been slow and that it would take a generation to survey the whole of British industry. That may or may not be true. But I do myself think that a thorough, searching and impartial investigation of a relatively small number of industries has been more valuable, in enabling one to form judgments of a range of typical situations and practices, than more rapid and more superficial investigation would have been.

Quite apart from these additions to our knowledge, I think we have had over the past twenty years an advance in our analytical thinking within the field of economics itself. Beginning with theoretical studies of duopoly and oligopoly, and going on to studies of price-leadership, I think we have come to understand more clearly the relation of market structure to price-formation, and to think of monopoly not so much in terms of black and white as of one end of a continuum—we have come increasingly to recognise that something almost indistinguishable from monopoly price may emerge in an industry in which, without any sort of agreement, written or tacit, firms follow

[1] This and the two following addresses formed the opening of a discussion on this topic at the Annual General Meeting of the Royal Economic Society on Wednesday, June 27, 1956. All three have been considerably abbreviated for publication.

a price-leader or make certain not at all improbable assumptions about each other's actions. Equally we have come to recognise that what is formally a monopoly—in the sense that one producer is turning out a very large part of total output—may be so weak a monopoly that its prices depart little if at all from the prices that would rule under competition. I think, for example, of the market situation of one producer who in that sense was a monopolist, but who was selling a large part of his output to a large and very efficient mass-assembly plant. His very keen competitors, he told me, were the cost-accountants of the firm to which he was selling: if his price was above the cost at which they thought they could produce for themselves, they would immediately establish a department of their own to produce his product. His was perhaps the limiting case of a weak monopolist, with no power to prevent entry, and depending wholly on the economies of large scale.

As a consequence, I would argue, of this development and clarification of economic thinking, we have come, I think, to emphasise more strongly the importance of market structure, and in particular the importance of freedom of entry into an industry. We have come also, I think, to place rather less emphasis on either the proportion of output in the hands of a single producer or association of producers—though this may be evidence of a particular market structure—or on formal agreements, except so far as these are agreements to prevent entry and to discriminate in favour of an approved and limited group and against new entrants. We are more concerned with the assumptions, of which entrepreneurs may hardly even be aware, as to how their competitors will behave and how they will respond to a change of prices by one producer.

This emphasis on the structure of the market has, as I see it, been reinforced by another line of thought and experience. I believe it is true to say that those who were nearest to war-time experience in attempting to control prices are most sceptical of the likelihood of exercising effective direct control over monopoly pricing in peace-time. In war-time one can hope to prevent flagrant exploitation of a state of scarcity. In peace-time it is infinitely more difficult to establish what are or are not reasonable rates of profit; what are or are not reasonable managerial salaries; what are or are not reasonable rates of amortisation of capital; whether the firm is efficiently run and reasonably progressive. Those who are conscious of these difficulties are the more anxious to create a market situation in which industry, of its own volition, establishes so near as is practicable the prices that are desirable.

I emphasise this because it seems to me to have a relevance to what appears to be the central theme of our attempts to control monopoly. As I see it, we have no doctrinaire view that concentration of output in a few hands is bad *per se*, and apart from any consequence it may have upon prices, output the pursuit of efficiency and similar more fundamental tests of actual performance. I think I would go further and say that there is increasing scepticism as to whether the breaking up of a more formal monopoly and its replacement by oligopoly will so fundamentally change the essential market

structure that one can say with confidence that the last stage is better than the first. One may indeed forfeit real economies of scale and specialisation, and produce a situation that is actually worse than the first.

I wonder whether I should also be right if I detected not only in recent thought, but also in recent action—or rather priorities of action—a view that, as a very broad generalisation, monopolies of the cartel type—associations of independent firms to maintain prices or to limit entry—have less good in them, to set against any damage they may do, than monopolies involving closer relations—monopolies of the merger type which yield economies of scale, of standardisation and of specialisation. It is, of course, quite unrealistic to divide monopolies crudely into these two main types. The investigations of the Commission have provided examples of cartel-type associations which do in fact result in greater specialisation of individual plants and longer runs of production than would probably emerge if there were imperfect competition and suppliers aimed to provide a full line of goods and services. But, by and large, I believe that we should be right in looking with rather special vigilance at cartel-type organisations. And I think we are increasingly coming to be aware of their ramifications.

I myself feel less concerned about the effects of the large single-firm monopoly than cartel-type monopoly for a second reason also. In a world that is rapidly advancing in technique it is necessary to look at the effects of any market structure not only statically and in the present but also in relation to research, innovation and progress. It is not difficult to show analytically that there are cases in which it may pay a monopolist to suppress innovations or to delay them. I have no doubt that cases may be discoverable in which that has happened. On the other hand, if, as is not infrequently true, the basis of the monopoly is the efficiency of large-scale, the monopolist has a rather special interest in maintaining his technical lead, provided always that entry is free. It is also true that a monopolist can gain more from his own research than a member of a competitive industry, who knows that his research will benefit his competitors as well as himself. In actual practice, I believe to be true in this country what Professor Galbraith has said of the United States, that if one seeks examples of innovation and of research applied to improvements of techniques, of materials, of quality of products, one will find the monopolists very often in the lead, and very competitive industries sometimes, but not always, in the rear. On the other hand, it would not be difficult to quote cases of monopolies which seem to be taking the advantage of their monopoly position in technical slumber. Where the industry cannot support more than a single optimum-sized firm, and more particularly where they are makers of machinery for other industries, the problem of awaking them becomes very serious. Free imports and temporary dependence on foreign supplies is an unsatisfactory solution to a country with a strained balance of payments, but may be the only remedy.

I have said that I think the first and most powerful defence against the undesirable consequences of monopolistic concentration is freedom of entry. If there is freedom of entry, the sources of monopoly power to exploit the

market are limited: they are represented by the economies of larger scal operations than a new entrant can assume; by goodwill which may ea become ill-will if over-exploited; by the advantages in some cases of us intra-marginal resources rather than marginal resources; by the opportu —which I would agree with Mr. Andrews is seldom seized because it da ages the long-run prospects of the firm—of making hay while the sun shi by exploiting the market in the short period before competition can bec effective. If monopoly power is limited to that extent how serious is I would like to know the judgment of others on this question. I fully rea that one can show analytically that the economies of scale will not be hausted. I believe we know far too little at present statistically and pra cally about the actual extent of economies of scale. If they are great damage may be great, but if, as I suspect, they are often beyond a p relatively small, and if the threat of new competition, or of the expansio existing competitors is real, the damage may be less than is someti supposed.

I have said that freedom of entry is the first defence. I believe that light of day—knowledge of what is being done—is the second and alm equally effective defence. I am glad that registration of all restrictive-trad agreements is to be required. I am glad that the Bill includes a provis that, with certain reasonable exceptions, the register is to be open to pu inspection. It is already, I think, clear that in a number of cases particip to restrictive agreements are asking themselves whether certain objectiona features of agreements that will have to be registered are really desirable even necessary to fulfil the objectives of the agreement. I sincerely h that freedom of public inspection of the register will never be surrende

I come now to the much more controversial questions of the present I As the result, first, of its detailed inquiries into ten industries, and, second the more generalised reference to the problems of collective discriminati the Commission, and through it the Board of Trade, has acquired a suffici knowledge of the operation of certain types of collective agreement for i form a general view of the effects of these agreements. The time seen clearly to have come for a wider and somewhat more rapid applicatio the results of its thinking than was possible by a continuation of the remiss to it of individual cases. A majority of the Commission recommended you will know, not only the registration of agreements but also the gen prohibition of the practices of collective discrimination that they had agr in holding to be undesirable. They suggested that it was better on bala to prohibit them and to provide a machinery to deal fairly and expeditio with exceptional cases in which there might be justification, than to deal w cases individually, only prohibiting after individual examination. They out certain grounds on which exception might, as they saw it, legitimately made. But if I understand them aright, these exceptional justifications not represent exceptions which they had encountered in their work a would be prepared to justify, but arguments which they could realise mi in some case they had not encountered conceivably provide justification.

The President of the Board of Trade has not felt able to go the whole way with them. He has preferred in his Bill to provide for registration, and for submission by the Registrar of cases which he believes to be incapable of justification to a Restrictive Practices Court, composed of one High Court Judge and two other members of the Court, each " qualified by virtue of his knowledge of or experience in industry, commerce or public affairs." The Court, after examination of the agreement, may make an order restraining the parties to it from enforcing it, or making any other agreement to the same effect.

I think there are clearly two major issues here. First, the method proposed by the new Bill requires examination of each and every agreement before prohibition. Even if many agreements are abandoned by the parties to them without waiting for them to be brought before the Court, this must be a slow business. It very much remains to be seen how far the Court can establish precedents, and how far its early decisions will result in wide abandonments of agreements. If it finds that each case is very much an individual case on its own, the pace of work of the Courts may not be very much greater than has been that of the Commission.

But the bigger issue seems to be the problem of the machinery and method for balancing almost imponderable considerations and arriving at a judgment of what constitutes the public interest and how on balance in a particular case it is affected. The President of the Board of Trade put the issue here with great clarity in opening the second-reading debate:

> " It is clearly not enough to record these various arrangements. It is necessary to provide for their examination and to determine whether they should be allowed to go on or whether they should be stopped. There is no solution to my knowledge in any country which precludes the need for some such decision to be made in any individual case.
>
> " The first question which has to be asked and answered is this: Who should determine the matter? There are only two choices—either an administrative tribunal answerable to a Minister or a court forming part of the judicial system of the country. There is no solution in between. It is not possible to imagine, or for the House to tolerate some administrative body deciding issues of this kind which has neither the status of the High Court determining an issue placed before it nor is responsible to a Minister answerable to Parliament. The choice is either the executive or the judiciary and there are forceful arguments for and against them both."

The President mustered—I hope I may be forgiven for saying it—the arguments against decision by a Minister, subject to Parliamentary debate, with great force. It was by implication rather than argument that one was left to suppose that the procedure of a Court must be better. This is where I myself am greatly looking forward to what Professor Montrose may have to say. Those of us who have been concerned by the trend of judgments on cases concerning the enforceability of contracts in restraint of trade may perhaps be unreasonably nervous as to whether a Court of Law is capable of the very difficult task of balancing conflicting elements in a complicated

economic situation and interpreting narrowly balanced economic arguments. Perhaps an economist may be wrong in seeing an undue tenderness for the more legal aspects of public interest—in particular, a tenderness for the sanctity of contracts whether desirable or undesirable. But I think we must wait to see how far Professor Montrose can satisfy some of us on that score.

There is one final point. I may have missed some relevant passages in Hansard, but I find it extraordinarily difficult to understand how the Court is to work. The Registrar, as I understand, will refer an agreement to the Court. The parties to the agreement will, no doubt, present through counsel their arguments as to how and why the agreement will work to the public interest—in terms of the recognised justifications included in Clause 16 of the Bill. Is the Court to exercise its own unaided judgment on the validity of these arguments? Is it for the Registrar to provide evidence to the contrary? Will the Registrar have a trained staff of economists and industrial experts as well as lawyers for this purpose? And if he does, will he not be duplicating the staff of the truncated Monopoly Commission, which in future is to withdraw from the field of restrictive practices and concern itself with other forms of monopoly? I see less difficulty myself in leaving the staff of the Monopoly Commission with some continuing responsibility here than others have done. I ask these questions because I believe that a great deal will turn on the success or failure of the Court in dealing wisely and impartially with some of the first cases that may be brought before it.

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HOW SHOULD WE CONTROL MONOPOLY?: II

PARLIAMENT is still in process of producing answers to certain issues of rule-making that are required if we are to be able to say " the keener the rivalry the better, so long as the competition is within the rules." But it seems reasonable to suppose that what will finally emerge will be something very similar to the present state of the bill. The answers which Parliament has given are roughly as follows:

(1) The only competent rule-making body should be the Government, and only in special cases should any group be permitted to frame rules of their own to regulate either their conduct or the eligibility of future competitors. The special circumstances for which provision is made in Clause 16 of the bill can be regarded as akin to the " advantage rule " which is found in a number of games. The Courts have power to suppress private rules.

(2) There is no need for the moment to promulgate rules additional to those which have been in force for some time, such as the Trade Marks Act, or to the common-law doctrine on " passing off " and similar issues.

(3) For the moment no new rule, governing the size or other qualifications of competitors, need be promulgated. This, however, is explicitly an interim decision. The Government, through the Monopolies Commission, is to consider whether disqualification of certain firms may from time to time prove necessary because of their large relative size, or alternatively, whether special rules of conduct may not have to be drawn up for such competitors, and the possibility of some new general rule at some later date is not excluded.

For present purposes I propose to take the decisions of Parliament as final and to consider the problems which arise in carrying them out. These problems arise for two sets of people; first, the Restrictive Practices Court, which has the duty of applying the " advantage " rule, and second, the reformed Monopolies Commission, which has the duty of investigating whether additional control is needed over the concentration of industry into large single units. I shall consider these two sets of people *seriatim*, since the special problems of the Monopoly Commissioners are simply additional to those which they share with the Restrictive Practices Court.

In operating the " advantage rule " the Court has the task of weighing the advantages claimed for particular restrictions under paragraphs (*a*) to (*g*) of Clause 16 against the damage to the public interest, which the Act presumes will in general follow from rules made by the players themselves. To weigh or to balance implies that the things compared have weights. Thus the Courts must be presumed to have some idea in advance not only

of the nature but also of the magnitude of the damage to the public interest which flows in the general case from restrictive practices. I have spoken of an idea of the magnitude deliberately, because I do not want to imply that the damage must necessarily be capable of being expressed in terms of precisely defined units of measurement. I mean that it should be measurable in the sense that we could say that a particular rule of cricket—say the rule against body-line bowling—has greatly improved the game; or, alternatively, that some modification of the rules has made very little difference one way or another to the game. We cannot say that the presence or absence of any particular rule has improved cricket by so many utils, but we can say whether the effect of the rule is big or small. In short, the Court will need to be able to assess both the nature and magnitude of the effects that are to be balanced.

The nature of the pleas in mitigation which a trade association may advance is set out explicitly in the Act (paragraphs (*a*) to (*g*) of Clause 16). The problem for the Court on this side of the balance is simply to assess the probability of the defendant's claim that such effects will follow if permitted. This will be difficult enough, but the greater difficulty is that there is no similar listing of either the nature or the magnitude of the effects which must be taken to have led Parliament to the general presumption that restrictive practices are normally against the public interest. Nor do I think that the Court will be able to form any clear idea of these effects from the various obvious sources which it may consult. This is not only true of the Parliamentary Debates, including the Government's statement of its motives in introducing legislation. More illumination is to be found in the reports of the Monopolies and Restrictive Practices Commission, but I think the Court will have difficulty in distilling any coherent body of doctrine from these, and I do not think they will derive great illumination from the technical writings of professional economists. In all these sources the doctrine is either too implicit or is presented in the form of a catalogue—frequently a hypothetical catalogue—without any significant attempt to sort out the relative weights of the different issues in the catalogue. I would like to make some suggestions as to the direction in which the Court will have to look to resolve these difficulties.

Let us first consider the public interest—a term which for obvious reasons is undefined in the legislation. It seems to me that the most natural definition of the public interest is what the public is interested in; and since the War the public has been primarily interested in two aspects of the functioning of the market economy. The first is the extent to which efficient and inefficient, low-cost and high-cost, firms co-exist in different industries. The second is the rate at which efficiency—now usually summarised as productivity—increases over time.

I suggest, therefore, that we should take the public interest to be the securing of the minimum intra-industry dispersion of efficiency which is compatible with economic progress.

If this is accepted, it follows that the onus which should be laid on the

lefendant association is to show that its rules do not tend to increase the lispersion of costs or to slow up progress, whilst, on the other hand, the langers under the heads recognised in Clause 16 with which they are deigned to cope are very real. In other words, the general presumption of the Court should be that restrictive practices do tend to prevent the elimination of the unfit and to check progress. The responsibility for proving this presumption wrong in a particular case is on those who wish to be allowed to make private rules.

Now such a presumption can be regarded as reasonable only if it is possible to say in principle what sort of evidence would convince the Court that in a particular case the practices under consideration did not significantly prejudice the achievement of minimum dispersion or maximum progress. If this question cannot be answered, then the advantage rule is merely an empty form, and paragraphs (*a*) to (*g*) of Clause 16 are redundant. This reasonable demand can be met only if we—and the Courts—are prepared to make some assumptions as to the basic mechanism of a market economy. I suggest that three conditions must be satisfied if we are to have " reasonable " dispersion of efficiency and progress:

(1) Efficient firms must be able to grow at the expense of less efficient.

(2) The individual firm must be able to experiment with new techniques or products to a degree limited only by its own financial resources.

(3) There must be some, so to speak, grit in the system which prevents any advance of one firm from being immediately imitated with full effectiveness by all the other firms in the industry.

I offer these three considerations as the essence of what is really meant by a competitive economy, and the first two are the more important for our present purpose.

If you will accept these, it is possible to conceive of the sort of defence by which a trade association could convince the Court that its rules are not increasing dispersion or checking progress. The defence would be in two parts: first, a demonstration that the rules do not in principle act in this way—need not necessarily do so; second, empirical evidence that they have not in fact done so. What sort of empirical evidence can we conceive the firm as offering? On the first question, that of the freedom for the efficient to grow at the expense of the less efficient, the relevant evidence is, I think, that of changes over time in the relative sizes of firms. In other words, I would regard it as a necessary condition for the industry to be operating in the way which we agreed to regard as consistent with the public interest, that the relative sizes of firms should change over time, for it is contrary to the whole idea of progress that relative efficiencies should remain unchanged for any considerable period of time. Such evidence would, I think, need to be supplemented by evidence on the extent to which new firms have entered the industry over a period. For firms sometimes die, and it is necessary, therefore, if ultimate oligopoly is not to supervene, that new firms

should be born. Empirical evidence on the freedom of firms to experiment with new techniques and products would, I think, have to be in the form of a technical catalogue listing significant advances and attributing responsibility for them.

The Court's ability to appreciate and assess such evidence depends, of course, on the availability of a body of comparable data for other industries. This is a task to which economists might well address themselves, and indeed it is perhaps not too visionary to envisage that if the Courts follow the line which I have been suggesting, business firms will feel it to their own advantage to make facilities, and perhaps finance, available for economists to undertake such work.

The other side of the Court's task is to decide the probability to be attached to claims by trade associations that the issues listed under paragraphs (*a*) to (*g*) are in fact clear and pressing dangers. All I want to say on this is that I believe the Courts should make an assumption of continuing general full employment when assessing these probabilities. Most of the arguments which trade associations have so far advanced in defence of their rules rest essentially on appeals to historical experiences which may well be irrelevant in an age of full employment (the argument from excess capacity).

May I turn now to the problems of the Monopolies Commission? It follows from the way in which I have defined the public interest that I take a technological rather than a product definition of an industry, and it is in terms of such an industry that I would define monopoly. The typical monopoly situation which we have to envisage is, I think, one in which an industry so defined contains one very large firm and a fringe of smaller firms, and if monopoly is so defined the two criteria of the public interest which I have advanced still hold good.

The danger which we feel in monopoly cases is that mere size will remove from the monopolist (the large firm in the industry) his fear of loss, and leave other firms in the industry with the feeling that they exist on sufferance. If they feel so, their hope of gain is largely removed and their fear of loss is non-activating, since they can do little or nothing to guard against it. If this be so, the problem of monopoly arises not so much from what the monopolist does as from what he might do. The effects follow merely from his size, independently of his actions.

I see no solution, therefore, for this problem short of the forcible dissolution of large firms, and many of us will feel serious inhibitions against any such course of action. I need perhaps mention only two of these. In the first place we feel that in some very real sense a firm is a much more organic entity than is a trade association, and this is perhaps at the root of our instinctive disinclination to cut into it. This, as I have said, is largely a matter of instinct. The second reason is much more explicit. Full employment, efficiency and progress in this country rest on our ability to sell enough exports to keep us going, and our industries selling exports do so in competition with those of other countries where large firms (not always monopolists

in their own countries) are also common. If mere size does in fact give fighting power, then it is something which we want to preserve. All economic action involves risk; but the risk that forcible dissolution of large firms in the interest of restoring the market mechanism in this country will, in the short term at least, damage our export capacity is one which we cannot afford to take. We must therefore, I think, live in the hope that the battle abroad will substitute for the pressures at home which are loosed when we reach a monopoly situation.

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HOW SHOULD WE CONTROL MONOPOLY?: III

An academic lawyer honoured by a request to talk to economists cannot but recall some of the discussions of the general relations between law and economics. The words "law" and "economics" are, of course, ambiguous: to speak of but one aspect of their multivalence, both refer equally to the activities of men who form part of the social scene, legislators and judges, buyers and sellers, and also to the reflections of scholars—they refer to social processes and to academic disciplines. It was to social processes that Stammler referred when he said that law was the form, and economics the content, of social life. In saying that, he was proclaiming, so far as law was concerned, that law was totalitarian, that no aspect of social life was unregulated by law. To interpret his thought correctly it is necessary to unmask another of the ambiguities of the term "law." Even in juristic contexts it may refer to descriptive generalisations of human behaviour. In this sense to say that no aspect of social life is unregulated by law is merely to express a sociological heuristic hypothesis that inquiry will reveal patterns in all aspects of human behaviour. But Stammler's thought went further. His belief was that the whole of social life was subject to planned control: a *laissez-faire* ideology was a plan to leave some aspects of human behaviour to non-governmental controls. Justice, the ideal of law, embraced the whole of life, so that there was no logical inconsistency in the entire regulation of life by law; but justice did not ignore the need for free development of human personality.

Berolzheimer, also writing about the beginning of the century, saw law and economics as partners. He, however, was thinking of the academic disciplines: he regretted the rise of the newer social sciences which did not possess the precision of the older social sciences of law and economics, which between them covered the whole of society. I do not share these intellectual pretensions: certainly I am aware of much vagueness and inaccuracy in law. But the thought behind Berolzheimer's statement that lawyers and economists should know of each others' work seems to me important. The economist has expertise, but economic propositions can be expounded so as to be understood, and even criticised, by lawyers. There are no mathematical or medical, legal or economic mysteries: there are only difficulties—physical, emotional, intellectual. They exist, like Everest, in order to be overcome.

This introduction has led me to a problem which might perhaps have been better considered within a framework of an ordered statement of the various questions concerned with the legal control of monopolies. A general question is that of the qualifications of a lawyer-judge for participating in the administration of a scheme of control of business activities. Of course, business activities are already the subject of legal control through lawyer-

manned courts in many ways; but the belief seems to exist that at present such laws are of the type of primitive precepts prescribing penalties in detailed circumstances: "mathematical formulas whose essence is their form." The judge's functions with such rules are limited. He ascertains the truth about the "facts" alleged by the parties; then, as the Supreme Court has put it, he gathers the significance of the rules "by taking the words and a dictionary"; and, finally, he arrives at his decision by a quasi-logical process of seeing whether the facts come within the rules or not. His task is to see that the rules of evidence and procedure are observed in the ascertainment of the facts, and that the relevant substantive rules are properly applied. He has no part to play in the formulation of the rules, he has no discretion to exercise which may permit the intrusion of social, economic or political doctrines or of human prejudices. He represents impartial justice with a modern electrical device which deals with mathematical formulas. The question is whether a lawyer should be permitted to discharge other functions. The Restrictive Practices Court, for example, as envisaged in the present Bill, has to determine whether "having regard to the conditions actually obtaining . . . the removal of the restriction would be likely to have a serious and persistent adverse effect on the general level of unemployment in an area in which a substantial proportion of the industry to which the agreement relates is situated." It also has to determine whether "a restriction is not unreasonable having regard to the balance between those circumstances [such as the one just stated] and any detriment to the public . . . likely to result from the operation of the restriction." Such rules contain no "mathematical formulas," but involve nice considerations of economic theories and economic, and even political, predictions. Lawyers, say one group of critics, have not the ability to administer such rules: judges, say another group, yearning for some non-Aristotelian dehumanised "government of laws," should not pollute the pure fountains with such matters. Let me turn to American experience of legal control of monopolies in dealing with these matters.

In 1890 the Sherman Act prohibited in broad terms practices in restraint of trade and the monopolising of trade. The Act was to be enforced by the criminal procedure of the courts. It was left to the courts to work out the patterns of behaviour which they considered violations of the Act, and one notable construction was that of the application of the so-called "rule of reason." A mere restraint of trade was held not to be illegal: it had to be unreasonable having regard to the balance of the interest of the parties and the public. The Clayton Act and the Federal Trade Commission Act of 1914 prohibited unfair methods of competition and set up a Commission charged with the task of enforcing the Act, subject, however, like other administrative tribunals, to judicial review by the ordinary courts. Those Acts, and the later Robinson–Patman Act of 1936, did contain some specific provisions, such as a prohibition of price discrimination where the effect is substantially to lessen competition or to tend to create a monopoly, and the prohibition of payment of a commission or brokerage or allowance of a dis-

count " except for services rendered." It was, however, by means of i " interpretation " of the general prohibition of " unfair methods of con petition " that the Supreme Court arrived at the ruling that a price-fixir agreement is illegal *per se*; and it was again the authority of the Supren Court's approval, and not any specific provision of the legislation, whic empowered the Commission to order a " combine " to divest itself of son of its units. In the *Sabine Chain Theatres* case, the Supreme Court, approvir of an order for a company to sell fifty of its 148 cinemas (so that it owned r more than two cinemas in any town and only one in the smaller towns said:

> " To require divestiture . . . is not to add to the penalties th Congress has provided in the anti-trust laws. Like restitution [remedy developed by courts in civil cases, as where money has bee paid by mistake] it merely deprives a defendant of the gains from h wrongful conduct. It is an equitable remedy designed in the publ interest to undo what could have been prevented had the defendan not outdistanced the government in their unlawful project."

It is as a result of " interpretation " that the Supreme Court has hithert held that " mere size is not an offence under the Sherman Act "—a hol ing which has been challenged in one powerful dissent—and has held th control of 98% of sugar refining and 90% of the production of shoe-makin machinery were not unlawful monopolies.

The administration of the anti-trust laws has not escaped criticism. Th is what one writer, a lawyer, has said:

> " Our courts were not trained with the complicated problems anti-trust. . . . The administration of the rule of reason by our cour has proved a complete failure. The preservation of our economi order of free competition by the judicial process of exclusion an inclusion, casts a burden upon our judges which is basically at odds witl and plays havoc upon, their exclusively legal training and goes far beyon the traditional common-law litigation between private parties."

My researches, which confessedly are limited, have, however, disclosed n criticism of American anti-trust legislation based upon bringing the cour into disrepute by casting doubt on their impartiality. The Sherman A has been said to do no more than " cast upon the courts its centuries-ol common-law judicial function ": one line of criticism has been that th courts have adhered too closely to the common law. " At common law, says Callman, " the rule of reason involved a balancing of private interes between the parties to a contract in restraint of trade, and this concept wa without further refinement, incorporated into Section 1 of the Sherman A which was enacted in the public interest." This, however, is a curiou reading of the common law. The classic judgment is that of Lord Ma naughton in the *Maxim-Nordenfeldt* case; the well-known dictum is:

> " Restraints of trade may be justified . . . if the restriction reasonable—reasonable, that is, in reference to the interests of th parties concerned and reasonable in reference to the interests of the public, so framed and so guarded as to afford adequate protection to the party in whose favour it is composed, while it is no way injurious to the public."

Not only do United States lawyers see in the administration of anti-trust laws by the courts the proper discharge of a judicial function, there are those who regard the participation by the courts in social issues as democratic procedure. This is what Douglas, J., has written of the Supreme Court:

> " The Court itself became part of the dynamic process of history. It did not live aloof from the turbulence of the times. It was part of the life of the community: absorbed from it the dominant attitudes and feelings of the day, and moved with the impetus of the era. . . . We too must be dynamic components of history if our institutions are to be vital directive forces in the life of our age."

But Douglas, J., was like Holmes, J., insistent that the judges should not read their own ideologies into law. " The problem of constitutional adjudication . . . is to keep the power of government unrestrained by the social or economic theories that one set of judges may entertain."

The contention that lawyer-courts have not the expertise to deal with economic issues has been largely accepted in the United States, and the rule of the ordinary courts restricted to review of the findings of administrative tribunals, which, however, do have lawyers among their personnel. Many hold that the findings of these tribunals should be accepted in all questions of fact. In the *Cement Institute* case the Supreme Court said that the Federal Trade Commission were the experts on the questions involved in anti-trust laws: " We are persuaded that the Commission's long and close examination of the questions it has decided has provided it with precisely the experience that fits it for performance of its statutory duty." But the policy of treating administrative tribunals in this fashion has been described recently as one of " judicial futility." Frankfurter, J., has said about the National Labor Relations Tribunal: " If I were a circuit judge I do not think I would be free to say this looks to me like another cock-and-bull story, but those fellows, Paul Herzog and the others, know human nature and I do not." The traditional dichotomy of leaving questions of fact to juries and commissions, and reserving questions of law to judges, has been subject to close scrutiny. The language of " fact " and " law " has long been regarded as ambiguous. Washed in logical acid, so-called " facts " dissolve often into processes of evaluation assuming inarticulate theories of many kinds. This is what the Supreme Court said two months ago about the most commonly employed concept of the common law to-day:

> " It must be borne in mind that negligence cannot be established by direct, precise evidence such as can be used to show that a piece of ground is or is not an acre. Surveyors can measure an acre. But measuring negligence is different. The definitions of negligence are not definitions at all, strictly speaking. . . . Issues of negligence call

for the exercise of common sense and sound judgment under the circumstances of particular cases."

The nature of the judicial process has been the subject of careful study n the United States. Douglas, J., going further than his great predecessor, Holmes, J., has said: " Precedents are made and unmade not on logic and istory alone. The choices left by the generality of a constitution relate to olicy." But it is not only constitutional provisions which contain those eneral propositions which, as Holmes, J., said, do not decide concrete ases. Legal provisions, whether established by the courts or by legislatures, ften take the form of broad standards and wide principles. Their applicaion often involves processes of evaluation and subordinate legislation, which re most wisely and efficiently carried out when the purpose of the law is ully realised. Two millennia ago Celsus said: " Scire leges non hoc est verba arum tenere sed vim ac potestatem." Lawyers ought to be acquainted vith the policies of the laws; and when the laws are concerned with econonic issues, it is vital for lawyers to appreciate the economic theories and olicies.

The subject for discussion is that of the problems which arise when use s made of tribunals similar to those of courts of law for the control of monoolistic practices. The problems that I can discern appear to me to be hese. What are the values which are sought to be attained by the governnental apparatus of the tribunals? What must be the character of rule lesigned for the maintenance of standards? What are the merits of flexiility and rigidity? Is a legal tribunal an efficient body for the ascertainnent of facts relevant to the investigation of a charge of monopolising? To what extent may courts of law be expert in the application of the relevan ules to the facts, seeing that this must involve the evaluation of facts in the ight of the economic policies controlling the rules? How far are norma egal remedies appropriate to the enforcement of machinery of economi regulation? Can courts develop or administer more appropriate remedie for the regulation of monopolies?

It is clear that the policies involved in the legal control of monopolies ar not purely " economic." Bentham taught that every law was a necessar " evil," since it was an infringement of liberty: it might, nevertheless, be good law, but to ascertain whether a law was so, the evil prevented by th enforcement of the law had to be weighed against the evil inherent in en forcement. We now consider that if a particular social good is to be attained by governmental control the calculation requisite is more complex Direct government action may be more efficient in achieving a particula economic end than the use of machinery of general laws and their admini stration through legal tribunals. But practical economics is politica economy. There are important social interests to be maintained throug due process of law courts which have to be put in the balance against th interests involved in monopoly control. Unfortunately, the felicific calculu of the weighing of evils, or the balancing of interests, cannot be arithmetisec The process of judgment involved has yet to be fully investigated. I do nc

ropose to do more here than suggest that there exists that problem for nvestigation. What I do propose to consider, or rather to assert, is that the olicies, other than those of the rule of law, involved in monopoly control re not solely economic. Justice raises its head in both of the ends which nay be predicated for such control. Political justice is involved in the control of economic power, designed to keep it within the limits tolerable in a lemocracy. Economic justice, or to use an older term, the *justum pretium*, s involved in the control which seeks to preserve competition so as to ensure air prices for consumers and producers.

The relation between economic power and political power is studied in nany disciplines. A distinction between *imperium* and *dominium* has long been drawn in juristic science. Its validity has always been questioned. It was indeed Austin and not Marx who said there could only be rights against persons, not over things. When the Sherman Act was passed, it was thought that it was directed against industrial empires. At the beginning of the century, however, in a number of cases, of which the *United States Steel* case was one, the Supreme Court held that mere size unaccompanied by unfair practices was not an infringement of the legislation. But by 1948, the Supreme Court's view had changed. In the *Columbia Steel* case the Supreme Court authorised the further expansion of the United States Steel Corporation by the acquisition of Consolidated Steel. The 5/4 majority did take size into account, but said it had to be balanced against the need of the industry for expansion. The minority, however, restated the doctrine that the evil of monopoly may lie solely in size. At first, size is related by them to economic factors.

> " The Curse of Bigness shows how size can become a menace—both industrial and social. It can become an industrial menace because it creates gross inequalities against existing or potential competitors. It can be a social menace because of its control of prices. Control of prices in the steel industry is a powerful leverage on our economy. For the price of steel determines the price of hundreds of other articles. Our price level determines in large measure whether we have prosperity or depression—an economy of abundance or scarcity."

The social menace referred to is one which may be categorised as economic. The court, however, went on to say:

> " In final analysis, size in steel is the menace of the power of a handful of men over our economy. . . . All power tends to develop into a government in itself. Power that controls the economy should be in the hands of the elected representatives of the people, not in the hands of an industrial oligarchy. Industrial power should be decentralised. It should be scattered into many hands so that the fortunes of the people will not be dependent on the whim or caprice, the political prejudices, the emotional stability of a few self-appointed men. The fact that they are not vicious men but respectable and social minded is irrelevant."

Nor does this opinion take direct note of the power that the directors of a big combine have more directly over the employees. The right to dismiss

workers moves from a private-law question of economic relations into the public-law problem of population mobility when the numbers involved pass into the thousands and tens of thousands.

The policy of monopoly control in the interest of fair prices is that of ensuring a " natural " control of prices as opposed to governmental price fixing. It is assumed that competition with other buyers and sellers in a market will ensure a just price. These " natural " forces may, however, eliminate competition: competitors do not compete in order to preserve competition. Undercutting is competition; but it may eliminate competition. It has been suggested that since the policy of the control of monopolies is the national interest in fair prices and productive efficiency, controls could be more direct. Instead of relying on fair competition to ensure the national interest, it is sufficient to keep a check on the economic units. Schemes involving such criteria would require different administrative practices than those seeking to control monopolies solely through maintenance of competition. The economist is perhaps the expert in weighing the merits of supervising machinery against suppression of restrictive practices, but can he assess the result of allowing economic power to pass into the sphere of political influence?

I am aware of the inadequacies of my consideration of the policies of monopoly control. I think, however, it is necessary for academic and practical lawyers to consider such policies if they are properly to understand or practise the relevant laws. I do not think it is possible to frame rules, which can be applied in some quasi-logical fashion, without consideration of policies. I wish, however, in this respect to deal with a single topic. The Dean of the Harvard School of Public Administration, reviewing United States case law, has said that the judges have thought in terms of restrictive practices, while economists concerned with the problem of trusts have thought in terms of the control of markets. The reason for this is, he thinks, that lawyers were concerned with tests that would stand up in a court of law, and that it is easier to draft workable rules prohibiting particular types of restrictive practices than to produce tests of a substantial degree of market control. I cannot accept this thesis. Restrictive practices are the means by which control of markets is obtained. What we have is not a conflict between lawyers and economists, but between hornbook rules and principles. It is an age-old conflict within the law, appearing in all its branches, between certainty and discretion. A series of rigid formulæ prohibiting particular practices may result in practices productive of market control escaping because they offend no formula, while others in fact innocent of market control are condemned. A rule embodying a flexible concept, on the other hand, may make difficult the task of prediction of judicial action, since it permits of a range of decisions. But this is no peculiarity of monopoly control law. In fact, the Sherman Act and the Clayton Act contain the wide terms of restraint of trade, monopolies and unfair competition. The "culture of two thousand years " has been said to lie between formalistic precepts and liberal rules.

Studies in the evaluation of various methods of ascertaining facts are comparatively rare. Such a study must begin with the need for distinguishing among the various classes of so-called " facts ": and with the need for realising that the law of England, quite apart from other legal systems, knows more than one method. It must not be assumed that the procedure at a jury criminal trial with its elaborate rules of evidence is the only legal procedure. For the Nuremberg trials the Charter provided, more in accordance with Continental ideas, that the only compulsory rule of evidence was the rejection of irrelevant matters. The Supreme Court said in the *Cement Institute* case: " Administrative agencies, like the Federal Trade Commission, have never been restricted by the rigid rules of evidence. And, of course, certain rules which bar certain types of evidence in criminal or quasi-criminal proceedings are not controlling in proceedings like these." But, on the other hand, it must not be assumed that the various English rules of evidence are without value. The problem of what rules of evidence should be adopted by a Restrictive Practices Court remains a problem.

One of the problems is the treatment of the evidence of economists. How far should hearsay evidence be admitted about the general conditions of an industry? What about the opinions of economists as to probable causes and effects, and about trends and goals? What should a court do when economists conflict? Should a court which contains experts as assessors, such as an admiralty court, receive the evidence of expert witnesses at all, and should it accept the assessor's evaluation of expert evidence?

Another problem of the ascertainment of facts lies in its bulk. The investigation in the *Cement Institute* case compares with the Nuremberg trial. It took three years for the trial examiner to hear the evidence, which consisted of 49,000 pages of oral testimony and 50,000 pages of exhibits. It has been said that the collection and digestion of evidence is *the* problem in anti-trust cases. It has been argued that economists alone have the expertise to distil the essential features from the facts and to make their implications clear. Is it, however, unreasonable to believe that lawyers have also from time to time shown some competence in the handling of unwieldy masses of complex facts?

The ambiguity of " facts " means that the problem of their evaluation overlaps with consideration of the role of the expert witness. The crux of the problem of control through courts may lie in this question. Scientific evidence often comes before the courts: judges do not presume " to lay down the law " about " geography and geology and physics and engineering." Analysis of judicial reasoning has led jurists to assert that its inarticulate premisses contain propositions within the realm of psychology and economics, politics and sociology. What are judges expert about? Here is Professor Davies' view of American judges: " Courts are masters of common law, constitutional law, ethical questions, *a priori* reasoning, traditions and philosophies of law and government, the meaning of non-technical words and explanation and interpretation of legislative history." What a lot of fun may be had in arguing for the abbreviation or the extension of this list.

There remains the question of the nature and efficacy of remedies operable through courts for the control of monopolies. I know I shall be forgiven if I confine myself to one observation. The dominant function of law is widely considered as an aspect of social control of human behaviour. It is prospective behaviour which is in mind. Courts collect past debts as part of a process of educating people in promise keeping. So, too, the principal object of monopoly-control legislation may be stated in language used in the *Cement Institute* case as " not to punish or fasten liability on violators for past conduct but to ban specific practices for the future." But the ordinary courts of law rely to a large extent for this purpose on the deterrent effect of a court order, and the interest of parties to litigation in bringing the violation of a court order before the court. Injunctions are often not granted where constant supervision of a defendant would be required, on the ground that courts have no machinery of supervision. The administration of law is more efficient when policing exists in support of court decisions.

One of the great advantages of the institution of the Federal Trade Commission is that it has the machinery for supervising the enforcement of its orders and for ensuring that practices accord with those orders. Another great advantage is that it has officers who can investigate criminal practices and bring appropriate cases before the courts. The experience of the nineteenth century in England testifies to the value of inspectorates if legislation is to be really effective. The absence of a " commercial police " is one of the reasons why many of the provisions of commercial legislation remain a dead letter. A conclusion from this discussion is that the Restrictive Trade Practices legislation is more likely to be effective if the Registrar of the court is assured of the services of inquirers who are able, for example, to provide him with the " reasonable cause to believe " required by Clause 11 of the existence of unregistered restrictive practices.

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THE MONOPOLIES COMMISSION AND PRICE FIXING

THE Monopolies Commission has concluded satisfactorily that phase of its investigation concerned with " restrictive entry " practices.[1] In its first general report, *Collective Discrimination*, adverse conclusions on the public interest of these practices were reached, and it recommended general prohibition of them.[2] A second general report on the practices of " common prices and agreed tendering " was referred to the Commission in October 1955. Unfortunately, this reference will now be cancelled, since these practices will, with the passing of legislation in 1956, come within the jurisdiction of the new Restrictive Practices Court. However, the Commission, in its various industrial reports, has dealt with a sufficient number of industry reports to make it worth while examining its experience.[3]

I

It is important to place price-fixing practices in relation to the other main group, the restrictive-entry practices. In the majority of cases examined by the Commission the two are entangled in one comprehensive system of restriction. The question which naturally arises is whether restrictive-entry practices are designed to support a price-fix, or is the price-fix an outcome of restricted entry. One commentator comes down firmly in favour of one view and says it was a mistake to have the first general report on agreements to enforce conditions of sale.[4] And he argues that the principle of whether " firms should agree upon common prices, output quotas, or the allocation of markets—the basic instruments of monopoly control " should first have been decided. The Board of Trade reference on common price arrangements, he maintains, should have preceded that of the *Collective Discrimination* report.

This view stresses the orthodox text-book approach, which sees the monopolist as mainly a price adjuster and output fixer. Close study of the Commission's reports suggests something different. Typically, firms appear to enter trade-association agreements to *protect* themselves. They are not concerned to choose the most advantageous point on their collective demand

[1] Broadly, exclusive dealing, collective boycotts, loyalty rebates and the enforcement of resale price maintenance. See A. Hunter, " The Monopolies Commission and Economic Welfare," *Manchester School*, January 1955, for an analysis of this phase of the Commission's activities; also R. L. Cohen, ECONOMIC JOURNAL, March 1953 (Mem. on Reports).

[2] Cmd. 9504, 1955. A general report makes a survey of the effect on the whole of industry of a specified set of practices; its approach is based on the experience of a number of industry reports. See A. Hunter, "The Progress of Monopoly Legislation in Britain," *Scottish Journal of Political Economy*, October 1955, for an estimate of the significance of the general report.

[3] There are four mainly price-fixing reports (*London Building*, *Copper Semi-Manufactures*, *Pneumatic Tyres* and *Sand and Gravel in Central Scotland*) and six others in which price fixing is involved with other practices.

[4] John Jewkes, " The Control of Industrial Monopoly," *Three Banks Review*, December 1955.

curve (although this conceivably can happen) so much as to keep the competitive spirit within bounds. That is, agreements seem designed to keep out, or keep under control, new firms, new products or services, new methods of production, etc. If this is the correct interpretation the price-fix appears as a subsidiary element of restrictive systems. True, it provides a higher and more stable income than would be the case with unrestricted competition; this is what one expects of a system of protection. But few reports of the Commission show that restrictive agreements support high profits; the aim of associations seems to be the earning of " reasonable " profits. And a more common result is the retention of excess capacity, keeping prices higher than necessary.[1] Then price fixing itself can frequently be seen as a mainly protective device to keep in existence the less efficient producers; it is a reflection of a " live and let live " spirit in the industry.[2] Certainly resale price maintenance has been enforced by distributors' associations [3] precisely because it prevents the entry of new methods (*e.g.*, self-service) which depend on price competition to become established.[4]

Hence it is difficult to maintain that the practitioners of restrictive agreements have the same rationale as text-book monopolists. The details of such agreements fall into perspective more readily if one regards them as instruments to avoid the severities of competition; " the best of all monopoly profits is a quiet life." [5] This means that the key practices in agreements concern *exclusion and enforcement*, not price fixing. It is significant, for instance, that the Commission has recommended that price-fixing arrangements be permitted to continue in three of its reports; whereas it has never contemplated allowing any of the restrictive-entry practices to persist. That is, the Commission appears to find that the forms of competition which make for change and flexibility, for a faster rate of economic progress,[6] are more fundamental than price competition. Indeed, price competition in some cases may be largely irrelevant.[7]

The administrator of monopoly legislation is less troubled by these theoretical points, but he comes to the same conclusion. What he sees is a

[1] E.g., *Dental Goods*, *Rainwater Goods*, *Calico Printing* and *Imported Timber*.

[2] E.g., *Copper Semi-Manufactures* and *Sand and Gravel in Central Scotland*.

[3] *Collective Discrimination*, paras. 169–71, and B. Yamey, *The Economics of Resale Price Maintenance*, Ch. IV.

[4] The methods by which trade associations fix prices confirm these views. Where they are known, an average is normally taken of members' (average unit) costs. It may be a simple average, the average of the three or four lowest-cost producers, a weighted average or even " the lowest basis of prices submitted " (*e.g.*, see below, pp. 590 and 594). Alternatively, members find a mutually satisfactory price in committee; occasionally this is a " compromise price [or increase] having in mind what the market will bear "; or, more simply, prices are the result of a percentage addition to price lists drawn up many years before, usually without the benefit of cost reviews. In a fully employed economy these price-fixes are rarely accompanied by deliberate restriction of the industry's output, and market sharing occurs in only a few cases. Whatever else, they are not methods which suggest a picture of entrepreneurs seeking to maximise joint profits. (Cf. T. Scitovsky, *Welfare and Competition*, pp. 378–84.)

[5] Cf. J. R. Hicks, " Annual Survey of Economic Theory: The Theory of Monopoly," *Econometrica*, January 1935, p. 8.

[6] Cf. Hunter, *op. cit.*, *Manchester School*, pp. 25–39.

[7] See below, p. 600.

complex of restrictive-entry practices and price fixing, with perhaps a market-sharing arrangement thrown in. His aim is to select for prior attention the strategic elements necessary to hold such a system together. It is not surprising that the Board of Trade first selected, as the " basic instruments of monopoly control," those practices, such as exclusive dealing, collective boycotts, aggregated rebates, etc., which *enforce* the system on both members and independents.

This is not to say that price fixing cannot be operated without the support of other practices. Common prices can be maintained with relatively little support where there is sufficient agreement within the industry. This occurs, for instance, if there are few manufacturers, where a relatively small territorial area is affected, if the association has a strongly organised central invoicing system or where it has retained a pricing procedure dating from inter-war recession years.[1] Two reports in particular are primarily price-fixing reports. Using them it is possible to isolate and assess, as the Commission sees them, the effects of this practice. The first, to be dealt with in Part II, concerns a " competitive " (*i.e.*, non-monopolistic or oligopolistic) type of industrial structure. The second, in Part III, is a case of oligopolistic price fixing.[2]

II

There are 140 firms in the Copper Semi-Manufactures (or Non-Ferrous Metals) industry, which produces to the value of £175 million per annum mainly for other industries. Imperial Chemical Industries (Metals Division) is the largest single producer, and makes almost every product of the industry. The next biggest is British Insulated Callenders' Cables Ltd. and its associated firms, also with a comprehensive range of products. There are other fairly large firms which are specialists—Delta Metal Company (for extrusion), M'Kechnie Bros. (extrusion), Enfield Rolling Mills (specialists in rolling) and London Electric Wire and Smiths Ltd. (wire drawing). These six are the giants of the industry, but no firm accounts for one-third of the industry's output, and therefore cannot qualify as a potential monopolist in its own right. The remaining firms are small and are inclined to specialise for the electrical and radio industry, for engineering, the motor industry, etc. The mild degree of concentration is typical of the engineering trades.[3] Of these 140 firms, seventy belong to one, or more than one, of twelve trade associations. The associations are organised according to the main products—the Tube Association, the Brass Wire Association, etc.—to regulate the trading practices of their members. In the aggregate the associations cover (by weight) 76% of the total production of the industry. Ten of the associations are members of the British Non-Ferrous Metals Federation, which is a co-ordinator of their activities and formulates such practices as " Standard Con-

[1] As in respectively *Pneumatic Tyres*, *London Building*, *Sand and Gravel in Central Scotland* and *Copper Semi-Manufactures*.

[2] The *Supply and Export of Certain Semi-Manufactures of Copper and Copper Based Alloys* (H.M.S.O., July 1955) and *The Supply and Export of Pneumatic Tyres* (H.M.S.O., December 1955).

[3] H. Leak and A. Maizels, " The Structure of British Industry," *Journal of The Royal Statistical Society*, 1945, Parts I–II, Appendix III.

ditions of Sale," a " Common Price Policy " and standard " Discounts and Rebates," as well as operating research and development schemes, a statistics service, etc.

The main restrictive practice of the industry, the Commission found, was that of fixing common minimum prices. It is the focal point of the associations' activities and is long-established, dating in most cases from the 1920s or even the late nineteenth century. The cost of the virgin metal may account for anything between 60 and 90% of the price of the product. The associations then add the conversion (manufacturing) costs, found, in most cases, by taking an average of costs submitted by members. Some are simple averages. Others adjust in various ways to eliminate individual costs which are thought to be too high or too low. For instance, the Cold Rolled Association eliminates the two highest and the two lowest, and averages the remainder. And the High Conductivity Association has a formula weighted to favour low-cost and large-output producers. Some associations are less " scientific " in their methods of finding a price, and simply add a margin to the cost of buying intermediate products from other associations; or they argue it out in committee.[1] Most other practices are found to be " incidents of the common minimum price system " [2] (collaborating on tenders, arranging the price of scrap from customers, standard discounts, etc.) and not very important especially in view of the subsequent recommendation of the Commission to abolish price fixing.

There is usually a " judicial hearing " at an advanced stage of the Commission's investigations; in this the British Non-Ferrous Metals Federation defended the price system on grounds made familiar in earlier reports. The main defence was that price collaboration was required to offset the industry's vulnerability to fluctuations of " prosperity, booms and slumps." In recession there is a strong " pressure to reduce prices below the economic level." This point is connected with the quality of the product. With 60–90% of the price in the raw material, the main burden of price-cutting falls on conversion costs. Consequently, there is a strong temptation to lower the quality of the product; a most undesirable development in an industry in which standards and specifications are so vital to the buyers. In any case, the Federation claims, competition is directed away from price " into more fruitful channels " and " provides a constant economic pressure to improve the product." It is stressed that research and development " thrive best in an industry which is stable and which encourages the investment of capital in new methods of production." And the Federation instances some

[1] In masterly understatement the Commission comments on " certain defects " in the system of costing employed within the associations. Less than half the members made returns (the smaller firms did not trouble); only the popular sizes were costed, and those which attracted small and medium-sized orders were neglected; the partial use of scrap metal in some cases was ignored; and prices were in many cases related to cost reviews carried out immediately after the War, and subsequently not altered in the light of later reviews.

[2] Except the practice of awarding loyalty and aggregated rebates, which falls into the restrictive-entry category. On these the Commission took the same line as in its general report; that such rebates " impede access to the market by independent producers because they provide a form of pecuniary pressure on buyers to confine their purchases to members of the association " (para. 319).

of the achievements of its research and development association and claims an " outstanding record in the development of technical improvements."

Besides these familiar points, two unusual defences were made by the Federation. First, it was maintained strongly that one factor which influenced the development of price fixing had been the need to protect the industry against the " power of the buyers and their potential ability to compete." The industry " serves other manufacturers and traders who know their jobs and have every reason to seek economies and to assess the value to them of all the alternative sources of supply of material and services. There are often powerful buying units, and others group together into powerful organisations which negotiate terms collectively." If true, this argument constitutes a considerable tribute to the influence of " countervailing power " in markets for semi-manufactured products.[1] Secondly, the Federation claimed that in the absence of price arrangements there would be a development of " concerns operating in specialised groups of products " and " achieving a real degree of monopoly power." Hence the theoretical advantages of low-cost production " would be offset in practice by the absence of competition." The existing arrangements gave " a very satisfactory balance between specialisation and diversity of production." These two arguments made an ingenious attempt to hoist the Commission with its own petard.

The Commission showed considerable skill in sorting out the complicated issues of the case, and deftly turned a number of the Federation's points to its own advantage. For instance, it pointed out that although the quality of the product is of the greatest importance to the customers of the industry, these same customers, by the Federation's own showing, are technically and commercially as well qualified as the suppliers and well able to protect their own interests. Hence it is not likely that price competition would be permitted to lower quality standards. The Commission also quickly disposed of the argument that greater specialisation in the industry would help establish monopoly positions. It reviewed the advantages of specialisation: the need for continuous operation of the more modern types of hot-working plant was emphasised; it was pointed out that the economies of large-scale production in the industry had already placed pressure on certain branches to amalgamate; and the view of the Anglo-American Productivity Report was cited that " the use of the most modern plant requires some rationalisation of production between manufacturers." The possible disadvantages are discounted, although clearly given serious consideration. It seemed to the Commission that the resources of other manufacturers in the industry and of the industry's customers are such that in the event of monopolistic abuses there would be every prospect of competition being re-established.

The Commission's main concern, however, was with the role of price competition in the industry.[2] The very considerable spread of costs found

[1] J. K. Galbraith, *American Capitalism*. The Commission is open to conviction on this point (cf. Hunter, *op. cit.*, *Manchester School*, pp. 31–4), but in this case the industry's claim was not sustained (see below). [2] Paras. 285–91 and 304–10 especially.

in the industry was brought out; [1] and the difficulties which the associatio experienced in finding an average price for their products was stressed. Th spread of costs varied not only according to the size and type of plant bu also with the type, and variations, of product and, markedly, with the size the order. The Federation stated, for instance, that "large produce capable of making cheaply fifty tons of a size and gauge are high cost pr ducers when they have to manufacture small lots specially, whereas the sma producers may be able to make small lots cheaply." Price fixing has tw consequences in these circumstances. The price of each product is related the average for all producers and not to the costs of the manufacturer wh can produce it most cheaply; it is therefore priced higher than it need b And, secondly, the common minimum price prevents the most economic producer from using price decreases to attract to himself a sufficient volume those products which he can manufacture economically. He is compelle to cover his overheads by taking orders for products which others coul produce more cheaply. On the other hand, if the price lists reflected th economies of specialisation—or better still if there were no price lists an therefore price competition—each firm would be compelled to concentra on the type of work and size of order which it could execute most econ mically. This increase in efficiency would apply to all sizes of firm (thoug it seems the Commission had in mind mainly the larger and more integrate production units). In addition, with price competition there would be greater incentive to reduce costs. The Commission concluded that the would be a better allocation of resources within the industry, givi lower costs and a lower general level of price, if firms were free compete in price with one another.[2]

The wide spread of profit earnings [3] confirmed the Commission in i

[1] For instance:

Product.	Lowest cost per ton.	Highest cost per ton.
Copper wire, 30 s.w.g.	£32	£53
Brass strip, 24 s.w.g.	£45	£135
Copper strip, 24 s.w.g.	£45	£85
Building service tubes, 1 in.	£72	£112
General copper tubes, ¼ in.	£139	£226
Brass wire, 10 s.w.g.	£57	£101

[2] Besides establishing the case for price competition, the Commission dealt with a second line defence which maintained that there was effective competition in other forms—*e.g.*, in quality a service among members, in price competition from independents and potential competition fr customers and alternative materials. The evidence of internal competition the Commission fou unconvincing; it appeared that aggressive independents were usually brought into line by t threat of indefinite price war; and potential competition did not operate rapidly or very powerful When competition from independents or customers appeared dangerous the arrangements w sufficiently flexible to make concessions and thus preserve the main structure of price fixing.

[3] *Profit as a % of Capital Employed in the Industry*

	1937.	1949.		1952.		1953.	
		Or. Cost.	Rpl. Cost.	Or. Cost.	Rpl. Cost.	Or. Cost.	Rpl. Cost.
Lowest	−1·3	8·6	3·4	9·3	6·5	−3·2	−4·5
Highest	30·4	60·1	40·9	81·2	61·0	69·7	51·3

Apart from the spread, profits in the industry were "generally reasonable" and "the average the industry as a whole has not been high" (para. 360).

reasoning. It was carefully stated that "high profits in themselves are not against the public interest provided they are earned in open competition as the reward for efficiency." But their existence in a trade which operated "a comprehensive system of minimum price fixing that practically excludes competition in price . . . inevitably suggests that prices are unnecessarily high."

The Commission's analysis of the merits of price competition in this industry appears to conform with accepted thinking on such matters. One possible objection, or omission, concerns the treatment of fluctuations. Prices are governed to a large extent by the price of the virgin copper, which is not exactly stable.[1] Also, it is a well-known thesis that price-fixing systems are an effective restraint on deflationary and inflationary pressures.[2] The Commission expressedly appreciates these points, particularly that common prices "may alleviate the worst consequences [of a slump] both for capital and labour." It could be argued from this that the influence of fluctuations on this industry should constitute a major aspect of the Commission's analysis, perhaps affecting the whole trend of its decision. Certainly the British Non-Ferrous Metals Federation appeared to think so; and most trade associations submitting cases to the Monopolies Commission have emphasised the vicissitudes of industrial fluctuations. However, the Commission invariably refuses to make concessions on this issue. In this report the case for stabilising prices is made and commented upon in one brief paragraph. Against the advantages of price fixing as a stabiliser the Commission is content to say that "there has been a marked change from the restrictionist attitudes of the 1930s" and "that it is the duty of the government of the day to take positive action whenever necessary to maintain a high and stable level of employment." [3] The first part of this comment exaggerates; many of the Commission's own reports testify that restrictionist attitudes are remarkably persistent. Presumably what is meant is that there *should* be a change in attitude for the reason given in the second part of the comment. On the fluctuations issue the Commission, understandably, avoids analysis and confines itself to a statement of the prevailing official optimism.

The treatment of price fixing in this report is consistent with views expressed in other reports.[4] The tentative conclusion can be drawn that it

[1] In fact, the price-fixing system was used to absorb fluctuation in the price of copper only to a minor extent. Government control of metal prices ended in 1953, and since then "some" firms have adjusted their holdings of stock in anticipation of prices. Also a few associations do not alter their fixed prices except for a minimum shift in the price of copper. But the majority of association prices alter in line with the current prices for copper quoted on the London Metal Exchange (paras. 226–7).

[2] K. Boulding, "In Defense of Monopoly," *Quarterly Journal of Economics*, August 1945, pp. 524–42, and J. R. Hicks, *Value and Capital* (1939), p. 267.

[3] Para. 287. In the Calico Printing industry, where there is admittedly a prospect of declining trade and increasing unemployment, the Commission is more explicit. It takes the position that price-fixing schemes would be "at the expense of other sections of the textile industry and of the wider public interest"; and advises that such arrangements will "only create a false sense of security for a time and delay the adjustments and redeployments of resources which will have to be made" (para. 210).

[4] In *Dental Goods* (paras. 229–30), *Rainwater Goods* (paras. 219–20), *Calico Printing* (paras. 192–211) and *Sand and Gravel in Central Scotland* (paras. 286–303).

represents the definitive attitude of the Commission for the " competitive " type of industrial structure.[1]

III

The output of the Tyre industry is about £100 million per annum (8% of which is the value of remould tyres). Between 30 and 40% of tyres are for the *replacement* market and *mileage contracts*; about 33% are for the *original-equipment* market (fitted to new vehicles); and between 25 and 33% go to export markets. Eleven manufacturers produce new tyres, and they are all members of the Tyre Manufacturers' Conference (T.M.C.) In terms of effective market power the number is even smaller. The Dunlop Group (Dunlop and India Tyre Company) produces about 50% of the total output. The next four largest manufacturers between them produce another 40%. This leaves only 10% between the remaining six small manufacturers. Of the four largest other than Dunlop three are subsidiaries of foreign companies; these are Michelin (France) and Firestone and Goodyear (U.S.A.). The other large firm, British Avon Tyre Company, has technical and market agreements with a further American firm.[2]

All members of the T.M.C. maintain identical retail prices for new tyres in the *replacement* market. For each group of products (Car, Giant, Aircraft, etc.) costs are submitted to an accounting firm. From these figures this firm calculates future costs for the industry and submits averages (weighted by the turnover of individual companies) to a representative T.M.C. Accountants' Panel. Further consideration is given to other influential factors, such as wages, and eventually recommendations are made to the appropriate Conference Groups, which finally decide the price for each class of product. These identical prices are further protected by: (1) agreed scales of discount to large users; (2) inspection panels to examine complaints about Giant and Agricultural tyres—substitution of damaged tyres can be a concealed form of price cutting; (3) an agreement not to make private brand or unbranded tyres; and (4) the branding of sub-standard tyres to ensure they are priced as remoulds, and therefore will not compete with first-line tyres.

In the other domestic markets the restrictions are of minor importance. In *mileage contracts* a common formula (to recover the retail price of the service tyre) is used. But the restrictive element here is the " natural result of the system of identical prices " rather than a policy of level tendering. In any case the bargaining strength of the transport undertakings appears to ensure reasonable prices; profits in this market are low or negative. Of

[1] The conclusions in the " agreed tendering " report are similar. It was stated that customers should not be prevented from choosing between grades of quality and service in a contractor; and that the selection of small groups of specially qualified builders for certain types of contract should properly be the function of the professional architect and not be undertaken by a private, interested organisation such as a builders' conference. The communication of tenders between competitors, to fix a price, frustrated the selection of competitive efficiency and kept prices higher than was necessary (*London Building*, paras. 214–34).

[2] There are altogether six foreign subsidiaries. They conduct themselves independently, but normally receive technical advice or direction from the parent company and agree to avoid its export markets.

original-equipment tyres, 95% are sold to customers on a " no restriction " register; that is, the price is an individual one. In practice, the vehicle manufacturers seem able to impose *their* common prices on the tyre industry. Profits in this market are not high. In the other original-equipment registers Dunlop sets the basic prices (followed by the others), and discounts are prescribed by the T.M.C.[1]

In the *export* market Dunlop has an informal arrangement with the principal American and Continental manufacturers for setting international prices; the " ceiling is usually the domestic price level in United Kingdom or the U.S.A. whichever happens at the time to be the lower." Dunlop informs the other British manufacturers of the decision reached, and they usually (not always) follow suit in export prices.

The enforcement of T.M.C. prices in the distribution of new replacement tyres is not undertaken by the Conference itself. In 1946 this task was handed to the British Motor Trade Association (B.M.T.A.). This association, set up originally on the initiative of the Society of Motor Manufacturers and Traders, is an unusual body. It undertakes to enforce prices in any branch of the motor industry—electrical accessories, sparking-plugs, etc.—and 17,000 manufacturers are members for this purpose. In the tyre industry it enforces the retail prices on all retailers on the Tyre Trade Register. To receive supplies at all a distributor must be on this register. The main method of the B.M.T.A. is to make test purchases from dealers suspected of price cutting. Where a good *prima facie* case is established the offender is invited to appear before a Price Protection Committee—in essentials an informal court or domestic tribunal where cases are conducted by counsel and presided over by retired colonial judges. Offenders may be warned, fined up to £100 or, in serious cases, placed on the Association's Stop List. The B.M.T.A. protects this anomalous position by the statement that its machinery cannot be used to enforce " ring " prices; and it demands an annual certificate from members to the effect that they are not parties to the fixing of common prices. It is therefore, on the face of it, concerned with *individual*, and not collective, price enforcement. But to quote the report " from the point of view of the consumer " there is little difference " between the practical effect of the T.M.C.'s arrangements and the situation which would result if an undertaking to fix common prices existed."

The tyre manufacturers repudiate the idea that prices are fixed in the industry. They contend that uniformity of prices is brought about by

[1] The *retread* industry is important: in 1954 the number of remoulds sold was 40% of new replacement tyres. T.M.C. members account for only 27% of this output; they were slow to appreciate the potentialities of this market, and a considerable retread industry developed independently. The Retread Manufacturers Association (R.M.A.) has eighty-five members. It recommends, but does not enforce, prices in line with those of T.M.C. remoulds. In practice, R.M.A. prices are rather lower than T.M.C. prices, and the smaller retreaders provide some price competition. The retread material is mainly supplied by T.M.C. members at identical prices. There is no restriction on the supply, and the quality is satisfactory. The Commission did not find the arrangements in the retread industry to be against the public interest, since T.M.C. remould prices are " subject to any competition that might be exerted by R.M.A. members " and R.M.A. prices are not enforced.

" competition which forces others to follow the price leader; . . . one manufacturer indicates a price and his competitors are compelled to follow sui because they would lose their customers if they charged more and because i they charged less, their tyres would be thought inferior." [1] In addition, th system has the advantage that it restrains price changes in an upwarc direction: " One or more manufacturers may be able to force prices dowr while virtual unanimity is required before prices can be increased." [1] Thi " competitive leadership system " is represented as a useful compromis between two extremes. On the one hand, there could be " full-blooded " (cut-throat) competition which would eliminate manufacturers and leave th survivors in such a state of exhaustion that prices would be raised to recou losses. The consumer would suffer eventually and the industry would b concentrated in fewer hands. On the other hand, there could be arrange ments to eliminate competition altogether and a monopolistic situation woul be created.

Resale price maintenance is justified separately by the T.M.C. First it stabilises the industry. Tyres could be a speculative product because while the total consumption is not much affected by price, the raw-materia prices do fluctuate widely. Secondly, it ensures that " essential " technica services are provided by the distributive trade. If prices are not maintaine price cutting would lead to smaller receipts, and in turn put pressure o distributors to scamp fitting and other technical services. In evidence Dunlop makes the arbitrary statement: " The only way to make buyer use this service is to make them pay for it in the expectation that, havin paid for it, they will use it." Also, collective enforcement of resale pric maintenance through the B.M.T.A. procedure is more effective than in dividual enforcement; the ordinary courts are slow, cumbersome an expensive.

The Commission quickly disposes of the argument that the T.M.C system is not a price-fixing organisation. It accepts the statement that ther exists no actual agreement binding manufacturers to charge identical price and that companies are free at any time to charge individually fixed price At the same time the Commission points out that Section 3 (2) of the 194 Act makes it possible to interpret conditions restrictive of competition whe manufacturers conduct their businesses so as to restrict competition whethe they do so " voluntarily or not and whether by agreement or arrangemer or not." The Commission then goes on to show that: (*a*) all changes in th prices of replacement tyres are discussed by T.M.C. members; (*b*) a manufacturers since 1946 have taken identical action following these di cussions; (*c*) the procedure of the Conference admittedly provides fc

[1] Paras. 450–2. Strictly speaking the two quotations represent two different types of oligopo and contradict one another. The first is a " price leadership " situation, where all must follow t more powerful leader. The second is a case of the " kinked demand curve," in which all produce are roughly equal in market power and one or more manufacturers can force the price dow (although they normally choose not to) but unanimity is required for a price rise.

xchange of information on costs and permits each manufacturer to form a hrewd idea of his competitors' trade position and therefore his intentions; nd (*d*) until the 1948 Act was passed the price-making decision of the Conference was actually registered as a collective decision and not, as now, set of individual decisions on prices. The conclusion is that the T.M.C. nembers " find it expedient to follow the policy of keeping their prices the ame; and in these circumstances—price competition is in fact restricted, lthough the policy is not embodied in an agreement and no manufacturer s bound to continue to adhere to it." [1]

It was decided that the Conference system operates against the public nterest, and its dissolution was recommended. To reach this conclusion the Commission takes the unusual course of setting out, in a separate paragraph, theoretical interpretation of the main features of this case. It analyses an oligopolistic market structure with characteristic elements of price leadership nd price fixing.[2] The reasons for the price fixing are partly historical; in he difficult and highly competitive conditions after the First World War the ndustry " began to develop a habit of price fixing " which continued. But he main reason for behaviour of this nature now lies in the structure of the ndustry. The industry is dominated by some half-a-dozen firms, one very much larger than the rest but the others all connected, in various ways, with foreign interests of comparable financial power. Each operates with a large amount of expensive special equipment and each knows that any aggressive market policy (pricing at less than short run marginal cost) on the part of any one of them might lead to a phase of cut-throat competition either at home or abroad " with disastrous effects on the profits of all." There is therefore " a powerful inducement to adjust their market behaviour to this situation even without any agreement to that effect," says the Commission. Dunlop predominates in the home and export markets, consequently this firm is, usually, in the position of price leader. But even Dunlop must act prudently in its pricing policy for fear of unpleasant financial results. Hence all the major firms have a strong incentive to avoid price competition and, " being few in number and fairly evenly matched in power, they can pursue this policy with a minimum of formal consultation, or with none at all." The Commission concludes that price competition " of the kind which

[1] It is notable that the Commission experiences no difficulty in establishing the existence of a price-fixing arrangement in this oligopolistic industry. Admittedly the procedure and timing of the Conferences makes the evidence conclusive. But the Commission (and most " economic " tribunals) would be satisfied with evidence establishing " conscious parallelism of action " in terms of price changes even for the purest case of oligopolistic understanding with no communication or agreement between the parties. By contrast, evidence of this nature is not likely to satisfy a court of justice (or a " legal " tribunal), which would demand knowledge of a written agreement or a verbal understanding. *E.g.*, the Supreme Court of the United States recently held that " economic evidence of conscious parallelism was not conclusive of conspiracy " (D. F. Turner, *Modern Law Review*, May 1955, pp. 257–8). And in the new (draft) Restrictive Trade Practices Bill the Restrictive Practices Court will base all of its judgments upon *agreements* of one description or another and will not venture into less-well-defined territory. This important area of oligopolistic understanding is clearly one where the wide terms of reference and flexible technique of investigation of the Commission could be usefully employed in the future.

[2] The Commission does not actually use the term " oligopoly."

is normal " cannot be expected in the tyre industry " without radical changes in the structure of the industry."

But even given an oligopolistically organised industry, price competition of some description is possible. First, on the manufacturing side the Commission takes the position that the conference procedure is redundant. Since an oligopolistic understanding exists anyway, tyre prices will remain more or less about the same level. Further, it is unlikely that the absence of discussion will lead to cut-throat competition. The theory of " competitive price leadership " which the Conference itself put forward as a guide to its behaviour is not compatible with such an outcome. And in support the Commission quotes a point made by Dunlop in evidence that it would be " an ill founded suggestion " to infer that prices would be much different " were there no consultation." Finally, the Commission noted that the foreign-controlled companies in Britain appeared satisfied with the pricing situation and were not likely to start a price war; in the export market a similar situation remained free of cut-throat competition, despite the absence of a conference procedure. On the other hand, were there no conference discussion there could be price competition within narrow limits which would help eliminate some of the rigidity of the T.M.C. system. Price changes would not be made quite simultaneously; there could be a development of different qualities, and therefore different prices, between manufacturers; and pressure from the distributors could probably compel a rather lower price for the less-popular makes. In addition, the lower-cost producers would not have the same knowledge of competitors' costs as before, and might feel compelled to move their prices a little nearer actual costs of production. While all of these are minor revisions of the T.M.C. regime, collectively they could make a significant contribution and, in the long run, lower the general level of prices. The tendency of the price-fixing procedure is to find " an average cost rather than the costs of the lower cost manufacturer." And the lower-cost manufacturers are often substantially below the average.[1]

[1]

Range of Costs (*All Manufacturers*) 1953

	£	s.	d.	£	s.	d.	£	s.	d.
Car covers	2	6	9	3	11	2	4	0	11
Giant covers	11	18	0	13	0	5	16	2	7
Motor-cycle covers . . .	1	11	3	1	18	5	2	3	9
Aircraft covers	8	12	2	41	0	0			

Range of Profit (% *of Capital*) *among Five Largest Producers*

	Lowest.	Highest.	Dunlop Group.	Weighted average.
1937	0·3	19·1	16·7	14·0
1948	24·3	53·3	29·3	28·1
1951	7·2	31·8	20·7	17·9
1952	2·7	20·4	11·5	10·8

" This wide variation in the profits of different manufacturers is consistent with the wide variations in their costs," although the correspondence is not always complete (para. 434).

" Since materials represented about 56% of the selling price of tyres in 1948 and 71% in 1951, it is evident that costs and profits are particularly sensitive to variations in commodity prices."

Secondly, the Commission seeks to introduce price competition on the distributive side of the replacement market. The resale conditions imposed by each manufacturer completely debar any form of price competition. Together with the T.M.C. discussion to fix identical prices this " brings about an extreme rigidity in the structure of prices and in the channels of distribution." Therefore the Commission finds that it cannot accept the industry's case that resale price maintenance is necessary to ensure " an efficient network of distribution " and " a proper tyre service " to customers. The cost of these conveniences is too great. But the problem of eliminating fixed prices in the distributive sphere is peculiarly difficult. Even given prohibition of the Conference discussions, the Commission is quite clear that either price leadership or informal discussions will lead to manufacturers setting more or less uniform retail prices. There is still the possibility that some distributors will cut prices and accept smaller margins. In relation to this, abolition of the price-enforcement machinery of the B.M.T.A. is considered; but it does not appear as a promising approach. Distributors would still be under contract to sell at manufacturers' price; a few might be willing to evade these obligations; but probably the main producers (five accounting for 90% of the output) would be strong enough, each acting individually, to provide reasonably efficient resale price maintenance for themselves. Consequently, the only way out of this difficulty, as the Commission sees it, is the unorthodox abolition of individual as well as collective resale price maintenance in the tyre industry. There are several merits to this course of action. Price competition would become possible among all of the 27,000 traders who supply the public. It might possibly encourage some competition among manufacturers in the prices at which they supply the replacement market and the retail prices they recommend to the trade. And it would leave the larger trader free to bargain individually with manufacturers for special discounts.[1]

The most interesting aspect of this report is the Commission's attitude to oligopoly. Confronted, on the manufacturing side, with what is almost a text-book example the Commission makes an accurate assessment of its important characteristics and goes on to a realistic appreciation of its advantages for the public interest. Superficial similarities do not mislead the Commission into an attempt to treat the situation as just another of the numerous cases of restricted competition operated by a trade association. It recognises the unique elements in the case: that small numbers and heavy capital investment protect the industry from competitive entry, and at the same time preclude price competition of any but the cut-throat type; it also

[1] This recommendation makes unnecessary the prohibition of the enforcement activities of the B.M.T.A.; and the Commission, probably on account of the many other industries involved, carefully declines to comment on the public interest of the enforcement system. On the other hand, the Commission makes critical comment on the domestic tribunal system and makes clear that it does not sympathise with a B.M.T.A. scheme to define by statute the powers of domestic tribunals, to give them surveillance by the law courts, the right to subpœna witnesses, etc.

ecognises that the price leadership of Dunlop, despite the share of the ıarket held by that firm, is far from being a monopolistic sinecure in view both f the excellence of competitors' products and their powerful technical and nancial connections abroad. On the performance side the Commission ppreciates that it has encountered in the tyre industry a form of competition ı which the dynamic changes of the industry are of more significance for conomic welfare than is the nature of the price structure at any given point ı time. General performance is so impressive that the Commission is repared to underwrite this " big-business " type of competition and is not :mpted to recommend any form of intervention in the industry.[1] For ıstance, it does not suggest breaking up the Dunlop Group to provide a ıore competitive industrial structure. Nor does it suggest, as in the *Matches* report, price control of the industry. It prefers to see the industry ɔntinue independently to make what it has analysed as oligopolistic price-xes provided the overt element of the procedure is eliminated and a ıoderate degree of price competition is allowed to develop.

Although they are not made explicit as such, one can pick out of the :port those points on the development and performance of the industry hich influenced this relatively favourable decision. Tyres are manu-ıctured by a fairly young industry, and the rate of progress, in terms of ındamental technical improvements, has always been high. Considerable ıms of money are spent on research to this end, both in Britain and abroad. ı 1952 research expenses varied from 0·7 to 1·4% of sales. The heaviest :penses are incurred by Dunlop on behalf of the whole Dunlop Group and ıbsidiaries located abroad; the foreign-controlled companies tend to leave ıis work to their parent firms and pay a fee for it. Dunlop has an excep-onally good record in new products; it was first in the field with aeroplane 'res (1910), bullet-proof tyres (1917), giant pneumatic (1921) and tubeless 'res of natural rubber (1953); it has also taken the lead in the introduction 'new materials, such as carbon black (1904) and rayon cords (1921), and minor improvements, such as non-skid treads, special treads for snow and e work, etc. The industry is now apparently " on the threshold of im-ɔrtant developments " in the use of artificial rubber. And, in this country, unlop has again been the pioneer. A pilot plant is already in operation, ıd a larger experimental plant is building. Then, together with Good-:ar, Firestone and Michelin, Dunlop has now formed an international ɔmpany to manufacture in quantity for the tyre industry.[2] It would seem ıat the use of different combinations of natural and artificial rubber for fferent parts of tyre construction is likely to revolutionise the nature of

[1] The underwriting of oligopolistic forms of competition is not new in the Commission's reports; t it emerges more clearly in this report. See, for instance, the *Electric Lamps*, *Electric Cables* and *ulin* reports for similar attitudes and recommendations; and cf. Hunter, *Manchester School*, nuary 1955, pp. 34–7.

[2] The International Synthetic Rubber Company formed in 1955 to manufacture 50,000 tons against Dunlop's present 2,000 tons per annum. Manufacture will be based on butadeine, a troleum by-product of the Esso Petroleum Company, which would not be manufactured in itain without the guarantee that the tyre and rubber industry will absorb the output.

the product. Thus, on development work, the Commission does not appear to find any lack of enterprise in the industry. And concerning Dunlop's claim that as part of its leadership function it acts as a " corpus of know-ledge" for the industry on tyre and rubber technique, it makes no adverse comment. In its conclusions the Commission goes so far as to state: " Apart from the specific matters mentioned in this report, we do not consider that Dunlop have used their dominant position in the industry to the detriment of the public interest, nor that the things that they do in order to maintain their leading position operate or may be expected to operate against the public interest; nor have we evidence to show that they may be expected so to operate in the future." In sum, the Commission appears to find the structure of the industry well adapted for the task of rapid economic develop-ment. It is probably this factor which most influenced the acceptance of a frankly oligopolistic market situation.

In addition the Commission must have been comforted by the know-ledge that long-term competitive forces in the industry help safeguard the position. In the domestic market Dunlop will not in future dominate in every branch. Two formidable competitors from another industry, Mon-santo Chemicals and I.C.I., have announced that they also intend going into the production of synthetic rubber. Their output is much smaller than that of the tyre group, and is probably not intended for tyre production; but its existence, and the possibility of expansion, must modify Dunlop's position. However, it is the competition of United States manufacturers in foreign markets which is the more important. As the result of war-time experience they are technically very advanced, especially in the field of synthetic rubber, where they appear to be ahead of Dunlop. The British industry, with exports at 25–30% of output, is the world's largest exporter; in addi-tion, Dunlop and other firms have subsidiaries abroad. But since the United States domestic market accounts for five-sevenths of the world's motor vehicles, the American industry is clearly in a potentially very strong competitive position. Indeed, it is not merely the development character-istics of this oligopolistically organised industry which makes for a favourable attitude. The Commission is probably satisfied that any other industrial structure is unlikely to preserve this advantageous position in international trade in the face of American competition. On the other hand, the " com-petitive leadership system," under the strong hand of Dunlop, appears to have found a *modus vivendi* with the United States industry. The Com-mission, significantly, does not find Dunlop's informal pricing arrangements in international trade to be " against the public interest." The alternative to these arrangements is likely to be a price war, and the Commission accepts the view put forward by Dunlop that a price war would not be in the in-terests of this country. In the short run it would adversely move the terms of trade; and in the long run would probably lose markets to the financially more powerful American firms.[1]

[1] It is clear that, for the Commission, " the public interest " is on a national and not a world level of economic welfare.

IV

It can be concluded that for any " competitive " industrial structure the Commission's opinions are in line with orthodox economic thinking. Price competition is found to be a useful element in the process of competitive adjustment making for a better allocation of resources between different products within the industry, the encouragement of the efficient and the elimination of the inefficient producers, lower prices to the consumer, etc. Agreements to fix common prices restrict this adjustment, and therefore the presumption is that they operate against the public interest. Only in a few special cases have exceptions to this rule been made. In one report the argument that price competition eroded quality standards was accepted for some products; the technical reasons for safeguarding standards were convincing and important.[1] In two more cases, where the trade association also organised a programme of collective research and exchange of technical information and patents among members, thus effectively promoting a rapid rate of development in the industry, the Commission conceded that the fixing of common prices was reasonable compensation for this pooling of manufacturing knowledge and experience.[2] But for this particular exception to be allowed it is clear that the Commission looks for a measure of success from a research and development association not normally found in small-scale industry; it is significant that both industries concerned were markedly oligopolistic in character.

It is in fact in oligopolistic industries that the Commission's reaction to price fixing becomes less orthodox and less predictable. There is still a presumption in favour of price competition where, as in the *Tyres* report, its practice appears both feasible and useful. But it seems that the Commission would not insist too strongly on this point and would—as in the *Insulin* and *Electric Lamps* reports—permit price-fixing agreements in certain circumstances. Certainly, there seems to be some doubt as to the practicability, or the value, of price competition in an oligopolistic industry. On the other hand, the oligopolistic setting frequently provides compensation through other, mainly innovatory, forms of competition. This is not invariably the case, of course; if an industry has exhausted most opportunities of development then government price control, or even nationalisation, might appear as the appropriate recommendation. Clearly the right decision depends very much on the circumstances surrounding an oligopolistic price-fix; the flexible, empirical approach is here very necessary. For the Commission probably the most influential factor is the general performance of the oligopolists in whose hands the industry is.

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[1] *Electric Cables*, paras. 273, 283 and 287.
[2] *Electric Lamps* and *Insulin* reports.

THE OPTIMUM RATE OF SAVING

1. THE most important choice before the government of a developing country is the choice concerning the rate of savings, *i.e.*, the proportion of national income to be devoted to investment, and hence not available for consumption. So far this choice has been made, it seems, on rather arbitrary grounds. In the free-enterprise economies of the nineteenth century it was left to the citizens individually, and the national average probably reflected the income distribution rather than any deliberate policy. In Russia, the first country to make a deliberate choice, it seems that no theoretical concepts have been at the basis of the choice. In the western democracies after the Second World War the situation was not very different in this respect: although saving was controlled to a large extent by the governments, the basis of the figures chosen was just as arbitrary.

Since the choice is of such a far-reaching impact on the economy, the question seems in place whether a more rational basis can be given to such a choice.

2. There need not be, in principle, any difference between the choice an individual makes and the choice to be made for a nation as a whole. For the sake of convenience we will use the terminology applying to an individual's choice. Two types of factors seem to enter into the problem: (i) those referring to the objective consequences of the choice, and (ii) those pertaining to the valuation of these consequences. The consequences of an extra unit of savings are: (*a*) a reduction of present consumption, and (*b*) an increase in future production and hence consumption possibilities. The valuation of these consequences will be based on the significance to the individual of present and future consumption, being the ultimate aim of economic activity. A description of both groups of factors will have to be based on certain simplifying assumptions. Since the results to be obtained will to some extent depend on the nature of these assumptions, it seems appropriate to vary them somewhat so as, if possible, to cover the most relevant situations that may arise.

3. Concerning the *objective consequences* of a variation in savings rate we make the assumption of the existence of a fixed " capital coefficient," *i.e.*, ratio between the additional investments and the resulting increase in future income. This coefficient we will indicate by K; it is well known that for long periods values of about 3 have been observed, whereas recently lower values down to $1\frac{1}{2}$ have been found. When using these figures we should not overlook, however, that they imply the assumption that all increases in incomes are due to increases in capital. This may be a considerable overestimate of what can be obtained by saving only. This state of affairs is illustrated also by the fact that the average saver gets much less increase in income as a consequence of his saving. A capital coefficient of 3 would

imply a yield of 33%, whereas the ordinary saver usually gets only a few %. Even the entrepreneur-saver will often have returns of no more than 10 or 20%. There may therefore be scope to apply considerably higher capital coefficients in our interpretations, up to figures of, say, 20.

Our formulæ will permit us to calculate alternative results, depending on the value of K. Indicating investment by $\mathcal{J}$ and income by Y, and assuming to start with that there is a negligible time lag between investment and the subsequent rate of increase $\dot{Y}$, we will have:

$$\mathcal{J} = K\dot{Y} \quad . \quad . \quad . \quad . \quad . \quad (1)$$

In order not to make our problem too complicated, we will further assume that a decision on the savings rate will be taken once for all, meaning that the rate chosen will continue to be applied during all other time units. Indicating by c the proportion of income consumed, and by C the absolute quantity of consumption, we will therefore have:

$$C = cY \quad . \quad . \quad . \quad . \quad . \quad (2)$$

Since, in addition,

$$Y = C + \mathcal{J} \quad . \quad . \quad . \quad . \quad (3)$$

the future development of consumption will be determined by these two coefficients: [1]

$$Y(1-c) = K\dot{Y} \quad . \quad . \quad . \quad . \quad (4)$$

$$Y_t = Y_0 \, exp\left(\frac{1-c}{K}t\right) = Y_0 e^{\frac{1-c}{K}t} \quad . \quad . \quad . \quad (5)$$

$$C_t = cY_0 \, exp\left(\frac{1-c}{K}t\right) \quad . \quad . \quad . \quad . \quad (6)$$

Here the subscripts t and 0 refer to time periods.

An alternative assumption with regard to the objective consequences of savings is that there be a lag of one time unit (for which a year was taken when we gave numerical values for K), leading to slightly different equations:

$$\mathcal{J}_t = K(Y_{t+1} - Y_t) \quad . \quad . \quad . \quad . \quad (1')$$

$$Y_{t+1} = \frac{1-c+K}{K} Y_t \quad . \quad . \quad . \quad . \quad (4')$$

and

$$C_t = cY_0\left(\frac{1-c+K}{K}\right)^t \quad . \quad . \quad . \quad . \quad (6')$$

4. As to the *valuation* by the individual (or the nation) of the results to be obtained from whatever decision on savings, we assume that the criterion will be the " utility " to be derived from all consumption, present and future. This utility we assume to be measurable, and to have the following characteristics:

(i) it is the sum total of the utilities to be derived from the consumption in each of the infinite series of time units;

(ii) it diminishes, for the same volume of consumption per time

[1] The reader will observe the similarity of this treatment to that given by R. F. Harrod, " An Essay in Dynamic Theory," ECONOMIC JOURNAL, XLIX (1939), p. 14.

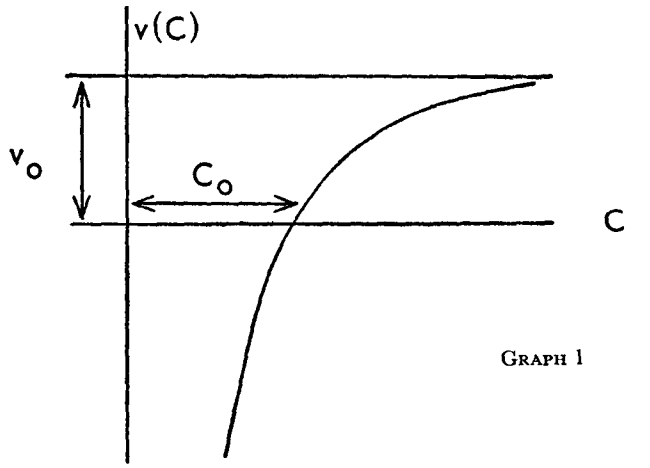
unit, if the time of consumption becomes more remote, proportional to a " discount factor " n^{-t}, where $n - 1$ may be called the " psychological discount rate," comparable to an interest rate;

(iii) it increases, for a given time of consumption, with increasing volume C of consumption, but proportional to a function $v(C)$ showing decreasing marginal rates of increase; *i.e.*, $v'(C)>0$, $v''(C)<0$. More specifically two functions $v(C)$ have been used alternatively, namely:

(*a*) $$v(C) = \log C \quad . \quad . \quad . \quad . \quad . \quad (7)$$

(*b*) $$v(C) = v_0\left(\frac{1-C_0}{C^E}\right) \quad . \quad . \quad . \quad . \quad (7')$$

The former of these two functions needs no further explanation; evidently the marginal utility $v'(C) = \frac{1}{C}$ diminishes with increasing C, but never becomes zero, whereas $v(C)$ has no upper boundary. The latter of the functions, illustrated by graph 1, is a hyperbola with a horizontal asymptote



GRAPH 1

at $v(C) = v_0$, *i.e.*, this $v(C)$ has an upper boundary. Both have in common that for no finite value of C, $v'(C) = 0$, *i.e.*, saturation is not supposed to be reached for any finite value of C. In the second function an arbitrary constant E has been included, enabling us to produce alternative shapes of curves. For large values of E the saturation level will be approached more quickly than for small values. For $E = 1$ the hyperbola is equilateral. The value of E will influence the marginal utility of consumption, on which statistical estimates have been made by Frisch.[1] Indicating the flexibility of the marginal utility of consumption by f, we have

$$f = \frac{C}{v'}\frac{\partial v'}{\partial C} = -(E+1)$$

According to Frisch's findings, this flexibility was about $-3{\cdot}5$ for French

[1] R. Frisch, *New Methods of Measuring Marginal Utility* (Tübingen, 1931): *Statistical Confluence Analysis by Means of Complete Regression Systems* (Universitetets Økonomiske Institutt, Publikasjon nr 5, Oslo, 1934).

workers and about -1 for American workers. The corresponding values for E are $E = 2{\cdot}5$ and $E = 0$ respectively.

Reference should be made finally to the well-known article about our subject published already in 1928 by Ramsey.[1] Ramsey, in his most imaginative pioneering approach, laid more stress on the existence of some finite income for which a state of complete satisfaction (" bliss ") would be attained. His approach is somewhat less easy for numerical application, however, since it is difficult to make numerical assumptions on this income; but for high values of E the value v_0 will be " almost " reached for " low " values of C already.

Indicating the utility of all consumption by U, we will have, according to our characteristics, in case (a):

$$U_a = \int_0^\infty \frac{\log C_t}{n^t}\,dt \quad . \quad . \quad . \quad . \quad . \quad (8)$$

and in case (b):

$$U_b = v_0 \int_0^\infty \left(1 - \frac{C_0}{C_t^E}\right)\frac{dt}{n^t} \quad . \quad . \quad . \quad (8')$$

5. We will now investigate the question for what values of c, with given values of n and K, these expressions for U are a maximum. In order to give the answer we evidently have to substitute either (6) or (6′) into (8) or (8′), to carry out the integration process, and subsequently to determine the maximum as a function of c. We will consider only three out of the four possible cases, since these will supply us with a sufficient insight into the answer. These cases will be numbered I (using (6) and (8)), II ((6) and (8′)) and III ((6′) and (8′)).

Case I. Here we find:

$$U_a = \int_0^\infty \frac{\log Y_0}{n^t}\,dt + \int_0^\infty \frac{\log c}{n^t}\,dt + \int_0^\infty \frac{(1-c)t}{n^{tK}}\,dt \quad . \quad (9)$$

We will use two auxiliary formulæ for two integrals:

$$\int_0^\infty \frac{dt}{n^t} = \frac{1}{\log n} \quad . \quad . \quad . \quad . \quad (10)$$

and

$$\int_0^\infty \frac{t\,dt}{n^t} = \frac{1}{\log^2 n} \quad . \quad . \quad . \quad . \quad (11)$$

With their aid we find:

$$U_a = \frac{\log Y_0 + \log c}{m} + \frac{1-c}{K}\frac{1}{m^2} \quad . \quad . \quad . \quad (12)$$

where m has been written for $\log n$; it so happens that approximately m equals the interest rate $n - 1$, since for small m, $\log(1+m) = m$. Even for a value of $m = 0{\cdot}3$, $\log(1+m) = 0{\cdot}26$, meaning that *qua* order of magnitude the approximation even holds for such high values as 0·3.

[1] F. P. Ramsey, " A Mathematical Theory of Saving," ECONOMIC JOURNAL, XXXVIII (1928), p. 543.

In order to find the optimum value of c we have to determine the maximum of U_a with respect to c; this optimum satisfies the relation

$$\frac{dU_a}{dc} = 0$$

which leads to

$$\frac{m}{c} = \frac{1}{K} \text{ or } c = mK \quad . \quad . \quad . \quad . \quad (13)$$

With $m = 0{\cdot}05$ and $0{\cdot}10$ and $K = 2$, 3 and 10 respectively, we find:[1]

	m =	0·05	0·10	0·30
K =				
2	c =	0·10	0·20	0·60
3	=	0·15	0·30	0·90
10	=	0·50	1·00	.
20	=	1·00	.	.

For the lower values of K and m these figures are amazingly low: they correspond to savings rates between 0·9 and 0·7. In order to obtain the value most commonly observed, *i.e.*, $c = 0{\cdot}9$, we would have to assume either values for K of 9 and higher, or, if $K = 3$, a psychological discount rate of $\frac{0{\cdot}9}{K}$, *i.e.*, 0·3.

6. *Case II.* Here,

$$U_b = v_0 \int_0^\infty \frac{dt}{n^t} - \frac{v_0 C_0}{c Y_0} \int_0^\infty \frac{dt}{\left(e^{\frac{1-c}{K}E} n\right)^t} \quad . \quad . \quad . \quad (9')$$

which, with the aid of (10) and (11), reduces to:

$$U_b = \frac{v_0}{\log n} - \frac{v_0 C_0}{c^E Y_0^E} \cdot \frac{1}{\log n + E\frac{1-c}{K}} \quad . \quad . \quad (12')$$

Writing m again for $\log n$, we will have to look for the value of c which renders

$$c^E\left(m + \frac{1-c}{K}E\right)$$

a maximum. We find

$$c = \frac{Km + E}{E + 1} \quad . \quad . \quad . \quad . \quad (13')$$

For $E = 0$ this formula coincides with (13). For some higher values for E and the same values of K and m as considered above we find:

	$E = 1$				$E = 2{\cdot}5$		
K =	m =	0·05	0·10	0·30	0·05	0·10	0·30
2	c =	0·55	0·60	0·80	0·74	0·77	0·89
3		0·58	0·65	0·95	0·76	0·80	0·97
10		0·75	1·00	.	0·86	1·00	.
20		1·00	.	.	1·00	.	.

[1] Dots will be shown where values for $c > 1$ are found; they will have to be replaced by the boundary condition $c = 1$.

Again for the lower values of K and m and $E = 1$, we find consumption quota much lower than observation yields. For $E = 2{\cdot}5$ more realistic figures are found. Evidently we can obtain figures as close to 1 as we want if only E is taken high enough, and then irrespective of what m and K are. Figures near 1 may also be obtained for the values of K approaching 10 or for values of m approaching 0·30.

Case III. Here finally

$$U_b = v_0 \int_0^\infty \frac{dt}{n^t} - \frac{v_0 C_0}{c Y_0} \int_0^\infty \frac{dt}{\left(n \frac{1 - c + K}{K}\right)^t} \quad . \quad . \quad (9'')$$

or

$$U_b = \frac{v_0}{m} - \frac{v_0 C_0}{c Y_0} \frac{1}{m + \log \frac{1 - c + K}{K}} \quad . \quad . \quad (12'')$$

Now the expression $cm + c \log (1 - c + K) - c \log K$ should be a maximum. This leads to a transcendental equation for c which for $m = 0{\cdot}1$ and $K = 3$ yields an optimum value of $c = 0{\cdot}7$. Again we find in order to obtain a value for c equal to almost 1 we have to assume a value of m of some 0·3 or more.

7. Some *tentative conclusions* may be drawn. They will have to be tentative, since evidently quite some influence appears to be exerted by: (i) the form of the utility function assumed; (ii) the values given to K; (iii) the values given to m; and (iv) those given to E.

(i) As regards the *utility function*, it would seem that our second function already somewhat overemphasises the phenomenon of diminishing marginal utility, since it assumes a ceiling for utility which according to many economists does not exist. The existence of such a ceiling will reduce the attractiveness to save, since additional units of future consumption will not add very much to U any more. The saving rates found with U_b therefore tend already, in our opinion, to be under-estimated.

(ii) The values to be given to the *capital coefficient* K, we saw, have to depend on whether we assume that, together with increased savings, there will be forthcoming the increased technological knowledge, organisation, etc., that, in the history of developed countries, accompanied the growth of their capital assets. In other words, whether together with savings the growth of knowledge and organisation can also be accelerated. If this is assumed to be the case, we should give to K the values of about 3 or even a little less; if not, K may be considerably higher, up to 20.

(iii) The values to be given to the *psychological discount rate m* may for individuals be quite high, as some well-known facts about money-lending rates show. This evidently particularly applies to individuals living near starvation. For a nation as a whole some would even maintain that it should be taken equal to zero.

(iv) The values of E evidently also depend on the level of well-being, and may therefore not be, at least for individuals, independent of the values for m.

Our first tentative conclusion from the tables shown is that optimum savings rates may well be considerably higher than observed saving rates, especially for developed countries (where E and m are low).

This conclusion also would apply for all countries if it is maintained that n should be taken equal to almost zero. The conclusion does not, however, apply if, with moderate values of m, K is considered to be above 10 anyhow.

A second tentative conclusion is that in order to explain observed personal rates of saving prevailing in most countries we must assume that either the capital coefficient is supposed to be much higher than the values usually now presented or the psychological discount rate is considerably higher than normal interest rates.

A third and last tentative conclusion is that the preceding conclusions are not influenced very much by a possible longer lag between investment and the resulting increase in income. This is shown, on the one hand, by a comparison of Cases II and III; on the other hand, it follows from a change in time units, which we might undertake. Suppose we take two years instead of one year as our time unit. This would reduce by 50% the value of K and raise by about 100% the value of m. Their product would not change appreciably, and hence the optimum values found for c would not either.

8. Some *final remarks* have to be added. The problem discussed is a well-known problem with some well-known difficulties. If the two characteristics (ii) and (iii) of the utility function introduced in Section 4 are neglected, the problem becomes intractable; if total consumption over an infinite period is to be maximised, the maximum will be found to correspond to the highest savings rate possible; *i.e.*, 1, which evidently is an unrealistic proposition. Even if the discount factor is introduced, this difficulty does not vanish. For values of m below the rate of increase in income again the optimum rate of savings will be 1. For values of m above that rate it will suddenly fall down to zero. This evidently even qualitatively is not a realistic picture of the choice problem before us. These experiences should be kept in mind when the idea of an optimum rate of savings is loosely being discussed in terms of a " maximum income or maximum consumption over a certain period." Only the introduction of both the characteristics seems to make the problem a tractable one.

Admittedly the approach chosen here is in many respects oversimplified still. It has been assumed that only one choice is made with regard to c and that this is a choice for all times. Evidently a more flexible approach is conceivable, where c would change as time goes on. Also the utility function might express two features not introduced explicitly—although present implicitly in our models: the feature of a minimum subsistence level and the one of a possible ceiling to consumption. As we already stated, we do not think that our conclusions will be invalidated by such refinements; but we have to admit that further research might reveal such limitations. The purpose of this paper is no other than to stimulate this further research.

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MR. HARROD ON THE BRITISH BOOM

MR. HARROD in his article in the ECONOMIC JOURNAL for March 1956, approaches the "British Boom, 1954–55," from the standpoint of Keynes's *General Theory*, interpreted in the light of the *Treatise on Money*. The "windfall profit," which the *Treatise* identified with "an excess of investment over saving," is the excess profit arising from a disparity of prices and costs. The *General Theory* makes the price level less fundamental:

> "When there is unemployment" [Mr. Harrod writes (pp. 2–3)] "an increment of investment has its main effect in expanding employment; but as we approach a full employment ceiling the increase in demand, due to the increment of investment and to its operation through the multiplier, has a divided effect, increasing employment somewhat, but also raising prices; finally at the point of absolutely full employment, any further increment of demand has its whole effect in producing a price rise. The excess of aggregate effective demand over the supply potential may be called the 'inflationary gap.'"

During the war the inflationary process was—

> "deliberately obstructed by war-time controls. . . . While such measures as taxation and the restriction of private investment tend to narrow the gap, price controls and rationing, formal or informal, do not do so; . . . they ensure that the gap that remains, instead of finding expression in a certain rise of prices, finds expression of equivalent value in unsatisfied demand."

In the chapter on the Theory of Prices in the *General Theory* (p. 303), Keynes described the condition of "true inflation," when "a further increase in the quantity of effective demand produces no further increase in output, and entirely spends itself on an increase in the cost-unit fully proportionate to the increase in effective demand." His analysis was consistently *static*, and was not concerned with the transitional conditions intervening before the full effect of demand on the cost-unit and on prices was felt.

The war-time price controls, however, could not be passed over as merely transitional. And Mr. Harrod amends Keynes's version of inflation by introducing the case of suppressed inflation and unsatisfied demand.

But, he points out, the appearance of unsatisfied demand and of its accompaniment of delivery delay is not peculiar to a regime of price controls. The representative entrepreneur, encountering an increased effective demand, does not "raise his price sufficiently to equate demand to supply and keep his order books of normal length. . . . He pursues a conservative pricing policy, and allows his order book to lengthen" (p. 4).

Undoubtedly, this is a very necessary modification of Keynes's analysis;

it is "part of the normal functioning of an inflationary economy." But it is not quite accurate to describe the situation as one of *unsatisfied* demand, for the demand of the consumers and users may be fully satisfied, without a rise of prices, from stocks (and from imports). The demand from traders for the replenishment of their stocks may be "unsatisfied" in consequence of delays in delivery. But a trader maintains a substantial margin of stocks in excess of the irreducible minimum, and, so long as some margin is preserved, he can afford to wait: supplies on order are then equivalent to supplies in hand. When wholesale dealers' stocks of a commodity decline towards the irreducible minimum, they raise their price above the replacement value, retailers follow, and the excess demand is checked. When wholesale dealers increase their margins, the producers are likely to reconsider their conservative pricing policy. And at this stage wage increases are likely to be granted, and the rise in the cost-unit is then reflected in a rise in price. It is when controls prevent the raising of prices that the consumers' demand is unsatisfied and shop shortages occur. But in the absence of a wage control, price control cannot prevail against a rise in costs.

Thus it is quite normal for an expansion of demand to be accompanied by no rise of prices or by a less than proportional rise. Yet the excess demand is not unsatisfied: there is an excess of spending over output which is *satisfied* from stocks, supplemented, if need be, from imports. Keynes's principle that saving and investment are identically equal really means that spending and output are identically equal, for saving plus consumption is equal to income and therefore to output, and spending is composed of investment plus consumption. The existence of excess spending is reconciled with this identity because in Keynes's phraseology the depletion of stocks is disinvestment, and the disbursements applied to it do not count as spending.

When over-spending occurs, and stocks are diminished, the immediate effect is to substitute a quantity of goods on order for an equal quantity of goods in stock. The "time interval between order and delivery" (p. 1) is lengthened. Mr. Harrod rightly calls attention to the importance of that factor.

To keep a manufacturing concern employed up to capacity, the completion of an order must always leave fresh orders to be started on. The flow of orders in an industry corresponds to the disposals of the product to consumers or users. If the flow exceeds the capacity of the industry, unexecuted orders begin to accumulate, and dealers' stocks to diminish. If the excess demand is transitory, so that it can be absorbed in stocks in the interval before the orders for replenishment are completed, there need be no significant reaction on the industry. But if the excess demand is believed to be more persistent, producers will extend their capital equipment (the acceleration principle) and seek more labour.

When excess spending occurs in the community as a whole, the excess demand is not confined to the products of a single industry, but is felt throughout industry. The excess demand for finished products is extended by the acceleration principle to instrumental products. Output can be

expanded beyond normal capacity by means of overtime, and, so long as output keeps pace with demand, there cannot be said to be an excess demand. But if, when output reaches its limit, manufacturers still pursue the " conservative pricing policy," there is little room for an " inflationary gap " measured by excess profits. And if excess demand takes effect only in an increased volume of orders on hand, there is no increase in income.

The excess demand causes an excess demand for labour, a state of over-employment, of which abnormal overtime is one of the symptoms, and there results a rise of wages. The process culminates in Keynes's " true inflation," when the increase in effective demand " spends itself on an increase in the cost-unit."

Mr. Harrod, in looking for the causes of the expansive movement of 1954–55, starts from Keynes's principle of " the increment of investment and its operation through the multiplier " (p. 3), as modified by the introduction of unsatisfied demand, and he sees evidence of an " industrial investment boom of very great magnitude " (p. 5) in the statistics of new factories started. Those started in the twelve months to June 1955 show a total, in square feet of factory space, 77% above the average for the five years 1949–53. Though " new factory building is but a small part of the total demand upon the building industry, what is important is the associated demands for industrial equipment." Since he wrote, later statistics have become available, and they add force to his contention, for the index for the whole year 1955 is no less than 207·8.

The explanation is given in the *Economic Survey* for 1956 (p. 45): " with the removal of controls late in 1954, building owners were free from the beginning of 1955, for the first time since the beginning of the War, to put in hand such work as the building and civil engineering industry was willing to undertake." There was thus a big increase in orders on hand so far as the building of factories itself is concerned, but in the circumstances it would not be warrantable to infer a corresponding increase in orders for equipment. For the effect of the controls may be supposed to have been an accumulation of arrears of replacements and extensions of factory space, without any corresponding accumulation of arrears of replacements and extensions of plant.

But, if the increase in factory building is to be accounted the cause of the boom of 1954–55, when did the boom begin? Mr. Harrod says that " by the Autumn of 1954 it was evident that the British economy was becoming subject to severe inflationary pressure " (p. 5). But that was not the beginning.

The index of industrial production shows a set-back in 1951 and 1952, but a substantial revival in 1953:

January 1951	116
,, 1952	117
,, 1953	118
,, 1954	129
,, 1955	135
,, 1956	139

The set-back in 1951–52 was almost entirely attributable to the textile and clothing industries, the production index of which has been:

January 1951	119
,, 1952	104
,, 1953	111
,, 1954	119
,, 1955	118

The number of unemployed in the textile industry rose from 6,842 in June 1951 to 153,238 in June 1952 and fell again to 16,437 in June 1953. The unemployment percentage in industries other than textiles and clothing rose only slightly in 1952.

The textile and clothing trades suffered from the inordinate rise in the prices of their raw materials (due to stock piling) in the spring of 1951. The index numbers of cotton and wool rose to 248·1 and 297·2 in May 1951, and cotton fell to 142·1 in January 1953 and wool to 125·6 in April 1952. The fluctuations were so considerable as to affect materially the prices of their finished products, so that markets at home and abroad felt the depressing effect of falling prices on sales.

As the textile and clothing industries account for one-eighth in the weighting of the index of industrial production, it is possible to calculate the index for the other industries:

January 1951	116
,, 1952	119
,, 1953	119
,, 1954	130
,, 1955	137
,, 1956	142

This shows a continuous expansion interrupted by a pause rather than a set-back in 1952, and resumed with an exceptional increase in 1953. The average weekly hours worked (men) show the progressive increase in overtime:

	April.	October.
1949	46·6	46·8
1950	47·0	47·6
1951	47·9	47·8
1952	47·3	47·7
1953	47·8	47·9
1954	48·3	48·5
1955	48·9	48·9

Mr. Harrod's index of factory building records an increase only from the middle of 1954. Actually the index for the first half of 1954 is 145, and already shows a big increase over the previous highest, and for the second half it is 157, making 151 for the year. But this does not help to explain the rapid increase in activity in 1953. And in the years 1952 and 1953 the

starts of factory building were reduced to an exceptionally low level because controls were tightened in order to release resources for rearmament expenditure. The year 1954 did no more than overtake the arrears of factory building accumulated in the two preceding years.

How far does " the increment of investment and its operation through the multiplier " help us to interpret the statistical material? In the working of the multiplier account must be taken not only of investment but of the expenditure of public authorities on goods and services. The following table shows the proportion (per cent) of expenditure on fixed capital formation, and of expenditure of public authorities, to gross national output for six years:

	1950.	1951.	1952.	1953.	1954.	1955.
Fixed capital . .	14·6	14·8	15·1	15·8	16·0	17·1
Public Authorities .	17·8	19·1	20·8	20·5	19·7	19·0
	32·4	33·9	35·9	36·3	35·7	36·1

The total has been remarkably steady. The substantial increase in public authorities' expenditure in the years 1950–52 was partly compensated by a relative stagnation of capital outlay, and the subsequent decline in public authorities' expenditure has been offset by a rise in capital outlay. The rise in capital outlay in 1955 may well be connected with the increased factory building then started, but it barely compensated the decrease in expenditure of public authorities since 1952. There may have been a further accumulation of orders for equipment. The orders on hand for machine tools have risen substantially since 1953, but, if allowance be made for the rise of prices, they have not yet reached the level of 1952. Other statistics of orders on hand are not to be had.

" Investment," as defined by Keynes, includes " the increment of capital equipment, whether it consists of fixed capital, working capital or liquid capital." Any excess spending is met either from stocks (liquid capital) or from imports, but we cannot take the state of stocks and imports as a simple indicator of excess spending because a *designed* net addition to stocks must be reckoned as spending. When traders' stocks are being depleted by excess spending, and industry is employed up to capacity, they will tend to replenish stocks, and to keep the total up to what they think convenient, by importing supplies and by retaining exportable goods at home. If they succeed in keeping their stocks at the acceptable level in this way, the adverse balance of payments will be equal to the over-spending. But in the years 1951–55, when productive capacity has been so severely strained, there has been a net *favourable* balance of payments of £166 million. And traders' stocks have greatly increased. The following table shows, year by year, the total value (in £ million) of traders' stocks (including Government trading stocks, but excluding surplus and strategic stocks), together with so much of each yearly increase as was attributable to quantity and not to price:

Year.	Value of Stocks.[1]	Quantitative increase.	
		Value.	%
1946	3,723	51	1·37
1947	3,899	422	10·82
1948	4,771	235	4·93
1949	5,331	97	1·82
1950	5,628	−183	−3·25
1951	6,095	471	7·73
1952	7,316	8	0·11
1953	7,274	83	1·14
1954	7,282	31	0·42
1955	7,388	297	4·02
1956	7,885	—	—

[1] At the beginning of the year.

In the years 1946–49 there was a cumulative increase of 20%. The American and Canadian loans, followed by Marshall Aid, may be assumed to have gone far towards making good the war-time loss of stocks. The reduction of stocks in 1950 is no doubt explained by the more severe import restrictions imposed after devaluation. Over the two years 1950 and 1951 taken together the increase was 4·2%. A relaxation of import restrictions in 1951 allowed an increase of 13% in the volume of imports. The rise in the prices of imported materials resulted in adverse terms of trade, and there was an adverse balance of £403 million. The cumulative increase in stocks from the end of 1949 to the end of 1954 was 6%, a yearly average of 1·2%. As the index of industrial production rose from 106 in 1949 to 130 in 1954, the increase in stocks was far from keeping pace with it. It was only in 1955 that there was once more a substantial increase. The following table compares the increase in stocks with the volume of imports:

	Increase in stocks, £ million.	Volume of imports, 100 in 1950.	Balance of visible trade, £ million.	Balance of payments, £ million.
1949	97	100	−137	+ 31
1950	−183	100	−133	+300
1951	471	113	−743	−403
1952	8	103	−117	+247
1953	83	112	−217	+177
1954	31	114	−192	+205
1955	297	131	−352	−103

Where are we to look for an explanation of the sudden increase in stocks and in imports in 1955?

Keynes's monetary theory was based on the rate of interest. A rate of interest below that which corresponds to full employment produces " a state of true inflation " (*General Theory*, p. 202). But he adhered to the view, argued in the *Treatise on Money* (Vol. I, p. 195; Vol. II, pp. 137–42 and 363) that the effect of changes in the rate of interest on traders' stocks is insignificant. An important part of his argument was that the charge for interest is small compared with the gain or loss through price fluctuations, but the price fluctuations he had in mind were those of primary products, such as

cotton, copper or wool. Of stocks of finished products he had nothing to say.

In the *General Theory* (pp. 141–4) he pointed out that expected changes in the wealth-value of the money unit affect activity because they affect the marginal efficiency of capital. The rate of interest which corresponds to full employment is the rate which is equal to the marginal efficiency of capital. If the money unit is expected to decline in value, that is to say, the price level is expected to rise, the rate of interest must be so much the higher, or else the " state of true inflation " will supervene.

In the chapter of the *General Theory* on Properties of Interest and Money Keynes points out the distinction between those capital-assets, such as houses, of which the yield is substantial while the carrying cost is negligible, and those, such as wheat, of which the yield is negligible and the carrying cost substantial. He attributed to a stock of wheat a " marginal efficiency " of a–c, where a is an expected rise of price and c the carrying cost. Since only those assets will be newly produced of which the marginal efficiency exceeds the rate of interest (*General Theory*, p. 228), no wheat will be produced unless the price of wheat is expected to rise to an extent sufficient to cover carrying costs *plus* interest. Of course the " rise " Keynes had in mind was not a rise in the price of wheat quoted in the market, but the difference between the dealer's buying price and his selling price. For wheat, and for stock-held goods in general regarded as capital assets, that difference represents " marginal efficiency " so long as market prices are expected to remain unchanged.

It was only for the sake of a formal analysis that Keynes made the rate of interest the decisive factor in determining whether any wheat was to be produced. Nevertheless, his concept of wheat or any other stock-held product as a capital asset with a " marginal efficiency " becomes significant in the case where a rise of market price is anticipated. A purchase of a surplus stock of the product with borrowed money appears profitable unless the rate of interest reckoned over the period to the resale of the product is high enough to offset the hoped-for rise of price. If there is an anticipation of a general rise of prices, so that the purchase of practically all products looks profitable, there may be extensive purchases amounting in the aggregate to a heavy item of investment. The rate of interest becomes a determining factor for those traders who have no redundant cash balances at the time, and who, therefore, have to make their extra purchases with borrowed money.

The devaluation of 1949 suddenly held out the prospect of a general rise of prices. It raised by 44% the sterling equivalent of those international prices that were reckoned in dollars. And as at the time the United States was the only important competitor to be met in international markets for manufactured goods, British manufacturers could look forward to an enormous increase in the prices they could ask. Nevertheless, in conformity with the " conservative " pricing policy, they tended to quote prices based on costs, *plus* a reasonable or conventional profit margin. The Government

appealed for a standstill of wages, and up to the end of 1950 increases of wages were very slight. The price index of materials used in manufacture (100 in June 1949) averaged in that year 138·6, and the price index of British manufactured goods was only 106·8.

In 1951 the standstill of wages was not persisted in. There ensued the biggest total of wage increases ever recorded in one year (£6,569,000 a week). The index of weekly wage-rates, which had risen only from 109 in September 1949 to 110 in September 1950, advanced in December 1951 to 126. The rise in costs was bound to mean a rise in prices, and it was easy for traders who watched the state of the labour market, and the progress of negotiations in industry after industry, to foresee price rises. But there was a further complication. The Korean crisis led to enormous stock-piling measures in Great Britain and America, and the prices of materials rose to a high level. The index rose in April 1951 to 209. It may be supposed that the rise in cost of materials along with the rise in wages stimulated purchases of manufactured goods for stock in the early part of 1951. On the other hand, there ensued a fall in prices of materials which in the course of three years brought the index down to 143·5. Though wages continued to rise, and the index of weekly wages reached 144 at the end of 1954, the price index of manufactured goods remained very stable, averaging 124·8 in 1951 and 125·5 in 1954.

In 1955 wages continued to rise, the index at the end of the year being 154. But the rise was no longer compensated by a fall in the cost of materials, the price index of which rose to 155·3. The price index of manufactured goods rose from 126·3 at the end of 1954 to 132·5 at the end of 1955.

The rise in materials reflected a rise in world prices; as Mr. Harrod says (p. 13), " the boom has now become world-wide." And the conditions favouring increases of wages were continuing; they were indeed gathering increased force, and were becoming familiar to everyone.

In the organised markets for staple primary products prices are determined speculatively. Forward dealers, who provide hedging facilities for traders who want to avoid speculating, are themselves professional speculators. The total stocks of such products to be held at a given moment are a determinate quantity, only to be varied by long-range decisions of producers. The speculative buyer does not have to become the physical possessor of a stock: he makes a forward purchase, which can be settled by a money payment when it matures, and can be prolonged from settlement to settlement.

Manufactured products, on the other hand, are not adapted to this type of transaction. The trader who wants to speculate on a rise of price makes his purchase in the form of an order to a manufacturer, and he has to accept the goods ordered when they are ready. Consequently, when market conditions favour speculation, the speculative purchases take visible shape in *additions to stocks*.

The conditions in 1955, when the prices quoted by manufacturers were still far below what markets would bear, were such as to induce speculative purchases on a great scale. The strain on the country's productive power at the present time, the scarcity of labour, the excessive overtime, the recur-

rence of an adverse balance of payments, these developments are quite rightly attributed to excess spending, but the excess spending is neither on consumption nor on capital outlay; it is on speculative purchases of finished products. The effect of the speculative purchases is not to be seen in the actual increases in stocks (which has been less than in proportion to output) but in the accumulation of unfilled orders. This accumulation represents forward purchases by traders who have good reason to expect prices to rise, and for whom therefore the " marginal efficiency " of stock-held goods is high.

When Bank Rate was put up to 4½% in February 1955 prices of manufactured goods were rising, and in the year that followed up to the further advance to 5½%, the rise of prices was accelerated. In the circumstances even the latter rate is to be reckoned low.

In 1920 prices were rising more rapidly than at the present time, and a rise of Bank Rate to 7% proved sufficient to check the rise. Critics of the Bank Rate policy would be found to shrink in horror from such a rate. But the only substantial ground for fearing it is that it would do its work. So long as the high rate merely diminishes the extra profit derived from rising prices, it places no burden on industry. And when prices cease to rise, the rate can be reduced; indeed, the immediate reduction of a high rate, as soon as its deterrent effect has been really felt, is an essential feature of the Bank Rate policy.

What short-term rate of interest would suffice to offset the expectation of rising prices? [1] So far as prices of materials are concerned, the organised markets, with their hedging facilities, may be assumed to take account of speculative prospects in current prices. The prices of finished products being governed by costs, the rate at which prices are expected to rise will approximate to the rate at which wages are expected to rise. The rise in the index of weekly wages from September 1950 to December 1951 was at the rate of 11% per annum. In the following three years the rise averaged 4½%. But in 1955 it was accelerated, and in the five months from December 1955 to May 1956 it was no less than 6½%, or at the rate of 16% per annum.

The index for May, 164, is 51% above that for 1949. The American index of hourly earnings has increased in the same period by 36%, so that British costs have covered only about 11% of the disparity of 44% created by devaluation. Even if something be allowed for American productivity per head having grown faster than British, the rise in British wages still has a long way to go before the disparity is extinguished—and there are signs portending a further rise in American wages, which will increase the distance to be covered.

If the traders who buy goods for stock become fully aware of this situation, may they not speculate on a rise of prices too great to be offset by any rate of short-term interest that can be practically contemplated? If a high rate (say, 10%) were found insufficient, recourse might be had to a restriction of

[1] It has been argued that only the net burden of interest, after deduction of income tax, is to be reckoned as deterrent. But as tax is paid on the profit from rising prices, gross interest must be set against gross profit.

advances. The " credit squeeze " might be more particularly directed against traders seeking to carry unnecessarily large stocks. How far the credit squeeze can be said to work on those lines, I do not know. We may suppose a borrowing trader to be reluctant to submit to criticism from his banker on matters on which he would suppose himself to be better qualified to judge than the banker.

What makes the speculation intractable is adherence to a rate of exchange which *ensures* a rise of the price-level up to a specifiable limit. The speculators believe themselves to be betting on a certainty. The best corrective would be a removal of that certainty from their minds.

When the Governor of the Bank of England, in October 1955, expressed his opinion that the pound was still undervalued, the natural sequel would have been a revision of the rate of exchange upwards. Yet the possibility of such a step was not seriously entertained. On the contrary, so far as his pronouncement was noticed at all by the public, the inference would seem to have been that there was plenty of room for further increases of wages and prices. At any rate, the rise of the wage-level has been accelerated.

Suppose the speculative purchase of finished products to be successfully quelled, whether by dear money, by the credit squeeze or by a prospect of a rise in the dollar value of the pound. The congestion of orders to manufacturers would be relieved, productive power would be released for export business, the excessive resort to overtime would cease.

The extent of the overtime which is being worked is revealed by the statistics of weekly hours. In October 1946 the average hours worked were substantially the same as in October 1938, 47·7 per week. After the big reductions of hours in 1946–48, amounting to two hours or more per week, the average was 46·8 in October 1949 and 47·6 in October 1950. The amount of overtime contained in the latter average must have been at least two hours; in the average of 48·9 reached in 1955 it must have exceeded three.

So much overtime must, of course, be contributing to the rise in production, though not in proportion to the hours worked, for overtime work notoriously yields diminishing returns. But overtime work, while it yields less in proportion to production, adds more in proportion to demand, since the work-people earn high hourly rates.

It is curious that, whereas in the controversies about inflation and the balance of payments, the one point on which all agree has always been the desirability of more production, yet a direct result of the elimination of excessive overtime would be an actual *fall* in production. But the paradox, after all, is not so irrational, for the fall in production would be associated with a rise in productivity per man-hour. And overtime rates of pay give rise to a consumer demand which exceeds the additional output secured.

The acceleration principle applies to stock-held goods as well as to instrumental capital. When demand expands, traders seek to hold stocks in proportion to the additional demand. Their purchases on this account are additional to the purchases induced by the prospect of rising prices. If the speculative purchases were successfully quelled, would there be a danger of

the cessation of excessive overtime making traders' stocks redundant an causing a serious slackening of productive activity? That would, I think hardly be possible consistently with a continuance of the under-valuation o the pound. The productive resources released would be fully employed i export trade and at home in competition with imports. Undoubtedly, i the pound were up-valued, that process ought to be applied gradually an cautiously.

Mr. Harrod (pp. 11–12) sees in the sudden increase in factory buildin in 1954–55 a delayed application of the acceleration principle, and h explains the delay in terms of the psychology of a representative entrepreneu It would seem probable that the acceleration principle has been at work eve since the end of the War, for industry has all the time been feeling the strai of an excessive demand. But the resulting capital outlay has not necessaril been a contributory cause of inflation, at any rate, since the long-term rat of interest has been free to adapt itself.

Mr. Harrod remarks (p. 2) that Keynes did not make clear whether ther might be equilibrium " if the propensity to invest, the rate of interest and th multiplier had values such that aggregate demand exceeded the suppl potential." In Keynes's view the condition of equilibrium would be a rat of interest equal to the marginal efficiency of capital. He found in th " speculative motive " an obstacle to the rate falling below a limit dete mined by " what is considered a fairly *safe* level " (*General Theory*, p. 201 so that the rate " may fluctuate for decades about a level which is chronicall too high for full employment " (p. 204). But he indicated no correspondin obstacle to a rise in the rate of interest. He held that the rate of interest determined by the " conditions of credit," that is to say, the terms on whic the banking system induces people " to sell the banks a debt or a bond i exchange for cash " (p. 200). But the practice of the monetary authorit may be " to concentrate upon short-term debts and to leave the price of long term debts to be influenced by belated and imperfect reactions from th price of short-term debts." That, of course, is what, according to his theor the British banking system does.

When the object is to raise the rate of interest, the inducement the bank offer is not to sell " a debt or a bond in exchange for cash," but to abstai from selling, or to buy. They extinguish cash. Even if the banks concer themselves only with the short-term rate, and fail to check long-term inves ment, the increase in investment will generate through the multiplier a increase in incomes, which will absorb an increased amount of cash in th transactions balances (M_1), and the shrinkage in the surplus balances (M_2 will cause a further rise in the rate of interest.

I think that Keynes would have said that there is no obstacle in the wa of a Bank Rate policy checking inflation, but that he would have qualifie this conclusion by reference to the highly " psychological " or " conve tional " character of the rate of interest, the vagaries of which the monetar authorities might find baffling.

London. RALPH HAWTREY

THE MYTH OF "FAIR" WAGES

THE periodic cycle of wage claims, amounting nowadays to an almost continuous process, has evoked a considerable amount of exhortation and advice. But the more copious the advice, the greater grows the confusion about what should be done. Not so long ago all analyses of wages were conducted in the most abstract manner, a manner which mainly ignored the social and psychological factors which make people behave as recognisable human beings. The present danger is of going to the other extreme and assuming that economic repercussions are of so little importance compared to social and ethical considerations that they need hardly be taken into account. On several occasions recently, for example, emphasis has been laid on the need to establish [1] " an authoritative and impartial body " to consider the whole complex of wage problems and " to give advice and guidance as to broad policy and possible action." The Chairman of the Trades Union Congress a year ago, in his presidential address, urged the setting up of an Arbitration Appeal Tribunal to act as a sort of House of Lords in settling disputes that resisted the existing arbitration machinery. The Royal Commission on the Civil Service insisted on the importance of establishing " fair " and " equitable " rates of pay; the Court of Enquiry into the railway dispute last year demanded " a fair and adequate " wage for railwaymen. These are but a few manifestations of a present tendency to look at wages from anything but an economic angle. Many of those who have stressed the need for new basic principles for the settlement of wages, or for impartial bodies to judge between rival claimants, seem to imply that present wages are more or less haphazard; that they have neither rhyme nor reason to explain them and are, indeed, solely the result of pressure-group activity within industry.

Two distinct but related questions call for attention. The first is: Are wages, in fact, so arbitrary and fortuitous as they are said to be by their critics? The second: Could we establish principles of remuneration on which wages might be so based as to commend them to current conceptions of justice and equity?

The " marginal productivity " theory on which most of us were brought up can be, and often is, stated in such a way as to provide an easy cockshy, but it is not as irrelevant to an understanding of movements in wage-rates as is often stated. In real life, of course, there is no irresistible force which equalises rates of pay for all work, whatever it is. Ability has not been doled out with such even-handed impartiality as that. We differ from one another in our innate capacities, and in a world in which the different jobs to be done need very different combinations of qualities, it follows that some

[1] Report of Court of Enquiry into Confederation of Shipbuilding and Engineering Unions, Command 9084, 1954, p. 48.

fortunate ones have more and rarer abilities than others. Even if there were perfect mobility, full knowledge of alternative occupations and absolute equality of opportunity to train whatever capacity an individual might possess, there would still be fewer people able to perform a delicate brain operation than to hoe turnips; and, as price reflects relative scarcity, different rates of pay would result. In the world as we know it, however, there is *not* perfect mobility, equality of opportunity and all the rest of it, and therefore the markets for these " differentiated products " have little connection with one another. Yet even so, they are not completely cut off from one another. The more skilful organisation of the labour market, with its network of communicating clearing houses, the wide diffusion of educational facilities and the increasing extent to which occupations are thrown open to the talents instead of being reserved for members of certain social groups, all increase the flow of human services into channels from which earlier they were blocked and this is, at least, *reflected* in the differences of pay they attract.

Equally, of course, it is not possible to isolate and measure the contribution of an individual worker, or even of a group of workers, to the productivity of a firm; nor are workers unaffected by social and psychological factors which hinder them from moving into or out of industries. But the difficulty of exact calculation does not mean that quantitative differences can be ignored. An employer may act on an estimate which would not satisfy a statistician; and though workers may be influenced by many other things than money, this does not mean that wages have no influence in their choice of jobs. Criticism of the far-fetched way in which theory has so often expressed the relationship between wages and the flow of labour is no excuse for throwing the baby away with the bath water and assuming that there is no relationship at all.

Nationalised industries may be permitted to act in a way that seems to put them above all economic considerations. But four-fifths of the economy is still in the hands of private enterprise, and as firms are compelled to keep their costs below selling prices if they wish to remain solvent, wages cannot be left out of their calculations. There is obviously a difference between industries in which labour costs represent a small proportion of the total (as in such very highly-mechanised forms of production as the manufacture of mineral waters or of industrial chemicals) and the general run of industries, in which the wages bill may be anything from 30 to 70% of the total cost of the product. The former can absorb increases in wages which would call for immediate readjustments in the latter: but even where wages are comparatively unimportant, changes *will* nevertheless be made as the wage bill goes up.

This is so obvious as to seem scarcely worth saying, but so much of the recent public discussion of wages has concentrated attention on wages as the reward for work rather than as an element in costs that this aspect is in danger of being overlooked. In a community such as ours, where 93% of the occupied population are employees of one sort or another, the social

ıplications of wages and salaries naturally loom extremely large. The ıy we get not only determines the standard of living we can maintain but so acts as one of the principal agents in establishing our social status. It is is aspect of wages that is, naturally enough, the principal concern of the cipient. But this does not alter the fact that to the employer his wages bill a cost that must be covered or else he must devise alternative ways of :tting the goods produced and marketed.

The effect of a rise in wage-rates is not direct and immediate, and a ısiness does not necessarily sack some of its workers when a wage goes up. may recently have invested heavily in new equipment and be therefore ıwilling to consider a change in techniques until this has had a reasonable ın; or it may be willing to try to buy a period of freedom from industrial ısputes by agreeing a wage that it thinks economically unsound. But ıless the higher labour cost can be offset in some other way it must eventually e reflected in higher prices, and except where the market is feather-bedded y subsidies or guaranteed prices, or unless the demand is completely inastic, the fall in consumption will mean a slackening in the demand for ıat particular type of worker. More often, however, the result of rising ages is a readier disposition to examine the possibility of producing the ıme product by alternative methods. Inventions are available for a long me before the stimulus becomes strong enough to try them out, and many ew techniques are not adopted until the wage bill goads the employer to ıange. How rapidly a firm alters its estimate of the " worth-whileness " its existing labour force depends on the readiness with which it receives ew ideas; but that it will eventually try to economise on high-priced orkers is not in doubt.

On the workers' side the estimate of " worth-whileness " is much more ɔmplicated, for it involves elements on which it is difficult to put a money alue. If you have to make up your mind that one job is more attractive ɔ you than another, you have to compare all that " goes with " each of ıem; and the things that " go with them " are continually altering with ıe changes that take place in social custom and social prestige. Dockers, ven in the days when their earnings were much lower and more irregular ıan they are now, used often to refuse industrial jobs because they could not ccustom themselves to working indoors on a rigid time schedule, and the ost-war Dock Labour Scheme still finds the set day a difficult nut to crack; ailway workers, before the War, accepted lower wages than they would ave got in some other occupations into which they might have gone because ıey had regularity of pay and security of tenure, but now they complain ıat the relative lowness of pay remains whilst other occupations have caught p with them in security. At one time the white collar and clean hands of ıe office worker, with the right to be called Mr. X or Miss Y, acted as a lure ɔ draw men and women into occupations that brought relatively low money ewards; and there is no doubt that many jobs attract people because of the igher social status that they believe them to confer. What causes one ccupation to rank higher in social prestige than another? Who can tell?

There are, no doubt, some jobs that owe their higher rating to the high pay they offer and, in some cases, particularly where the occupation is a fairly new one and the rating not yet established, a deliberate attempt may be made to create prestige for it by establishing high salaries. (Presumably the recommendations of the Herbert Committee for higher salaries for the members of the Central Electricity Board must be of this type, for the net addition to the recipient after surtax would be negligible.) But in other cases, where the occupation has customarily been put high on the social scale, this is not so, and many types of work continue to have high prestige though the money income is modest. The clergyman is conventionally awarded a social status higher than that of workers in industry earning two or three times his income. He enters that profession presumably because of the non-monetary satisfactions he gains from it, and when he looks for an increase in pay it is not in order to raise the esteem in which his calling is held, but because even a man of God must pay his bills.

Prestige, regularity, chances of promotion, mental or spiritual satisfaction, leisure, access to particular social groups—there is no end to the things that " go with " a job and so influence people in deciding what to do. The trouble is that we often miss their significance for they are not as obvious as changes in money wages. We are still in the dark, for instance, in trying to estimate the importance workers attach to security of tenure in a country where there has been no unemployment for fifteen or sixteen years; or the extent to which, in money terms, week-end work or night shifts deter men and women from entering jobs that need them. Nor do we know whether the black-coated job still takes precedence and, if so by how much in weekly terms, now that there is so much greater uniformity in off-duty clothing and leisure-time activities amongst all social classes. We can conclude that men dislike the danger and discomfort of working underground from the fact that it is difficult to recruit them to the coal-mines, although earnings in the industry have gone up so much more proportionately than elsewhere; we know, too, that some men, even after serving their apprenticeship to a skilled trade, prefer to take semi-skilled work in order to earn more on piece rates. But just what is the quantitative expression of these factors we do not know. Very few people attempt to make anything approaching an exact calculation in their own minds of the various elements in jobs, but some estimate they must make, for the fact is, that men and women *do* move from one job to another, and presumably they do so after deciding, however hazily, that one job with all that goes with it—pay, security, prestige, leisure and so on—is more worth-while to them than the job they leave or don't go into.

It has been usual in some circles to pour scorn on this whole conception of the " choice of occupation " and its relationship to the occupational distribution of the population. What choice, it is rhetorically asked, is there open to a working man, ignorant of alternative possibilities, compelled to choose quickly or go hungry, with no resources behind him to enable him to train for a job in the future, circumscribed by the industrial specialisation

the locality in which he happens to live and so on? Freedom of choice, deed, is not absolute. We are limited, first of all, by our own capacity lack of it; we are still further bound by the expense and difficulty of aining what abilities we do possess. Even in these days of abundant lucational facilities, it is much easier for a middle-class boy to fit himself for ertain jobs than it is for the son of a labourer, whatever his native ability. ut even the son of the labourer who fails to get or does not want a place in a ammar school is not bound to follow his father's footsteps—he can become postman or a policeman, a docker or a soldier, a builder or a miner or enter y one of a dozen other occupations carried on within his area and open to e of his physique and capacity. Which he does actually go into—unless e is completely irresponsible, aimlessly floating as a bit of flotsam on the dustrial waters—is decided by his own idea of which job is worth-while, hatever the elements in that worth-whileness that particularly attract him, hether it is more money, or more leisure, or anything else.

There are types of social organisation in which such decisions are unecessary or prohibited. In a monastery, for example, there is no question f raising the reward attached to particular jobs or of luring men into them y other methods. The monks are under a vow of obedience and are bound o act as their superior orders them. Similarly, in the Israeli *kibbutz*, at the resent time, all share equally in what is produced, irrespective of the task erformed by each member, and men and women can be allocated to whatver job is considered most urgent at the moment. Here the members of the ittle community voluntarily surrender their freedom of choice for what they elieve to be more valuable—a life in common based on friendly co-operaion instead of competition. But it must be remembered that nobody is ompelled to remain in the *kibbutz* if he comes to believe that the loss of reedom has been too dearly bought. At any time members can leave the ettlement, and many do. Yet even here experience shows that there are certain types of work which are not voluntarily undertaken, and which are done so unwillingly by the members allocated to them, that many of the *kibbutzim* have now come to employ non-members for these jobs at market rates of pay.

This point has been stressed because it is important to face the fact squarely that, unless we are prepared to institute direct control of labour, there is literally no way at all of getting workers into some jobs and out of others except by the changes in these jobs' relative worth-whileness—the clumsy phrase I continue to use to make it clear that it includes all the factors that make one job more attractive than others as well as the actual money wage. It may go against the grain to speak of wages as a " price," because for so long—on humanitarian grounds—there has been a passionate revulsion against the concept of labour as a commodity to be bought and sold. But so long as people want to exercise freedom of choice in deciding what job to do and where to do it, a price is what, fundamentally, a wage is, performing the function of every other price—that is, of sign-posting resources into different channels of marketable value. However we try to

avoid using the term, we have to face the nature of the wage bargain, which means that we must recognise that basically it is determined by the movements of the market and not by ethical and social considerations.

It is often asserted that the spread of collective bargaining has completely altered the situation, and that wages now represent much more a social assessment than an economic compromise. It is true, of course, that the method of settling wage-rates is different when agreements are made on behalf of organised groups instead of between individuals, but this is no more than saying that the labour market is now one of monopolistic competition. A strong trade union can compel a particular rate to be fixed, as a monopoly firm can enforce minimum prices for its products; but neither can force the purchaser to buy, and both must face the possibility of unsold " stocks " if the price is fixed beyond what the market is prepared to pay for what is on offer. Collective bargaining has, indeed, introduced new elements into the wage bargain, but it has not materially altered its economic nature. There may be differences of opinion as to whether all these new elements are in the public interest, or, even, in the long-term interests of the members themselves, just as there may be divided views on how far such a system as Resale Price Maintenance is disadvantageous to the consumer. To say that wages are what they are primarily as a result of economic forces is not to say that the particular wages being paid at any time are the wisest and best that could be devised in the best of all possible worlds. It is an analysis and not a judgment. It points merely to the conclusion that present wage-rates are not entirely arbitrary nor entirely haphazard.

The economic basis of wages is obscured by the slowness with which changes in wage-rates operate on the supply of workers of different kinds. A man does not easily leave his job, even if alternative employments offer higher rates or greater amenities. An engineer cannot become a printer any more than a lawyer can easily become a doctor. It takes time and money to acquire the necessary qualifications, and an adult can rarely afford to move. Having made his choice during adolescence, he must either stick to it and follow the fortunes of his trade, up or down, or else demote himself by taking semi-skilled work in some other occupation. Even in semi-skilled operations, familiarity with the materials and the machine counts a lot, and it takes a fair amount of provocation to persuade a worker to change. He is much more likely to do so if he loses his own job and has to look round for something else than he is if he hears of other work on offer at better pay.

When, as so often happens when areas have highly specialised industrial production, the alternative employment is in another district, movement from one industry to another is even more severely impeded. There are the hazards attached to giving up a house before being certain that another will be available; there is the natural dislike of uprooting oneself from familiar surroundings and leaving one's friends; or of upsetting a son or daughter happily settled at school or at work. All these things help to make a worker stay put in the district and occupation where he happens to be. Yet slowly

and jerkily the movement from one industry to another does in fact take place, as is evidenced by the rapidly altering figures attached to different occupations. The movement is partly brought about by the new recruits to employment, who are more likely to attach themselves to the trades whose prospects seem better; but adults also change when the higher earnings and general worth-whileness of other types of work are sufficiently attractive.

Government intervention in wage settlement recognises the " price " nature of the bargain, and in neither the Wages Councils nor the arbitration machinery is there any attempt to introduce any different foundation for wages than those that exist for voluntary agreements. Much criticism has been levelled recently at the Government for not laying down clearly the principles on which these bodies should base their recommendations, but such criticism shows a complete misunderstanding of what they were established to do. It has never been part of the intention that they should supersede voluntary negotiation and agreement between the parties concerned—the employers and workers in the industry. In fact, recourse to arbitration may not be made until all the voluntary procedures of negotiation have been fully explored; and, by statute, the Minister of Labour is prevented from setting up a Wage Council in any trade in which there seems any possibility of the development of effective voluntary organisation on the part of the workers themselves. In both cases the purpose is to get an agreement between employers and workers in circumstances in which such an agreement might not be possible without some outside assistance. The decisions of the Wages Councils are given legal sanction and enforced by a Government inspectorate simply because otherwise they might not be kept. When a trade union makes an agreement there is no need for it to be enforceable at law, because the union member can complain to his shop steward if he thinks he has been wrongly treated and the union can take the necessary steps. In an unorganised trade the workers are too ignorant of their rights or too afraid to demand them, and a Government inspectorate is therefore needed. But in the fixing of the rates exactly the same considerations are taken into account as would be taken by workers and employers if they were sufficiently well organised to be able to carry on their negotiations unaided. In fact, Wage Councils are simply statutory collective bargaining.

Similarly, the arbitration machinery is a part of the voluntary negotiation of wages, and this characteristic is continually underlined. A wage is a contract between two interested parties, and whenever a contract has to be settled between two individuals or two groups of people whose interests are not entirely identical some compromise is the only solution. It is because this is recognised that there has always been such opposition to any suggestion that arbitration should be compulsory with legally enforceable awards. If a compromise has to be effected it must be what each party believes to be, if not all that was hoped for, then at least a reasonable part of it. But what is unreasonable? or reasonable? What " ought " to be the differential between skilled and unskilled workers? What " ought " to be the " right " working day? How far " ought " the standard of living to be a determining factor

in a wage-rate? Whose standard is to be the measuring-rod? We have only to ask these questions to see what a volume and variety of answers they must evolve. A judge in a court of law is not asked to formulate moral principles; he is asked to administer the law. The principles have been already agreed either by statute or by common law, and all he has to do is to apply them to the particular situation with which he has to deal. He is an interpreter of laws, not a law-maker. But in the face of the complete lack of any body of agreed principles on all the matters in which industrial disputes take place, a compulsory arbitrator would be in the position of a one-man Parliament, not a judge.

Compulsory arbitration was successful during the War for two reasons. First, it was instituted by common consent. Both employers and employed agreed to give up the voluntary method for the period of emergency because other things were more important. Secondly, there was no legal freedom of choice of occupation during the War. The Minister of Labour could allocate man-power according to national needs, and, therefore, could if he wished lay down the conditions of employment.

Voluntary arbitration is successful because the disputants are simply expressing their willingness to accept a compromise if a reasonable one can be suggested to them. Rather than the suffering and expense of a stoppage, each side takes the risk of getting a little less than it might have got after a fight and has the hope that it might get a little more than it would have been forced to agree to.

This brings me to the second question I put myself. Could we establish principles on which such rates could be based as would commend themselves to the current conception of justice and equity? In the recent report of the Royal Commission on the Civil Service there is a valiant, but unsuccessful attempt to do just this for the pay of Civil Servants. The Report quotes disapprovingly a statement made by an earlier committee to which this matter had been referred.[1] "In our view there is only one principle in which all the factors of responsibility, cost of living, marriage, social position, etc., are included—the employer should pay what is necessary to recruit and retain an efficient staff."[2] In its criticism of this statement the Report argues: (1) that financial considerations are not the sole nor necessarily even the principal motives that attract men into the Service; (2) that wastage is not a reliable indicator of fairness or unfairness, because specialists cannot always move to another field, and (3) that it is very difficult to assess "efficiency," since a sense of grievance may lead to a slow deterioration impossible to measure. In none of these respects, however, is the Civil Service different from other fields of employment. People go into other jobs because of family tradition, interest in the work and desire to serve their fellow men; difficulty of movement affects anybody with specialised qualifications, and the work of even unskilled labourers is affected by their contentment or lack of it. And indeed, after a lot of discussion leading nowhere,

[1] Royal Commission on the Civil Service 1953–55, Command 9613, 1955, p. 18.
[2] Interim Report of Court of Enquiry into N.U.R. Dispute, Command 9352, 1955, p. 6.

all that the Report can do is to say that justice is established if Civil Service rates bear a "fair comparison" with those paid to people with similar qualifications doing similar work in other occupations. If this is not what the framers of the earlier principle meant, what else could it have been? After pages of argument designed to get away from what seems so coldly economic, there they are back again at the point from which they started.

A much more disastrous attempt to establish a "right" basis for wages was made by the Court of Enquiry into the dispute between the British Transport Commission and the N.U.R. in January 1955.

> "We feel" [said the Report] "that we must state in the plainest of terms what we apprehend to be the proper approach. The Nation has provided by statute that there shall be a nationalised system of railway transport which must therefore be regarded as a public utility of the first importance. Having willed the ends the Nation must will the means. This implies that employees of such a national service should receive a fair and adequate wage and that in broad terms the railwayman should be in no worse case than his colleague in a comparable industry."

This is one of the most inept statements ever delivered by a responsible body. What do these portentous phrases signify? What is a comparable industry to the railway? and why? And who is the railwayman's colleague in such an industry? Many railwaymen live along the line in villages and country towns. Is it, then, the agricultural worker with whose standard of living his should be compared? Or, if he lives in a mining community, with a miner's? Or is the comparable industry road haulage, or aircraft or what? If the comparison is to be made on the basis of skill, how does one assess the hierarchy of skill? Is a doctor more skilled than a lawyer? Is the railway driver more skilled than the miner or the mechanic? What is the scale by which one measures these different skills? Is it the time taken in training? But the craft apprentice takes almost as long as the doctor to train; and in many jobs, such as industrial management, the highest skill is attainable only through experience on the job. Is the touchstone to be the responsibility involved? But how, again, can this be assessed? A surgeon, however skilled he may be, can kill only one man at a time; but the express-train driver can kill hundreds at once. Does this mean that his "fair and adequate" wage should be higher than the surgeon's? There has been much discussion recently of the shortage of science masters in grammar schools caused by the higher pay offered by Goverment Departments and by industry. Which is the comparable industry, and who is the science master's colleague to whose pay his remuneration should be allied? Is it the amount earned by a scientist in industry, or is it the scale paid to the English and Classics masters in the same school? All manner of devices are now being discussed to enable Education Authorities to pay more to science masters without seeming to do so, but this is economic compulsion and not a new interpretation of justice.

The trouble is that when we talk, as we so often do, of comparable occu-

pations and comparable skills, we are thinking backwards. We know that over a considerable period of time certain kinds of work have afforded similar standards of living to those employed in them and have, on the whole, recruited their workers from the same or closely related social groups; and it is this knowledge which makes us class them together. We argue from the pay back to the industry and the skill, and not the other way round. So that when big changes take place in the relative demands for these different kinds of work and their customary relationship is disturbed, there is anger and resentment on the part of those who find themselves losing ground. Quite aside from the adequacy or otherwise of their earnings to maintain their accustomed pattern of expenditure, they feel that their social status is in danger.

The large part played by differentials in recent wage disputes is indicative of the uneasiness which so many groups of workers feel in a world in which long-standing customary relationships have been rapidly changed by factors which have hardly been noticed until the full force of their effect suddenly makes its impact felt. Professor Phelps Brown, in a recent article, gives evidence to show that the differentials in the building industry probably remained unchanged from Agincourt to the First World War. During all that time unskilled rates were from 50 to 60% of skilled rates. But from then there has been a sudden and rapid alteration, until nowadays the rates are about 85% of the skilled. The Oxford Institute of Statistics shows that building is not alone in this respect; but that exactly the same thing has been happening in shipbuilding and engineering, though, of course, here the earlier rate has not such a long history behind it.

Three factors can be distinguished as co-operating to bring about the new situation. (1) Two world wars in which the whole man-power of the community was mobilised put labour, as such, irrespective of its skills, at a premium. Many more proportionately of the skilled workers than of the unskilled were kept out of the Forces, and the consequent shortage of semi-skilled and unskilled workers caused their wages to rise more rapidly than those of the skilled. (2) The fall in the value of money has led to constant demands to keep real wages steady. For many years these demands were made in the form of a claim for a flat increase all round and this, obviously, meant a higher percentage increase to the lower-paid workers. Moreover, when the White Paper on Personal Incomes was published, Sir Stafford Cripps in urging trade unions to observe the wage freeze made an exception on compassionate grounds in favour of the lowest-paid groups, for whom increases might still be permissible. During the years, then, in which the wage freeze operated to restrain the upward surge of wages for the better-off workers it sanctioned rises for the lower paid, composed largely, though not entirely, of the unskilled. (3) Perhaps the most potent factor, however, in narrowing differentials has been the growth of the giant amalgamated trade union—the outstanding characteristic of modern trade unionism. The number of separate unions has decreased whilst the membership has greatly increased, and the most powerful unions, those which set the pace for

the others, have a very varied membership covering a very wide range of skills and occupations. In theory there is no compulsion on a union to make a claim on behalf of all its members at once; but in practice it is very difficult to avoid doing so. Thus the narrow differentials that developed as a result of the other two factors have become established by the overall union demand. Which of these differentials is the right one from the social or moral standpoint—the old one or the new?

The difficulty of introducing social and ethical considerations into wage rates has long been illustrated by the problem the trade unions set themselves over a hundred years ago, and to which they have still not found a solution—the reconciliation between two objectives that are mutually incompatible. On the one hand, experience soon showed them that protection for the individual could be obtained only through the strict enforcement of an occupational rate; on the other their social aspirations led them to demand a "living wage"—one based, that is, on the needs of the worker as citizen, husband and father. But there is nothing which necessarily brings these two into line with one another. Not only do the worker's needs vary according to the size of the family he has to maintain, but there is also no reason to suppose that the needs of the skilled worker are higher than those of the unskilled. In fact, one might argue exactly the opposite, for even with the general fall in the birth-rate, the average size of the family amongst unskilled labourers is, according to the 1951 Census, 40% larger than that usual amongst the skilled. No trade union, however, has yet argued that unskilled wages should be higher than skilled, and if it did it would soon lose its skilled members. The skilled worker thinks he "ought" to get more because he is "worth" more—not presumably as a man or a citizen, but as an economic asset to the firm, and he points out that unless he does get more the flow of skilled workers will soon dry up. We come back to the same point again.

This insistence on the essential nature of a wage as a price and not an expression of social or moral sentiments might lead to the belief that the State must stand aside from all wage settlement and leave economic forces to "do their worst." But this does not follow. In the contemporary climate of opinion it is agreed that the State has a duty to protect the welfare of its members, and that it must ensure that the social structure, within which economic forces are permitted to work, should commend itself to the conscience of the community. It can, for example, lay down a minimum standard of pay below which no person could be employed; and, in effect, it does this by the maintenance of unemployment insurance benefit. It can recognise that there are labour markets in which the difficulties of organisation put the workers in a peculiarly vulnerable position and that some supervision of the wage bargain is necessary if the strong are to be prevented from exploiting the weak. Again it can provide as generously as it likes the facilities to enable everybody to develop to the full whatever abilities they possess and thus fit themselves to seek occupations into which they might otherwise not have been able to go. It might even decide that there are certain types of work which are socially valuable into which people go for

reasons which are so preponderantly non-financial that certain rates of pay must be enforced in order to ensure that the people in them are able to carry on their work without starving themselves or their families; for example, the Church might be considered one such field of employment. I myself am not suggesting that this is so, but giving it simply as one illustration. Such actions as these do not try to establish a moral basis for wage-rates; they recognise them for what they are—a contract between two persons or groups of persons in which each is primarily concerned with safeguarding his own interest. What they do is make sure that neither side can take advantage of the other by superior knowledge or by superior resources.

It is ironic that the keen desire to find some social foundation for wages has grown stronger just at the time that it is least justified. Uneasiness about " wages as a price " derives primarily from the recognition that the wage-earner is responsible for more than his own welfare. As the father of a family, the ups and downs of his economic fortune have lasting influence on the health and education of the next generation. It is this double aspect of wages—the economic face looking towards costs of production and the other towards standards of living—that has produced in trade unions an ambivalence which makes them assert, on the one hand, that the wage should be recognised as the basis of the standard of living and, on the other, as the occupational rate irrespective of the circumstances of the individual worker.

The unions tried to ignore this dilemma by assuming the existence of a typical, or standard, or average family. By and large, they argued, most men have similar responsibilities, and for some reason these come to be summed up as the upkeep of a wife and three dependent children. Nobody asked whether this size of family was indeed typical, but the figure was so widely accepted that it became the unit that continually figured without question in discussions of the adequacy of wages. It was Eleanor Rathbone who first pointed out that at any one time only 8·8% of the men then at work actually had three children dependent on them and that if wages had been based on the amount it cost to provide for a wife and three children, they would have provided for 16 million phantom children that did not exist in the families with less than three, whilst failing to provide for over one and a quarter million real children in the larger families.

Since the survey in which this calculation was made the size of the family has shrunk further, and the typical family that now figures so largely in wage discussions is generally taken as consisting of two dependent children. But this typical family is as much a myth now as the larger one was then. According to the Family Census taken for the Royal Commission on Population in 1945, the modal family is now just over two instead of the five of the late nineteenth century. But not all these children are dependent throughout a man's working life. In more than 80% of families the family is completed within the first ten years of marriage. If then we take a period of three years as separating the births of the two children and remember that the school-leaving age is fifteen we can see that the total period during which the father has dependent children to maintain is no more than eighteen years out of a total working life of half a century (fifteen to sixty-five). This is confirmed by the analysis of households and earners in the Census of 1951. Of the 14½ million separate households in this country 56% had no children at all under sixteen years of age, and 21·5% had only one. But 2 million of these households consisted of people with no earners in them—that is, they were all either unoccupied or had retired, so these should be left out of the present discussion. Mr. Brennan has analysed the households with an " occupied " head to see how many dependants each had. In many households the man is no longer the sole breadwinner. The small family has freed wives from full-time domestic duties, for it is now for only a comparatively short period that there are young children to be looked after. Between the ages of thirty and fifty about two-thirds of all women employed are married. In fact, there are now only one in every six households in which there is only one earner and dependent children, and only one in three [1] which have only one earner and any dependant at all, child or adult; 46% of all households with an " occupied " head have two or more earners, and only 22% have as many as two dependent children with only one earner. This means that at any time 78% of those who are affected by wage negotiations have not got the family responsibilities which are assumed by the negotiators. In fact, the old-established unit of " bread-winner and dependent family " has disappeared as the typical family structure.

There is, moreover, another, and even more important, respect in which the situation has changed. In the last century the standard of living of the family was almost completely dependent on the earnings of the father, for unless they were close to destitution, there was no social provision on which they could rely. Since then there has been a social revolution, and the father of a family is no longer its sole support; the State has gone into partnership with him. Consider the part played by the State in the maintenance of the family. Last year the average earnings of adult men in industry were about £10 a week. A married man with two children earning £500 a year, at the rates of income tax then ruling, paid no direct tax at all; a bachelor with the same earnings paid £112. In addition, family allowances, free medical attention, free education up to whatever level the children's abilities can take them, subsidised housing and food, all ease the burden on the family man. Young children are not the only dependants; elderly parents have to be cared for. Here, too, the State has relieved the breadwinner by the provision of retirement pensions. What, indeed, we have done in the last couple of decades is to provide a new basis for standards of living. Members of the community—individuals or families—no longer have to adjust their standards of living to their earnings. Society provides a " social income " which bears no relationship to earning power and, unlike

[1] T. Brennan, " Household Structure and Family Income," *Scottish Journal of Political Economy*, June 1955.

wages, has no difficulty in adjusting itself to varying needs. It is not pretended that this social income now puts the family man on the same footing as the bachelor or the childless couple, but it could do so. We have devised a method which could be developed as far as the conscience of the community directs without bringing about those distortions of the economy created by wholesale wage movements. It used to be said that the British Empire was created in a fit of absent-mindedness. It could, perhaps, be said with more truth that we have created, by inadvertence, the way out of the dilemma of " wages—needs or productivity? " Most of us during the last twenty or thirty years have been split personalities—with one half of our minds recognising the economic function of wages and the other half trying to devise ways and means for developing a more secure and more equal community. Perhaps a clearer realisation of the power we possess to procure the latter by other means than individual earnings may make us more ready to leave wages alone to do their proper job.

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STATE

THE SUPPLY FACTOR IN PROFESSOR HICKS' THEORY OF THE CYCLE [1]

MANY modern writers on income fluctuation show a distinct bias of interest towards the factors affecting demand. Perhaps it is the current disenchantment with the theory of the firm that explains this as much as the influence of Keynes. The comparative neglect of the supply side, however, in Keynesian economics, has provoked a recent controversy around an article by Mr. de Jong [2]; and it is in the hope of being in on a growing fashion that this paper sets out to consider the supply side of the particular element of the post-Keynesian school of trade-cycle theories represented by Professor Hicks. It is concerned less with the substance of Professor Hicks' theory than with its formulation—no new nails are forged for the coffin of the acceleration principle, for example; but the general conclusion is that when it is reformulated to take explicit account of the supply factor it is less easy to accept its fundamental contention that the economic system is naturally unstable and caused to exhibit, by collision with external restraints, the limited oscillations observable in the real world. The analysis falls into three parts. First, the implicit supply assumptions of Professor Hicks are brought out. Secondly, some criticism is made of these assumptions. And finally, a more general model is presented in which the influence of the supply factor is analysed.

For Hicks, consumption demand in any period t is a constant proportion of output (regarded as identical with income) in the previous period. Investment demand is divided into two parts; some is induced and is a constant proportion of the change in output between the previous period and the period before that, and some is autonomous. Aggregate demand in period t can thus be symbolically stated as:

$$D_t = A_t + cY_{t-1} + v(Y_{t-1} - Y_{t-2}) \quad . \quad . \quad . \quad . \quad (1)$$

Now Hicks nowhere writes down an expression which he calls aggregate demand. But the elements which compose the right-hand side of (1) must surely be interpreted as demands of one sort or another, and their sum as aggregate demand. We may begin work on the expression, as Mr. Harrod does on its equivalent in his dynamic model, by asking about the conditions of equilibrium, or equality between demand and supply, in period t. Let us suppose, then, that equilibrium exists in period t, and see what follows. Putting $Y_t = D_t$, we have:

$$Y_t = A_t + cY_{t-1} + v(Y_{t-1} - Y_{t-2}) \quad . \quad . \quad . \quad . \quad (2)$$

But this is curious. For Hicks plainly regards this equation, not as stating something about the conditions of equilibrium in period t between demand

[1] I am most grateful to Mr. G. D. N. Worswick and Professor Hicks in particular for valuable comment and suggestions.

[2] ECONOMIC JOURNAL, March 1954 and September 1955.

and supply, but as describing the actual behaviour of output.[1] He is meaning to tell us that given certain values of A_t, Y_{t-1}, Y_{t-2}, c and v, then we can deduce, not what output of the current period *must* be if it is to be exactly equal to demand, but what output of the current period actually *will* be. Yet he has told us nothing so far about what determines output in period t; our sole information, contained in equation (1), is about what determines demand. Or is it perhaps that in writing $Y_t = D_t$, and thus arriving at equation (2), he is not meaning to assume that equilibrium exists for the purpose of studying its implications, but is actually setting up an equation intended to describe how supply is determined? He is, of course, perfectly at liberty to use a supply equation of the form $Y_t = D_t$; its interpretation is simply that in each period output accommodates itself exactly to demand. Whatever is demanded is supplied. It is in fact an inverted form of Say's Law; " demand creates its own supply." In order to see more clearly what it amounts to, let us provide Hicks' model with an explicit form of supply equation:

$$Y_t = (1 + A)Y_{t-1} + \alpha(D_t - Y_t) \quad . \quad . \quad . \quad . \quad (3)$$

What is the interpretation of (3)? It is that there are two elements which determine output in any period. First, there is the element of secular growth represented by A and determined by factors which are for the most part exogenous, such as the rate of growth of technical knowledge. Secondly, there is the endogenous element representing the adjustment of output which entrepreneurs will make to situations of excess supply or excess demand, and α is a positive coefficient whose size measures the readiness of entrepreneurs to vary their output away from its secular trend for this purpose. Whether this adjustment occurs through the medium of the price mechanism or in some other way we need not now decide. All that we postulate is that if excess demand exists, entrepreneurs speed up the rate of growth of output above the secular rate A, and if demand is deficient they keep it below. Combining this explicit statement of the supply conditions (3) with Hicks' description of demand, his system becomes:

$$\left.\begin{aligned} D_t &= A_t + cY_{t-1} + v(Y_{t-1} - Y_{t-2}) \\ Y_t &= (1 + A)Y_{t-1} + \alpha(D_t - Y_t) \end{aligned}\right\} . \quad . \quad . \quad . \quad (4)$$

Evidently Hicks' special supply assumption is that

$$\alpha = \infty ;$$

for in this case the second equation reduces to

$$Y_t = D_t$$

and substituting for D_t in the first equation we obtain Hicks' description of the actual behaviour of output, (2) above, which originally aroused our curiosity.

It appears, then, that implied in Hicks' argument is the assumption that

[1] See *A Contribution to the Theory of the Trade Cycle*, Mathematical Appendix, p. 183, equation 17.1.

output responds to an emerging disequilibrium between demand and supply with such alacrity that it eliminates the disequilibrium entirely within the period in which it appears. This prompts the question whether anything is known empirically which would enable us to judge whether this type of response is in normal circumstances [1] likely. We cannot attempt any comprehensive review of the evidence, but there is some which can be adduced in favour of Hicks' implied view. In the first place, a number of statistical cost studies have been done, of which it has been said that " one striking finding . . . has been the apparent linearity, over wide ranges of output, of the short-run total production cost functions of observed firms, implying a constant short-run average variable and marginal cost except at extremely small or large outputs." [2] Where the short-run marginal-cost curve is flat, entrepreneurs whose aim is to maximise profits will adjust their output to the full extent required by lateral movements of the demand curve facing them, without any need to quote a different price. (This is illustrated in Fig. 1.) For those who prefer their entrepreneurs decontaminated of the suspicion that their paramount aim is to maximise profits, we can offer the evidence of Messrs. Hall and Hitch's witnesses and their " full cost principle." [3] The business-men questioned in this study displayed a reluctance to alter the price they had fixed for their product on the basis of full cost, and a willingness in the short run to sell whatever might be demanded at that price, accepting with a good grace whatever variations that might involve in their profit margin compared with its expected level. One suspects, however, that stoicism such as this must be contingent upon the costliness of meeting fluctuations in demand. Under the conditions of Fig. 2, for example, where short-run average costs rise steeply either side of their minimum, not only unexpectedly low profits but actual losses would be experienced if comparatively small movements in the quantity demanded at each price were fully met. It could still be true that as a matter of fact entrepreneurs were willing for other reasons to bear such losses. But adherence to the " full-cost principle " strongly suggests that the conditions of production must be very different from those of Fig. 2 and such as to make it a matter of indifference, as far as the profit margin is concerned, what output is produced; must be in other words conditions approaching constancy of the short-run average cost curve. Thus the " full-cost principle " seems to support the statistical findings already mentioned, and both sets of evidence appear favourable to Hicks' assumption that in the short run supply accommodates itself freely to demand.

[1] That is to say, before the cycle has really got under way. Once this has happened we should expect to find supply reactions changing. For example, as the boom progressed, supply would become more and more inflexible. This is allowed for by Hicks, and is an integral part of his explanation of the downturn. But we are concerned now with the question whether, with entrepreneurs behaving normally, the system is nevertheless unstable.

[2] *A Survey of Contemporary Economics*, Vol. 1 (ed. Howard Ellis), pp. 140–1. The contributor of this chapter on Price and Production Policies, Joe S. Bain, also claims that " the better cost analyses . . . have defended their findings rather well " against statistical criticisms.

[3] R. L. Hall and C. J. Hitch, " Price Theory and Business Behaviour," *Oxford Economic Papers*, no. 2, May 1939, pp. 12–45.

But when we study this supply assumption, not for its factual validity, but in the context of Hicks' complete model, we are involved in a serious logical difficulty. It is curious to find it in the same bed as the acceleration principle. For the acceleration principle itself has supply implications of the opposite kind. It tells us that entrepreneurs make their investment decisions in such a way as to preserve a constant ratio between capital and output. Why should they be so much concerned about this ratio? Presumably because their capital equipment has a certain closely defined capacity, and to operate at any other ratio (if indeed it is technically possible) seriously inflates their costs. Their short-run cost situation presents a picture of a very steep-sided and narrow-based U, like Fig. 2. Increases in the output of their existing plant are costly, and only if disequilibrium between supply and demand involves a substantial increase in price will they be worth while.

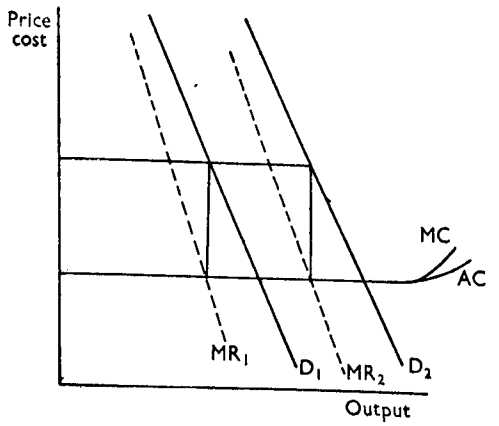


FIG. 1

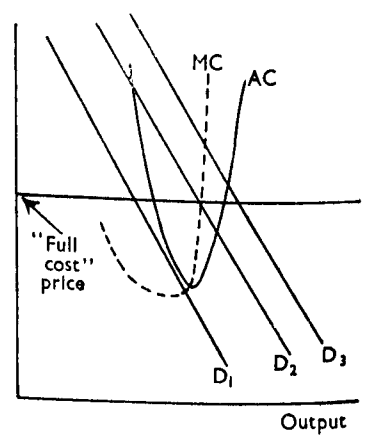


FIG. 2

More output requires more plant; and whatever may be the case in the long run when plant has been expanded to the appropriate size, in the short run output is very inelastic. Thus the acceleration principle carries its own armoury of supply assumptions. It is therefore very odd to find side by side with it in the same theory an assumption about supply which appears to involve very different considerations; an assumption that supply is extremely elastic in the short period, accommodating itself exactly to demand by the time the period is finished. In one place we find the notion that supply in the short period will respond only if there is a large price rise to induce entrepreneurs to bear the formidable costs of overworking capacity; [1] in another the idea that supply in the short period responds fully to demand, and consequently obviates any necessity for a price rise. Inadvertently, through failure to make the supply side of his theory explicit, Hicks has fallen into inconsistency. His theory of investment demand, the accelerator theory, is based

[1] To the extent that price rises are relied upon, in the conditions of inflexible capacity assumed by the acceleration principle, to achieve short-run equilibrium between demand and supply, the assumption of a constant c must come under suspicion.

upon a view of the conditions under which production is taking place which is implicitly denied in the process of arriving at the " basic equation " (2) purporting to describe the path of output.

Let us examine Hicks' supply assumption a little further. There is no reason why we should not at the same time assume perfect elasticity of supply in the *long run* and (as the acceleration principle demands) an exceedingly low elasticity in the short. Once enough time has elapsed for investment or disinvestment to restore the " correct " relation between capacity and output, it may be possible for entrepreneurs to meet a higher level of demand without any rise in average or marginal costs; there may be constant returns to scale. But Hicks' assumption obviously relates to the short run.[1] There are, however, other circumstances in which it might claim consistency with the acceleration principle; and these are the circumstances of the very short run. In the very short run changes in demand may be met by running down or accumulating stocks. Let us here make the distinction, which we have hitherto left blurred, between output and supplies. A firm produces a certain output; but this may differ from the amount that it supplies to the market to the extent that it is prepared to accommodate a shortage by relinquishing stocks or a glut by accumulating them. Supplies (Y_t') and output (Y_t) will be related to each other thus:

$$Y_t' = Y_t + u_t$$

where u_t represents the accommodating [2] accumulation or decumulation of stocks. Having introduced this distinction, it becomes possible to say that although output may be as inflexible as the acceleration principle assumes, supplies may still have infinite elasticity through the medium of changes in stocks. Explicitly, our output and supply equations may take the form:

$$Y_t = (1 + A)Y_{t-1} + \alpha(D_t - Y_t)$$
$$u_t = \beta(D_t - Y_t')$$

and to make the assumption that $\beta = \infty$ need not involve a clash with the acceleration principle. But although the introduction of stock changes embellishes the model, it does not resolve the fundamental difficulty. We must, after all, make some assumption about the way in which output as well as supply responds to a disequilibrium; and if we are committed already to the acceleration principle, we are compelled to assume that output is comparatively unresponsive, or, in the symbols of (3) above, that α is small.

It is possible, however, that we can resolve the apparent inconsistency between Hicks' supply assumption and the acceleration principle if we interpret the latter to mean that entrepreneurs keep a constant ratio, not between output and capital *in use*, but between output and *total* capital; and

[1] Perfect long-run adjustment of supply to demand would be expressed by a supply equation of the type $Y_{t+n} = D_t$, where n represents the gestation period of the requisite additional capital. But this would not lead us, combined with (1), to Hicks' " basic equation."

[2] As distinguished from its autonomous counterpart, *i.e.*, stockbuilding (positive or negative) decided on independently of the emergence of market disequilibria.

that these two differ because they like to keep some reserve capacity.[1] If w suppose this, we can at the same time maintain without inconsistency:

(*a*) that supply accommodates itself fully to demand in the short ru by using up reserve capacity; and

(*b*) that investment demand behaves according to the acceleratio principle in the sense that total capital is expanded so as to preserve i original ratio to output and the original degree of reserve capacity.

This line of escape from the apparent inconsistency between the Hicksia supply assumption and the acceleration principle depends upon the concep of reserve capacity. There is some evidence that this is something tha entrepreneurs like to have.[2] But one suspects that it is something which the like to have, not for its own sake, but for use on occasions. One such occasio would be a sudden upsurge of demand. Reserve capacity now comes int its own; it smartly supplies the goods and saves, perhaps enhances, th entrepreneur's reputation. But does this mean that the entrepreneur is no worried by the fact that he has no longer any reserve capacity, and plans t expand his plant in order to restore the original ratio of output to tot capital and thereby the original percentage of reserve capacity? To behav in other words, according to the acceleration principle as now interpreted The answer to this depends upon the considerations which influence th entrepreneur's decision why and how much reserve should be held. To th extent that the reserve is designed to cope with fluctuations in demand of th type normally experienced in the cycle, there is no reason why the fact that is successfully doing so should set in motion investment plans intended t restore the normal ratio of capital to output, and thereby the normal pe centage of reserve capacity. The reserve is in this case a form of insuranc whose purpose is to obviate the need to adjust capital when output change It is therefore a reason why entrepreneurs should *not* behave according to th acceleration principle. It may be that if there were no reserve, it would b necessary for them so to behave; and this may be a reason why they a anxious to keep one. But once they have decided to keep a reserve capacity capable of meeting normal fluctuations in demand, they have r need to make short-run adjustments of their capital stock, and the acceler tion principle disappears. Thus to maintain at the same time that entr preneurs are able from their reserve capacity fully to meet changes in deman and that they frame their investment plans accelerator-wise for the purpo of restoring the reserve, seems to envisage that the purpose for which th reserve is held is something other than that of accommodating norm fluctuations. It seems to imply that when a boom gets under way and brin the reserve capacity into operation, entrepreneurs do not congratula themselves that the expected is now happening, but are anxious lest th unexpected should catch them without room to manœuvre. This giv them a reason to re-create the reserve which has been swallowed up in mee

[1] I owe this point to Mr. Worswick.

[2] See J. Steindl, *Maturity and Stagnation in American Capitalism*, pp. 9–14.

ing the increased demand, and so to be obedient to the acceleration principle. If, then, we are to use the "reserve capacity" argument to remove the inconsistency suspected of Hicks' model, we have to assert that the purpose for which the reserve is held is that of meeting unforeseen and abnormal changes in demand, whose possibility is always present at every phase of the cycle.[1] The argument would amount to the following propositions:

(*a*) output is elastic in the short run because reserve capacity is available;

(*b*) but this reserve capacity is something which entrepreneurs *always* wish to have;

(*c*) consequently the use of reserve capacity in meeting short-run changes in demand is not something which entrepreneurs are willing to accept as the justification for its existence, but leads to investment intended to restore the original percentage of reserve capacity.

Thus it is logically possible to achieve consistency between Hicks' special supply assumption and the acceleration principle. But it is quite a struggle, and by the time it has been won the system is in danger of becoming almost Ptolemaic. A simpler course would be to relax his assumptions, and this will shortly be done.

Thus far we have shown that Hicks' model, although explicitly stated on the demand side, makes certain implicit assumptions about supply. Let us now in place of Hicks' original model consider one which includes explicit assumptions about supply:

$$\left.\begin{array}{ll} \text{(i) Demand equation:} & D_t = A_t + cY_{t-1} + v(Y_{t-1} - Y_{t-2}) \\ \text{(ii) Supply equations:} & Y_t' = Y_t + u_t \\ & Y_t = (1 + A)Y_{t-1} + \alpha(D_t - Y_t) \\ & u_t = \beta(D_t - Y_t') \end{array}\right\} \quad . \quad . \quad (5)$$

As before, Y_t' represents supplies, Y_t represents output and u_t represents the accommodating movement of stocks which links the two. Hicks' special case is that in which both β and α are equal to infinity, the latter (but not the former) being an assumption which takes some reconciling with the accelera- tion principle. But once the nature of Hicks' assumption is clear, we are led into some confusion in the subsequent stages of his analysis. Having obtained the actual path of the system, which he does by substituting his special supply assumption $Y_t = D_t$ into the demand equation of (5) above, so as to find that:

$$Y_t = A_t + cY_{t-1} + v(Y_{t-1} - Y_{t-2})$$

he casts around for some equilibrium path with which to compare it; and he yields to the temptation to identify equilibrium with a condition of steady growth. But the special supply assumption that he makes means that the

[1] Among such abnormal changes we would include, of course, changes occurring during the normal course of the cycle, which are nevertheless abnormally large or small compared to what would be expected at that particular phase of the cycle.

system is in equilibrium *all the time*, whether it is following a path of steady growth or not, in the sense that in each period supply adjusts itself to demand. Its actual path *is* an equilibrium path. Demand and supply are equal all the time because this is enforced by the supply conditions assumed to obtain. Under these conditions, therefore, it is meaningless to inquire into " the possibility of equilibrium "; disequilibrium is impossible.[1] What, then, is in Hicks' mind when he makes the inquiry? The question that he should really be asking is, " Under what conditions would a system, which always maintains itself in equilibrium, move along a path of steady growth? " Given his supply assumption, it is quite improper for Hicks to identify equilibrium with a condition of steady growth and to deny the description to other modes of the system's behaviour. But once we abandon this assumption it is perfectly proper to inquire into the possibility of equilibrium; for disequilibrium is no longer ruled out.

Let us, then, make this inquiry of our system (5). We will first make the simplifying assumption that $\beta = \infty$.[2] If there is equilibrium, the system reduces, by setting Y_t equal to D_t, to:

$$Y_t = A_t + cY_{t-1} + v(Y_{t-1} - Y_{t-2})$$
$$Y_t = (1 + A)Y_{t-1}$$

These are the conditions of equilibrium. How do we interpret them? The second condition signifies that if the system is in equilibrium it must be following some path of steady growth.[3] The first condition is more complex.

[1] Of course we cannot deny Hicks the right to use the term equilibrium to mean something other than that supply equals demand. He writes: " I think that my use of this term is open to criticism, though I would not put the criticism in just the way you do. Since I treated $D = y$ always, I didn't need to use ' equilibrium ' in the supply and demand sense. Consequently I had it free for other uses. There is continuity between these uses and some of the regular uses; the stationary state is still an equilibrium even in my sense. And there is continuity with the use of the term in Newtonian dynamics. Nevertheless, I have often wished that I had used some other word."

[2] It is useful to make this assumption, and retain it throughout the rest of this paper, for another reason. Since our purpose is to examine Hicks' system, we must retain the acceleration principle. But if we do this, we must also assume that output is inflexible in the short run. There then arises the question: " If output will not respond fully to demand, what is the mechanism by which the two are equated in the short run? " If we answer " flexible prices," we can hardly continue to assume a constant c. But if we allow the short-run disequilibrium to be fully absorbed by accommodating stock changes (*i.e.*, let $\beta = \infty$), we are relieved from taking account of any disturbances through the price system. Or are we forgetting that stocks have to be financed, so that their accommodating variations may disturb interest rates? I do not think that this need worry us. Since interest rates are entirely immobile in Hicks' theory, he must have already paralysed them with the assumption that the supply of money is also infinitely elastic.

[3] But observe that the converse is not true, *i.e.*, it is not required that if the system is following a path of steady growth, it must be in equilibrium. If we solve the system (5) for the Ys, we find:

$$Y_t = \left[\frac{(1 + A) + \alpha(c + v)}{(1 + \alpha)}\right] Y_{t-1} - \left[\frac{\alpha v}{(1 + \alpha)}\right] Y_{t-2} + \frac{\alpha}{(1 + \alpha)} A_t$$

If $\alpha = 0$ (as perhaps in a fully planned economy) the system would move along the path

$$Y_t = (1 + A)Y_{t-1},$$

but it would not necessarily be in equilibrium.

y substitution from the second condition it can be reduced to:

$$A_t = Y_t\left(1 - \frac{c + v}{1 + A} + \frac{v}{(1 + A)^2}\right)$$

his tells us that equilibrium requires that autonomous investment of each eriod should be a constant fraction of the output of that period; or, since quilibrium requires that output should be expanding at a steady rate, it also equires that autonomous investment should be expanding at the same rate. ut this is not a sufficient condition of equilibrium. For let us make the ssumption that what is required of autonomous investment is actually so; n assumption that we shall cling to from now on. Supposing, then that it is fact that:

$$A_t = (1 + A)A_{t-1}$$

Ve can now reduce the first condition of equilibrium still further to

$$\frac{A_0}{Y_0} = \left(1 - \frac{c + v}{1 + A} + \frac{v}{(1 + A)^2}\right) \quad . \quad . \quad . \quad . \quad (6)$$

Ve might now be content to say that this tells us that if there is to be equilibium there must be a certain relationship between the component parts f the system. But we must probe this relationship further; for there are wo ways in which we can interpret it. On the one hand we can suppose hat there is a particular desired rate of growth prevalent within the system, a ertain value of A being adopted. In this case the condition (6) tells us what he structure of the system must be like if this rate of growth which it is ttempting to put into effect is to lead it along a path of continuous equilibium and, therefore, of steady progress. For example, if $(1 + A)$ is 1·05, hen the system will progress in equilibrium at a 5% rate of growth if (among ther possibilities) $A_0 = 0{\cdot}1Y_0$, $c = 0{\cdot}8$ and $v = 3{\cdot}045$. On the other hand, ve can observe the actual structure of the system, making measurements of A_0/Y_0, c and v, and then use (6) to determine what rate of growth, A, the ystem would have to be attempting if it were to make steady progress in ontinuous equilibrium. For example, if we observed values of 0·1 for A_0/Y_0, 0·8 for c and 2 for v, the system would have either to try to double itself ach period or to grow by slightly over 11% in order to preserve equilibrium. Now the most satisfactory procedure, and the one which is preferred by Hicks, s the first.[1] What we are seeking is some datum line against which we can ompare the actual movement of the system. On the second procedure, we earch for a rate of growth which would preserve equilibrium within the ctual structure of the system, an equilibrium rate of growth. The difficulty bout this procedure is that the structure of the system as it is may make the quilibrium rate of growth fantastically unrealistic, or may even refuse to llow one to exist at all.[2] There is little point in attempting to compare the ctual movement of the system with a path which may not be open to it at all

[1] Contribution to the *Theory of the Trade Cycle*, appendix to Chap. V, p. 184.

[2] In other words the equation (6) may have no real roots. See Alexander, " The Accelerator as a Generator of Steady Growth," *Q.J.E.*, May 1949.

or which in the real world it could never hope to attain. Following the first procedure, we can begin from a path which the system is actually attempting to follow, and study its aberrations from there, confident that these will occur unless the system is of a very special type. But we cannot really describe the desired path which the system attempts to follow as an equilibrium path. It is true that it could be a path along which equilibrium was continually realised, if the structure of the system were of a certain kind (if there were a certain relationship between c, v and A_0/Y_0), which if our theory is to be interesting we must assume it is not. We can, in fact, distinguish three paths. First, there is the path which the system actually follows, meeting and reacting to disequilibria, a path which can be traced by reducing the system of equations set out in (5) to the single difference equation:

$$Y_t = \left[\frac{(1+A)+\alpha(c+v)}{(1+\alpha)}\right] Y_{t-1} - \frac{\alpha v}{(1+\alpha)} Y_{t-2} + \frac{\alpha}{(1+\alpha)} A_t \quad . \quad (7)$$

Secondly, there is the path which the system is attempting to follow, or what may conveniently be called the desired rate of growth, described by:

$$Y_t = (1+A)Y_{t-1}$$

Thirdly, there is the path which the system would have to follow if it were to maintain itself continuously in equilibrium. It is the last of these possible paths which most obviously deserves the title of the equilibrium rate of growth. But for our purposes it is a mere *curiosum*. What should interest us is the comparison between the first and the second, between the path the system actually follows and that which it attempts to follow. Evidently this is also what interests Hicks [1]; but he confuses the proceedings by attaching to the latter path the label of equilibrium and thus misrepresenting its status.

This threefold distinction between the actual path, the desired path and the equilibrium path is of particular importance in the understanding of the mechanism by which the system turns down from full employment and recovers from a slump. A very important feature of Hicks' system are the restraints imposed upon its free movement, on the one hand, by the full employment ceiling and, on the other, by the limited rate at which surplus capital equipment is retired. He argues that when in the course of the boom the system hits the full-employment ceiling, it can no longer grow at a rate which will generate new capital requirements large enough to absorb the savings forthcoming at the boom level of income; and this produces the down-swing. Let us examine this mechanism in the light of our expanded model (5). Making the assumption that β is infinite, we find the actual, unrestrained path of the system as in (7). This we must compare with the desired path. Let us denote points along the desired path by $\overline{Y}$, so that we have:

$$\overline{Y}_t = (1+A)\overline{Y}_{t-1} = (1+A)^2\overline{Y}_{t-2} = \ldots = (1+A)^n\overline{Y}_{t-n} \quad . \quad (8)$$

[1] Hicks, *op. cit.*, p. 184: ". . . it is much more intelligible to suppose that g is already determined from the autonomous rate of growth of A_n."

For the ratio of actual output at time t to desired output at time t, write y_t. Thus dividing both sides of (7) by $\overline{Y}_t$, we find:

$$y_t - \left[\frac{(1+A)+\alpha(c+v)}{(1+\alpha)(1+A)}\right] y_{t-1} + \left[\frac{\alpha v}{(1+A)^2(1+\alpha)}\right] y_{t-2} = \frac{\alpha}{1+\alpha}\frac{A_t}{\overline{Y}_t} \quad . \quad . \quad . \quad (9)$$

This equation shows the proportionate deviation at any time of the actual from the desired path of the system; if $y_t = 1$, the system is at time t on the desired path. Now the situation which at the moment interests us is that which ensues upon the system's having struck the full-employment ceiling. At this point actual output is considerably in excess of what it would have been had the system held to its desired path. Let the ratio of actual to desired output at the moment when the ceiling was struck be k, k being in this case greater than one. If we assume that the maximum rate at which output can increase along the ceiling is the desired rate A, then as long as the system is moving along the ceiling, it exhibits the same ratio k to its desired path. Equation (9) enables us to determine whether, when the system has been moving along the ceiling with output k times the desired level, it will of its own volition turn down. If $y_{t-1} = y_{t-2} = k$, what will y_t be? From (9):

$$\begin{aligned} y_t &= k\left(\frac{(1+A)+\alpha(c+v)}{(1+\alpha)(1+A)} - \frac{\alpha v}{(1+\alpha)(1+A)^2}\right) + \frac{\alpha}{(1+\alpha)}\frac{A_t}{\overline{Y}_t} \\ &= k + \frac{\alpha}{(1+\alpha)}\left[\frac{A_t}{\overline{Y}_t} - k\left(1 - \frac{c+v}{(1+A)} + \frac{v}{(1+A)^2}\right)\right] \quad . \quad . \quad (10) \end{aligned}$$

If the square bracket is positive, the impulse of the system at time t, were it unrestrained, would be to burst through the full-employment ceiling; but it will be prevented from doing this and will continue, not along the path indicated by (10), but along the ceiling.[1] But if k is large, the square bracket will be negative, and at time t the ratio of actual output to its desired path will be somewhat less than k. The downturn will have arrived. But it is possible that it may never arrive. Suppose that $A_t/\overline{Y}_t$, the proportion of desired output absorbed by autonomous investment, greatly exceeds [2]

$$\left(1 - \frac{c+v}{(1+A)} + \frac{v}{(1+A)^2}\right)$$

Then it may be that the full-employment value of k is still not large enough to make the square bracket in (10) anything other than positive; and if it remains positive, actual output must continue along the full-employment ceiling. Our general expectation that a downturn will occur, based on the fact that at full employment k is at its highest value, is subject to the qualification

[1] Or formally speaking, along the path indicated by (10) with α reduced to zero.

[2] Equality between $A_t/\overline{Y}_t$ and $\left(1 - \frac{c+v}{(1+A)} + \frac{v}{(1+A)^2}\right)$ constitutes the special case in which the desired path is also an equilibrium path.

tion that the system might possess so much upward bias, in the sense that $A_t/\overline{Y}_t$ greatly exceeded

$$\left(1 - \frac{c+v}{(1+A)} + \frac{v}{(1+A)^2}\right)$$

that it bumped indefinitely along the full-employment ceiling and never bounced off it towards the floor. The mechanism of the upswing can also be studied in (10). When the system is moving along the floor, k is less than one; and this makes it likely that the square bracket in (10) will be positive and that output will rise above the floor to begin the recovery. *A fortiori*, this must happen if the system possesses an upward bias in the sense defined above. But if it has a downward bias, our expectation of recovery will not necessarily be fulfilled. For even a small value of k may leave the square bracket of (10) negative and the system irretrievably depressed. In the general case, where the values of $A_t/\overline{Y}_t$ and of

$$\left(1 - \frac{c+v}{(1+A)} + \frac{v}{(1+A)^2}\right)$$

are not very greatly different, we can be confident that the Hicksian restraints on the free movement of the system will successfully perform their intended function of providing it with its turning points. In other words, the movement of k from its low slump value to its high value at full employment (and vice versa) will be enough to change the square bracket of (10) from positive to negative (and back again). But the distinction we have made between the desired path of the system and its equilibrium path has brought to light the possibility of booms and slumps which have no inclination to reverse themselves but are happy to bump chronically along the ceiling or the floor.

We began our examination of Hicks' theory by bringing out his special supply assumption and questioning its consistency with other parts of his model. We then found that the adoption of this special supply assumption raised terminological difficulties in later stages of his analysis. It led him to ask a meaningless question about the possibility of equilibrium and then to apply the term " equilibrium rate of growth " to a path which could have the property of equilibrium only under very special circumstances. This confused use of terms arose from his failure to make an explicit statement of the supply side of his model. This we have done in (5); and it remains to test the properties of the expanded model in its reduced form (9). Let us remind ourselves that the mainspring of Hicks' theory is the tendency of his system to exhibit explosive fluctuations. Will these occur, and under what conditions, in the expanded version of it?

Consider first the homogeneous difference equation obtained by setting the left-hand side of (9) equal to zero. It is exactly similar in form to Hicks' own " basic equation ":

$$y_t - (c+v)y_{t-1} + vy_{t-2} = 0$$

and the key element of this expression is the coefficient of y_{t-2}. If the coefficient of y_{t-2} exceeds unity in a difference equation of this form, the ys

will exhibit explosive fluctuations, or in the extreme case unfluctuating explosion. It is evident that the constant term on the right-hand side of (9) cannot qualify this condition for explosive behaviour.[1] Thus the expanded version of Hicks' system, with supply assumptions made explicit, will behave according to plan as long as:

$$\frac{\alpha v}{(1+\alpha)(1+A)^2} > 1$$

Now in the original version of Hicks' model explosive fluctuations merely required that v should exceed unity; and it seemed almost certain that this would be the case. But in our expanded version, to the extent that the acceleration principle suggests that output in the short period is comparatively unresponsive to the existence of disequilibrium between supply and demand, we cannot be so certain that the condition for explosive fluctuations will be present. If a large v implies a small α, we cannot be at all confident that the coefficient of y_{t-2} in our equation (9) will exceed unity. It is not, of course, impossible that it should; but the mainspring of the system may be a good deal less resilient than was thought. The chances are as great that it will run down altogether as that its natural violence will hurl it against the ceiling and bounce it down to the floor.

It seems, then, that in denying Hicks' system his special supply assumption, we may also deprive it of its essential kick. But we cannot leave matters there. For we have been guilty of an illogicality. Whether or not we are right in suggesting that the acceleration principle implies that output is unresponsive in the short run, there will sometimes be circumstances in which this is the case, in which it is difficult to adjust output without adjusting capital. To cover these circumstances we ought to frame the accelerator in such a way as to make the investment component of aggregate demand depend, not upon the way in which output actually changes, but upon the way in which entrepreneurs would like it to change if it were possible. Writing I_t for the demand for net investment at time t, what we have done hitherto is to suppose:

$$I_t = v(Y_{t-1} - Y_{t-2}) \quad . \quad . \quad . \quad . \quad . \quad . \quad (11)$$

in other words, to suppose that it depends upon an actual change in output. But if the actual change in output has been held down to a low figure because

[1] The solution of the non-homogeneous difference equation (9) will have the form

$$y_t = y_0\left(\sqrt{\frac{\alpha v}{(1+\alpha)(1+A)}}\right)^t \frac{\cos(t\theta+\epsilon)}{\cos\epsilon} + K$$

where K is a particular solution. In this case

$$K = y_0 \frac{A_0}{\overline{Y}_0} \frac{(1+A)^2}{(1+A)^2 - (c+v)(1+A) + v}$$

The maximum value that y can reach in the course of each cycle is:

$$y_t(\text{max.}) = \frac{y_0}{\cos\epsilon}\left(\sqrt{\frac{\alpha v}{(1+\alpha)(1+A)}}\right)^t + K$$

As long as the expression in the square root (the coefficient of y_{t-2}) exceeds unity, this maximum will increase with time, *i.e.*, at the top of each successive boom output will be proportionately farther from the desired path.

it is difficult to achieve much without adding to capital, it is absurd to suppose that the demand for capital is also kept low by the same influence. Because output has *not* been able to respond, the demand for capital will be intense. It will be more logical if we make the latter depend instead upon how output could have responded if the necessary capital had been there; in other words, upon the change in aggregate demand. In place of (11) we had better write[1]:

$$I_t = v(D_{t-1} - D_{t-2}) \quad . \quad . \quad . \quad . \quad . \quad . \quad (12)$$

At the same time it will be convenient to make a second amendment to our expanded system as stated in (5). There lurks within the supply equation:

$$Y_t = (1 + A)Y_{t-1} + \alpha(D_t - Y_t)$$

an instantaneous component which seems out of place among the lags which hold sway everywhere else. Output in a certain period is determined partly by what happens within that period. Let us make the system lagged throughout and suppose that output in a certain period is determined only by what has already happened in a previous period. Thus the supply equation becomes:

$$Y_t = (1 + A)Y_{t-1} + \alpha(D_{t-1} - Y_{t-1}) \quad . \quad . \quad . \quad (13)$$

But now that we have introduced a lag into the adjustment of output to demand, a perfect adjustment, such as we have accused Hicks of assuming to take place, no longer requires an infinite α. In period t, with our new supply equation (13), the size of the disequilibrium resulting from time $t - 1$, which must now be met, is known before period ts output is determined. All that is required for perfect adjustment of output to demand is that output should be adjusted by the known finite amount that is needed. Perfect adjustment will be represented by $\alpha = (1 + A)$, in which case we have from (13):

$$\frac{Y_t}{(1 + A)} = D_{t-1}$$

that is, output in the current period, discounted for the trend factor which also influences it, accommodates itself exactly to the demand of the previous period. If we interpret perfect adjustment in this way, we can no longer pretend that (13) is a general form of Hicks' special supply assumption; for no finite value of α can reduce (13) to the Hicksian proposition that $Y_t = D_t$. But (13) is a formulation which should not be repugnant to Hicks. Moreover, it has the advantage that it enables us to take account of conditions under which the supply adjustment is more than perfect as well as less, *i.e.*, when

$$\frac{Y_t}{(1 + A)} > D_{t-1}$$

[1] This formulation meets also the circumstances in which (despite the acceleration principle) output can respond in the short period; for then the Ys and the Ds do not greatly differ.

Setting out our expanded system complete with the two amendments suggested:

$$\left.\begin{aligned} D_t &= A_t + cY_{t-1} + v(D_{t-1} - D_{t-2}) \\ Y_t &= (1 + A)Y_{t-1} + \alpha(D_{t-1} - Y_{t-1}) \end{aligned}\right\} \quad . \quad . \quad . \quad (14)$$

we can, I think, still confidently describe it as Hicksian. Our purpose now is to study the properties of this expanded and amended Hicksian model, and in particular its propensity for explosive oscillation; and to see how it is influenced by different conditions of short-period supply as described by α.

The system in (14) is easily manipulated into a difference equation:

$$Y_t - [(1 + A) - \alpha + v]Y_{t-1} + [v(1 + A) - \alpha(c + v) + v]Y_{t-2} - [v(1 + A) - \alpha v]Y_{t-2} = \alpha A_{t-1}$$

and dividing both sides by $\overline{Y}_t$, desired output, into a difference equation in the ys:

$$y_t - \left[\frac{(1 + A) - \alpha + v}{(1 + A)}\right]y_{t-1} + \left[\frac{v(1 + A) - \alpha(c + v) + v}{(1 + A)^2}\right]y_{t-2} - \left[\frac{v(1 + A) - \alpha v}{(1 + A)^3}\right]y_{t-3} = \frac{\alpha}{(1 + A)}\frac{A_0}{\overline{Y}_0} \quad . \quad . \quad . \quad (15)$$

The solution of this equation is presented and discussed in the Appendices; but the influence of the short-period supply factor on the behaviour of the system is best studied in the following table. Here there are computed for various values of v and α, and assuming throughout that $c = 0{\cdot}8$ and $A = 0{\cdot}03$, the moduli of the complex roots of equation (15). For our purpose the significance of the modulus is that when it exceeds unity the equation will exhibit explosive oscillations as required in a Hicksian system; and when it is less than unity, the oscillations will progressively damp themselves out and the system will cease to be Hicksian. The results in the table are expressed graphically in the diagram. No entry is made in the column of the table, where $v = 3$ for values of α of 0·8 and above, because in these circumstances the system explodes without oscillation; and none is made in the diagram where $v = 1{\cdot}2$ for values of α in the neighbourhood of 1, because here the system converges without oscillation on a particular value of y. Values of α greater than 1·5 have not been shown because soon after α has advanced beyond this level (and in all cases when it has advanced to 2) it subjects the system to period-to-period oscillations of increasing violence, and it ceases to be of interest as a model of the trade cycle as we know it.

Reasons are advanced in Appendix I for believing (although I have not been able to show this conclusively) that the results of the table are general. What are these results? Most important is the fact that if the system is to be explosive whatever the conditions of short-period supply (whatever α), then v must certainly be greater than two. Values of v between one and two which were sufficient to explode Hicks' original model will in our model damp it out, except for extreme values of α. It will clear the ground if at this point

we say something about these extreme values. First of all, consider the explosiveness which seems to be inherent in very low values of α. The

TABLE

The Influence of α on the Modulus of (15)

	α	$v = 1{\cdot}2$	$v = 1{\cdot}5$	$v = 2{\cdot}0$	$v = 2{\cdot}5$	$v = 3{\cdot}0$
More than perfect adjustment	1·5	0·81	0·94	1·14	1·31	—
	1·2	0·72	0·87	1·09	1·28	—
Perfect adjustment	1·03	0·59	0·80	1·05	1·26	—
Less than perfect adjustment	0·8	0·56	0·67	0·98	1·22	—
	0·6	0·74	0·83	1·01	1·20	1·39
	0·4	0·86	0·97	1·13	1·26	1·44
	0·2	0·97	1·09	1·26	1·41	1·54
	0·0	1·06	1·19	1·37	1·53	1·68

($A = 0{\cdot}03$; $c = 0{\cdot}8$).

movement of our model is determined by a weighted average of the real root, which is less than unity, and the complex roots; [1] and when α is low the weight attached to the real root is large and the weight attached to the complex roots is small.[2] Consequently the system is dominated in the early stages of its movement by the real root of less than unity, and will begin to exhibit the explosiveness inherent in its complex roots (whose modulus is made greater than unity by a low α) only after enough time has elapsed for the real root to damp itself into insignificance. The explosion, although it will occur eventually, will be long delayed; and for this reason the instability which our system is capable of exhibiting in the special case of a low α is not very interesting. For the long delay before the instability becomes significant must call in question the constant coefficients which we have used throughout and which are tolerable only if they can be shown to produce a rapid explosion. If we are trying to show, then, that the cycle is a product of the inherent explosiveness of the economic system, penned in by external restraints, we shall not be much excited by an explosion which requires such a long fuse to set it off as is necessary when α is low. We should regard such an explosion as an isolated phenomenon produced by special circumstances rather than as one which is generally interesting.

We may now turn in the opposite direction to the high values of α which also appear to increase the willingness of the system to explode. But again we must look carefully at the nature of the explosion. When α has reached a value of 2 the system will be subject to fluctuations of increasing amplitude,

[1] The general solution (see Appendices) has the form:

$$y_t = B + \left(\frac{z \cdot \cos(\theta + \epsilon) - \cos\epsilon}{z \cdot \cos(\theta + \epsilon) - x_1 \cos}\right) x_1{}^t + \left(\frac{(1 - x_1)}{z \cdot \cos(\theta + \epsilon) - x_1 \cos\epsilon}\right) z^t \cos(t\theta + \epsilon)$$

where B is a particular solution, x_1 is the real root of less than unity and z is the modulus, which is a function of x_1.

[2] When α is zero the latter weight reduces to zero, so that (as we should expect when output cannot respond at all to a disequilibrium between supply and demand) no fluctuations occur.

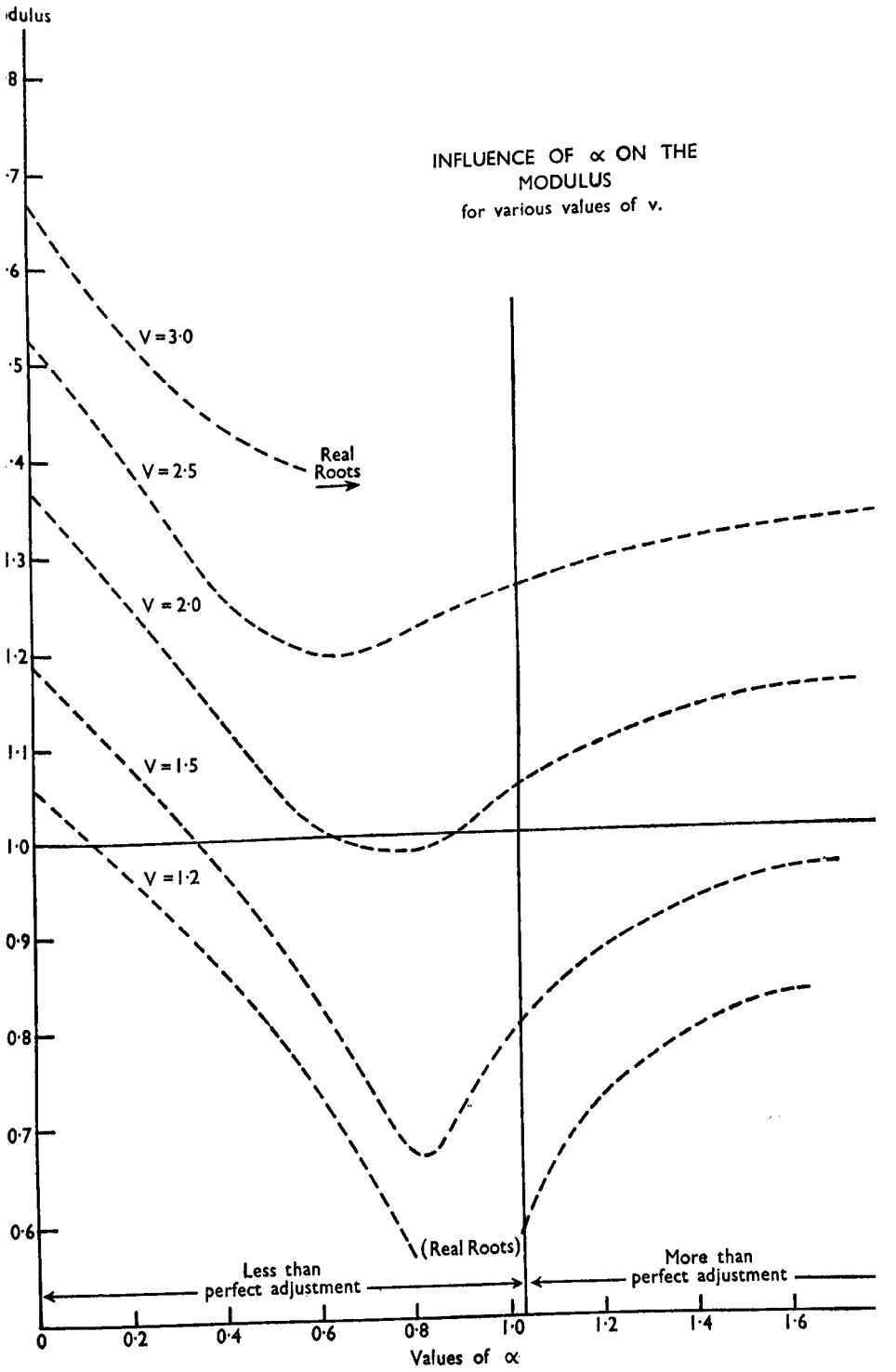


DIAGRAM A

not over a number of periods, but from one period to the next.[1] This i another type of behaviour which is of little interest to us if we are seeking t reproduce in our model the cycle as we know it. Before this stage is reached, as we advance α upwards from 1·03, period-to-period oscillations occur, bu eventually damp themselves out as time goes on. However, the higher becomes, the more the system is dominated by these short-period oscillation (damped as they may be), and the less convincingly will it exhibit explosive ness of the type required.[3]

It appears, then, that of the values of α shown, it is the middle ones whic will produce the type of behaviour which is likely to interest most that schoc of cycle theories built upon the idea of a natural instability in the economi system. The extreme values of α produce explosions of a type which eithe appear only after long delay (as when α is low) or are unduly complicated b side-effects (as when α is high). But we cannot be confident that the middl values of α will give us an explosion at all. Whereas it was not difficult t accept the requirement of Hicks' original model that v should exceed unit in order that the system be unstable, we should be under some strain t swallow the requirement of our reformulated Hicksian model that, if it is t be unstable independently of the supply conditions, v should be in the neigh bourhood of 2 or more. When we take account of the conditions of supply is less easy to accept without further question a portrayal of the cycle as th product of centrifugal forces inherent in the economy. There is, it is tru some reason to suppose that the middle ranges of α may not damp down th system as much as the table and the diagram suggest. As we saw earlier the acceleration principle is not innocent of assumptions about supply. It probable, therefore, that v and α are functionally related. The less flexib is supply in the short period (the lower α), the larger the additional capit that entrepreneurs will be likely to require when demand increases (th greater v). Thus as we diminish α from a value exceeding $(1 + A)$ and dam down the system as illustrated in the diagram, we simultaneously increase We do not simply move leftwards down one of the v curves, but at the sam time move to a higher v curve. Although with given v a diminished α mig in its middle ranges damp the oscillations out altogether, they may retai their explosiveness because the diminution of α causes a higher v. But whi this inverse relation between v and α may defend some explosive oscillatio from extinction, it does not guarantee their existence in the first plac That such are possible is a proposition of which it is only possible for us say " non-proven " and ask to be reassured by Professor Hicks.

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[1] See Appendix I, p. 657, footnote 1.

[2] It is reached, when $v = 2{\cdot}5$ at $\alpha = 1{\cdot}795$; when $v = 2{\cdot}0$ at $\alpha = 1{\cdot}754$; when $v = 1{\cdot}5$ $\alpha = 1{\cdot}697$; and when $v = 1{\cdot}2$ at $\alpha = 1{\cdot}65$.

[3] In addition to this there is the consideration emphasised earlier that high values of α a difficult to reconcile with the acceleration principle.

[4] P. 638.

APPENDIX I

Properties of the Third-order Difference Equation (15)

The general solution of the third-order difference equation:

$$y_t - \left[\frac{(1+A) - \alpha + v}{(1+A)}\right] y_{t-1} + \left[\frac{v(1+A) - \alpha(c+v) + v}{(1+A)^2}\right] y_{t-2} - \left[\frac{v(1+A) - \alpha v}{(1+A)^3}\right] y_{t-3} = \frac{\alpha}{(1+A)} \frac{A_0}{\overline{Y}_0} \quad . \quad . \quad . \quad (a)$$

will consist of a particular solution of the non-homogeneous equation plus the general solution of the homogeneous equation obtained by setting the left-hand side of (a) equal to zero. The particular solution is easy to find; the non-homogeneous equation will be satisfied by:

$$y_t = \frac{\frac{A_0}{\overline{Y}_0}}{1 - \frac{c+v}{(1+A)} + \frac{v}{(1+A)^2}}$$

Since this particular solution is independent of α, we need not concern ourselves with it when we are investigating the influence of α on the behaviour of the system. We need only look at the influence of α on the solution of the homogeneous equation. Let us write the homogeneous equation as:

$$y_t + a_1 y_{t-1} + a_2 y_{t-2} + a_3 y_{t-3} = 0 \quad . \quad . \quad . \quad . \quad . \quad (b)$$

Putting $y_t = x^t$, we find its characteristic equation:

$$f(x) = x^3 + a_1 x^2 + a_2 x + a_3 = 0 \quad . \quad . \quad . \quad . \quad . \quad (c)$$

Can we say anything in general about the three roots of this equation? We know, of course, that they must either be all real or consist of one real and a pair of complex roots. We can go further than this, however, and observe that as long as α is less than $(1 + A)$, there cannot be any negative real roots. For when α is less than $(1 + A)$, a_1 and a_3 of (c) are necessarily negative, and a_2, which if α is equal to $(1 + A)$ becomes $\frac{v - (1+A)c}{(1+A)^2}$, can be assumed to be positive. If, then, we try any negative real value of x in the characteristic equation (c), all four of its terms will be negative and cannot add up to zero. Let us then leave aside the case where negative real roots are possible because α exceeds $(1 + A)$ and concentrate on the case where α is less than $(1 + A)$.

It follows from the fact that there must be at least one real root and no negative real roots, that there must be at least one real positive root of (c). It can also be shown that this real positive root must be less than unity. The value of $f(x)$ when $x = 0$ is a_3, which is negative; when $x = 1$, it is:

$$f(x)_{x=1} = \frac{\alpha}{(1+A)}\left(1 - \frac{c+v}{(1+A)} + \frac{v}{(1+A)^2}\right)$$

which can safely be assumed positive. Consequently the function $f(x)$ must cross the zero line between zero and one. (See diagram B.) There must therefore be at least one real root of (c) which is positive and less than unity. This property of (c) is important because it means that one root will damp itself out

after a while and any explosive potential which the system possesses when α is less than $(1 + A)$ must reside within the other two. It is also evident that this real root increases steadily from zero to unity as α falls from $(1 + A)$ to zero.

Let us now look at the two special cases in which $\alpha = (1 + A)$ and $\alpha = 0$. When $\alpha = (1 + A)$, $a_3 = 0$; and since a_3 is the value of $f(x)$ when $x = 0$, there is

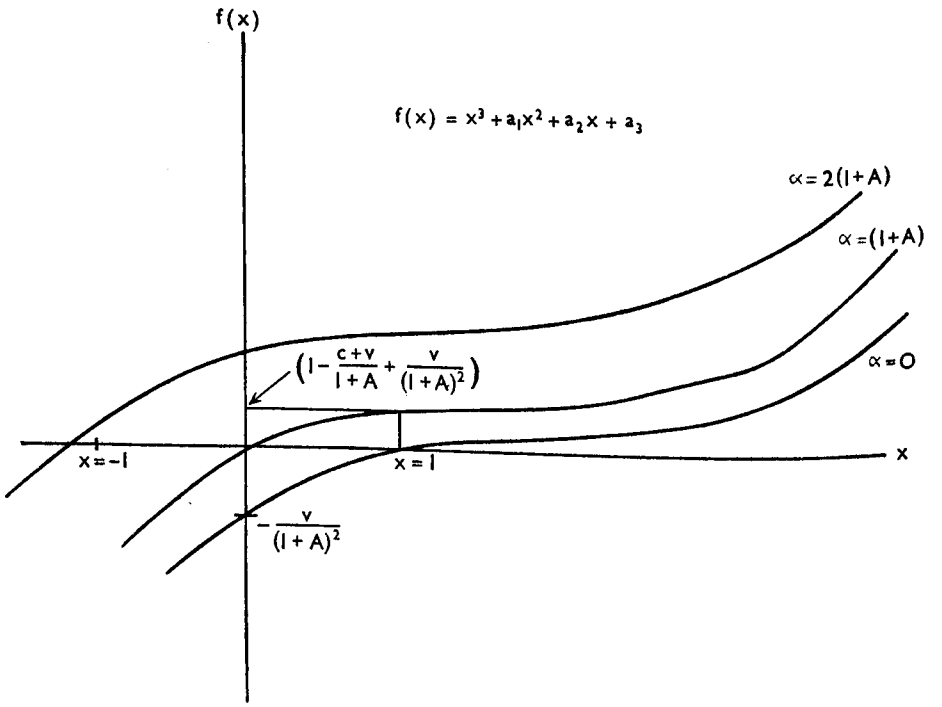


Diagram B

obviously a solution at $x = 0$. Let us call this root x_1. The other two roots, x_2 and x_3, can be deduced from the known relations between roots and coefficients:

$$\left.\begin{aligned} x_1 + x_2 + x_3 &= -a_1 \\ x_1x_2 + x_2x_3 + x_1x_3 &= a_2 \end{aligned}\right\} \quad \ldots\ldots \quad (d)$$

When $\alpha = (1 + A)$, $a_1 = -\dfrac{v}{(1 + A)}$, and $a_2 = \dfrac{v - (1 + A)c}{(1 + A)^2}$. Solving (d), we find that x_2 and x_3 come to:

$$\frac{1}{2(1 + A)}\left(v \pm \sqrt{v^2 - 4v + 4(1 + A)c}\right)$$

They will be real if:

$$v^2 - 4v + 4(1 + A)c > 0$$

and if this expression is negative, they will be a pair of conjugate complex roots. Now our main interest in the roots of the characteristic equation (c) is to investigate its explosive potential; and for this we shall have to concentrate our search on the area of complex roots. For somewhere within this area the system will undergo a change from exhibiting damped to exhibiting explosive oscillations. Once it has emerged into the clear air of real roots, we know that it will either die or explode

without a flicker of fluctuation; but somewhere within the area of complex roots there lies the crucial frontier, which we must determine, between explosive and damped oscillation. Let us assume, then, that

$$v^2 - 4v + 4(1 + A)c < 0$$

so that for $\alpha = (1 + A)$ the two roots x_2 and x_3 are complex conjugates. They can therefore be written:

$$\frac{v}{2(1 + A)} \pm i\sqrt{-v^2 + 4v - 4(1 + A)c}$$

and their modulus will be:

$$\sqrt{\frac{v - (1 + A)c}{(1 + A)^2}}$$

Now consider the other special case where $\alpha = 0$. When $\alpha = 0$ we have:

$$\underset{x=1}{f(x)} = \frac{\alpha}{(1 + A)}\left(1 - \frac{c + v}{(1 + A)} + \frac{v}{(1 + A)^2}\right) = 0$$

There is therefore a solution at $x_1 = 1$. From known relations of coefficients and roots as before, we can work out the other two roots, x_2 and x_3:

$$\frac{1}{2(1 + A)}\left(v \pm \sqrt{v^2 - 4v}\right)$$

Since we have already assumed that $v^2 - 4v + 4(1 + A)c < 0$, it follows *a fortiori* that $v^2 - 4v < 0$. When $\alpha = 0$ therefore x_2 and x_3 are a pair of conjugate complex roots, whose modulus will be:

$$\sqrt{\frac{v}{(1 + A)^2}}$$

What have we found out so far about the properties of (c)? We have found out that for values of α below $(1 + A)$:

(1) it must have one real root which is positive and less than unity; and

(2) for values of v in the middle ranges of the possible, *i.e.*, when $v^2 - 4v + 4(1 + A)c < 0$,[1] the other two roots will be complex conjugates whose moduli are $\sqrt{\dfrac{v - (1 + A)c}{(1 + A)^2}}$ when $\alpha = (1 + A)$ and $\sqrt{\dfrac{v}{(1 + A)^2}}$ when $\alpha = 0$.

Now it is these moduli which particularly concern us. For whether the oscillations of our revised Hicksian system expressed in (a) are explosive depends upon the modulus of its complex roots exceeding unity.[2] It will be obvious that in the case where $\alpha = (1 + A)$, which most nearly approximates the supply assumption of Hicks' original model, v must *considerably* exceed $(1 + A)$ in order to provide explosive fluctuations; it will not suffice, as in the original, for it *just* to exceed $(1 + A)$. On the other hand, when $\alpha = 0$, a value of v which just exceeds $(1 + A)$ does provide a sufficient condition for explosive fluctuation.[3] Our problem is to determine what happens to the modulus of the complex roots as we

[1] If $(1 + A) = 1{\cdot}03$ and $c = 0{\cdot}8$, x_2 and x_3 will be real if v exceeds 2·839 or is below 1·161.

[2] The real root, as we have seen, is less than unity, and cannot contribute to any explosion.

[3] But in this case, as we shall see, no oscillations actually occur, as indeed is obvious from the fact that $\alpha = 0$ means that the system cannot move from its desired path whatever disequilibria there may be to tempt it to do so.

diminish α from $(1 + A)$ towards zero. As the adjustment of supply to excess demand becomes progressively less perfect, will it damp down the explosive potential of the system, or increase it, or have some more complicated effect?

The answer which is suggested to this question by the numerical computations on p. 650 I have not been able to confirm with a general proof; but some light may be thrown on it by what follows. It is shown in Appendix II that the general solution of (b), in the case where complex roots exist, is of the form:

$$y_t = A_1 x_1^t + A_2(\sqrt{x_1^2 + a_1 x_1 + a_2})^t \cos(t\theta + \epsilon) \quad . \quad . \quad . \quad (e)$$

where A_1 and A_2 are constants to be determined from the initial conditions and x_1 is the real positive root of less than unity which we have seen must exist when α is less than $(1 + A)$. This formulation is useful because it exhibits the modulus of the complex roots as a function of the real root. Consider the function:

$$\phi(x) = x_1^2 + a_1 x_1 + a_2 \quad . \quad . \quad . \quad . \quad . \quad . \quad (f)$$

We want to know how this function is influenced by α. There is a double influence. Not only does a change in α change the coefficients a_1 and a_2; it also changes x_1. For as we have seen, when $\alpha = (1 + A)$, $x_1 = 0$, and when $\alpha = 0$, $x_1 = 1$; and the value of x_1 rises steadily from zero to unity as α declines from $(1 + A)$ to zero. In diagram C the ϕ function is plotted with respect to x_1 for given values of α. But the dependence of x_1 on α means that only one point on each α-curve is possible. Suppose we start from $\alpha = (1 + A)$. Then $x_1 = 0$ and we are at point A on the middle α-curve. As we diminish α, two conflicting effects occur. Because we have diminished α we have raised x_1 and therefore move to the right down the curve from A; but because we have diminished α we must move to a higher α curve. So the square of the modulus, or ϕ function, is lowered by the first effect and raised by the second. It seems reasonable to infer, although I have not been able to prove,[1] the conclusion that the numerical examples on p. 649 suggest; namely that as we first begin to diminish α from $(1 + A)$, the first effect prevails because the α curves are relatively steep at their left-hand ends and the slide down the curve overcomes the jump to a higher curve. As we go on, however, this downward pressure on the modulus is relaxed, since the α curves become flatter and the second effect prevails, thus raising the square of the modulus until it reaches $\frac{v}{(1 + A)^2}$ when $\alpha = 0$ (point C in diagram C).

Hitherto we have considered only the case in which α is less than $(1 + A)$—the case of less than perfect supply adjustment—when only positive real roots are possible. But if α is raised above $(1 + A)$ we come into the range of negative real roots. For $f(x)$ when $x_1 = 0$ has the value a_3, which is positive when α exceeds $(1 + A)$; and as x_1 tends towards minus infinity $f(x)$ must become negative as the x_1^3 term predominates. It must therefore cross the zero line somewhere between zero and minus infinity, yielding a negative real root. This will superimpose upon whatever fluctuations are generated by the other roots a period-to-period oscillation. So long as the negative real root is less than unity,

[1] The difficulty lies in the fact that in order to show the conditions under which the conclusion would be true, a necessary step is the explicit evaluation of x_1 in terms of a_1, a_2 and a_3. There is no reason in principle why this should not be done, as the reader can see by referring to Appendix II; but the results show no sign of resolving themselves into any remotely illuminating form.

these period-to-period movements damp themselves out after a while and the system is dominated by its other roots. But if it is greater than unity it transforms the character of the system in a direction which makes it no longer interesting for the character of the system in a direction which makes it no longer interesting for trade-cycle analysis; for it is dominated by the period-to-period fluctuation.[1] Now as we cross into the territory of negative real roots, by raising α from $(1 + A)$, what will the effect be upon the modulus of the complex roots? It seems reasonable to suppose that it will increase. Referring again to diagram C, when $\alpha = (1 + A)$ we are at point A. As we raise α above $(1 + A)$ we drop to a lower α curve and this in itself has a dampening influence on the modulus. But at the same time, because x_1 changes, we move up the curve to the left; and this,

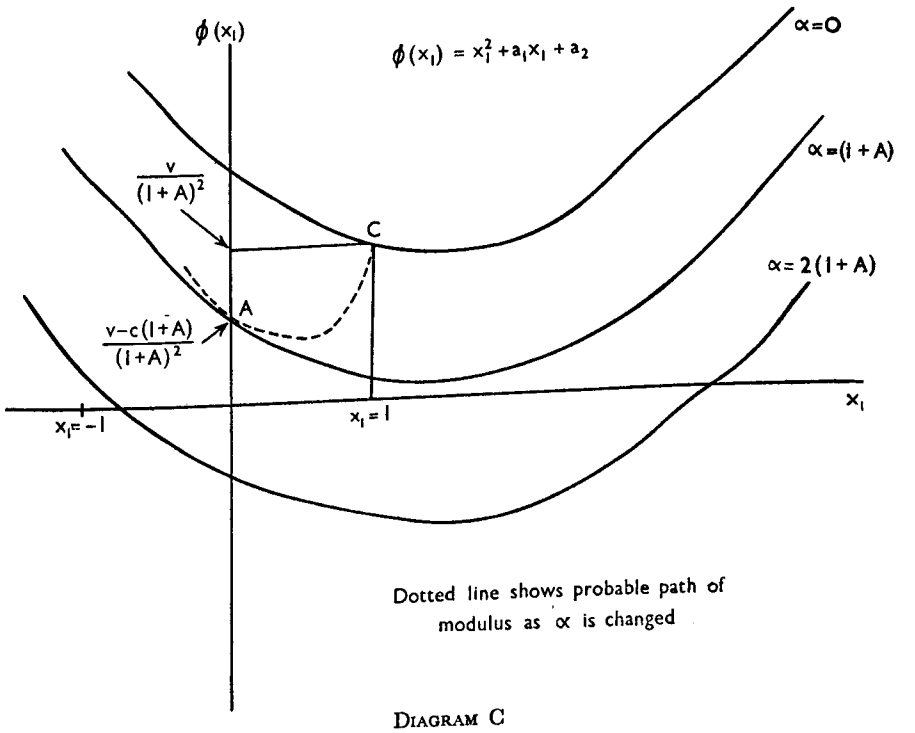


DIAGRAM C

taken by itself, will increase the modulus. Since the slope of the α-curve is relatively steep and getting steeper as we move to the left, the second influence will tend to overcome the first and the modulus will increase. Again it must be said that I have not been able to demonstrate this; but the argument above gives us confidence in the generality of the numerical example on p. 649, which shows this result.

Fully to understand the behaviour of (b), however, we must look not only at the modulus of the complex roots but at the system as a whole. It is shown in

[1] This will occur before α has reached the value of $2(1 + A)$; for with $\alpha = 2(1 + A)$ we have:

$$\underset{x=-1}{f(x)} = \frac{2c}{(1 + A)}$$

i.e., $f(x)$ is still positive and will only cross the zero line when x has become more negative. If it is to cross it while x still has a negative value of less than unity, α must be less than $2(1 + A)$.

Appendix II that with initial conditions $y_0 = y_1 = 1$, *i.e.*, assuming that initially the system is moving along the desired path, the general solution can be expressed:

$$y_t = \frac{(z \cdot \cos(\theta + \varepsilon) - \cos\varepsilon)x_1^t + (1 - x_1)(\sqrt{z})^t \cos(t\theta + \varepsilon)}{(z \cdot \cos(\theta + \varepsilon) - x_1 \cos\varepsilon)} \quad . \quad . \quad (g)$$

where x_1 is the real root and $z = x_1^2 + a_1x_1 + a_2$. The general solution is thus a weighted average of the real root and the complex roots. But the weights as well as the roots themselves are functions of α. As we have seen, when $\alpha = (1 + A)$, $x_1 = 0$; and in this case (g) reduces to the original Hicksian form:

$$y_t = \frac{1}{a_2 \cos(\theta + \varepsilon)} (\sqrt{a_2})^t \cos(t\theta + \varepsilon)$$

As α is diminished and x_1 rises, the weight attached to the complex roots decreases and the weight attached to the real root increases, until when $\alpha = 0$ and $x_1 = 1$ the complex roots disappear and the solution becomes:

$$y_t = 1$$

i.e., the system continues to move along its desired path because, α being zero, it is not able to diverge from it to adjust supply to demand. When α is not actually zero but is close to zero, the system will be dominated in its early stages by the real root, and the complex roots, however potentially explosive, will be weighted down. Ultimately the real root will become insignificant, since it is less than unity, and the complex roots, provided their modulus is greater than unity, will make the system explode. But the explosion may be a long time in coming, and therefore, as argued in the text, less interesting.

Appendix II

Solution of the Third-order Difference Equation $y_t + a_1y_{t-1} + a_2y_{t-2} + a_3y_{t-3} = 0$

Put $x^t = y_t$. Substituting into the above we get the characteristic equation:

$$x^3 + a_1x^2 + a_2x + a_3 = 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

Eliminate the x^2 term by putting: $x = z - \frac{a_1}{3}$

We then get:

$$z^3 + \left(a_2 - \frac{a_1^2}{3}\right)z + \left(\frac{2a_1^3}{27} - \frac{a_1a_2}{3} + a_3\right) = 0 \quad . \quad . \quad . \quad (2)$$

If $z = n$ is a solution of (2), then $x = \left(n - \frac{a_1}{3}\right)$ is a solution of (1). Write (2) in the form:

$$z^3 + qz + r = 0$$

Its roots are:

$$z_1 = -\sqrt[3]{L} - \sqrt[3]{M}$$
$$z_2 = -\omega\sqrt[3]{L} - \omega^2\sqrt[3]{M} \qquad \text{where } \omega = \left(\cos\frac{2}{3}\pi + i\sin\frac{2}{3}\pi\right)$$
$$z_3 = -\omega^2\sqrt[3]{L} - \omega\sqrt[3]{M}$$

where $L = \frac{r}{2} + \sqrt{\frac{r^2}{4} + \frac{q^3}{27}}$ and $M = \frac{r}{2} - \sqrt{\frac{r^2}{4} + \frac{q^3}{27}}$.

The roots of (1) are therefore:

$$x_1 = -\sqrt[3]{L} - \sqrt[3]{M} - \frac{a_1}{3}$$
$$x_2 = -\omega\sqrt[3]{L} - \omega^2\sqrt[3]{M} - \frac{a_1}{3}$$
$$x_3 = -\omega^2\sqrt[3]{L} - \omega\sqrt[3]{M} - \frac{a_1}{3}$$

Suppose that L and M are real numbers $\left(i.e., \frac{r^2}{4} + \frac{q^3}{27} > 0\right)$. Then x_1 is a real root of (1) and x_2 and x_3 are conjugate complex roots which can be written:

$$x_2 = c + di$$
$$x_3 = c - di$$

where $c = \cos\frac{\pi}{3}(\sqrt[3]{L} + \sqrt[3]{M}) - \frac{a_1}{3}$, and $d = -\sin\frac{\pi}{3}(\sqrt[3]{L} - \sqrt[3]{M})$.

(See note at end.)

The general solution of the difference equation in the ys will then be:

$$y_t = Ax_1^t + B(c + di)^t + C(c - di)^t$$
$$= Ax_1^t + [\sqrt{(c^2 + d^2)}]^t(B(\cos t\theta + i\sin t\theta) + C(\cos t\theta - i\sin t\theta))$$

Putting $B = k(\cos\varepsilon + i\sin\varepsilon)$ and $C = k(\cos\varepsilon - i\sin\varepsilon)$, this reduces to:

$$y_t = Ax_1^t + (\sqrt{c^2 + d^2})^t 2k\cos(t\theta + \varepsilon)$$

which can be written:

$$y_t = A_1x_1^t + A_2(\sqrt{c^2 + d^2})^t \cos(t\theta + \varepsilon)$$

The modulus can be worked out as follows:

$$(\sqrt{c^2 + d^2}) = \left[\left(\cos\frac{\pi}{3}(\sqrt[3]{L} + \sqrt[3]{M}) - \frac{a_1}{3}\right)^2 + \left(-\sin\frac{\pi}{3}(\sqrt[3]{L} - \sqrt[3]{M})\right)^2\right]^{\frac{1}{2}}$$

$$= \left[\cos^2\frac{\pi}{3}(\sqrt[3]{L})^2 + \cos^2\frac{\pi}{3}(\sqrt[3]{M})^2 + 2\cos^2\frac{\pi}{3}(\sqrt[3]{L}\sqrt[3]{M}) + \frac{a_1^2}{9} - 2\frac{a_1}{3}\cos\frac{\pi}{3}(\sqrt[3]{L} + \sqrt[3]{M}) + \sin^2\frac{\pi}{3}(\sqrt[3]{L})^2 + \sin^2\frac{\pi}{3}(\sqrt[3]{M})^2 - 2\sin^2\frac{\pi}{3}(\sqrt[3]{L}\sqrt[3]{M})\right]^{\frac{1}{2}}$$

$$= \left[(\sqrt[3]{L})^2 + (\sqrt[3]{M})^2 + 2(\sqrt[3]{L}\sqrt[3]{M})\left(\cos^2\frac{\pi}{3} - \sin^2\frac{\pi}{3}\right) + \frac{a_1^2}{9} - \frac{2a_1}{3}\cos\frac{\pi}{3}(\sqrt[3]{L} + \sqrt[3]{M})\right]^{\frac{1}{2}}$$

$$= \left[(\sqrt[3]{L})^2 + (\sqrt[3]{M})^2 + 2(\sqrt[3]{L}\sqrt[3]{M})\cos\frac{2}{3}\pi + \frac{a_1^2}{3} - \frac{2a_1}{3}\cos\frac{\pi}{3}(\sqrt[3]{L} + \sqrt[3]{M})\right]^{\frac{1}{2}}$$

$$= \left[(\sqrt[3]{L})^2 + (\sqrt[3]{M})^2 - (\sqrt[3]{L}\sqrt[3]{M}) + \frac{a_1^2}{9} - \frac{a}{3}(\sqrt[3]{L} + \sqrt[3]{M})\right]^{\frac{1}{2}}$$

Now since the square of the real root x_1 is:

$$x_1^2 = (\sqrt[3]{L})^2 + (\sqrt[3]{M})^2 + 2(\sqrt[3]{L}\sqrt[3]{M}) + \frac{a_1^2}{9} + \frac{2a_1}{3}(\sqrt[3]{L} + \sqrt[3]{M})$$

we can write:

$$(\sqrt{c^2 + d^2}) = [x_1^2 - 3(\sqrt[3]{L}\sqrt[3]{M}) - a_1(\sqrt[3]{L} + \sqrt[3]{M})]^{\frac{1}{2}}$$

Further since $x_1 = -(\sqrt[3]{L} + \sqrt[3]{M}) - \frac{a_1}{3}$,

$$(\sqrt{c^2 + d^2}) = \left[x_1 - 3(\sqrt[3]{L}\sqrt[3]{M}) + a_1 x_1 + \frac{a_1^2}{3}\right]^{\frac{1}{2}}$$

Again since $(\sqrt[3]{L}\sqrt[3]{M}) = \sqrt[3]{LM} = \sqrt[3]{-\frac{q^3}{27}} = -\frac{q}{3}$,

we have: $-3\sqrt[3]{L}\sqrt[3]{M} = q = \left(a_2 - \frac{a_1^2}{3}\right)$;

and so $$(\sqrt{c^2 + d^2}) = \left[x_1^2 + a_2 - \frac{a_1^2}{3} + a_1 x_1 + \frac{a_1^2}{3}\right]^{\frac{1}{2}}$$

$$= [x_1^2 + a_1 x_1 + a_2]^{\frac{1}{2}}$$

Thus the general solution of the third order difference equation is:

$$y_t = A_1 x_1^t + A_2(\sqrt{x^2_1 + a_1 x_1 + a_2})^t \cos(t\theta + \varepsilon)$$

The initial conditions.

Let: $y_0 = A_1 + A_2 \cos\varepsilon = 1$

$$y_1 = A_1 x_1 + A_2\sqrt{x_1^2 + a_1 x_1 + a_2}\cos(\theta + \varepsilon) = 1$$

Write $\sqrt{x_1^2 + a_1 x_1 + a_2} = z.$

From the first initial condition: $A_1 = 1 - A_2 \cos\varepsilon$

Substituting in the second:

$$(1 - A_2\cos\varepsilon)x_1 + A_2 z\cos(\theta + \varepsilon) = 1$$

$$A_2(z\cos(\theta + \varepsilon) - x_1\cos\varepsilon) = (1 - x_1)$$

$$A_2 = \frac{(1 - x_1)}{(z\cos(\theta + \varepsilon) - x_1\cos\varepsilon)}$$

Thus $$A_1 = 1 - \frac{(1 - x_1)\cos\varepsilon}{(z\cos(\theta + \varepsilon) - x_1\cos\varepsilon)}$$

$$= \frac{z\cos(\theta + \varepsilon) - \cos\varepsilon}{z\cos(\theta + \varepsilon) - x_1\cos\varepsilon}$$

Using these initial conditions the general solution becomes:

$$y_t = \frac{(z\cos(\theta + \varepsilon) - \cos\varepsilon)x_1^t + (1 - x_1)(\sqrt{x_1^2 + a_1 x_1 + a_2})^t \cos(t\theta + \varepsilon)}{(z\cos(\theta + \varepsilon) - x_1\cos\varepsilon)}$$

n the special case where $\alpha = \infty$ and therefore $x_1 = 0$, this becomes

$$y_t = \frac{1}{z\cos(\theta + \varepsilon)}(\sqrt{a_2})^t \cos(t\theta + \varepsilon)$$

$$= \frac{1}{\sqrt{a_2}\cos(\theta + \varepsilon)}(\sqrt{a_2})^t \cos(t\theta + \varepsilon)$$

n the other special case where $\alpha = 0$ and $x_1 = 1$, it becomes:

$$y_t = \frac{(z\cos(\theta + \varepsilon) - \cos\varepsilon)}{(z\cos(\theta + \varepsilon) - \cos\varepsilon)}(1)^t = 1$$

Vote on the form of the complex roots x_2 and x_3.

$$x_2 = c + di = -\omega\sqrt[3]{L} - \omega^2\sqrt[3]{M} - \frac{a_1}{3}$$

$$x_3 = c - di = -\omega^2\sqrt[3]{L} - \omega\sqrt[3]{M} - \frac{a_1}{3}$$

The two equations

$$c + di = -\omega\sqrt{L} - \omega^2\sqrt[3]{M} - \frac{a_1}{3}$$

$$c - di = -\omega^2\sqrt[3]{L} - \omega\sqrt[3]{M} - \frac{a_1}{3}$$

an be solved for c and d, so that x_2 and x_3 can be expressed in terms of L, M, $_1$ and π.

THE MARGINAL EFFICIENCY OF CAPITAL AND INVESTMENT PROGRAMMING

I

THE expression *marginal efficiency of capital*, which has figured so prominently in the literature since the middle thirties, does not, unfortunately, denote a concept whose meaning and implications have been so carefully construed that no further analysis seems reasonable or necessary. Not only do most writers utilising the marginal efficiency notion tend to oversimplify the problems connected with discounting expected future earnings by neglecting to assign numbers and solve for complex and specific cases, but also they generally fail to recognise the alternative formulations of the concept which must be delineated before any operationally meaningful use can be made of it. Beyond this, it appears that the collection of additional empirical information concerning the respective roles of interest and the marginal efficiency of capital in shaping actual investment programs is both necessary and desirable.

In this paper we propose to deal in some measure with each of these shortcomings, and in the following manner: First, by considering the most commonly used equations for defining the marginal efficiency of capital and their relation to the rate of interest in determining the volume of investment along with alternative definitions which have appeared from time to time in the literature.

Second, by relating this analysis to the more important results of a survey of investment-planning practices conducted by the authors. This survey was conducted by means of questionnaires mailed to 175 manufacturing firms, including companies engaged in the refining of petroleum products. These firms were selected at random from 644 corporations whose securities are actively traded on the New York Stock Exchange.[1] The Stock Exchange listing was used because we wished to obtain information from large firms which are experienced in investment financing. The survey does not purport, therefore, to be representative of all firms, but only those which might be presumed to be most knowledgeable concerning the marginal efficiency of capital concept. Completed questionnaires were returned by 33%[2] of

[1] In addition, copies of the questionnaire were sent to public-utility companies in the water, gas, electric and communications fields for the purpose of making a comparison of public-utility and manufacturing (including petroleum refining) investment planning. Replies were received from seventeen firms comprising over 20% of the utility companies whose securities are actively traded on the New York Stock Exchange. Since the survey questionnaire was drawn up primarily for completion by manufacturing corporations, it was in some respects unsatisfactory for eliciting information concerning public-utility operations. The main comparisons which can be made between the utilities and the other firms surveyed are: (1) heavy reliance on *external* sources for new capital; (2) inclusion of depreciation in rate-of-return calculations as prescribed by law; (3) longer estimated lives of plant and equipment; and (4) less frequent use of pay-out period methods in selecting investments. [2] Fifty-seven firms.

the corporations sampled. This response compares favorably with that reported by other questionnaire surveys of business firms.[1] The survey must be interpreted with some reservation, of course, since the statistical confidence limits for the resulting data are rather broad.

Investment planning has been the subject of some prior investigation and comment. It is emphasised that the present study is *not* a comprehensive analysis of planning practices. The questionnaire was confined to: (*a*) determinants of future income; (*b*) degree of detail with which future returns are estimated; (*c*) sources of funds for new investment; (*d*) relevance of the market rate of interest in profits estimates; (*e*) evaluation of alternative investments, both internal and external to the firm; and (*f*) what consideration appears to be given to time as a factor affecting the profitability of investment.

The firms responding range in size from five employing less than 2,000 persons to several with more than 50,000 employees. In tabulating the results, the respondents were separated into: (*a*) those with less than 7,500 employees, and (*b*) those with more than 7,500 employees. Twenty-five corporations were in the former group and thirty-two in the latter. Generally speaking, the differences between the two groups were not large. Where they are worth noting, differences are reported in the subsequent analysis of the results.

Finally, comment is made upon the methods for calculating the discounted present value of future income, including a suggested procedure for calculation.

II

Numerous equations for rigorously structuring the marginal efficiency concept have been devised, but subtle variations in their meanings and usefulness ought at all times to be recognised. Perhaps the most widely used version of all is that which Professor Hansen employs [2] to discount the expected future earnings of an asset down to its current supply price (*i.e.*, replacement cost, not market price).[3]

If C be the cost of a capital good, and $R_1, R_2, \ldots R_n$ represent the successive anticipated annual earnings, then the rate of discount, r, appears as follows:

$$C = \frac{R_1}{(1+r)} + \frac{R_2}{(1+r)^2} + \ldots \frac{R_n}{(1+r)^n} \quad . \quad . \quad . \quad (1)$$

Here r is the counterpart of Keynes' " precise " definition of the marginal efficiency of capital.[4] At this juncture in most treatments of these calcula-

[1] For example, the Oxford Research Group reported a 25% response on their study of the influence of the interest rate. R. S. Sayers, " Business Men and the Terms of Borrowing," *Oxford Economic Papers*, No. 3 (February 1940), pp. 23 ff. W. J. Eiteman and G. E. Guthrie, " The Shape of the Average Cost Curve," *American Economic Review*, Vol. XLII (December 1952), p. 836, reported a 36·6% response in a survey for which they employed a somewhat simpler questionnaire than that used for the present study.

[2] Alvin H. Hansen, *Business Cycles and National Income* (New York: W. W. Norton, 1951), pp. 125 ff.

[3] John Maynard Keynes, *The General Theory of Employment, Interest and Money* (London: Macmillan, 1936), p. 135. [4] *Loc. cit.*

tions concerning investment profitability, one of two procedures is generally observed; either r is compared directly to the rate of interest, i, or an "asset value" (*i.e.*, "demand price") equation is constructed. Professor Hansen, observing the latter course, uses:

$$V = \frac{R_1}{(1+i)} + \frac{R_2}{(1+i)^2} + \ldots \frac{R_n}{(1+i)^n} \quad . \quad . \quad . \quad (2)$$

With i representing the rate of interest, $V > C$ in the same proportion as $r > i$.[1] This is perfectly true, but it would seem both proper and relevant at this point to provide a numerical example of an actual application of the equations; and this suggestion does not refer to, nor is it satisfied by, over-simplified examples of the form:

$$\$3{,}000 = \frac{\$1{,}100}{1{\cdot}10} + \frac{\$2{,}420}{(1{\cdot}10)^2} \quad . \quad . \quad . \quad . \quad . \quad (3)$$

Though no more helpful, the marginal unit of investment is sometimes expressed as:

$$\Sigma \left\{ \frac{Q_n}{(1+r)^n} \right\} = C \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$

"Where Q_n is the expected quasi-rent of the nth year, r is the rate of interest expressed as a fraction of unity, and C the marginal cost of the capital good." [2]

To handle the similar problem, Professor Shackle utilises ". . . an exponent μ such that the value of the instrument,

$$v = \int_0^\infty c(x) e^{-\mu x}\, dx \quad . \quad . \quad . \quad . \quad . \quad . \quad (5)$$

is equal to u its purchase price." [3]

A last variation that may be mentioned is Professor Sanderson's expression for *average rate of return over cost*, i:

$$K = \frac{a_1}{1+i} + \frac{a_2}{(1+i)^2} + \ldots + \frac{a_n}{(1+i)^n} \quad . \quad . \quad . \quad (6)$$

Here K refers to the total amount to be invested in the present, while a_1, a_2, . . . a_n represent ". . . net returns at the end of years 1, 2, . . . n . . ." [4]

In general, these formulations are rather abstract.[5] This is partially the consequence of numerous complications in the marginal efficiency con-

[1] Hansen, *op. cit.*, p. 125.

[2] P. T. Bauer and P. R. Marrack, "Depreciation and Interest," ECONOMIC JOURNAL, Vol. XLIX (June 1939), p. 237.

[3] G. L. S. Shackle, "Interest Rates and the Pace of Investment," ECONOMIC JOURNAL, Vol. LVI (March 1946), p. 11.

[4] G. B. Sanderson, "A Note on the Theory of Investment," *Economica*, Vol. VIII (May 1941), pp. 178–9.

[5] Some authors, of course, abstract because of the nature of the material, or purposely. For an example of the latter, see the analysis of the "abstract relation of the yield of capital assets to interest, with especial reference to the level of interest in a 'stationary' state," by T. Morgan, "Interest, Time Preference, and the Yield of Capital," *American Economic Review*, Vol. XXXV (March 1945), pp. 81–98.

cept. For example, even the simplifying and "intuitively obvious" assumption that, *ceteris paribus*, the rate of interest and gross investment (the dependent variable) are inversely related has been questioned by Benjamin Caplan, who, after defining gross investment as net investment plus reinvestment, declares:

> "A change in the rate of interest operates on reinvestment by bringing near or postponing the *abandonment* and *premature* abandonment of existing capital. An increase in the interest rate tends to increase in general the abandonment of existing capital and also the premature abandonment of those capital goods which are to be replaced by goods of intermediate durability. But though the decision to abandon is hastened by the increase in the interest rate, this does not *automatically* swell the flow of reinvestment. It may or may not." [1]

In Mr. Caplan's schema the rate of interest operates primarily through its effect upon the opportunity cost of carrying old capital on the books when working capital could otherwise be released via returns from salvage on abandoned or prematurely abandoned capital.[2]

Perhaps the most notable departure from Keynes' marginal efficiency of capital concept is that of Dr. C. F. Roos, who claims that his ". . . studies indicate that actual investment lags returns or profits rather than leads them. Thus, past rather than future profits determine investment, and so Keynes has overemphasized the role of expected profits and consequently produced a somewhat unrealistic idealized theory." [3]

Formally, the interest rate is a determinant of investment in Keynes' theory,[4] but the implication is made that its influence is more than cancelled out by the effect of business expectations resulting from anticipated changes in the levels of employment and effective demand.[5] Later writers have been more specific on this point than Keynes and have questioned that interest-rate changes have any influence whatever upon the volume of investment. Professor F. A. Lutz is of the opinion that in most areas of the economy the interest rate may have no more than an indirect effect upon investment by altering "the readiness of financial institutions to grant credit or to float bonds and stocks, so that the interest rate may influence the volume of investment even without changing the profit calculations of entrepreneurs." [6] The study of British corporations by the Oxford Economic Group supports Lutz's view that only in public-utility operations and residential construction

[1] B. Caplan, "Reinvestment and the Rate of Interest," *American Economic Review*, Vol. XXX (September 1940), p. 561.

[2] Another technique relating salvage value and the interest rate is discussed by A. D. Knox, "The Acceleration Principle and the Theory of Investment," *Economica*, Vol. XIX (August 1952), p. 285. Knox points out the practical problem of estimating *ex ante* the economic life of new equipment. He also notes that the principal reason for the widespread use in business of rough-and-ready methods of estimating profits expected from new investment is the extreme uncertainty which beclouds the remote future. Professor Joel Dean takes up the analysis of this problem where Knox leaves it. Dean's views are discussed in greater detail on p. 668 below.

[3] C. F. Roos, "The Demand for Investment Goods," *American Economic Review*, Vol. XXXVIII (May 1948), Suppl., p. 313. [4] Keynes, *op. cit.*, p. 183. [5] *Ibid.*, p. 185, also p. 164.

[6] F. A. Lutz, "The Interest Rate and Investment in a Dynamic Economy," *American Economic Review*, Vol. XXXV (December 1945), p. 830.

is the interest rate of direct significance.[1] Ezekiel, in his study of America corporate investment, also found the interest rate to be without apparer influence.[2] Recent economic opinion appears to agree with the conclusion that

> "The marginal efficiency of a new investment to a businessman likely to vary widely, from perhaps 100 percent per year or more in th warmth of optimism about a new process, new synthetic, or new mark down to minus 30 percent from the *best* investment open in the gloo of deep depression. . . . A fluctuation of interest rates within the rang we have experienced in recent decades, say 6 to 2 percent, is of secondar importance." [3]

There also are other reasons for the evident unimportance of the mark rate of interest. One of these is the noteworthy independence of large ente prise from the capital-funds markets. Internal sources (retained earnin and depreciation or depletion allowances) supplied 64% of total corpora capital requirements in the period 1946–53 inclusive.[4] Of the firms respon ing to our questionnaire, 85% reported that internal sources were of princip importance in financing plant and equipment purchases. The other respo dents were evenly divided between: (*a*) those firms reporting prima dependence upon external financing (borrowing and stock issues), and (those about equally dependent upon both internal and external sourc All of the firms mainly dependent upon external sources were in the gro with under 7,500 employees. The decreased relative importance of t capital markets in recent years for business-financing purposes can scarce have failed to diminish the significance of fluctuations in the market rate interest as either a deterrent or incentive to investment.[5]

A large number of companies are indifferent to the opportunity cost capital. Professor Dean comments that salaried top executives, who ha little to gain from higher profits, but much to lose from corporate reorganis tion should plans financed with outside capital misfire, are reluctant borrow or even to raise funds from equity sources.[6] No matter what t opportunities, some companies are firmly unwilling to borrow.[7] On t other hand, there is a strong tendency to retain a substantial part of incon even though the profits which might be realised from internal use fall su stantially below the going rates of return elsewhere. Dean concludes th in theory, the market cost of capital should signal: (1) when dividends sho restrict internal accumulation and use of funds, and (2) "when recou should be had to external supply." [8]

[1] H. D. Henderson, "The Significance of the Rate of Interest," *Oxford Economic Papers*, N (October 1938), pp. 4–6.

[2] Mordecai Ezekiel, "Statistical Investigations of Saving, Consumption, and Investmer *American Economic Review*, Vol. XXXII (June 1942), p. 283.

[3] Theodore Morgan, *Income and Employment*, 2nd ed. (New York: Prentice-Hall, 1952), p.

[4] Northern Trust Company, *Business Comment*, November 1954, p. 4.

[5] The logic of grouping equity issues with debt issues in asserting that external sources of fu are more affected by interest-rate considerations than internal sources is suggested by the obse tion of Joel Dean that in the modern corporation dividends "are a kind of interest inc (although more uncertain than contractual interest)." See his *Capital Budgeting* (New Y Columbia, 1951), p. 40. [6] *Ibid.*, p. 55. [7] *Ibid.*, p. 53. [8] *Ibid.*, p. 70.

Our survey disclosed, however, that the market cost of funds is widely disregarded in business capital planning. Fifty-nine per cent of the respondent firms indicated that they do not consider the market rate of interest in calculating the estimated returns from a proposed investment in plant or equipment to be financed with internally supplied funds. This appears to be especially significant in view of the heavy proportion of large firms which depend primarily upon internal capital, as noted earlier. Information also was obtained on the circumstances under which the respondents would consider new types of investment. Two companies, including one which has a large business in government contracts and therefore favors "diversification at a low rate of return as insurance" against the vicissitudes of its main operation, indicated they would not expect a new product to earn as high a return as an established product. Other firms, however, wanted returns of 50 and 100% greater on a new product, and some companies were obviously not interested in a new product in any circumstances.[1] One company reported that it would not be interested in a new product "unless we had sufficient facilities for the manufacture of our present products to protect our industry position." Perhaps this reservation is in the minds of many executives.

Companies were also asked how much larger the return would have to be than that on their present operations before they would consider investment in another company over which they would not have "substantial management control." Significantly, the firms showing the least reluctance to consider this proposition were companies already having highly diversified operations. Fully 22% commented that they were not interested without management control. One company specified that it would not consider such an investment without at least a "70%" stock interest in the other company. The answers from several other companies suggested that they, too, regarded management control as a primary factor. One cannot take particular exception to this policy. The companies surveyed were manufacturing firms, not investment trusts. At the same time the results showed a variety of emphases, and especially the great importance to management of being able to control absolutely the use of corporate funds as well as to have control of the sources from which funds used internally are obtained.

Another reason is given by Lawrence Klein. He claims that the methods typically used by firms to discount for risk greatly minimise the importance of the interest rate.[2] It is well known that the "pay-out" period, which is the number of years required for an asset's earnings to recover its initial cost, or an alternative formulation amounting to virtually the same thing (the percentage of the initial cost recovered in earnings each year), is the most generally used method for evaluating prospective investments. In our sur-

[1] Higher earnings requirements for new investments appears to be important as a way of offsetting uncertainty in estimates of future income, since the calculation of all anticipated costs and returns is susceptible to considerable error. See Lloyd Reynolds, *The Structure of Labor Markets* (New York: Harper, 1951), p. 179.

[2] Lawrence Klein, *The Keynesian Revolution* (New York: Macmillan, 1947), pp. 64–5.

vey 85% of the firms answering the questions reported using this method.[1] Klein's observation is based upon the shortness of this period. According to the McGraw-Hill survey of capital-spending plans conducted in 1948, three out of four manufacturing companies expect new equipment to pay out in five years or less.[2]

The pay-out method has been strongly criticised in recent years, and apparently this criticism has had some effect, inasmuch as a small number of the firms contacted in the authors' survey had reservations about the method, and one large company stated specifically that it had discontinued using it.[3]

One of the strongest critics of the pay-out method is the Machinery and Allied Products Institute (" MAPI "), the leading trade association in the machine-tool field.[4] Ordinarily, application of the pay-out method entails a cut-off point—either a maximum number of years for cost recovery or a minimum percentage of original cost to be earned each year. All projects requiring a longer period (or expected to return a lower percentage of initial cost) are summarily rejected. According to MAPI, executives who use such a device are " shooting blind." [5] " Different industrialists have their favorite pay-off or return requirements as they have their favorite cigarettes." [6]

Dean calls the pay-out period " a misleading measure of capital productivity." [7] " Capital productivity should usually be measured by earnings over the whole life of the asset. . . ." [8]

[1] All things considered and the subsequent criticism notwithstanding, the pay-out method might at least be defended as better than no method at all, for it reduces to a system—albeit too simple a one—information which it might otherwise not be possible to compare in any comprehensive fashion. If a group of small-sized firms were surveyed it is rather likely that they would show less reliance upon the pay-out method, and would not offer any systematic substitute. This conclusion seems warranted on the basis that small firms are less specialised and, therefore, probably will not accord as much recognition to the problems of investment programming at the staff level.

[2] *Business Week*, January 22, 1949, p. 59. However, according to M. G. de Chazeau, the mere fact that the making of pay-out calculations is very widespread among large firms is not a necessary sign that these materially affect the final choices from among investment alternatives, which are said still to depend mainly on " less tangible " and " more variable " considerations of judgment. de Chazeau, " The Individual Firm, " in de Chazeau, ed., *Regularization of Business Investment* (Princeton: Princeton University Press, 1954), p. 95.

[3] Five per cent of the firms definitely stated that they do not use the method. All of these are in the group with 7,500 and more employees.

[4] See their *MAPI Replacement Manual for the Attainment of a Dynamic Equipment Policy* (1950), 78 pp. Also George Terborgh, *Dynamic Equipment Policy* (New York: McGraw-Hill, 1949), 290 pp., upon which the *MAPI Manual* is based.

[5] MAPI, *op. cit.*, p. 4.

[6] *Ibid.*

[7] *Op. cit.*, p. 22.

[8] *Ibid.*, p. 21. All of the adverse effects of present methods of investment decision are not, however, internal to the firm or industry. Mr. Lewis Mumford, the well known writer and city planner, has recently complained against the attitude that " Money is not interested in looking further ahead than the next five years." In his opinion, this view leads to the creation of specific properties which may be inimical to the long-run public interest in a co-ordinated, efficient and æsthetic urban environment. Lewis Mumford, " The Sky Line," *New Yorker*, March 19, 1955, p. 85.

Pay-out periods contrast sharply in length with the estimated service lives of plant and equipment assets. Terborgh, for example, indicates that fifteen- and twenty-year service life periods, in that order, are the periods most commonly recommended by the Bureau of Internal Revenue for charging off depreciation and obsolescence (Bulletin F).[1] The actual useful life of an asset, however, may be intermediate between these two extremes. In the case of machine tools, the average depreciation period is reported to be 20·7 years and the pay-out period only three years, while the actual period for which the machinery can be used before obsolescence is from seven to ten years.[2]

Dean, as a practical matter, believes that the income productivity of an asset might well be ascertained on the basis of a period shorter than the depreciation period, the prime useful life of the asset. He thinks that the relevant period may be that required for an asset to become obsolete in its prime use—the intermediate period between pay out and total useful life noted above, even though it may continue to yield a value product subsequently in other capacities inside or outside the firm.[3] In other words, the appropriate time period for estimating the profitability of a given capital asset is specifically that period during which it will probably be employed in the exact use for which it is purchased. Its cost, according to this reasoning, is the supply price, C, minus resale value.

The marginal efficiency of capital, it was noted earlier, has been variously regarded as being: (1) gross, or (2) net of depreciation. Dean favors the latter,[4] and the difference between C and the resale value will consist of accrued depreciation for the period (user cost) and a larger proportion of the total obsolescence which the asset will incur before it is finally scrapped. This is, then, a method for writing off a large part of the obsolescence during the early part of the total life of the asset, which is also achieved by the constant-percentage method and by use of the short pay-out period.

While the foregoing may suggest useful criteria for establishing the appropriate investment period in a given situation, there is not available a compilation of estimated time periods which can serve as a first approximation, as does Bulletin F in the case of depreciation rates. There would appear to be some difficulty, therefore, in establishing the length of the useful life according to Dean's definition. This should not, however, deter a firm from conjecturing about the length of prime useful asset life.

The main impetus for the use of the pay-out method is the uncertainty of future returns. Our survey reveals that, in estimating future profits, factors which are exogenous to the firm tend to be more important than factors

[1] George Terborgh, *Realistic Depreciation Policy* (Washington: Machinery and Allied Products Institute, 1954), p. 81. These figures do not, of course, reflect the present great importance of five-year " emergency " amortisation as provided for in the Internal Revenue Act of 1954 (*U.S. Stats.*, 1954, Vol. 68A, p. 52) and in earlier legislation.

[2] L. D. Bethel and others, *Industrial Organization and Management*, 2nd ed. (New York: McGraw-Hill, 1950), p. 441.

[3] Dean, *op. cit.*, p. 22.

[4] *Ibid.*, pp. 22–3.

over which it has more direct control.[1] These factors are, of course, the less predictable. The very short average pay-out period may provide a rate of discount against these uncertainties which is much too steep because it overshadows other relevant quantities which should be taken account of in the capital-rationing process. It contains an inherent bias in favor of assets with a high rate of return in their early years and against those investments which may yield truly greater returns over a longer period but at a constant rate, or those which will become most productive of income at a subsequent date. It is not merely that the pay-out method is " crude," [2] it is also inappropriate for accomplishing the maximisation of income in the long run. The pay-out method is a device for " cash budgeting," but since it does not measure profitability is not suitable for capital budgeting.[3] Dean and several other writers would prefer to discount for the uncertainty of future returns by means of probability multipliers applied to the anticipated earnings of each case for each year, rather than by the use of the cut-off date or rate.[4]

And Shackle, concentrating more heavily upon the unpredictable element of technological change, maintains that:

> ". . . the strength of the influence of interest-rates on the pace of investment in those kinds of equipment which are subject to the hazards of invention and fashion can be rendered negligible by an allowance, of a size such as enterprisers themselves imply that they adopt, for doubt concerning the correctness of the ' best guess ' they can make, on available knowledge, as to the size of future net returns from such equipment; provided the *form* of this allowance is that of a rate used for discounting in the same manner as the interest-rate; or in some other strongly-increasing function of futurity." [5]

An effort was made to ascertain in what detail estimates of the profitability of new investments are projected. The survey showed that 45% of the responding firms confine their estimates of new-asset earnings to a period of five years or less. The answers of some of these firms indicate that the length of the pay-out period employed also determines the interval for which earnings estimates will be made. Approximately the same percentage of the respondents indicated that they typically estimate for periods longer than five years. A large proportion of these companies reported that the useful

[1] Firms were queried on whether or not their estimates of future earnings from new investments take the form of a constant annual rate or are variable over time to take account of anticipated developments which will affect annual profits. Fifty-eight per cent of the respondents reported making variable annual estimates. These were asked to specify their reasons for using variable estimates. Twenty-nine per cent of them indicated that some assumed change in general business conditions is the principal reason accounting for variations. Another 29% specified an anticipated change in the competitive conditions within their industries. Other main reasons given were: a change in productivity 14%; use of a depreciation formula (constant percentage or service unit) which writes off different amounts of value each year 12%; and anticipated change in technology affecting the usefulness of the asset 16%.

[2] *Op. cit.*, p. 27. [3] *Ibid.*, pp. 24–5.

[4] *Ibid.*, pp. 29–31. Also, compare with Fellner's concept of the safety margin. W. Fellner, *Competition Among the Few* (New York: Knopf, 1949), pp. 152–7; and the " caution-factor " of Sanderson, *op. cit.*, pp. 180 ff. [5] Shackle, *op. cit.*, pp. 16–17.

life of the asset is the relevant factor establishing the length of time over which they estimate future returns.[1]

Previously, mention was made of the conclusion of C. F. Roos that investment depends upon the performance of profits in the preceding period.[2] The low horizon of most business calculations concerning future returns probably limits these to a considerable extent to present experience or that of the recent past. While our survey showed that 37% of responding firms make studies of the anticipated market the basis of their determinations regarding the profitability of investment proposals, 32% stated that their studies were to a considerable degree based upon extrapolations of present (or immediately past) performance of profits. A variety of methods were reported by the other 3% of the firms. It seems quite possible that detailed inquiry would show that the dependence of investment plans upon the record of earnings in the immediate past is even more widespread than the above findings indicate.

All things considered, the discussions in the literature of the appropriate handling of prospective yield are not bereft of utility. However, they leave unanswered the question of " what's to be maximised? " Is it: (1) the internal rate of return (*i.e.*, the discount rate that would equate the current value of the stream of costs of an asset to the current value of the stream of receipts from the same asset); (2) the difference between the present value of the cost and revenue streams, both discounted at the going rate of interest; or (3) the rate of profit over cost (found by dividing the present value of the revenue stream—determined by discounting the future revenue stream at the market rate of interest—by the present value of the cost stream, discounted similarly)? [3]

The consensus of opinion among economists would *appear* to indicate that it is the difference between the present value of the cost and revenue streams (*i.e.*, total profit) that is maximised.[4]

[1] Among the comments made on this question was that of one firm which said its estimates were for the pay-out period plus one or two years, or the period for which funds have been borrowed in the case of assets purchased with outside capital. Another said its calculations are for the period required to reach maximum output levels, and one company working on government contracts (not the same company cited previously) stated that its estimates are for the period of the contract (equipment costs being fully amortised over the contract period). [2] *Loc. cit.*

[3] F. A. Lutz, " The Criterion of Maximum Profits in the Theory of Investment," *Quarterly Journal of Economics*, Vol. LX (November 1945), pp. 56–77.

For a further analysis of the maximisation problem, but one which omits the " rate of profit over cost " aspect, see C. Hildreth, " A Note on Maximization Criteria," *Quarterly Journal of Economics*, Vol. LXI (November 1946), pp. 156–64.

And finally, attention should also be drawn here to one of the earliest and most competently handled surveys of the more specific issues implicit in business planning for maximum profit under conditions of uncertainty. Cf. A. G. Hart, " Anticipations, Business Planning and the Cycle," *Quarterly Journal of Economics*, Vol. LI (February 1937), pp. 273–97.

[4] And, in most instances, is what *ought* to be maximised. Certaintly Professor Lutz implies this, although he carefully notes that Böhm-Bawerk, Wicksell, Knight, Akerman and Boulding stress the importance of maximising what amounts to the *internal rate of return*. Lutz, " The Criterion of Maximum Profits in the Theory of Investment," pp. 56–61, 76–7.

Of course there is always the possibility that a monopolistically-empowered firm may prefer to stop short of full profit maximisation. Cf. Fellner, *op. cit.*, pp. 142 ff.

Economists have failed, however, to communicate this conclusion to those who are actually engaged in business investment planning. In our survey we found that the respondents always expressed a preference for the shorter-term investment if all other conditions are equal, but few companies revealed any awareness of the discount problem as such or actually employed some explicit means for formally taking account of the effect of time upon the value of expected returns from future years.[1] In fact, of the companies surveyed, only four indicated a definite familiarity with the concept of discounting future returns, and only two really appear to be practicing discounting now. Apart from the effects of depreciation and obsolescence, a majority of firms appeared to take no formal account of the passage of time.

Presumably, in these profit-maximisation formulations the implications of the imperfectly competitive model are tacitly understood. None the less, the importance of the assumption of a negatively sloped demand schedule is so critical that it should be singled out for special consideration. Care must be exercised in order to avoid mistaking profit on a marginal increment of capital alone and of itself for the net contribution to *total profit* created by that same incremental capital. For as soon as one departs from the assumption that the firm's marginal revenue schedule is infinitely elastic, these two quantities will differ—net contribution to total profit will be the lesser. That is to say, the *marginal revenue product* created by the additional investment is less than the *value of the marginal product* created thereby.[2]

Thus, it is not enough to inquire as to the relation between the rate of interest, i, and the marginal efficiency of capital, r, and to ascertain that $r > i$. In the circumstances induced by the downward-sloping demand schedule, the significant number (or numbers) to be discounted (*i.e.*, R_1, R_2, . . R_n in equation (1)) to current supply price, and to be divided by the rate of interest (as in equation (2)), is that which represents the new asset's contribution to total profit (on existing, plus incremental, capital), rather than net earnings on new capital alone without regard to the effect of these earnings on yields from already existing facilities.[3]

The only respect in which our study sheds light upon this aspect of profit maximisation is the observation noted earlier that corporate estimates of future profits are greatly influenced by expected changes in competitive conditions.

Neither the economic theorists nor the business economists who have

[1] Of course there is a form of " implicit " discounting for time in the pay-out method of investment selection, since prospective assets are judged according to the swiftness with which their cost can be recovered.

[2] The model is further complicated by all those issues associated with the mutual indeterminacy of price-output policies among oligopolists, and by the more specific problem of bilateral oligopoly. Fellner, *op. cit.*, pp. 9 ff.

[3] Moreover, it should be made clear that R includes depreciation, as well as surplus, in the Keynesian formulation. Cf. Alvin H. Hansen, *A Guide to Keynes* (New York: McGraw-Hill, 1953), p. 122.

Professor Hamberg, in his construction, excludes depreciation, yet applies the label " marginal efficiency of capital." D. Hamberg, *Business Cycles* (New York: Macmillan, 1951), pp. 62–3.

recognised the importance of the discount problem have suggested how it might be handled in practice.[1] Yet, according to Dean:

> " Discounting the stream of capital earnings to take account of the diminishing value of distant earnings is an integral part of the theory of capital value. . . . When the economic life of assets is short or fairly uniform, when estimates are necessarily rough, and when uncertainty rises steeply in the distant future, this refinement is not worth its complexity cost. On the other hand, discounting has practical importance when there are distinctive time patterns of the income streams of different assets and when the rate of discount (logically the firm's cost of capital) is high . . ." [2]

According to Terborgh, discounting for futurity " requires that all present and future magnitudes involved in replacement analyses be brought to a common time reference for comparison." [3] And, " Interest works both forwards and backwards. It is not only an increment to past magnitudes, it is a discount for future magnitudes. . . . Everything must be brought to a common time reference by means of the interest rate." [4]

III

These comments, however, furnish no clues to the unsophisticated reader as to what method might best be employed to effectuate the practice of discounting in a firm's capital programming.[5] The obvious justification for such failure is, of course, apparent in Dean's comment concerning the quality of the estimates and the sharp increase in the uncertainty of returns from future years.

Despite the validity of these arguments for treating discounting as a parenthetical aside on the subject of investment programming, the present trend toward the development of more refined and detailed estimates suggests that heretofore neglected areas should be explored further. It is widely believed that the automation of administrative procedure is approaching in many large firms. The implication has been drawn from this, that while the primary justification for introducing electronic methods in administration will be cost savings which can be realised in the performance of certain routine clerical tasks, a potential capacity is likely to be created which will

[1] The most explicit study by a business firm recognising the effect of time upon investment decisions which we have seen is American Telephone and Telegraph Company, Dept. of Operation and Engineering, *Engineering Economy* (1952), 75 pp. and appendices. This study, however, assumes the rate of return or discount to be known and confines its attention to the determination of either: (1) present worth, or (2) future worth by use of conversion tables. Such an emphasis, which is the opposite of that in our study, is appropriate in regulated utility operations, where the rate of return for most, although not all, new investment expenditures is fixed.

[2] Dean, *op. cit.*, p. 22.

[3] Terborgh, *Dynamic Equipment Policy*, *op. cit.*, p. 43.

[4] *Ibid.*, p. 160.

[5] Another writer, Billy F. Goetz, *Management Planning and Control* (New York: McGraw-Hill, 1949), p. 183, is slightly more explicit: Discounting, he states, " involves estimating dates at which each cash receipt and disbursement is expected to occur if the plan with which it is associated is adopted, followed by application of compound interest formulas to reduce each program to a comparable basis."

make it feasible to expand greatly the firm's research for purposes of improved administrative control.[1] It has been estimated that in the future the output of the computer system of a large firm will be "hundreds of times" the present output of "paper work"; "in fact, current record keeping and other clerical activities will represent less than 1% of its activity."[2]

It seems, therefore, that there is a likelihood of rapid further development of capital programming methods. Computation of the rate of return on a basis that takes account of the time factor (discounting), however, need not await programming on a computer if estimates of net dollar returns have already been established by the firm. Indeed, problems of this type may be much more expeditiously handled with a desk calculator. Using equation (1), the procedure for programming the calculation of the discounted (or exact) rate of return on investment is as follows:

The procedure consists of two steps: first, obtaining two approximate values for r and, second, interpolation for a more accurate intermediate value which will be the final answer. The objective of this calculation is to obtain a value, S, which is as nearly equal as desired to the supply price of the asset, C.

1. Commencing with the return in the last year, R_n, and multiplying this term by x_0, which is 1 minus an assumed r, and then this product and all successive products plus the R for each year preceding also by x_0, the procedure is continued until completed for the R's of all years, n through $n - n + 1$.

$$
\begin{aligned}
&R_n \\
&R_{nx_0} + R_{n-1} \\
&(R_{nx_0} + R_{n-1})\, x_0 \\
&[(R_{nx_0} + R_{n-1})\, x_0 + R_{n-2}]\, x_0 \\
&\{[(R_{nx_0} + R_{n-1})\, x_0 + R_{n-2}]\, x_0 + R_{n-3}\}\, x_0 \ \ldots
\end{aligned}
$$

2. When S_0, the approximation to C, is obtained, the procedure is repeated using a different value for x, which is either higher or lower than x_0 as S_0 is higher or lower than C. Given these two approximations to C, S_0 and S_1, a better answer may be obtained by the method of proportional parts, which is

$$S_2, \text{ a better approximation to } C, = \frac{C - S_0}{S_1 - S_0} d + (1 - x_0),$$

where d is the difference between $(1 - x_0)$ and $(1 - x_1)$.

Ordinarily, this result will be sufficiently accurate for obtaining a discounted rate of profit on contemplated investments. However, further refinement could be obtained in the answer by means of Newton's Method.[1] The advantage is that each of the approximations in part 1 may be carried through in the calculator without any need for writing down partial results or clearing the machine. Since the method of proportional parts is accurate to four places, its use is more than sufficient to cope with the usual discounting problem.

[1] Roddy F. Osborn, "*GE* and *UNIVAC*; Harnessing the High-speed Computer," *Harvard Business Review*, July–August 1954, p. 109, reports that the General Electric Company commenced computer operations at its Appliance Park plant, Louisville, on the basis of a saving of $500,000 in clerical labor annually on just four standard operations. Osborn states that there will be plenty of free time on the computer system, because these four operations would occupy the equipment for only one-half of one shift when the plant is operating at capacity.

And, according to R. F. Clippinger, "Economics of the Digital Computer," *Harvard Business Review*, January–February 1955, p. 81, there are definite economies of scale to be realised in computer operations, or, as he puts it, "the manpower capacity tends to increase faster than the cost of the computer."

For other discussions of the subject see P. B. Laubach and Laurence E. Thompson, "Electronic Computers: A Progress Report," *Harvard Business Review*, March–April 1956, pp. 120 ff. Also the American Management Association's Office Management Series, Nos. 131 and 136 (1952? and 1954?), *Electronics in the Office: Problems and Prospects* and *The Impact of Computers on Office Management*. In the last mentioned publication, W. W. Smith ("The Computer in Industry," p. 8) points out that in the GE Appliance Park operations computer use has made possible the calculations of the budgeted net income for 37,000 possible combinations of selling prices, production model mixes and price allowances in one department alone which were deserving of analysis.

[2] Clippinger, *op. cit.*, p. 88.

IV. Conclusions

1. The marginal efficiency of capital is useful both as a theoretical refinement and as a practical step in measuring the relative desirability of different investment opportunities.

2. Methods of investment programming are still fairly crude in most firms, with programs being closely dependent upon: (*a*) judgment, and (*b*) performance in the present and immediate past. The discounting problem is scarcely recognised, and is even more rarely dealt with in practice.

3. The literature has not treated the discounting problem sufficiently, in view of the fact that the whole subject of capital programming is expected to become a much more important part of management practice in the not too distant future.

4. A simple procedure for handling the discounting problem is provided in the expectation that (*a*) it can be usefully applied, and (*b*) that it will serve as a base for further discussion and analysis.

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[1] One of the most straightforward treatments of the use of the proportional parts method and Newton's Method in solving interest problems is F. C. Kent, *Mathematical Principles of Finance*, 2nd ed. (New York: McGraw-Hill, 1927), pp. 23–8, 136–9, *et passim*. Also F. C. and M. E. Kent, *Compound Interest and Annuity Tables* (New York: McGraw-Hill, 1926), pp. 2–3, 8–11. Also see E. B. Skinner, *The Mathematical Theory of Investment* (Boston: Ginn, 1913), pp. 109–11. A more advanced discussion of these and other interpolation methods is D. E. Littlewood, *A University Algebra* (Melbourne: Heinemann, 1950), pp. 178–86.

PRODUCTIVITY, TRADE BALANCE AND INTERNATIONAL STRUCTURE [1]

In recent years there has been a good deal of fresh thinking on the elationship between productivity trends and the balance of trade. This as produced a number of highly interesting and provocative theories, but nevitably also the threat of some confusion.

The real world situation which the recent models [2] have sought to luminate is, of course, the dollar shortage, a predicament which most of hem agree in regarding as a sympton of certain differentials in performance etween America and the rest of the world, whether in current *levels* of productivity or in the *rate* of economic progress through time.[3] Confining urselves to the second type of argument, which alone appears to have eceived analytic treatment of a rigorous sort, we may follow Mr. H. G. ohnson in dividing the protagonists into two groups: those who emphasise he international burden of adjustment due to a higher *overall* rate of progress n one of the areas concerned, and those who stress the real losses arising om an unfavourable *distribution* of the superior productivity gains between ndustries of varying orientation towards foreign trade (export industries and mport-competing branches).

The main arguments of the first type of theory have found embodiment n a model of great simplicity and elegance by Mr. H. G. Johnson,[4] while he essence of theories of the second type has been most clearly stated in 'rofessor Hicks' inaugural lecture.[4] Professor Hicks' contention, it will be emembered, was that all would be well for the rest of the world so long as he progressive country's productivity trends were " export biased," but hat grave difficulties, monetary or real, would be bound to arise when its gains came to be concentrated upon import-competing industries.

My chief concern in this article is the reconciliation of the two models in slightly generalised scheme which, though falling painfully short of either n conciseness and intellectual charm, may help to restore to view a number of skeletons still lurking in various cupboards. In making such an attempt am well aware that all that can be hoped for is a relaxation of the narrowest

[1] My thanks are due to Sir Donald MacDougall for helpful suggestions concerning both matter and form.

[2] Since this article was submitted a number of further important contributions have appeared, notably Mr. H. G. Johnson's article in *The Manchester School of Social and Economic Studies*, May 1955. It is regretted that no account could be taken of them in this paper.

[3] It may be well at this point to disclaim any notion that America is, of necessity, the faster in the rate of productivity growth through time, although such a presumption may well have inspired some of the early models in the field. It is, however, in no way essential to their validity or relevance, and may be the direct opposite of the truth during the crucial post-war period.

[4] H. G. Johnson in the ECONOMIC JOURNAL, September 1954, and J. R. Hicks in *Oxford Economic Papers*, June 1953.

restrictions and, perhaps, the removal of certain threats to internal consistency—improvements which do not necessarily imply an increase in the degree of realism to which the model may lay claim. Those critics, therefore, whose objections to the Hicksian and Johnsonian models are based on charges of empirical inadequacy will not, I fear, find anything to their comfort in the following pages, and unless sufficiently imbued with the rationalist faith that the process of generalisation is itself an approach to objective truth, may well persist in their verdict that any resemblance between models of this sort and international currency problems, past or present, is largely coincidental. Nevertheless, it seems desirable that we should extend our exploration of any *given* level of abstraction, particularly when it is fast establishing itself as a secure home base to some and a worthwhile target for attack to others.

I

Let us begin by stating that the foreign-trade effects [1] which a country's productivity gain might be expected to transmit to the outside world will (on our level of abstraction) depend upon:

(1) the response of the country's money incomes (whether automatic *via* profit inflation and wage claims, or consciously elicited by monetary policies);

(2) the foreign-trade elasticities, both in the progressive country and abroad;

(3) the internal distribution of the productivity gain among the industries impinging on foreign trade (more particularly among the export and import-competing sectors);

(4) international structure,[2] *i.e.*, the progressive country's position in the world economy as determined by its relative share in the total output of internationally traded goods.

As we have seen, Mr. Johnson's type of model concentrates attention on points 1 and 2, while Professor Hicks' scheme takes in point 3 as well. Point 4 does not seem to figure in any of the formalised models at all. Yet it is clear that it must be very closely bound up with point 3; so much so, in fact, that its absence threatens to deprive that point of an essential part of its meaning: A productivity gain of a given internal incidence must surely produce quite different foreign-trade effects if, for instance, the country's share in the world output of the exported commodity were double what it was, or if its share in the total consumption of the imported commodity were only half its actual size; for in these cases the two industries would " impinge on foreign trade " in quite a different way. One would expect, therefore, that the omission of structural considerations from the two models would

[1] *I.e.*, movements in the terms of trade, export and import volumes, and the trade balance (in money terms).

[2] A vague feeling that this factor might be relevant is often expressed in loose statements such as " America is too large," or " Britain is too specialised," etc.

result in logical inconsistencies of a fairly obvious sort. This, however, is not so.

Professor Hicks is able to avoid the complications of structure by virtue of his simplifying assumption concerning income responses (point 1) coupled with his radical interpretation of the terms "export bias" and "import bias" (point 3); if there are no income responses at all, and if technical progress affects only *one* industry (either the export or the import-competing sector, but not both), the model is in many ways reduced to equivalence with the single good case, and the following prominent features of the two-commodity situation are eliminated from the start:

> (*a*) the fact that a given change in *income* will have different inflationary effects on the two commodity markets (export goods and import-competing goods) due to varying income elasticities of demand; and
>
> (*b*) the fact that a given increase in *productivity* will have different deflationary effects according to whether it occurs in export or in import-competing industries; for in the first case the supply to home consumers—being but a fraction of the industry's total output—will be *more* than proportionately affected,[1] while in the second case the home consumer will enjoy a *less* than proportionate benefit (since he is partly dependent on foreign sources whose productivity has by assumption remained constant).

By postulating constant incomes, Professor Hicks is able to avoid complication (*a*), while his working hypothesis that productivity gains are wholly concentrated on one of the two industries allows him to ignore complication (*b*). In the general case, however, when technical progress must be allowed to affect both industries simultaneously, the complications stated under (*b*) may turn out to be a vital part of the story.

Within the restricted range marked out by Professor Hicks' assumptions, his model is undoubtedly correct. It is, moreover, an eminently fertile model, not the least of its merits being that it clearly points the way to the general solution, in which (as I hope to show) the crucial concepts of "export bias" and "import bias" retain the commanding position in which Professor Hicks has installed them, although they must be re-interpreted in a way which opens the flood-gates to the long-neglected structural considerations of point 4. This, however, will be explored in the following sections. Suffice it to say here that Professor Hicks fully succeeds in banishing point 4—and for that matter point 2 (elasticities)[2]—by virtue of his restrictive assumptions concerning points 1 and 3. The forces of point 3 can therefore exercise their casting vote over the direction of the outcome.

Mr. Johnson's position regarding our four points is somewhat more difficult to assess, as he restricts each country to the production of a single

[1] For any given export volume.

[2] The only exception is the portion of the argument which refers directly to the balance of trade in money terms, where an import demand elasticity exceeding unity appears to be assumed.

commodity. Hence, national productivity gains cannot affect more than one industry, and the question of "bias" does not arise. Furthermore, the physical outputs of the two countries become incommensurable and the concept of "international structure" loses much of its meaning. If, therefore, Mr. Johnson's commodities are interpreted in the literal sense of single homogeneous goods, he does indeed avoid the embarrassments of points 3 and 4. But the model's claim to greater relevance must, I imagine, rest on the possibility of regarding each country's "commodity" as the representative of a heterogeneous bundle of goods, and this is where the difficulty arises: As soon as the sub-set of goods which is exported can cease to be a scale model of the *total* output assortment, the country's industries must vary in "export proneness" (and "import competingness"). A "uniform" productivity gain affecting each industry equally would therefore produce deflationary effects of varying strength in the different commodity markets (see *b* above), and the final outcome could not fail to be influenced by export and import ratios,[1] *i.e.*, by "international structure." Now the conclusions which Mr. Johnson draws from his model are largely dependent on the existence of a *single* inflationary pressure exerting itself with equal force on the exported and on the retained portion of a country's output. While a situation of this sort might indeed arise even in a *multiple*-industry country, it would in general presuppose a *non-uniform* (and, in view of *b*, presumably "import biased") distribution of productivity gains between the constituent industries. It may therefore be said that Mr. Johnson's model succeeds in avoiding the complications of point 4 only by transmuting them, as it were, into tacit assumptions concerning the internal incidence of productivity gains (point 3).

It will be clear from the foregoing that there is something to be gained by restoring the neglected structural factor to the general picture and constructing a model which, even at some cost in conciseness and elegance, permits all four of the basic factors to play their parts untrammelled. This will be our endeavour in the following sections.

II

Our model postulates a two-country, two-commodity world in which each country exports one of the commodities in exchange for the other, but remains a producer and consumer of both. The analysis will be conducted in terms of an international currency, with the forces of competition ensuring that an identical commodity fetches the same price in both countries, irrespective of its origin (*i.e.*, whether home-produced or imported). In contrast to most previous models of this sort we shall postulate the existence of *several* factors of production, all of them fully employed. For the rest there will be no attempt to relax the traditional simplifying assumptions, whether openly stated or implied: the portions of supply and demand which may be

[1] The proportions of total output exported and the proportions of total consumption derived from imports.

responsive to expectations and the rate of interest will be excluded from the model, being presumed to offset each other under the influence of forces which do not interfere with the rest of the mechanism.[1] International capital movements will also be left outside the purview of the model, and so will cost effects due to the import content of exports. All these factors, and many others, will be relegated to the background in order to concentrate attention on the simpler and more immediate responses of *output*, *income*, *prices*, *demand* and *supply*.

The Constants and Variables of the Model

There are two commodities, (X) and (Y). Suffixes 1 and 2 refer the symbols to countries I and II (assumed to be the only ones in existence):

Commodities.	Country I.		Country II.	
	(X)	(Y)	(X)	(Y)
Output	x_1	y_1	x_2	y_2
Export	$\bar{x}$		$\bar{\ }$	$\bar{y}$
Price	p	q	p	q
Index of physical productivity *	a_1	b_1	a_2	b_2
Index of productivity deflation *	α_1	β_1	α_2	β_2
Index of inflationary pressure *	ξ_1	η_1	ξ_2	η_2
Price elasticities (export supply and import demand)	σ_1	δ_1	δ_2	σ_2
Income elasticities (export supply and import demand*)	σ_1'	δ_1'	δ_2'	σ_2'
Disposable money income.	ω_1		ω_2	

* Explained in the following sections.

As we are chiefly interested in (proportionate) *changes* in our variables, we shall denote these in a special manner: for any variable z, conceived as a function of "time,"[2] we define:

$$(0.0) \qquad \hat{z} \equiv \frac{dx}{dt} \cdot \frac{1}{x} = \frac{d \log x}{dt} = \text{"the change in } x\text{"}$$

The "capped" variables obey certain simple rules which will greatly facilitate our calculations:

$$(0.1) \quad \begin{array}{lll} \text{If } z = \mathrm{k} \,.\, uv, \text{ then } \hat{z} = \hat{u} + \hat{v} & & (k \text{ constant}) \\ \text{If } z = k \,.\, u/v, \text{ then } \hat{z} = \hat{u} - \hat{v} & & (\ ,, \quad ,,\ ) \\ \text{If } z = f(u, v), \text{ then } \hat{z} = \dfrac{Ez}{Eu}\hat{u} + \dfrac{Ez}{Ev}\hat{v}, & & \end{array}$$

where the coefficients are the elasticities of z with respect to u and v.

[1] This leaves us free to follow the usual practice of treating internationally traded commodities as if they were to all intents and purposes consumption goods.

[2] In reality "time" is, of course, a dummy variable of which nothing is more required than that it should vary independently of all the other variables of the system. The convenient designation "time" does not elevate our essentially static system to the dignity of a dynamic one.

Elasticities

The income elasticities of export supply are here understood as measures of the proportion of output diverted from home consumption to exports (in response to a fall in income) *on the assumption of unchanged total output at home.* Similarly, the income elasticities of import demand are taken to measure the effect on imports of a rise in income *on the assumption of unchanged home production* in the import-competing line.

In the course of the analysis we shall often be interested in a country's income elasticities in relation to the *total* elasticity of the international market (for the commodities concerned), and it will be useful to define "relative income elasticities" as:

$$(0.2) \quad \begin{array}{ll} \sigma_{10}' \equiv \dfrac{\sigma_1'}{\sigma_1' + \delta_2'} & \delta_{10}' \equiv \dfrac{\delta_1'}{\delta_1' + \sigma_2'} \\ \sigma_{20}' \equiv \dfrac{\sigma_2'}{\sigma_2' + \delta_1'} & \delta_{20}' \equiv \dfrac{\delta_2'}{\delta_2' + \sigma_1'} \end{array}$$

Since the strength or weakness of a country's influence on international trade depends not merely on how radically it makes its income changes felt abroad, but on how much *more* (or less) radically it does so than the rest of the world, it is clear that the relative income elasticities can be regarded as indicators of some significance in their own right.[1]

As will appear shortly, the complications of a two-country, two-commodity model are such that our results will often depend on certain odd-looking combinations of price and income elasticities which constantly recur in the final formulæ. These need not cause undue alarm, since all their relevance to the argument is contained in the simple fact that they are *elasticity* constants, and normally positive.[2]

The Meaning of "Productivity"

The chief problem of a model which allows more than one commodity to be produced in any country is the disentanglement of productivity *as an independent force* from those of its variations which are due to changes in scales

[1] A number of simple relations involving income elasticities are given below for future reference. While of no particular relevance in themselves, they will be found to simplify the algebra of the subsequent argument quite considerably. From definitions (0.2) it follows at once that: $\sigma_1'\delta_{20}' = \sigma_{10}'\delta_2'$, $\sigma_2'\delta_{10}' = \sigma_{20}'\delta_1'$ and $\sigma_{10}' + \delta_{20}' = \sigma_{20}' + \delta_{10}' = 1$. We can therefore distinguish two "invariants" of the income elasticities which will play an important part in our calculations:

$$\pi \equiv \sigma_1'\delta_{20}' + \delta_1'\sigma_{20}' = \sigma_2'\delta_{10}' + \delta_2'\sigma_{10}'$$
$$\Delta \equiv \delta_{10}' - \sigma_{10}' = \delta_{20}' - \sigma_{20}'$$

We shall not attempt to place an economic interpretation on these constants. The name "invariants" is suggested by the fact that they would retain their value if the roles of countries I and II were reversed.

[2] We define the following mixed elasticity constants:

$$R \equiv \frac{\sigma_1 + \delta_2}{\sigma_1' + \delta_2'} + \frac{\sigma_2 + \delta_1}{\sigma_2' + \delta_1'} - 1$$
$$S \equiv 1 + \sigma_1 + \sigma_2 - (\sigma_1 + \delta_2)\sigma_{10}' - (\sigma_2 + \delta_1)\sigma_{20}'$$
$$Q \equiv R\pi + S\Delta \text{ (see footnote } sup.\text{)}$$

of production, particularly when the latter are induced by shifts in factor employment which are themselves responses to productivity changes.[1] The following definition of productivity is suggested to meet this difficulty:

Let x_1 and y_1 be the output of the two commodities in country I (with a total endowment of two factors measured by u_1 and v_1),[2] and let the production functions be of the form:

$$(0.3) \qquad \begin{aligned} x_1 &= a_1 F_1(u_1', v_1') \\ y_1 &= b_1 G_1(u_1'', v_1'') \end{aligned}$$

where the primed variables denote the factor inputs of the two industries respectively. No definite assumption concerning the shape of these functions need be made,[3] increasing and decreasing returns to scale being equally admissible.

We shall now define rises in productivity as (proportionate) *increases in the coefficients a_1 and b_1* ($\hat{a}_1$ and $\hat{b}_1$). It should be noted that we do not pretend to know how given *levels* of productivity should be measured. All that we postulate is that technological change takes the form of increasing a given output by the same percentage *for any combination of factor inputs in the relevant range*, and that this percentage may be taken as a measure of the rise in productivity in the industry concerned.

Since the factor supply to an industry will, *cet. par.*, depend on the monetary reward which it can offer per unit factor relatively to the rewards obtainable elsewhere, our formulæ (0.3) may be re-written [4]

$$(0.4) \qquad \begin{aligned} x_1 &= a_1 L_1\left(\frac{a_1 p}{b_1 q}\right) = a_1 L_1(e_{11} t_1) \\ y_1 &= b_1 M_1\left(\frac{b_1 q}{a_1 p}\right) = b_1 M_1\left(\frac{1}{e_{11} t_1}\right) \end{aligned}$$

where e_{11} stands for the "export bias" of the country's productivity ($= a_1/b_1$) and t_1 for the price ratio p/q (which in our model also represents country I's terms of trade). The expression e_{11} assumes a definite meaning only when productivities *change*, in which case $\hat{e}_{11}$ ($= \hat{a}_1 - \hat{b}_1$) is the export bias of country I's productivity gain, and $\hat{e}_{22}$ ($= \hat{b}_2 - \hat{a}_2$) that of country II.

[1] Mr. H. G. Johnson remarks (*op. cit.*, p. 64) that "the assumption that a number of goods are produced, unless hedged about by enough assumptions to reduce it to equivalence with the single-good case, either introduces problems of re-allocation at varying real cost, which make the change in productivity in part a dependent variable, or, on the assumption of constant relative cost of all products, introduces awkward problems of discontinuity in international adjustment."

[2] The number of factors is immaterial to this argument; so is the postulate of fixed total endowments: u_1 and v_1 may vary autonomously with "time" as long as they remain fully employed.

[3] But see footnote 4 below.

[4] The transition from (0.3) to (0.4) can be effected as follows: if p and q are the two commodity prices, the equilibrium condition of equal marginal products for each factor in the two industries requires that $\frac{pa_1}{qb_1}\frac{\partial F_1}{\partial u_1'} = \frac{\partial G_1}{\partial u_1''}$ and $\frac{\partial F_1}{\partial v_1'} = \frac{qb_1}{pa_1}\frac{\partial G_1}{\partial v_1''}$. For any given total factor endowment (u_1, v_1) the factor inputs into (Y) may be expressed as $u_1 - u_1'$ and $v_1 - v_1'$, and the two equations solved for u_1' and v_1' (certain types of production functions, notably linear forms, which would make the equations trivial or insoluble, may be excluded without loss of generality). The substitution of these solutions in (0.3) yields (0.4).

To find the direct nexus between productivity gains and output gains (in the absence of price changes) we need only apply our rules (0.1) to the above equations while holding prices constant ($\hat{t}_1 = 0$). In this way we obtain:

$$(0.5) \qquad \begin{aligned} \hat{x}_1' &= \hat{a}_1 + \lambda_1 \hat{e}_{11} \\ \hat{y}_1' &= \hat{b}_1 - \mu_1 \hat{e}_{11} \end{aligned}$$

where λ_1 and μ_1 are the factor supply elasticities. These definitions of what we shall call the *productivity-induced output gains* summarise the two non-price effects of a productivity gain of given internal incidence:

(1) The immediate output growth resulting at the given level of factor employment in the industry.

(2) The secondary output change due to a factor *shift* induced by the bias of the productivity gain in favour of the industry under consideration.

The priming of the letters in (0.5) indicates that we exclude the effect of any further factor shifts which may be caused by the resulting change in relative *prices*.[1]

Productivity Deflation and Income Inflation

In international dealings each of the productivity-induced output gains will generate its own deflationary pressure, which we propose to measure by what (for want of a better term) we shall call its "income absorption." This is defined for any given output gain x_1' (and therefore for the productivity gain by which it is induced) as the *percentage rise in the country's total money income which would be just sufficient to absorb the incremental supply at home without a change in its price.* An income rise of this magnitude would exactly revoke or "sterilise" the direct effect which the productivity gain would otherwise have had on the foreign-trade flow concerned: In the case of an export good, it would restore its supply to foreign markets, and in the case of an import-substitute the demand for its importation from abroad (both at the old price).

To find the algebraic nexus between a productivity gain and its "income absorptions" as defined above, we proceed as follows:

(1) The incremental output of industry X induced by the productivity gain will be $x_1\hat{x}_1'$.

(2) The effect of a hypothetical income rise $\hat{\omega}_1$ on the country's export supply (x) would be a reduction by $100\sigma_1'\hat{\omega}_1\%$ through increased home consumption, *i.e.*, an absolute decrement of $x\sigma_1'\hat{\omega}_1$.

(3) If the income rise is to revoke exactly the productivity gain in the

[1] As will appear shortly, not much depends on the algebraic link between productivity and output gains as here established. Indeed, the following analysis would retain much of its validity if it dispensed with a definition of productivity altogether, and took for its starting point the assumption of autonomous changes in *output* ($\hat{x}_1', \hat{y}_1'$) rather than in productivity. But no harm is done—and some conceptual definiteness achieved—by thinking of these as sparked by physical productivity gains in the sense defined above.

field of exports, it must satisfy the equation $x_1\hat{x}_1' = x\sigma_1'\hat{\omega}_1$. Hence the "income absorption" of the gain as far as commodity (X) is concerned will be

$$\hat{\alpha}_1 = \frac{x_1}{x\sigma_1}\hat{x}_1'. \tag{0.6}$$

The argument in the case of the import-competing industry is exactly analogous: An output increment $y_1\hat{y}_1'$ must be absorbed by an income-induced demand increment $y\delta_1'\hat{\omega}_1$. The necessary income rise must therefore be:

$$\hat{\beta}_1 = \frac{y_1}{y\delta_1}\hat{y}_1'. \tag{0.7}$$

Similar equations will, of course, obtain for country II:

$$\hat{\alpha}_2 = \frac{x_2}{x\delta_2}\hat{x}_2' \qquad \text{and} \qquad \hat{\beta}_2 = \frac{y_1}{y\sigma_2}\hat{y}_2'. \tag{0.8}$$

These magnitudes may be regarded as the "productivity deflations" operative in international trade, or alternatively as the productivity gains *themselves* as measured in the economically relevant terms of "income absorption."

The latter expression may be more readily understood if we visualise the simultaneous occurrence of an income rise and a productivity gain, with the latter "absorbing" a portion of the former's effects and leaving only a residual to exert inflationary pressure on the commodity markets concerned. We might interpret this pressure as the income rise which would have been necessary to produce the same price effects *in the absence of a productivity gain*. Let us therefore define the net "inflationary pressures" exerted by each of the two countries in the two markets as:

$$\hat{\xi}_r \equiv \hat{\omega}_r - \hat{\alpha}_r \qquad \text{and} \qquad \hat{\eta}_r \equiv \hat{\omega}_r - \hat{\beta}_r. \qquad (r = 1, 2) \tag{0.9}$$

In order to give a concrete meaning to the symbols α_r and β_r (as opposed to their proportionate changes $\hat{\alpha}_r$ and $\hat{\beta}_r$) we shall arbitrarily define them as equal to the money income *as long as no productivity changes take place*, but as varying in response to such changes in the manner of equations (0.6) to (0.8), regardless of the subsequent behaviour of *actual* money incomes. This will make the indices of inflationary pressure $\xi_r\left(\equiv \frac{\omega_r}{\alpha_r}\right)$ and $\eta_r\left(\equiv \frac{\omega_r}{\beta_r}\right)$ equal to unity in the absence of all change, and allow them to increase only when incomes rise *faster* than would be necessary to absorb attendant productivity gains. In any situation involving productivity changes, therefore, these variables would seem to be the proper replacements for the normal income terms in demand and supply functions.

III

Armed with the conceptual tools assembled in the previous sections we shall now proceed to the actual mechanism of the model.

International Flow Equations and the Terms of Trade

Each of the two foreign-trade flows (x and y) can be simultaneously regarded as an export supply and an import demand, according to the country whose point of view we choose to adopt. In either of these capacities we shall assume the trade flows to be dependent on two variables:

(a) The price of the commodity *relative to that of the other good*; in our two-commodity model this is, of course, identical with the terms of trade ($t_1 = p/q$).

(b) A composite income term, designed to measure only such *residual inflationary pressure* on the market concerned as remains after allowing for the deflating effect of productivity gains. Since we are looking at *real* rather than monetary relationships (our price-term is a *ratio* and not an absolute price), this inflationary pressure must be measured in terms of its commodity equivalent rather than in money, the *numéraire* always being the commodity *not involved* in the dependent variable of the function.

The international flow equations may therefore be written as follows:

$$\begin{aligned} x &= S_1\left(t_1, \frac{\xi_1}{q}\right) = D_2\left(t_1, \frac{\xi_2}{q}\right) \\ y &= S_2\left(\frac{1}{t_1}, \frac{\eta_2}{p}\right) = D_1\left(\frac{1}{t_1}, \frac{\eta_1}{p}\right). \end{aligned} \tag{1.0}$$

We shall now set the system in motion by assuming autonomous changes in the *four productivity levels* ($\hat{a}_1$, $\hat{a}_2$, $\hat{b}_1$, $\hat{b}_2$) and the *two money incomes* ($\hat{\omega}_1$ and $\hat{\omega}_2$). There will be no necessary connection between the former and the latter; for whatever induced income changes may be brought about by the productivity gains (through higher profits and wage demands, etc.) might well be counteracted or reinforced by a monetary policy aimed at full employment, or by a train of saving-investment reactions whose outcome is sufficiently remote from the initial impulse to qualify as an independent force.[1] The postulated changes will produce inflationary pressures ($\hat{\xi}_1$, $\hat{\eta}_1$; $\hat{\xi}_2$, $\hat{\eta}_2$) and affect the foreign-trade flows (1.0) in the following way:[2]

$$\begin{aligned} \hat{x} &= \sigma_1\hat{t}_1 - \sigma_1'(\hat{\xi}_1 - \hat{q}) = -\delta_2\hat{t}_1 + \delta_2'(\hat{\xi}_2 - \hat{q}) \\ \hat{y} &= -\sigma_2\hat{t}_1 - \sigma_2'(\hat{\eta}_2 - \hat{p}) = \delta_1\hat{t}_1 + \delta_1'(\hat{\eta}_1 - \hat{p}). \end{aligned} \tag{1.1}$$

As usual, we have chosen the signs of the price and income elasticities in such a way that the relevant symbols will in all normal cases represent positive values.[3]

[1] The income relevant to demand functions (ω_r) is in fact best regarded as the *spendable* income of consumers. It will vary under the influence of wage demands, farm support prices, budgetary tax and welfare provisions, etc., and need not equal the sum of factor incomes in any given period (*i.e.*, $\omega_r \neq px_r + qy_r$). In this respect we part company with Mr. Johnson, who expressly postulates $\omega_1 = px_1$ and $\omega_2 = qy_2$ (for single-industry countries), relationships which incidentally serve him as a substitute for export-supply functions. [2] See equations (0.1).

[3] Negativity is not, of course, excluded, but carries the usual connotation of "inferiority" or upward-sloping demand curves.

The equations may now be solved to determine the price changes consistent with equilibrium. Having regard to (0.9) and (0.2), we can write:

$$\text{(1.2)} \qquad \begin{aligned} \hat{p} &= \frac{\sigma_2 + \delta_1}{\sigma_2' + \delta_1'}\hat{t}_1 + \sigma_{20}'\hat{\omega}_2 + \delta_{10}'\hat{\omega}_1 - \hat{\beta} \\ \hat{q} &= -\frac{\sigma_1 + \delta_2}{\sigma_1' + \delta_2'}\hat{t}_1 + \sigma_{10}'\hat{\omega}_1 + \delta_{20}'\hat{\omega}_2 - \hat{\alpha} \end{aligned}$$

where the extreme R.H.S. arises from an additional (and fairly obvious) definition of " world productivity deflations " as weighed averages of their national components, *i.e.*:

$$\text{(1.3)} \qquad \begin{aligned} \hat{\alpha} &\equiv \sigma_{10}'\hat{\alpha}_1 + \delta_{20}'\hat{\alpha}_2 \\ \hat{\beta} &\equiv \delta_{10}'\hat{\beta}_1 + \sigma_{20}'\hat{\beta}_2. \end{aligned}$$

The effects on the terms of trade may now be determined by simply subtracting equations (1.2) from one another and solving for $\hat{t}_1$. Using the notation of footnotes 1 and 2 on p. 681, this yields:

$$\text{(1.4)} \qquad \hat{t}_1 = -\frac{\Delta}{R}\hat{\phi}_1 - \frac{\hat{\alpha} - \hat{\beta}}{R}$$

where $\hat{\phi}_1$ stands for the movement of relative money incomes, sometimes referred to as the " factorial terms of trade ":

$$\text{(1.5)} \qquad \phi_1 \equiv \frac{\omega_1}{\omega_2} \text{(hence } \hat{\phi}_1 = \hat{\omega}_1 - \hat{\omega}_2).$$

If we can regard R as positive, which would seem to be a reasonable assumption,[1] equation (1.4) gives a more precise interpretation to the obvious fact that in the absence of income changes a country's commodity terms of trade will *improve* ($\hat{t}_1 > 0$) if the deflationary pressure of international productivity gains falls more heavily on its *imports* than on its exports ($\hat{\beta} > \hat{\alpha}$), and deteriorate in the converse case. With changes in incomes, the commodity terms of trade will tend to move in the direction of the factorial terms of trade if Δ is negative, and in the opposite direction if Δ is positive. Again, this is no more than might have been expected; for if the *supply* reactions to income changes are stronger than the *demand* reactions (*i.e.*, $\Delta < 0$),[2] a country whose money income increases relatively to that of the outside world will curtail its export supply more radically than it expands its import demand, thus generating a pressure on relative prices favourable to itself.[3]

The chief merit of equation (1.4) for our purpose is the separation of the income effect from the productivity effect, the first of which ($\hat{\phi}_1$) may in certain circumstances qualify as a " parameter of action," since (within certain limits) it is open to manipulation by conscious monetary or

[1] With two commodities only, which are bound to be mutual substitutes, price elasticities may be expected to be larger than the corresponding income elasticities; see footnote 2 on p. 681.

[2] Or $\sigma_{ro} > \delta_{ro}$ for both countries; see footnote 1 on p. 681.

[3] This pressure cannot be revoked by the price elasticities as long as these are larger than the income elasticities ($R > 0$).

fiscal policy,[1] while the second will be determined by the direction which technological progress happens to take in any particular period.

The Balance of Trade

A country's trade balance will here be measured by the ratio of its export to its import value: [2]

$$\text{(1.6)} \qquad \tau_1 \equiv \frac{px}{qy} = \frac{x}{y}t_1 \text{ (hence } \hat{\tau}_1 = \hat{x} - \hat{y} + \hat{t}_1).$$

To explore the behaviour of this crucial ratio in response to income and productivity changes we need only subtract the second from the first equation in (1.1) and add the expression for $\hat{t}_1$ from (1.4). Using the notation of footnotes 1 and 2 on p. 681, this yields:

$$\text{(1.7)} \qquad \hat{\tau}_1 = -\frac{Q}{R}\hat{\phi}_1 - \frac{S}{R}(\hat{\alpha} - \hat{\beta}) + \pi\hat{\Lambda}_1$$

where $\hat{\Lambda}_1$ stands for a weighted average of the " productivity leads " of country I over country II in the two existing lines of production (measured in terms of deflation equivalents):

$$\text{(1.8)} \qquad \hat{\Lambda}_1 \equiv \frac{\sigma_1'\delta_{20}'(\hat{\alpha}_1 - \hat{\alpha}_2) + \delta_1'\sigma_{20}'(\hat{\beta}_1 - \hat{\beta}_2)}{\sigma_1'\delta_{20}' + \delta_1'\sigma_{20}'}.$$

Equation (1.7) makes explicit a number of determinants of the trade balance whose separate effects have often been noted in the past without, however, being brought together in a single formula. Since the constants π, R, S and Q may normally be taken to be positive,[3] the equation states that a country's trade balance will tend to *improve* ($\hat{\tau}_1 > 0$), if:

(1) its money income falls relatively to that of the outside world, *i.e.*, $\hat{\phi}_1 < 0$;

(2) international progress has a " deflation bias " towards the imported commodity, *i.e.*, $\hat{\beta} > \hat{\alpha}$;

(3) the country's " average " productivity deflation is greater than that of the outside world, *i.e.*, $\hat{\Lambda}_1 > 0$.

Monetary Policy and the Terms of Trade

In the previous sections we have tried to show how the terms of trade (1.4) and the trade balance (1.7) will react to productivity changes, given that the countries' money incomes are free to vary in response to internal stimuli (suitably corrected to safeguard full employment) without being manipulated by monetary or fiscal measures to counteract untoward developments in the sphere of foreign trade itself. This is of considerable interest, but we

[1] *E.g.*, general income deflation or devaluation in country I may achieve $\hat{\phi}_1 < 0$.

[2] Although usually conceived of as the *difference* of these values ($px - qy$), the present definition of the trade balance as their *ratio* has obvious algebraic advantages when interest centres on proportional changes. The same definition is used in Mr. Johnson's article (*op. cit.*) to excellent purpose.

[3] In the case of π this merely excludes " inferiority " and upward-sloping demand curves; in the case of the other constants it excludes what are generally acknowledged to be " perverse " cases, such as a deterioration in the trade balance after devaluation ($Q < 0$), etc.

may wish to follow Professor Hicks and examine the behaviour of the terms of trade when income movements are so manipulated as to maintain (or restore) a threatened balance of trade. The *rationale* of such an analysis rests on the belief that it is precisely when monetary policies imperative in the interest of national solvency result in continual real losses through adverse movements in the terms of trade, that we can speak of currency shortages that are at once chronic and acute.[1]

Let us, then, assume that country I, faced with the threat of a negative trade balance through "adverse" world productivity trends (*i.e.*, $\hat{\alpha} > \hat{\beta}$ and/or $\hat{\Lambda}_1 < 0$), decides to reduce its money income relatively to the rest of the world ($\hat{\phi}_1 < 0$) by exactly as much as is necessary to counter the threat and keep the trade balance stable. How will this affect the terms of trade? Algebraically the answer is easily found. We need only put (1.7) equal to zero, solve for $\hat{\phi}_1$ and substitute in (1.4). The result may be written[2]:

$$(1.9) \qquad \hat{t}_1' = -\frac{\pi}{Q}\left[\frac{\frac{\sigma_1'\delta_1'}{\sigma_1'+\delta_1'}\hat{\epsilon}_{11} + \frac{\sigma_2'\delta_2'}{\sigma_2'+\delta_2'}\hat{\epsilon}_{12}}{\frac{\sigma_1'\delta_1'}{\sigma_1'+\delta_1'} + \frac{\sigma_2'\delta_2'}{\sigma_2'+\delta_2'}}\right] = -\frac{\pi}{Q}\hat{\epsilon}_1$$

where $\hat{\epsilon}_{11}$ and $\hat{\epsilon}_{12}$ are defined as the *degrees of (deflation) bias* in favour of country I's exports (X) exerted by the productivity gains of countries I and II respectively, *i.e.*:

$$(1.10) \qquad \hat{\epsilon}_{11} \equiv \hat{\alpha}_1 - \hat{\beta}_1$$
$$\hat{\epsilon}_{12} \equiv \hat{\alpha}_2 - \hat{\beta}_2$$

The expression $\hat{\epsilon}_1$, analysed in the square brackets of (1.9), is a simple weighted average of the two countries' (deflation) biases in favour of commodity X,[3] and may therefore be interpreted as the "international bias" in favour of country I's exports.

It is equation (1.9) which relates what appear to be the most decisive variables of the problem *in the long run*, *i.e.*, when neither country can afford to lose reserves indefinitely ($\hat{\tau}_1 = 0$). Above all, it defines the sense in which Professor Hicks' indictment of import-biased productivity trends retains its general validity: since both π and Q are assumed to be positive, we find that an international bias in favour of country I's exports ($\hat{\epsilon}_1 > 0$, which is, of course, an *import* bias from country II's point of view) will in the long run turn the terms of trade against country I, notwithstanding that country's possible leadership in technological progress, and regardless of the movements in relative money incomes. It must be emphasised, however, that "export bias" and "import bias" are here defined in terms of *income absorption* (*i.e.*, deflation effects) and not in *physical* terms.

In the particular case where country II is completely stationary (*i.e.*,

[1] It may well be that this fact, and hence the following analysis, is more relevant to the case of *Britain* (rather than America) *contra mundum*, since the terms of trade will seriously affect real income only where foreign trade bulks largely in the economy.

[2] The primed symbol $\hat{t}_1'$ denotes the change in the terms of trade *subject to the condition* $\hat{\tau}_1 = 0$.

[3] The weights are the harmonic means of the relevant income elasticities.

$\hat{\epsilon}_{12} = 0$), the "world bias" $\hat{\epsilon}_1$ will be proportional to $\hat{\alpha}_1 - \hat{\beta}_1$. It is clear, therefore, that if in addition all progress in country I were concentrated on the export industry, *i.e.*, $\hat{\beta}_1 < 0$ [1] and therefore $\hat{\epsilon}_1 > 0$, the terms of trade must turn in favour of country II ($\hat{t}_1 < 0$), while "extreme" import bias ($\hat{\alpha}_1 < 0$ [2] and $\hat{\epsilon}_1 < 0$) would have the opposite effect. Since, moreover, in these particular cases the sign of the *deflation* bias $\hat{\epsilon}_1$ cannot fail to accord with that of the *physical* bias, Professor Hicks' contentions are completely borne out under the restrictive assumptions specified. But as soon as the postulate of a one-country, one-industry productivity gain is abandoned, the re-interpretation of his theorem in terms of *deflationary* productivity bias (as defined in (1.9)) assumes a crucial importance; for the latter may differ in direction as well as in extent from the *physical* bias by which it is caused. It is precisely the transmutation of physical productivity gains into deflationary bias which opens the door to the long-neglected factor of *international structure* and, as we shall see in the following section, assures it a place of central importance in our model.

IV

In the previous section we concluded that the maintenance of international solvency ($\hat{\tau}_1 = 0$) will cause a country to suffer from steadily worsening terms of trade ($\hat{t}_1' < 0$) if, given the prevailing demand and supply elasticities, the incidence of economic progress in the world is such as to exert a greater deflationary pressure on its exports than on its imports ($\hat{\epsilon}_1 > 0$). In order to identify the simplest patterns of output and technology productive of such export-biased deflation effects we must re-translate the "income absorptions" which have so far served us as measures of productivity gains ($\hat{\alpha}_r$, $\hat{\beta}_r$) into the *physical* rates of improvement ($\hat{a}_r$, $\hat{b}_r$) from which they were originally derived.

From (1.9) and (1.10) it is evident that an export bias in terms of productivity deflation ($\hat{\epsilon}_1 > 0$) must imply that

$$(2.0) \qquad \frac{\sigma_1'\delta_1'}{\sigma_1'+\delta_1'}(\hat{\alpha}_1 - \hat{\beta}_1) + \frac{\sigma_2'\delta_2'}{\sigma_2'+\delta_2'}(\hat{\alpha}_2 - \hat{\beta}_2) > 0.$$

By expressing $\hat{\alpha}_r$ and $\hat{\beta}_r$ in terms of the "productivity-induced" output gains (see (0.6) to (0.8)), this condition may be put as:

$$(2.1) \qquad \frac{\delta_1'y_{10}}{\sigma_1'+\delta_1'}\left(\frac{x_{10}}{y_{10}} - \frac{\hat{y}_1'}{\hat{x}_1'}\frac{\sigma_1'}{\delta_1'}\right)\hat{x}_1' > \frac{\delta_2'x_{20}}{\sigma_2'+\delta_2'}\left(\frac{y_{20}}{x_{20}} - \frac{\hat{x}_2'}{\hat{y}_2'}\frac{\sigma_2'}{\delta_2'}\right)\hat{y}_2'$$

where x_{ro} and y_{ro} stand for the ratios of national outputs to foreign trade flows, *i.e.*,

$$(2.2) \qquad x_{ro} = \frac{x_r}{x} \qquad \text{and} \qquad y_{ro} = \frac{y_r}{y}.$$

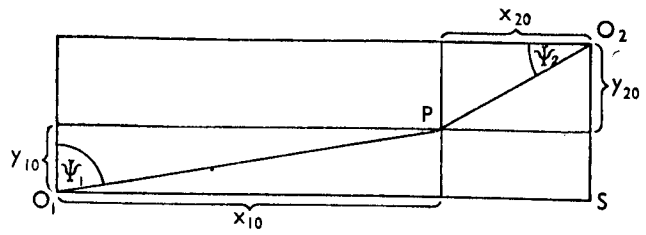
The cross-ratios $\frac{x_{10}}{y_{10}}$ and $\frac{y_{20}}{x_{20}}$ in (2.1) may be interpreted as the "degrees of specialisation" of the two countries in the international division of labour; for "specialisation" can be said to increase whenever a country's importance

[1] Since $\hat{y}_1' = -\mu_1\hat{a}_1$; see (0.5).

[2] Since $\hat{x}_1' = -\lambda_1\hat{b}_1$; see (0.5).

as a producer of the exported commodity (x_{10} and y_{20}) grows at the expense of its relative weight as a producer of the imported commodity (y_{10} and x_{20}). The position can be represented on the traditional two-country, two-commodity diagram.

DIAGRAM 1



The sides of the rectangle measure the world output of the two commodities ($x_{10} + x_{20}$ and $y_{10} + y_{20}$), the physical units of measurement being chosen so as to make both export volumes (x and y) equal to unity.[1] Point P represents the international structure of world production, with the contributions of country I measured from O_1, and those of country II (in the opposite directions from O_2). The two "degrees of specialisation" are therefore measured by the tangents of angles ψ_1 and ψ_2 respectively. The larger these angles, the greater the extent of international specialisation, until in the extreme case point P becomes coincident with S, the point of "complete specialisation."

The Case of "Uniform" Productivity Trends

Let us now assume that each country's productivity gain is *uniformly* distributed over the two industries, *i.e.*, $\hat{a}_r = \hat{b}_r \equiv \hat{z}_r$. In that case all physical export bias ($\hat{e}_{rr}$) will vanish and, in conformity with (0.5), the "productivity-induced output gains" will both be equated to the country's overall rate of advance, *i.e.*, $\hat{x}_r' = \hat{y}_r' = \hat{z}_r$.[2]

Condition (2.1) therefore reduces to:

(2.3) $\hat{\epsilon}_1 > 0$ (hence $\hat{t}_1' < 0$),[3] if $A_1\hat{z}_1 > A_2\hat{z}_2$

where $$A_1 \equiv \frac{\delta_1' y_{10}}{\sigma_1' + \delta_1'}\left(\frac{x_{10}}{y_{10}} - \frac{\sigma_1'}{\delta_1'}\right)$$

and $$A_2 \equiv \frac{\delta_2' x_{20}}{\sigma_2' + \delta_1'}\left(\frac{y_{20}}{x_{20}} - \frac{\sigma_2'}{\delta_2'}\right)$$

A glance at the definitions of the constants A_1 and A_2 will convince us that, given positive income elasticities, their signs (and hence the validity of

[1] If we start from a position of balanced trade ($px = qy$) this means measurement proportional to current value, since $x = y = 1$ implies the equality of the two prices p and q.

[2] It should be noted that our particular definition of productivity, though probably the most amenable to this sort of analysis, is by no means the only one to give the subsequent argument relevance or validity. *Any* definition which allows us to speak of "uniform" productivity gains whenever the two industries show equal productivity-induced output increases may be substituted without prejudice to the conclusions of this section.

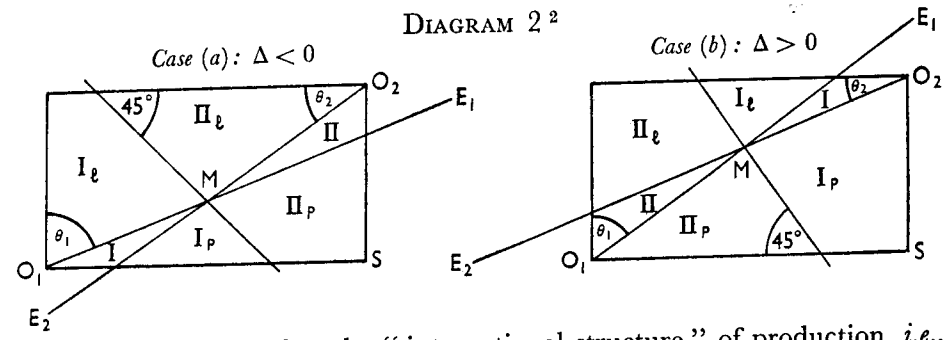
[3] The symbol $\hat{t}_1'$, it will be remembered, stands for the change in the terms of trade *given that the trade balance is kept stable.*

(2.3)) will depend entirely on the position of the production point P relative to the elasticity-ratios $\frac{\sigma_1'}{\delta_1'}$ and $\frac{\sigma_2'}{\delta_2'}$. In fact, when the latter are represented (as in Diagram 2) by two straight lines (E_1 and E_2) issuing from the origins and intersecting at M,[1] we can mark out a number of zones for P, for which various propositions regarding conditions (2.3), and hence the long-run term-of-trade effects may be quite generally asserted. It is clear from inspection that condition (2.3), inflicting adverse terms of trade movements on country I, must obtain:

(1) For *any* $\hat{z}_1$ and $\hat{z}_2$, if $A_1 > 0$ *and* $A_2 < 0$. Zone *I*.
(2) For all $\hat{z}_1 > \hat{z}_2$ if $A_1 > A_2 > 0$ . . . . Zone I_p.
(3) For all $\hat{z}_1 < \hat{z}_2$ if $0 > A_1 > A_2$ . . . . Zone I_l.

Similar assertions *mutatis mutandis* may, of course, be made concerning country II, thereby defining the analogous Zones *II*, II_p, II_l.

DIAGRAM 2[2]



It appears, then, that the "international structure" of production, *i.e.*, the zonal position of the production point on the diagrams, plays quite as important a role in allocating the real gains and losses in foreign trade as do the elasticities of demand and supply, *i.e.*, the position of the zonal boundaries.[3]

The General Case of Biased Productivity Trends

Everything that may be deduced from Diagram 2 concerning the case of "uniform" trends remains valid in the general case, provided only that the

[1] Where $\tan\theta_1 = \frac{\sigma_1'}{\delta_1'}$ and $\tan\theta_2 = \frac{\sigma_2'}{\delta_2'}$.

[2] Should the elasticity-lines E_1 and E_2 intersect *outside* the rectangle, the number of effective zones will be reduced to three, *e.g.*:



[3] Perhaps the simplest way of "reading" the diagrams is to say: With the production point in zone $I_l/I_p/I$, the maintenance of balanced trade will result in terms of trade movements against country I if it is *relatively laggard/relatively progressive/in any case*; and *mutatis mutandis* for country II. In other situations, *e.g.*, where the production point is in I_l and country I is *not* laggard, the terms of trade will still turn against it, unless the margin of its lead over country II exceeds a certain minimum (see (2.3)).

diagram is re-interpreted in the light of condition (2.1) rather than of its simplified version (2.3):

(1) The angles θ_1 and θ_2 will no longer depend exclusively on the countries' elasticity-ratios, but must be taken to *increase* to the extent that physical *import* bias is present $\left(i.e., \tan\theta_1 = \frac{\hat{y}_1'}{\hat{x}_1'}\frac{\sigma_1'}{\delta_1'} \text{ and } \tan\theta_2 = \frac{\hat{x}_2'}{\hat{y}_2'}\frac{\sigma_2'}{\delta_2'}\right)$.

(2) The " lead " or " lag " of a country must now be taken as determined by the behaviour of export industries only, *i.e.*, country I is " leading " (or " lagging ") if its *export* industry develops faster (or slower) than the *export* industry of country II (*i.e.*, I_p causes $\hat{t}_1' < 0$ if $\hat{x}_1' > \hat{y}_2'$, and I_l in the converse case).

When re-interpreted in this way, the delineation and significance of the zones in Diagram 2 remains unaffected by the relaxation of the " uniformity " postulate.

We may mention one particular conclusion which can easily be read off the Diagram: As country II's import bias increases (*i.e.*, the angle θ_2 grows), the danger area within which country I may suffer worsening terms of trade ($I + I_l + I_p$) is correspondingly enlarged. The opposite is true in the case of increasing export bias. From this it follows that import bias abroad, though by far not the only factor decisive of the outcome, can only make matters worse (or less good) for a country than they would otherwise have been, while export bias abroad, by the same token, can only be an influence for good (or the mitigation of evil).

V

In section I of this article we listed four major factors which, on our level of abstraction, may be held to determine the foreign-trade effects of international productivity gains: Income responses, foreign-trade elasticities, the bias of productivity gains, and " international structure." The first of these has independent status only when we are concerned with the *direct* and *automatic* effect of world progress on a country's trade balance (Mr. Johnson's problem). If, however, we allow for the conscious pursuit of national solvency through corrective income manipulation (deflation or devaluation), and our interest centres on the incidence of the " real cost " of that solvency in barter terms (Professor Hicks' problem), the first of our factors loses independent status, and the burden of deciding the outcome is thrown upon the remaining three: the foreign-trade elasticities, the bias of productivity gains, and " international structure."

It has been our concern to show that *all three* of these are relevant. More particularly, we have seen that the existence of export or import bias by itself cannot be decisive of the outcome, unless the terms are understood to refer to the *deflation effects* of these gains (as defined in (1.9)), rather than to the gains themselves. In the normal *physical* interpretation of the term such a bias may turn the country's terms of trade in either direction, depending on the pre-existing structure of world production, without which the whole problem would appear to be incompletely specified.

The particular manner in which our three factors combine to decide the outcome is too complicated to be stated in a few simple propositions; it is probably most concisely stated in diagrammatic form (see Diagram 2): The ratio of each country's foreign-trade elasticities multiplied by the import bias of its productivity gain determines the position of the zonal boundaries which divide the rectangle (*i.e.*, angles θ_1 and θ_2), while the forces of " international structure " determine the position of the production point within the diagram. Clearly, a knowledge of all these factors is required before the " victim " of international progress-cum-solvency can be identified (see footnote 3 on p. 691).[1]

For the sake of concreteness we shall single out two obvious ways in which the forces of international structure may come into play:

(1) *Relative Size.* If country I's " size " is measured by the distance of the production point O_1 (Diagram 2, case *a*), it is clear that the larger it bulks in world production, the greater will be the chance of the production point lying in zones II_l, II_p or II, *i.e.*, the greater the danger of adverse terms-of-trade movements for country II, whether it be progressive or laggard.[2] In a sense, therefore, the frequent statement that the mere predominance of a country may create adjustment difficulties where these might otherwise not have existed, cannot be ruled out of court.

(2) *International Division of Labour.* In any situation in which the barter trends are against a laggard country (*i.e.*, production point in zones I or II_l), the balance of advantage might conceivably be redressed by an increased degree of international specialisation, *i.e.*, a movement of the production point towards S, the " point of complete specialisation."[3] If such a manœuvre could ever be successful it would turn the terms of trade against the relatively progressive country, which is presumably better able to bear the attendant real losses. There is thus a sense in which it may be true to say that international balance is endangered by too much autarky in one or both of the major subdivisions of the world.

It would be tedious to ring the changes of all possible configurations in our diagrams, and unpardonable to deduce policy recommendations from them. But enough has been said to show that, even on our level of abstraction, the forces of international structure are an integral part of the picture, and that occasionally they work in a manner that lends support to certain naïve preconceptions which recent theoretical thinking has tended to brush aside.

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[1] In addition, of course, we must know which is the country with the faster rate of progress.

[2] The argument is here confined to case (*a*) for the sake of simplicity; in case (*b*) the converse applies. Apart from the fact that case (*a*) is probably the more usual of the two, its potentialities for international disequilibrium are also the more serious: Terms of trade movements against the *smaller* country are obviously less bearable than the converse, since the smaller country is also the one whose real income is more profoundly affected by the terms of trade.

[3] This applies to both cases (*a*) and (*b*).

REVIEWS

The Theory of Economic Growth. By W. A. Lewis. (London: Allen and Unwin, 1955. Pp. 453. 30*s*.)

It is the great merit of Professor Lewis' treatise on economic growth that it knits together many different strands of thought that have generally been allowed to go unrelated. The process of growth and development is seen as a single phenomenon whether it takes place in developed or underdeveloped countries; whether the point of departure is the firm, the national economy or the world as a whole; whether one looks back a long way to the ancient world, or a short way to the emergence of modern industry in Western Europe, or looks forward to the structural changes that further development will dictate; whether it is technological change that has to be explained or the accumulation of capital. At one moment Professor Lewis is ransacking history to show why and how growth occurs; at another he is deep in the sociology of knowledge and expounding how new ideas originate and gain acceptance; at yet another, he is shaking his head over what governments do, or puzzling over why they do it and why some countries get good governments while others do not. He ranges over the globe for his illustrations with a freedom that even Adam Smith might have envied. Although narrowed in the opening sentence of the book to "growth of output per head of population," the subject matter rapidly expands and the theme of growth becomes progressively universal. Only artistic activity seems to be left out.

It would be possible to regard this very universality of approach as a weakness; and from the point of view of the student who wants a rounded treatment of a series of discrete problems and a set of analytic propositions posing as theory it undoubtedly is. The reader is swept from one subject to another in a steady stream of argument, with no pauses for model-building, and a good deal of turning back towards territory already traversed. The arrangement does not lend itself to normal text-book requirements. But what the teacher may regret, the general reader with some elementary knowledge of economics will applaud. He is offered a book that is meant to be read as a whole, that is abundantly readable, and is full of stimulating comment on matters of great contemporary importance.

The professional economist will be struck first by the novelty of the lay-out. Professor Lewis starts by listing three proximate and inter-related causes of economic growth: a change in the strength of economic motivations; technical progress; and capital accumulation. The first of these is analysed in chapters dealing with "the will to economise" and with the economic institutions that promote or discourage economic effort; then follows a chapter on the growth and application of knowledge; capital is the subject of one chapter, and population and international trade are grouped in the next; finally comes a chapter on government and its power

influence growth. Professor Lewis is at some pains to emphasise that it wrong to fasten on any one of these factors to the exclusion of the others d that in practice they are usually self-reinforcing.

A second feature is the complete absence of citations and footnotes: ere is not a single quotation in the entire volume. This makes it impossible know on what authority judgments are expressed or to identify the econosts to whom vague allusions are made from time to time as members of s or that school of thought. Even the general reader may be tempted to quire whether the generalisations that are so boldly advanced would be cepted by other economists. If the book were as lacking in originality as superficial as Professor Lewis modestly suggests in his Preface, this ght not matter; but it just is not possible for anyone of his gifts to write ingle page without some arresting statement that a more cautious econost might challenge.

The most arresting generalisations appear in the chapter on capital. ıere, Professor Lewis argues that "the central problem in the theory of ɔnomic growth is to understand the process by which a community is nverted from being a 5% to a 12% saver" (p. 226). This process is, in view, "essentially dependent upon the rise of profits relatively to national ɔme" (p. 236), and this in turn depends upon the emergence of a new ss of profit-making entrepreneurs who think in terms of productive investnt rather than pyramids, temples and conspicuous consumption. Prosor Lewis is obviously a Ricardian at heart, and not content with extolling e entrepreneur and castigating the landlord, is prepared to cast his argunt in terms of percentages.

There are several features of his argument that call for comment. It viously introduces a dichotomy between the theory of growth in underveloped countries and the theory as it applies to countries with a large and ll-established capitalist sector. This dichotomy is made to originate in measurable difference in the rate of capital accumulation, although the idence that there is such a difference or that the difference is a persistent e, or that countries can be simultaneously ranged in order of stage of velopment and rate of capital formation so that the one serves as a useful dex of the other is highly uncertain and is not produced.

Again, does the process of capital accumulation in some way *explain* the ocess of income growth, or would Professor Lewis' proposition be essenlly altered if one viewed capital formation as a *response* to the growth of come? The central problem is surely to understand why there is a spurt productivity or in the rate of growth of the national income; there are enty of good reasons for expecting capital to grow at about the same rate income; but to transfer the focus of interest from income to capital is to ant to capital a dominance over the other factors in income growth that repudiated elsewhere in the book.

Let us take the second proposition. Is it really true that a growing te of capital formation requires an expansion in profits relatively to national come? It is no doubt impressive to observe the limitations of the capital

market at an early stage of development and quite right to underline the need for self-financing in the expanding sectors of the economy. But this does not require us to dismiss agriculture as if it were never the most promising sector for expansion; nor need we regard high profits in commerce as the indispensable or most satisfactory preliminary to industrialisation. What matters is where there are unexploited opportunities of remunerative investment. Once these exist, *any* class in the community may seize them and turn entrepreneur; and the very fact that the investments are highly profitable will help to generate finance exactly where expansion requires it.

The third proposition is also open to doubt. A community may be full of " penny capitalists," to use Sol Tax's phrase, whose responses are identical with those of the " new men " who later grow into a capitalist class, but no development whatever may take place. An extreme example is the village of Panajachel studied by Tax; and in nearly all communities there are traders who are quick to seize a profit and would readily engage in productive investment if they knew enough to form a rough judgment of their chances of gain or loss. The problem for them is not one of finance only but of ignorance, inexperience and market limitations. So far as it is a problem of finance, it is often the risks of fixed long-term investment that are the main deterrent and the relatively low return that such investment may carry. This is not a problem that can be resolved simply in terms of the savings habits of different classes of the community.

Of the ensuing argument in which Professor Lewis develops his theory of growth, there is room for comment on one point only. Since development is largely a response to opportunity, those who study it do so mainly in the hope of learning how opportunities of growth arise or may be created. Probably the most powerful weapon is the pressure of demand, and this weapon can most readily be brought into play by inflation. Professor Lewis is obviously tempted to recommend inflation on the grounds that it involves a shift to profits and overcomes financial obstacles to growth. He treats inflation as a kind of race in which beleaguered consumers are ultimately relieved by the new supplies that are rushing along the pipe-lines towards the market. This view of things is not unfamiliar and has some substance in industrialised countries where supply reactions are swift and powerful. But it might have been well to emphasise more strongly the difficulty of keeping inflation under control and using it constructively in less-developed economies.

Growth is an historical, not a purely logical, process; and to understand it calls for a sense of history quite as much as analytic subtlety. But a sense of history is not conveyed merely by historical parallels and illustrations; it is necessary also to divine what in the circumstances of to-day is new and represents a break with the forces operating in the past and what is a continuation of earlier impulses. Is technological progress, for example, the same phenomenon to-day as it was half a century ago? Do we really understand what governs marriage and fertility rates? Is the experience of a country like Japan, which Professor Lewis cites so often, still relevant when

the way of the world seems so different? Must all the stages through which the industrial countries have passed be repeated, the same attitudes emerge, the same conflicts be resolved? Are the shifts in income distribution that Professor Lewis believes necessary on the basis of his reading of the past quite inescapable? Or will our views of growth be transformed by the end of the century as much as they have been since the beginning? If the example of Mill, to which Professor Lewis refers in his Preface, serves as a warning against finality, might it not be useful to dwell at more length on the waywardness of the parameters and the uncertainty of the conclusions?

One last impression remains. The theory of growth is an enormous canvas on which to paint; after all, is not all economic theory about growth except when the possibility is deliberately excluded? If some of the painting is a little sketchy, the whole effect is still remarkable. Few economists could sustain for so long, and with such clarity and good judgment, an argument that embraces most of the major issues of economic policy.

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Contemporary Capitalism. By JOHN STRACHEY. (London: Victor Gollancz, 1956. Pp. 302. 25*s.*)

MR. STRACHEY makes his survey of contemporary capitalism in terms of a critique of economic theories. The vigour and sweep of his treatment is refreshing. Viewing economics from the outside, as an active politician, he sees it in the large and marks the outlines which are generally lost in the controversies of professionals. He shows how the original vision of a harmonious free economy, directed by the hidden hand of competition, has been rendered obsolete by the concentration of modern industry into oligopolies and monopolies. The orthodox marginalist school only distracted attention from the important questions by fussing over minor ones, and to this very day has failed to take note of the mutation in capitalism which makes their elegant logic inapplicable to reality.

Meanwhile Marx had seen the point, but latter-day Marxists have permitted what were plausible observations in 1848 to harden into dogma, and they, too, have been left high and dry while history has changed its course into a fresh channel.

Mr. Strachey's central argument is that Marx was in one sense quite correct in predicting that the purely economic forces of capitalism, developing towards monopoly, would depress the standard of life of the workers and lead to an ever-growing inequality in the distribution of income, but that he failed to take account of the counteracting political forces of democracy and trade-union power, which have in fact succeeded in keeping the share of wages in the growing product of industry more or less constant, and so have fended off the cataclysmic end that Marx foresaw.

> " We reach the paradoxical conclusion that it has been, precisely, the struggle of the democratic forces *against* capitalism which has saved

the system. It has done so not only by making tolerable the conditions of life of the wage earners, but also by keeping open the indispensable market for the final product which the self-destructive drive of capitalism to a more and more inequitable distribution of the national income would otherwise have closed. Thus democracy has had far reaching economic consequences" (p. 154).

As Mr. Strachey later admits (p. 208), this is a somewhat artificial way of looking at the matter. "It may well be that if we treat all the democratic institutions which we have been discussing in the preceding chapters as *a part* of contemporary capitalism: if we treat trade unions, representative institutions with a universal franchise functioning effectively, freedom of speech and of assembly, and the whole mental climate which such institutions produce, together with all the heavy, moulding pressure which they exercise upon the economy—if we treat all this as part and parcel of contemporary capitalism," then the stabilising mechanism cannot be separated off and opposed to a hypothetical "pure" capitalism which could not have survived.

Moreover, Mr. Strachey, giving all the credit to democracy, passes over another influence which might be held to have played no less a part in raising the general standard of life; that is, the spread of family planning to the working-class. When capital (including command over natural resources) is accumulating less rapidly than the population is growing no amount of democracy can do much to raise the level of real wages. But then industrialisation, and the rise in education which is necessary for it, lead to family planning, so that this, too, may be regarded as a part of the system.

Though Mr. Strachey regards it as his main task to account for what must be to a socialist the surprising success of contemporary capitalism, he remains none the less a socialist. This comes out in his discussion of Keynes. Keynes believed himself to be a defender of capitalism. By analysing its faults he intended to show how they could be remedied and the system made viable. But Mr. Strachey points out that once it has been shown that unearned income is not necessary for capital accumulation, that distribution can be moulded by political means, that investment decisions cannot safely be left to the uncontrolled choice of the oligopolists, the justification for capitalism has been irremediably eroded and that democracy can survive only if it presses on towards socialism.

After this point the argument seems to grow less sharp, and the proportion of rhetoric to analysis grows greater. Mr. Strachey promises further studies which will deal with the political side of the subject, but surely in this, the economic, volume he should at least have posed the question, how planning is to be combined with democracy. Planning without democracy is prone to fall into Stalinism, while a form of democracy which permits industries to be nationalised, de-nationalised and re-nationalised according to the fancy of a handful of marginal voters is not propitious to planning. Faced with a choice of evils Mr. Strachey unhesitatingly prefers democracy, but then what about planning? Where do we go from here?

Cambridge. JOAN ROBINSON

ie Business Cycle in the Post-war World. Proceedings of a Conference held by the International Economic Association. Edited by ERIK LUNDBERG, assisted by A. D. KNOX. (London: Macmillan, 1955. Pp. xvi + 367. 30*s*.)

THE first and longest section of these proceedings consists of a series of pers on business fluctuations in individual countries since the war, with a ief general introduction by Sir Dennis Robertson. The second section ntains a more loosely related group of papers on business-cycle theory and application. Finally, there is a summary account of the discussions that ok place at the Conference, prepared by Mr. Knox.

The country papers suffer to a particular extent from the delay of over ree years that has elapsed between the Conference itself, held in September 52, and the publication of its proceedings. Many of the authors describe ents in their countries year by year, and the interest of such narratives is evitably reduced by their stopping in 1952—not an especially significant eaking-off point, as it has turned out. Moreover, the character of events tween 1945 and 1952 was such that most of the authors, quite justifiably, e more concerned with problems of post-war readjustment, inflation and control, and the balance of payments, than with the business cycle as ormally understood. Thus only Professor Fellner, on the United States, as any extended treatment of what is normally regarded as the central pic in business-cycle theory, the inducement to invest—a topic which recent velopments in Britain and elsewhere have brought back into prominence.

However, there is much of interest in the country papers, and all of em contain material of value for reference. Four in particular may be entioned. Professor Fellner assesses the relative importance of the various urces from which the post-war American boom has derived its strength: pital restocking, cold war expenditure, residential building, high liquidity, ructural changes in the economy. Professor Robinson surveys the balance supply and demand for resources in the United Kingdom in each of the ars 1947–51, with special reference to the relation between expectations s revealed by the *Economic Surveys*) and events. Professor Lundberg, viewing the Swedish experience, has interesting comments on weaknesses the inflationary-gap type of analysis. Professor Tsuru provides an exptionally lucid account of the different stages in the post-war development the Japanese economy. The other countries dealt with in this section the book are Denmark (by J. Pedersen), France (by A. Piatier), Western ermany (by E. Preiser and W. Krelle) and Italy (by P. Saraceno).

The second part of the book contains five papers. Dr. Goodwin's Model of Cyclical Growth" is already well known. A curious feature of is model is that the desired stock of capital is endowed with an upward end over time, attributed to innovations, irrespective of any growth there ay be in output. An approach more in line with usual concepts of capital ould be to regard innovation as causing obsolescence in the existing stock

of capital without necessarily increasing the amount appropriate to any level of output. This would not seem to alter the general working of the model. Professor Klein presents in summary form an econometric model of the United States economy and makes some valuable general comments on econometric methods. Dr. Polak compares two theoretical models of balance of payments behaviour: one, labelled "inter-war," in which imports depend on income (with or without a lag) and hence, via the foreign-trade multiplier, on exports; the other, labelled "post-war," in which imports are a lagged function of the level of foreign exchange reserves (and hence of imports in former periods, as well as of exports). Both models could in principle lead to cyclical fluctuations, but the degree of damping in the two is differently determined. Mr. Kaldor writes on the international impact of cyclical movements and its relation to alternative national policies. Finally, Professor Gordon, in a paper that may be regarded as complementary to Professor Fellner's, discusses investment opportunities in the United States before and after the War. In this paper the author carries into practice, with illuminating results, the disaggregation to which so many participants in the Conference pay lip-service.

The record of the discussion is well arranged and is among the most interesting parts of the book. Less disagreement than might have been expected was displayed about methods of research, and controversy centred chiefly on questions of policy. On the basic issue whether and in what sense "the" business cycle has persisted in the post-war world, the participants simply lacked the evidence to do more than make guesses, just as a similar assembly of economists would have done seven years after the end of the First World War.

R. C. O. MATTHEWS

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Cambridge.

Uncertainty in Economics and Other Reflections. By G. L. S. SHACKLE. (London: Cambridge University Press, 1955. Pp. xv + 267. 25*s*.)

THIS volume is a collection of some of Professor Shackle's papers from 1939 to 1953; about half of them being developments or explanations of his theory of expectations, and the rest making frequent reference to his profound conviction of the importance of uncertainty in the economic system. This is a matter on which he is on strong ground, and his critics have never really attempted to assert that economic models which give no place to uncertainty can be realistic. But such models continue to be devised and used; the influence of the way in which people think of an uncertain future is regarded as itself so uncertain that it must be swept aside or treated as a casual irregularity or a frictional loss. Professor Shackle's theory of expectations is still regarded as an interesting possibility, but not one of which much use need be made; and yet there has been little effort given to the propounding of rival theories.

This is disappointing, but a reading of the first nine essays in the book gests a reason. This is not a field of study in which a new theory can ve strong claims to immediate acceptance; it is not even certain how it be tested, nor what range of alternative theories can fit the facts. When first dust of controversy has settled, therefore, there is a need for people get together to find the highest common factor of agreement—to see which the new ideas are acceptable to all, and which are still uncertain. But ofessor Shackle—I hope I do not do him an injustice—still gives the pression of campaigning for his theory, the whole theory, and nothing t the theory. He concedes very little to his critics; in his justified attacks the follies of those who apply frequency-ratio probability to unique ations, he gives little attention to the tradition of another interpretation subjective probability. He prefers to stand alone, and in so doing makes lifficult for the subject to advance by agreed improvement and amendment.

But in expounding his own ideas he has the invaluable service of a command of the English language such as few economists since Marshall have ssessed. He is a master of the homely but apposite example (see, for tance, the remarkable suitability of the quotation on p. 3); he can lighten argument by the sudden literary allusion, bringing in the Ancient Mariner a clerihew with the deftness of Professor Robertson quoting Lewis Carroll. ke the psalmist, he is sometimes repetitive, driving home his points by the eated light blows of a well-aimed hammer. The advantage of his style nowhere better illustrated than in his final essay, on "What makes an nomist?", which deserves long use as a tract for those aspiring to academic nours.

But perhaps the central section of the book, containing Professor Shackle's 49 paper on the Nature of Interest Rates, opens up the most interesting ssibilities. The theory of the rate of interest has been worked over so en that it might seem that there is little more to be said, and yet it is still vided by a great gulf from the explanation of what happens on the London ock Exchange. Professor Shackle's view is that interest is mainly a manitation of uncertainty, and he supports his argument by an examination of ld structures in 1945–47. There is good reason for further work along is line, not only to strengthen knowledge of the determinants of interest tes, but because the Stock Exchange probably provides the fullest and most sily used data for the testing of rival theories of expectations.

The remaining articles include two on the Multiplier; a sympathetic position of Myrdal's book on *Monetary Equilibrium*, which Profesor Shackle nsiders to have been neglected because it was published in English on the e of the war, and a small exercise in algebra on "the deflative or inflative ndency of government receipts and disbursements." Professor Shackle serves, for the whole, congratulations on having attained the dignity of an thology, and it is to be hoped that it will be but the beginning of a series.

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Marginal Cost Price—Output Control. A Critical History and Restatement of the Theory. By BURNHAM PUTNAM BECKWITH. (New York: Columbia University Press, 1955. Pp. 283. 45*s*.)

MOST economists will find this an irritating book to read. Dr. Beckwith regards the marginal-cost principle of pricing and output determination as the most important discovery of economics in the years 1933–48 (p. 168), and treats it with an earnestness and reverence almost amounting to fanaticism. He distinguishes carefully between "capitalist" and "socialist" economists, and implies considerable tendentiousness in the former group. In the long discussion of the history of the doctrine he treats some writers so roughly (and frequently so unjustly) as to invite the same treatment of his own work. He claims to be a logical positivist, yet speaks of "the verification of ethical propositions" (p. 163) and accuses Bergson of believing "that economic policies, including that of marginal cost control, are sound only if the results which they produce are approved by priests and philosophers." He admits to an ignorance of calculus, yet seems to understand sufficient of mathematical technique to reach the conclusion that when mathematical reasoning "yields correct results, it always begs the question by using assumptions which imply the desired conclusion" (p. 133). Verbal techniques are apparently immune from this objection. He nowhere proves the main proposition that marginal-cost pricing is desirable, and much of the book lacks the rigour we nowadays expect from works in theoretical economics.

Yet with all these shortcomings, it is an interesting, even a stimulating book. It may also serve as a useful introduction to students, provided some of the mistakes are pointed out to them. Dr. Beckwith puts forward the following main propositions: (1) that the relevant marginal cost for the "rule" is "the current cost of the intensive margin," that is, the cost of additional factors hired to produce an additional unit; (2) that the concept of long-run marginal cost is meaningless; (3) that the theory of optimum capacity is distinct from the theory of marginal-cost pricing; (4) that deficits in increasing returns industries are due to the carrying out of an optimum investment programme, and not to the implementation of the "rule," and (5) that interpersonal comparisons of utility are feasible. He also derives nine corollaries from the main "rule," which are more or less obvious.

The discussion of the "relevant" marginal-cost curve is marred by a confusion between lumpiness and delays. The long-run marginal-cost curve may differ from the short-run curve because, as Marshall argued, it takes time to increase the size of plant, or because, say, it takes time to attract more labour of sufficient skill. Dr. Beckwith, with one exception, assumes that all investment is lumpy, so that the cost of extra plant cannot be imputed to any one unit increment in output. This has always been recognised. Yet the problem of which marginal cost, long or short (when a valid distinction exists), to charge remains. It is not true, as Dr. Beckwith argues, that once a piece of equipment has been acquired, its cost is fixed and cannot enter variable cost, since this ignores user cost. Nor is the implied principle sensible in a society where wage contracts are weekly and raw-material contracts are also used. For if it is true that once resources have been committed for any length of time, their costs should not enter marginal costs, most goods would be free. If an industry attracts resources to itself, the *ex ante* cost to society is not only the other goods given up now, but also in the future. Why the future should be ignored it is difficult to see.

On the other hand, the lumpiness problem remains, and Dr. Beckwith is perfectly right in arguing that lumpy investment decisions require comparisons of lumpy returns and costs. However, he deliberately ignores what Professor Lachmann has called Investment repercussions in framing his optimum investment rule, in the belief that the phrase "increase in productivity" is a simple and self-obvious one. None the less, Dr. Beckwith has performed a service, in making clear that many of the problems of marginal-cost pricing are really problems of lumpy investment decisions.

Dr. Beckwith is at his best when attacking the average cost equals price school. His argument that the definition and measurement of average cost in practice is likely to be more difficult than similar marginal-cost definitions and estimates is very convincing. He is at his very worst when defending the marginal cost equals price rule. He states that the "basic reason (for the rule) is merely that real benefits should be equal to real costs at the margin because this maximises welfare" (p. 194) and then "demonstrates" this by showing that when all prices equal marginal cost, the marginal-value productivity of variable factors is the same everywhere. That the introduction of the rule will produce considerable changes in the distribution of welfare, that even granted the comparability of the welfare of different individuals, such welfare must also be ascertainable, that poll taxes clearly cannot redistribute income, while profit and inheritance taxes (suggested by him) violate the basic optimum rule, of all this he is quite unaware. In short, the basic proposition of the book is continuously asserted, and never proved.

This review has been mainly critical, but it would be a pity if Dr. Beckwith's book were not widely read, for it deals with topics of great importance, and as already mentioned, if it does not convince, it certainly stimulates.

F. H. HAHN

University of Birmingham.

Introduction to Money. By HONOR CROOME. (London: Methuen, 1956. Pp. vii + 209. 10*s*. 6*d*.)

MRS. CROOME has written an attractive book dealing principally with the nature and development of money, but ranging also over a wide field of national and international economic activity. Introductory volumes tend to be of two types: those which concentrate on theoretical concepts and their inter-relationship as elementary models, and those in which the analytical skeleton is pushed into the background, well-hidden by description and

narrative. The former is mainly of use to the university student, as the first step in a large systematic course; the latter serves best the intelligent general reader. Mrs. Croome's book is of this second type; the professional reader will always be conscious of the intellectual scaffolding in the background, but it never obtrudes. Analysis, description and historical narrative go always hand in hand. Yet superficiality, the danger of this approach, is avoided, and the reader, while he is guided away from the obscurities and difficulties in the subject, is at the same time properly made aware of their existence. The style is clear and energetic, and good use is made of vivid analogy and example.

Part I of the book deals with the essential properties and the development of money and credit, the familiar story being well told so as to bring out (as originally did Menger) the position of money as the asset with the greatest degree of marketability. The following part deals with the banking system, and Part III leads off into a discussion of how the value of money is measured, and, afterwards, of the causes and the effects of changes in its value. The lay reader is likely to find this the most difficult part of the book so far; in the account of how the general price level is determined an intricate argument has had to be much compressed, and, if one recalls the average freshman's initial confusion over the notions of saving and investing, hoarding, lending, spending and the like, one wonders how much an ordinary reader will genuinely understand of it. It is perhaps a pity that " The Value of Money; Causes of Change " is discussed in Chapter ix before " The General Theory of Keynes " is dealt with in Chapter xi. The main trouble, of course, arises not from defects in Mrs. Croome's exposition, but simply because it is hardly if at all possible to get a true and useful understanding of such complex economic processes without employing explicitly a technical apparatus—without, that is, some more systematic study of theory.

In her discussion of the aims and means of monetary policy the author is in no doubt about the need for active management, but stresses that objectives should be modest and has much that is sensible and balanced to say about the reconciliation of high employment with flexibility and price stability. The reader may disagree with some minor points of the exposition of the mechanics of monetary control; the argument, for example, on p. 134, that open-market policy ceases " outside quite narrow limits " to be purely monetary policy, because it is said necessarily to cause a Budget surplus or deficit, did not convince the present reviewer. On another point, is it correct to give the impression (p. 124) that inflation will be worse if there are monopolies to exploit the sellers' market? It is easily conceivable that the monopolist's prices would rise less fast than those of competitive business. But these errors, if indeed they are errors, leave the general discussion unimpaired.

Part IV covers the foreign-exchange market, the gold standard, exchange control and post-war international institutions. This in itself is surely very wide, but there is also, in the chapter on exchange control, a very useful discussion of the post-war economic situation in the United Kingdom, and

of how, " taken together, the comparison of money earnings and money assets with price tags of all kinds—including the price tags, at the official rate of exchange, of foreign goods and services, gave the British public, individual by individual, a totally misleading message," so that a false idea of potential economic prosperity was easily engendered. In this Mrs. Croome's sure grasp and expository power are seen to excellent advantage.

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An Introduction to British Economic Statistics. By E. DEVONS. (London: Cambridge University Press, 1956. Pp. vii + 255. 22*s.* 6*d.*)

THIS book will be of considerable use to many people and will doubtless need a second edition. The latter fact must justify a review which may seem ungenerous in its concentration on the scope for further improvement.

In the preface Professor Devons describes his objective as " to fill the need for a book which provides the [first- or second-year] student with a general survey of the main British economic statistics—tells him where they can be found, what they mean, what problems arise in using and interpreting them, and guides him in further reading and in consulting the original sources themselves." At the same time he firmly expresses the view—with which anyone who has tried to teach applied economic statistics will agree—that the best way for the student to learn to handle economic statistics is by actually trying to do it himself; consequently the book " is meant to guide the student in using original sources, rather than merely to enable him to acquire a superficial acquaintance with them at second hand."

This objective is a complex one, and it seems to me that Professor Devons has not been consistent in the role which he intends the book to play. This does not prevent it from being a very useful one, but it means that the teacher should think rather carefully, chapter by chapter, how he should tell the student to make use of it. An unaided student will, I fear, usually get far less benefit from it than he might, and its emphasis on pitfalls may make him discouraged with the whole subject.

There are many possible ways in which one might try to write a book to help the student, but perhaps the one which follows most naturally from the declared objective would be the " subject " approach. As a rule a student who wishes to use statistics in an economic problem will need information about a particular subject—employment in the cotton industry, for example —and guidance on how to use it; he will not be starting with the idea of learning something from a particular source-book, such as the Census of Production. On this plan therefore the author would arrange his book in a number of sections and sub-sections dealing with particular subjects, and under each would let the reader see, quickly and easily, what was available on that subject in the main source-books—very probably a semi-tabular form would be best. There would usually need to be an introductory discussion of general points relevant to the use of such figures—for example, the different

meanings of " employment "—and some notes on the reliability of the particular sources. Where different sources provide information on the same subject (as is the case with employment in the cotton industry) it would be helpful to give some guidance as to the types of problem for which each is most suitable, and what the student should do when they appear to give different answers.

An alternative approach would be *via* the source-book, instead of the subject. Each of the main primary source-books would be considered in turn, and the student provided with a guide to the usefulness and snags in the main tables. This would fit naturally with Professor Devons' second idea of providing something to help the student in using source-books: the " guide " would hardly be readable without the source-book, and the student would have to find his own way to the right source-book.

Perhaps inevitably, Professor Devons has compromised between these two approaches, sometimes putting the emphasis on one, and sometimes on the other. But he seldom does as much comparison of different sources as the " subject " approach would suggest; and in the course of compromising he has introduced quite a lot of material which seems of little use except to give the reader that " superficial acquaintance at second-hand " which he so rightly deplores. Thus the chapter on Population starts with several pages of textual description of various publications of the Registrars-General, which would be of less value to a student trying to find out where to look for information about any subject than a simple list (let alone something arranged by *subject*), whilst anyone who had found the source-book could see what was in it much better from its table of contents. The second edition of the book would gain from a ruthless application of the question " Is this what a *user* of the source-books wants to know? "

My other suggestion is that Professor Devons should try to make the whole outlook of his book less negative. Time and again one is told that " these statistics must be used with the greatest caution," or that " attempts to do this are most dangerous "; at a rough estimate, there are perhaps a hundred such warnings in the book. Very seldom indeed is the student given an example of an important conclusion which *can* be deduced—the emphasis is all on snags rather than uses. Moreover, he is seldom given any guidance as to what he should *do* in the face of these warnings—whether the figures in question can be used as a broad indicator of movement, but not as a measure of absolute size, or whether it is only *for beginners* that it is " very dangerous " (p. 141) or " most dangerous " (p. 166) to attempt to see what is happening to the current balance of payments by using the monthly trade returns.

I for one would not like the student to feel that this twice-repeated warning will continue to apply even when he has become experienced in preparing tentative estimates by less crude methods than Professor Devons apparently assumes to be used (judging by the very tendentious statistics quoted on p. 167 to support his warning). And I would like Professor Devons in his second edition to face the fact that in the real world it may be necessary to take decisions which should depend (for example) on one's view as to what is happening to the current balance of payments, and that if the trade figures are clearly showing a marked change (as in 1951 or 1956) it may be much *more* dangerous for the statistician to profess complete ignorance on the subject than to make a tentative estimate.

Taken as a whole, the book as it stands is probably of greatest value to somebody who has been using economic statistics for some time, including the would-be teacher who needs to consolidate and systematise his knowledge. For him the concentration on snags and limitations is correct, since the statistics themselves and their uses are broadly familiar to him; for the student who has not yet met the statistics it seems better to start with more about uses, and not to imitate the Latin grammar's emphasis on exceptions rather than rules.

There are, however, chapters which are admirably suited to the beginner's needs, notably Chapter VIII (Incomes) and Chapter IX (National Income and Expenditure), and the part of Chapter VI which deals with the balance of payments. Professor Devons is very good at explaining the broad plan of such things as the capital account in the balance of payments, and showing how the different parts fit together conceptually and what problems are involved: all these parts are excellent for the student to read before he tackles the statistics, and to re-read after he has made his first mistakes.

In brief, the book is undoubtedly a useful one, on a subject which has not been well covered in the past; I hope that the second edition will be even better.

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Short-term Economic Forecasting. By the Conference on Research in Income and Wealth of the National Bureau of Economic Research, New York (Editor L. R. KLEIN). (Princeton: Princeton University Press, 1955. Pp. 506 + xi. $7.50.)

THIS report of the NBER provides the reader with seven papers delivered to a conference on research in income and wealth, and with comments by other participants (and sometimes replies by the authors) which often add a good deal to the value of the papers. The subject is of great importance, and the contributors experts in their fields—often with first-hand experience of conducting the various surveys, etc.—who dealt with their subjects clearly and well: it is all the more to be regretted therefore that the report of a conference held in September 1951 should bear the publication date 1955 (and in fairness perhaps the reviewer should apologise for taking six months to deliver his MS.). The passage of time has certainly not rendered the material useless, but inevitably the reader wonders (for example) how far the authors were right in attributing certain results to the peculiarities of the immediate post-war years, or in entering *caveats* against assuming comparable results under other conditions; and at least one author refers to his paper as

an interim report, so that the reader is left in doubt as to whether a final one has appeared and perhaps altered the provisional conclusions.

Nearly all the papers are concerned with the collection and use of " forward " figures from consumers or businesses. One has to be very careful about the language which one uses about these figures, because a good part of the problem turns on what they are supposed to represent, and whether they do or can. But in nearly all cases they are figures about the respondent's own activities—his capital expenditure (or his firm's), his shipments, his purchases of consumer durables. The authors refer very little (and then in rather unflattering terms) to the collection of estimates about the future level of the GNP or of business activity, etc.

In principle these forward figures might, at one extreme, represent firm decisions by the respondent about his future action, which cannot (or at least will not) be varied significantly one way or the other, whatever may happen to the national economy or the industry in which the company operates; some capital expenditure may fall in this category, though it is clear that it is not all as predetermined as a forecaster would like to assume. In this type of case the respondent can give an accurate answer, and the forecaster can enter the results in his tables without any allowance for the influence of other elements on this one.

At the other extreme are figures for things which depend predominantly on what happens in the economy as a whole, so that the replies are " estimates " or " forecasts," not " plans," and the accuracy of an individual respondent (or even the average of the group) depends fundamentally on his ability to forecast something for which he has no special expertise. Such figures are of no direct value, but they might be of some use to the forecaster if they in fact influence the respondent's behaviour in some way—*e.g.*, sales forecasts by retailers might be no use for forecasting retail sales, but may be a good guide to retailers' *purchases* over a short period.

In general, of course, the figures which are collected contain some elements of definite plan, some of contingent plan (" I will buy if things go well " —but the conditions are usually not precisely formulated), and some of pure estimate—with the basis for these estimates being partly things about which the respondent is in a good position to take a view and partly general developments in the economy. There is thus great scope for discussion and experiment about what to try to collect, how to do it and how to use the results. In particular, are the forecasts which one makes by aggregating these individual figures (perhaps with some allowance for a consistent bias, if past experience will provide a formula) a sufficient improvement on those made without them to justify the work involved?

The papers in this volume throw a great deal of very valuable light on such matters. Negatively, one may take the analysis of quarterly " shippers' forecasts " which had been collected by a fairly elaborate procedure ever since 1927 for the very practical purpose of helping the railways to arrange for the right number of freight-cars to be available. Here it seems that the aggregated results were markedly less accurate than those which one could

obtain in a few minutes by the simple device of assuming that the coming quarter would show the same percentage increase compared with a year ago as the latest one; the examination of the biases is most instructive, but the authors found no formula for allowing for them which would make the results of real use.

Positively, the " forward figures " for capital expenditure by businesses both in the United States and in Canada seem to have been of real value, and perhaps the most stimulating parts of the book are the ones which show how, in each country, the accuracy of the aggregates emerged from individual returns which showed wide discrepancies. The authors do not altogether escape, however, from the language pitfalls in discussing these results. Particularly on the American form the instruction is to give " estimates of costs which according to present planning will be incurred," so that if this is taken literally a firm which does little planning for more than six months ahead would be quite correct in giving a figure well below the actual out-turn; moreover, a very alert firm which revised its plans in mid-1950 because of the invasion of Korea must similarly not be classed as a " poor forecaster " because its figures were " too low "—it was not asked for a forecast. In effect, it seems that the Canadians were more logical in asking for " estimates of expenditure," which can reasonably cover the minor items which several American commentators note as being omitted because " not scheduled (by the firms) in detail," and a reasonable allowance for contingent items. But the central forecaster must recognise that such figures will not be firm ones, which the respondent intends to hold to under all likely circumstances; even if they were, his forecast might still be upset by such things as delays in delivery of machinery.

With capital expenditure it seems that there is sufficient firmness about next year's figures for them to be of real value, even if the general economic developments are not exactly as foreseen (but not, of course, if Korea is invaded); at any rate, nobody at the Conference seems to have produced a method of forecasting which would give as good results (*e.g.*, by a formula based on profits or trends in production). And the Canadians clearly attached importance to the detailed figures for industries and regions which they produce.

With consumers, however, the picture is not so clear. Everyone welcomed data about liquid assets, income changes and perhaps individuals' general assessments of their financial position. But statements about future purchases of automobiles and durable goods for a year ahead get a mixed reception, and the re-interviews made it clear that there is not much " plan " about these statements: in particular, table 25 on p. 419 shows that over half the new cars bought in the year, and over three-quarters of the used ones, were bought by people who had been classified in the category " Do not expect to buy new or used "—not even in " Undecided." Miss Brady's comment on p. 489 suggests that other simple methods would give better results than the individual consumers' estimates, and the reader should on no account miss Tobin's comments on the general issue (pp. 444–50), forcefully

illustrated by the statement that in predicting funeral expenditures one would gain nothing by asking consumer units their plans. However, Schweiger's table on p. 461 provides supporters of consumer surveys with useful material, and the real issues are probably *what* data to collect from consumers and *how* to use it. On this matter experience since the Conference may well have shed further light.

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World Population and Resources. A Report by PEP. (London: Political and Economic Planning (distributed by Allen & Unwin), 1954. Pp. xxxvii + 339. 30*s*.).

PEP enjoys a reputation for the careful presentation of burning problems. The problem they chose for the present book is burning indeed. It concerns the steep rise, since the War, in the annual growth of population in underdeveloped countries. Unfortunately this Report fails, in my view, to reach the high standard customarily associated with PEP. Its treatment of the economic problems arising from the change in the rate of growth seems to me inadequate and often questionable.

Most of its space is taken up with passionate pleas for the introduction of birth control in these underdeveloped areas. It tells the reader little about the world's resources and the nations' ability to develop them. Only about a quarter of the volume deals with resources or other economic aspects of the accelerated rise in population. One-third describes legislative measures by which the governments of six different nations have tried to influence their respective birth-rates. The balance is taken up with descriptions of the impact of the medical revolution on a number of supposedly representative regions—many of which are only doubtfully representative—and by recommendations of policy. This review must limit itself to the handling of the economic problems created by the medical revolution.

There is undoubtedly here a major problem. The great medical advance in lengthening the expectation of life, made recently with the aid of North America and Europe, has not been, and cannot be in the near future, balanced by a corresponding decline in births among tradition-ridden peoples. A time lag is unavoidable, leading to a sudden quickening of the rates of population growth, and creating in turn many economic problems, of which the finding of sustenance for the extra mouths is only one. But instead of an examination of the manifold problems arising and of their possible solutions, we are offered vague *dicta* to the effect that unless a rapid decline in birth-rates is achieved, the standard of living will fall, a "standard" that takes no account of the boon of seeing most of one's children grow to maturity.

PEP have spotlighted the challenge with which the second half of the twentieth century will be faced. They missed their opportunity by failing

to examine whether modern man generally, and the underdeveloped nations in particular, can rise to it. Nothing is more unreal than projecting into a far future tendencies which appear for the moment to produce a disequilibrium, and inferring therefore an ever-widening gap. It overlooks man's ability to respond to a challenge and to adjust to new conditions.

The PEP Report reasons as follows: world population over the next, say, twenty-five years will grow at a rate of 1·3% per annum, but food output must grow at 2·25% per annum in order to make good the present, assumed, underconsumption. Such an increase having never previously been achieved, it cannot be achieved in the future. *Ergo* starvation, unless the rate of population growth is reduced.

The rate of 1·3% need not be questioned here, although predictions by experts in the past have often gone awry. But a minimum rate of increase in food production of 2·25% (75% more rapid than of mouths) is questionable. It is derived from an estimate of calorie intake, without considering the contradiction between supposedly unbearable malnutrition and the facts of rapidly increasing health and life expectation. Still more questionable is the contention that an increase of 2·25% cannot be obtained in future because it is unprecedented. Not only had the Report to admit, almost in the same breath, that for many important foodstuffs much higher rates had in fact recently been achieved, but it overlooked completely that the conditions which kept output below a growth rate of 2·25% in the past, have themselves been radically changed by the very fact of the increase in population growth, as well as by the new factor of international co-operation and the quickened dissemination of knowledge. The Report does, it is true, record the beneficent effect of the medical revolution on people's working capacity, but gives this only scant attention. Generally the authors seem to ignore the fact that with every new mouth goes also a pair of hands and a brain.

In the second place, the PEP Report argues that, if we look, say, two generations ahead present known reserves of some of the more important metals, including copper, lead, zinc and tin, will be approaching exhaustion as the result of rapidly increasing consumption, and that their "real" costs will rise so steeply as to make future supplies of manufactures doubtful. The Report fails, however, to give any measure of the (consequent) increase of "real" costs or evidence of their rise. It admits that there will be no lack of energy; this admission, reflecting the progress in nuclear science, to my mind throws doubt upon the whole line of reasoning of the PEP Report. I would argue that, if energy is abundant and scientific knowledge is advancing, the "real" costs of energy and minerals—the measure of which is human effort—are bound to decline, as indeed they have throughout this century. Thus I would myself expect that future supplies will not in practice fail, since only a fraction of the earth's deposits have so far been exploited; "real" costs have been the limiting factor. If energy, minerals and manufactures can be made abundant, so, I feel confident, can food, the output of which is a function of these three variables, with knowledge added as a

fourth. Thus I myself arrive at the opposite conclusions from those of the Report. The authors have whetted my appetite, but they have given me something that I find good only in parts.

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Labour Policy in the U.S.S.R. 1917–1928. By MARGARET DEWAR. (London and New York: Royal Institute of International Affairs, 1956. Pp. viii + 286. 45*s.*)

Some Problems of Incentives and Labour Productivity in Soviet Industry. By G. R. BARKER. (Oxford: Basil Blackwell for the Department of Economics and Institutions of the U.S.S.R., University of Birmingham, 1956. Pp. xii + 131. 14*s.*)

THESE two books are alike in being research studies in the field of labour policy in the U.S.S.R.; the first conducted under the ægis of Chatham House, the second opening a series of monographs emanating from the Birmingham Department of Economics and Institutions of the U.S.S.R. under Professor Baykov's editorship. In other respects, however, they are dissimilar.

Mrs. Dewar, while ranging over all aspects of labour policy, from wage payment and factory committees to social insurance and labour legislation, concentrates on giving a systematic historical record of ten years—ten crucial years, certainly, that witnessed some striking changes and contrasts—and nearly half the book is occupied with appendices (including a detailed list and summary of all Labour Decrees during the period, including the Labour Codes of 1918 and 1922, which will lay future students of this subject and period greatly in her debt). Of particular interest is the summary of the reports of the trade-union congresses of the period and of discussions of trade-union and labour questions at Party congresses. Just occasionally one has an impression of losing one's way among the trees, and Mrs. Dewar may perhaps be too inclined to blur the distinctions of viewpoint in the crucial trade-union discussion of 1920 which preceded NEP—also in general to play too much on the contrast between design and achievement. But on the whole commendable discrimination and clarity are preserved.

Mr. Barker's treatment is also historical in that he divides his study into four main periods between 1917 and 1950; but although he has concentrated on a single theme, his treatment is generally much slighter. His account is interesting enough, and is presented readably on the whole; moreover, one gathers that the author has thought about his material and is more interested in the ideas behind the policies he describes than in composing a systematic chronicle, or in giving quantitative precision to his conclusions. Yet one cannot altogether avoid the impression that he may have fallen between two stools, and finding himself with too much material for an article or paper have ended up with being rather too lightweight for a book. Nor is Mr. Barker consistently lucid in his exposition, especially of such theoretical points as he touches: for example, his reference to the

index-number problem on pp. 3–4, which contains a curious remark about measurement of output at constant prices causing weights to be "distorted" because the "price remained fixed"—a defect which he seems to suggest would be removed by "calculations based on changes in labour content." There are some other cryptic passages in the Introduction (*e.g.*, on pp. 8 and 10). In this connection one is rather surprised that in a monograph about productivity no account is given of the Soviet method of calculating labour productivity and of discussions about this (of which there is a fairly full analysis in a work that is mentioned in Mr. Barker's footnotes—Volume iii of A. I. Rotstein's useful study of Soviet industrial statistics). It is also to be regretted that, although much is said about payment by results, there is no more than a quite brief description of the actual systems in force and their adaptation to different kinds of work.

The transition from wages-in-kind and "levelling" and "obligatory labour service" under the scarcity-conditions of "war communism" to a labour market and collective bargaining under NEP, and then again from Tomsky's "wage-levelling" to the widening of differentials in the thirties, are conveniently and concisely sketched. In the concluding section on the present situation there is an interesting summary of the worker's position in Labour Law (which is a branch of law separate from Civil Law), in the course of which reference is made to the partial repeal in 1951 of the 1940 Decrees (penalising change of work without permission and absenteeism), which preceded their final repeal this year; and there is also some account of non-financial incentives and the methods of "norm-fixing" (where it is concluded that "nothing *new* of any significance has emerged").

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Income and Wealth: Series IV. Edited by MILTON GILBERT and RICHARD STONE for the International Association for Research in Income and Wealth. (Cambridge: Bowes and Bowes, 1955. Pp. xii + 388. 42*s.*)

THIS volume contains ten selected papers presented at the third conference of the International Association for Research in Income and Wealth. Four papers—by R. Frisch, Stone, Schouten and Lips, and Stuvel—deal with the relation between social accounts and policy-making in the United States and Western Europe. Two papers, by Marczewski and E. F. Jackson, discuss the related topic of the form and uses of social accounting in communist countries. Two papers, one by Deborah Paige and Adler, and one by Milton Gilbert and Kravis, are concerned with problems of international comparison and one, by J. L. Nicholson, with comparisons of real product over time. A final paper, by R. Goldsmith, describes the application of his technique for establishing a national balance sheet for the United States. Like its predecessors, this volume is invaluable as a survey of recent develop-

ments in the application of social accounting in a number of countries and in a variety of fields of study.

The common theme of six of these papers is the practical uses of social accounting. From this volume, readers who are not specialists in Soviet economics (which, unfortunately, means most people who cannot read Slavonic languages) can get some impression of the differences, and similarities, in the techniques of applied economics between communist and western countries.

In his remarkably comprehensive survey of recent work on " model building," Stone emphasises the distinction between fiscal policy or growth models, which concentrate on the determinants of final demand, and treat resources as, broadly, homogeneous, and technological models, based on input–output tables, which concentrate on changes in the uses of specific resources. In the west, the operational use of social accounts is for the most part restricted —by the limitations on Government action—to the fiscal policy model. The function of Government is primarily the maintenance of general equilibrium; the main object of social accountants is to produce an accounting structure which is comprehensive and internally consistent and which will illustrate, in aggregate terms, the broad effects of government policy, and of changes in, for example, final demand and incomes. The papers by Frisch, Schouten and Lips and Stuvel show how social accounts are used, and could be developed, for this kind of purpose, drawing on the experience of Norway and the Netherlands. The technological type of model, although invaluable for subsequent explanation of what happened, is only in limited ways useful as a guide to policy. (Had input-output analysis been sufficiently developed, it might have had very great operational significance in war-time.)

The emphasis in communist countries is reversed. From Marczewski's and Jackson's papers it appears that the crucial operational statistics—those on which planning decisions are based—are the " material balances " which concentrate on the technological relationships. These are essentially commodity flow tables, showing actual and projected supplies of a given product against its various uses, and are thus half-brothers of western input–output tables. They cover both intermediate and final products (such tables are drawn up for about 1,600 separate commodities in the Soviet Union) and their form, and use, would no doubt be clear enough to anyone familiar with war-time allocation procedures in the United Kingdom or the United States. Similar tables are compiled for man-power (resembling the United Kingdom man-power budgets).

Since economic planning rests so heavily on these material balances, which are set up in physical units, the statistics of national income and expenditure, and of national output, appear to play a relatively small part, and less attention is devoted to the purity of the concepts. Thus, the well-known restriction of the calculation of total national output to physical commodities (plus certain services, such as transport, required by industry) seems to be justified partly on the ground that it covers all branches of the

economy which are worth planning, in the sense that they raise problems of technological relationships susceptible to policy decisions. The justification sometimes given—that the omitted economic activities, such as government administration and much passenger transport, are really intermediate and not final services—may be less important. This theoretical justification certainly makes it difficult to understand the omission of, for example, communal baths and art galleries, and it is clear from Marczewski's and Jackson's papers that the communist economists are themselves in conflict about just where the " boundary of production " should be drawn.

It is interesting to see that the problem of forecasting consumption patterns is dealt with by communist planners, as in the west, by demand analysis based on family budgets. In present conditions, however—or because, some may say, the problem of monetary equilibrium has been neglected—forecasting errors are not likely to lead very often to excess supplies. On the other hand, it is clear that no attempt is necessary in communist countries to forecast capital investment as a dependent variable; from the point of view of the communist planning technician, it is an independent variable—but one given by a committee decision and not an economist's judgment about probable business behaviour.

It may be added that Marczewski's paper is wholly methodological; Jackson's paper includes a survey of the social-accounting statistics actually available for Eastern Europe (but not the U.S.S.R.), and is useful background for the publications of E.C.E.—the only current source for a conspectus of these statistics. The recent publication of a statistical year book for the Soviet Union leads one to hope that it may now become possible for the non-specialist to go beyond speculative theorising about the techniques of communist economic planning.

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London.

Individuals, Groups, and Economic Behavior. By ADDISON HICKMAN and MANFORD H. KUHN. (New York: The Dryden Press, 1956. Pp. xvii + 266. $4.75.)

IF a librarian, in his list of classified new arrivals, were to introduce a category " Librarian's Nightmare," this book should be included. The preface is an essay on the borderlines of economics and on that no-man's land which lies between economics and neighbouring disciplines. The first chapter sets out to give a survey of modern psychology with special reference to the theory of Freud, the field theory, the learning theory and the authors' own " self-theory."

Two chapters deal with the behaviour of the firm, particularly with managerial behaviour and with the influence of taxation on initiative. Another chapter discourses on the problems of consumers' satisfaction. From there the reader is taken to a discussion on planning and freedom. The book concludes with a description of a new method of research invented and

used by social psychologists. Strangely enough, the subject of industrial relations, of equal interest to social psychologist and economist, is omitted.

In spite of its weaknesses, this is a book which should not be dismissed lightly; for it contains a message. The message is simple: economists and social psychologists should work more closely together. The economist constantly oversteps the boundaries of pure economics: he deals with human behaviour be it that of consumer, manager or worker, his preferences, satisfactions, wants and needs. On the issue " planning versus freedom " the swampy field of values, of politics has been entered. The social psychologist offers his help in testing the economist's hypotheses on human behaviour.

As soon as so generous an offer is accepted the difficulties in forging links between disciplines emerge. One of the main obstacles is the special terminology used in each field. " Rationalisation " means something very different to the economist and to the psychologist. To the economist, many of the terms of social psychology used in this book are, on first sight, meaningless; for instance, " afferent neural interaction," the " stimulus-response-paradigm," " status personality " and " authentic personality," " semistructured " and " unstructured " situations, " extremes of societal continuum " and " physiological correlates of specific goal-directed activities." Research methods include " coefficients of reproducibility." A footnote containing the remark " what the symbolic interactionist calls a theory is, to the self-theorist, merely an orientation " may serve as a warning example of barriers set up against communication between disciplines.

However, contact with the jargon of other faculties brings its rewards. We are, for instance, introduced to the concept of " relative deprivation," which deals with the relation between the promotion of the few and the discontent of the many. It appears, from a study of United States service men in the Second World War, that the discontent of the unpromoted was felt most acutely in those units where promotion was most frequent. The concept applied to economics would throw new light on problems connected with special rewards, incentives, promotions and other discriminatory improvements.

The chapters on managerial behaviour suffer from the slightly misleading title of the book. Examples given are limited to the United States, while human behaviour, after all, is not. These chapters, based largely on public opinion polls, do demonstrate a not entirely new but essential truth: that profit maximisation can be only one of the many factors determining managerial decision making. Other factors investigated are power, prestige, creativity, success, sense of responsibility, public approval, loyalty, etc.

A " content analysis " of how certain regions try to attract new firms reveals appeals like those launched by the Iowa Development Commission, which contained, *inter alia*, phrases such as " the care and feeding of executives is a fine art in Iowa " or " You'll make just as much money . . . and live longer . . . in Iowa "; a new contribution to the theory of the location of industry.

The authors repeatedly stress one point: satisfactions are the results of

achieving group-held values. It depends on the " reference group "—that s the group with which one identifies oneself—what needs, wants and motives determine one's actions. An individual may belong to several " reference groups," and from them may derive conflicting motives and values.

The reference group is to provide a key to economic behaviour. An American study of ownership of television sets undertaken in 1952 is quoted as having found no strong correlation of TV ownership with income-groups but with reference groups—those with and without graduate training. At a time when a given income range no longer reflects a relatively homogeneous social group—when incomes of middle class and working-class families overlap—a given level of income can no longer be associated with any particular pattern of spending and saving; the social psychologist's offer of additional information may, therefore, prove useful to the economist.

It is possible that economists and social psychologists will move away from each other and fruitful communication may become impossible. To have made a practical attempt at *rapprochement*, at constructing a bridge between two disciplines, is the great merit of this book.

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Economics and Liberalism. Collected Papers. By O. H. TAYLOR. (Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 1955. Pp. 321. 40*s*.)

FEW liberal economists are consciously consumed by the need for a total explanation of the universe. Whatever may be their unconscious desires for a unity of knowledge, they proceed as their predecessors have done for a century, seeking solutions to problems narrowly defined in their subject matter. It has not always been so. But the urge to construct an analogue to the physical sciences led, in the very heyday of liberal economics, to a close prescription of its methods and limits. The liberal economist might agree with von Thunen's quotation from Madame de Stael that " In the tops of the trees all sciences come together," but would insist that such was not his proper abode. Hardened creature that he was, he could eschew the yearnings of other men for both social and intellectual unity. He placed his competitive individualism against the social cosiness of the idealists, and his method of abstraction against the intellectual cosiness of those who sought to prove that all truth was one. It was an attitude appropriate to a lusty confidence.

To-day much has changed. Liberal economics is abandoning its splendid isolation. The psychologists, sociologists and anthropologists insist upon being heard. The total effect on outlook is an idealism at least reminiscent of the plea of T. H. Green in mid-Victorian England for a " positive freedom " in which the state should actively promote fullness of life. But the reassertion of the need for intellectual unity has been slower in making its appearance.

Now, from within the community of liberal economists comes a volume from one whose life preoccupation has in fact lain precisely here. For this reason Professor Taylor's book is of great interest. He askes: what in fact are the starting points of economic thinking; can we attain to a unity of knowledge? Some will feel that he has left many secondary questions unanswered, and left the primary one in equivocal condition. But his search for wisdom about matters customarily assumed is what matters.

Professor Taylor has been taking the long view for a long time; in fact, since he was a pupil of Taussig and Allyn Young thirty years ago. His book is not, as the primary title might suggest, a treatise, but something almost antithetical. It consists of his published writings as they appeared in the journals, together with an introduction giving his intellectual background and explaining the genesis of each piece. Few authors could stand up to this treatment, especially when, as Professor Taylor points out, there are collisions between the ideas set forth. But here is a sensitive, conscientious mind, preoccupied through a hectic generation with a single set of fundamental problems. We begin with the eager Ph.D. candidate, with his tendency to oversharpen distinctions, producing two excellent articles from his thesis on the eighteenth-century concepts of natural law. The search for unity and harmony, thus well begun, was never to be abandoned. But the young teacher was assailed, with his generation, by the depression of the thirties, the New Deal with its challenge to " do something," and the problems of power in a contracting economy. Then follow ten years of gestation after 1935, as he sought once more to unify the knowledge on which economists unwittingly depend, seeking to synthesise all major philosophical, social, economic, moral and political thought; an effort which has not, as yet, produced a " great book," but has yielded a powerful condensed conspectus. Finally, comes the attempt to apply his learning to post-war problems of education, the trend toward security-mindedness, the problems of freedom, and the future of economic liberalism. It is a fascinating, honest and graceful piece of intellectual history.

Liberalism, for Professor Taylor, " by its nature involves or requires and carries with it a philosophy of all existence, history, and science." An economist must rest his thinking upon a unified and structured view of the whole of human experience. He is not only not entitled to take over such a view without scrutiny; he must accept the duty of continuous re-examination.

This is a tall order. Moreover, it involves what appears to be an irreducible dilemma. How are we to reconcile the liberal's duty of continuous re-examination with the belief in such a synthesis? For, once discovered, it would, as in the past, itself become a dogma. The problem of education dramatises the difficulty. If liberal education means a comprehensive grasp of all leading aspects of human thought, we need a new Aristotle or Aquinas to provide a new unity so that it may serve as a basis of selection. But could the inquiring mind as conceived by the liberal survive in such an atmosphere?

There is a further perplexity. Professor Taylor has come to the conclusion that there are serious limitations to the power of reason to produce

such a cosmic synthesis, bringing together ultimate values and practical decisions. Faith is required. But what is its nature? Is it a sort of rationalists' residual—something to fall back upon when reason is exhausted; is it the psychologist's concept of intuitive intellect which operates passively or jumps by intuition to the essence of things; does it derive from some atavistic or unconscious will to believe in unity? With faith thus relied upon, how is the problem of communication to be solved—how can a man or a society convey a point of view to a second party; how can the traditional hope of the rationalist be met—that by reason men can be led to mutual understanding and sympathy? An explicit statement of the problem of faith in economics could hardly fail to be illuminating.

Professor Taylor's search for universal intellectual coherence on a liberal basis is a fascinating spectacle. For others such a synthesis may be available. For the liberal it must be eternally receding—an inspiration to thought always to be striven for, but never attained, and therefore, in itself no guide to action. But the struggle toward it may well illuminate policy. The author in fact has much to say about problems of action, and though specific prescription is rare, the exercise of practical perspective and judgement permeates his book.

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Philosophy, Politics and Society. A Collection edited by PETER LASLETT. (Oxford: Basil Blackwell, 1956. Pp. xvi + 184. 18*s*.)

WHY has this age no political philosophers of the stature of Hobbes or Locke, Mill or Marx? Accepting it as generally true that " for the moment, anyway, political philosophy is dead," Mr. Laslett addresses himself to the question " Who killed Cock Robin? " and compiles ten articles, mainly from learned journals, to illustrate what has taken its place. They indeed provide strong evidence for the prosecution of the Logical Positivists and, to a minor degree, the sociologists: for apart from Professor Michael Oakeshott's inaugural lecture at the London School of Economics on " Political Education," and Mr. Laslett's own contribution on " The Face to Face Society," they ponder not the broad issues and themes of political philosophy but offer instead only technical analyses of terms and concepts. Mr. T. D. Weldon's bleak and dispiriting conception of political theory is restated more concisely, and therefore even less plausibly, than it was stated in his *The Vocabulary of Politics*. Professor Gallie's consideration of liberal and socialist moralities falls into the common error of moral philosophers, of endowing everyday political demands, based on avowed sectional interest, with an ethical aura that they entirely lack either in the minds of the people making them or in the process by which they are met in actual politics. These opposite extremes, of shying away from all value judgments or of endowing ordinary political trends with secret value judgments, are characteristic of most of these articles.

At least three broad considerations modify the impression of modern

political thinking as it is here presented. First, even the traditional forms of political theory are not so entirely absent to-day as this collection implies. The works of Lord Lindsay and Sir Ernest Barker, of Mr. J. D. Mabbott (mentioned by Mr. Laslett) and Professor Laski stand in the central tradition. Secondly, if it be true that the Logical Positivists have withdrawn modern philosophy from its traditional relationship with political thinking and reduced both to verbal quibbles, whilst the sociologists have appropriated large territories formerly cultivated by political theory without making much use of them, it is even more significantly true that the economists have raced ahead of all other social scientists in making their own field of exploration a well-charted, fertile land. The rebirth of " political economy " which occurred during the inter-war years, with the decline in belief that economics were distinct from politics, helped to doom politics as a distinct subject for study. In a climate of opinion which gave economics primacy over politics and which coincided with a new technical mastery of economic principles, the emphasis of constructive thinking naturally shifted. Marx and Keynes should stand in Mr. Laslett's dock, alongside Ayer and Mannheim.

More important still, the traditions of political philosophy were disjointed by events: and not merely by the violence of twentieth-century politics, which meant, in Mr. Laslett's phrase, that " Faced with Hiroshima and Belsen, a man is unlikely to address himself to a neat and original theory of political obligation." Here, too, divergent pulls left something of a blank. In liberal democracy it became a habit to take more and more things " out of politics ": the constitutional monarchy, religion, the civil service, the police and the increasing number of highly important activities entrusted to " public corporations." Even differences between political parties narrowed with war-time coalitions, bipartisan policies, " Butskellism " and " Mendèsism." On the other hand, in the single-party states everything became political —police, administration, economic life, education, even culture. This totalitarianism killed political philosophy in an opposite way—by leaving it little to debate, smothering it in dogma and leadership principles.

This last trend, coming on top of the existing impoverishment of political philosophy, deprived political thinking of its former focus. Old-style politics were less important than they used to be, because the place where political activity occurred was now inside the party, the corporation, the trade union, the social institution, rather than between such bodies. Hence the limited value of the studies lavished upon electioneering procedures and statistics, the enhanced value of the study of political party organisations, of public administration, of trade-union structures. It may be only that political science is now engaged in the basic work that economists did a generation ago. If so, Mr. Laslett's collection will become not an inquest or even an obituary notice, but rather a Proustian *recherche du temps perdu*. Political theory awaits its Keynes.

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Private Credit and Public Debt. By A. MURAD. (Washington, D.C.: Public Affairs Press, 1954. Pp. 195. $3.75.)

THE scope of this book is a good deal wider than might be suggested by the title. Briefly, the argument is that there exists in capitalistic societies a chronic tendency for investment to decline and for the propensity to save to increase; public debt has to be issued in increasing amounts in an attempt to neutralise the deflationary effects of this, but the process must eventually lead to the collapse of the capitalistic system. In a word, the author is presenting another version of the well-known stagnation thesis, and, since this line of thought is already so familiar, the reviewer may be forgiven for concentrating on the new twists which the author gives to the argument. But it should be said that in general the book is well written and the ideas persuasively presented.

The first difference between this and most other versions of the stagnation thesis is that the author sets out to argue the entire case from first principles, beginning with the manner in which credit arises in the most simple acts of exchange and gradually building up the Keynesian theory of employment in language which would be understandable to someone previously innocent of economics. The reader already acquainted with Keynesian theory may find this rather tedious, since he will constantly be mentally translating the argument into more familiar language, but it may very well be that to the layman the author's approach would be refreshingly intelligible and coherent. The attempt to speak in plain language, plus a markedly partisan approach, unfortunately leads to a good many over-statements (the present-day capitalist is " someone who periodically clips coupons off the gilt-edged papers idly resting in his safe "; " socialism is engulfing the world " and so on), but except for this a very competent job is done here.

So far as the underlying monetary theory is concerned, the book is less impressive. Language apart, the argument is a familiar one, and the author's attempts to stake a claim of originality unquestionably lead him into error. For example, what is in all important respects the Keynesian theory of the rate of interest is presented; yet the author is at some pains to deny this fact, and the grounds on which he does so (pp. 92–3) are not very strong. It is simply not true that the banks " are fully capable of providing the community with all the currency it wishes to hold," since apart from legal restrictions there are factors which tend to make the demand for liquidity infinite when interest rates are very low. Nor does it follow that because human beings find it pleasant to receive an income without working they will invariably prefer securities to cash, as the author argues. Securities carry a risk of capital loss as well as a promise of income, and it is precisely because of this that the speculative demand for cash exists.

A more basic weakness arises from the author's identification of saving with a desire to obtain unearned income. The latter may often be the motive for the former, but the two are in no sense synonymous. Professor Murad states correctly that the " result of the community's desire to save

more than is being invested is to deprive itself of income and employment" (p. 125), but because he identifies saving with the desire to purchase securities he is driven to equate this excess propensity to save with a "thirst for securities," and confusion results. The author seems to lose sight of the fact that deflation occurs not because people buy securities but because they do not buy goods; the two things are not at all the same. The U.S. Government increased its debt in the 1930s not "to enable people to hold securities" (p. 129) but to augment effective demand without needing to simultaneously reduce it through extra taxation. It is the government *expenditure* which does the trick, not the increased public debt, which may or may not be the by-product; by stressing the debt rather than the expenditure, the author puts the cart before the horse throughout, and fatally weakens his case thereby.

A third new twist to the argument is the exposition of what is called "the principle of diminishing net investment." The assertion here is that investment results in the construction of new plants, and that as new plants are finished more labour must be drawn from the capital-good industries in order to operate and maintain them. Ultimately there will be so many plants that the entire labour force will be needed to operate them; no labour will be left to construct additional plant, and hence net investment will cease. The fallacy here, of course, is that it is implicitly assumed that all investment consists of capital-widening and not capital-deepening; it is common knowledge, surely, that in practice investment frequently results in a reduction rather than an increase of the operational labour force.

As to the rest, the familiar stagnationist arguments are presented, albeit very competently—falling marginal propensity to consume, capital-saving inventions (atomic-power plants being included in this category, curiously enough), declining rate of population growth and so on. How impressed one is by all these points seems to be primarily a matter of temperament; for myself, I suspect that the position most of us take up in this rather dog-eared debate nowadays is decided more by faith than good works.

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Housing Taxation. By W. A. MORTON. (Madison, Wisconsin: University of Wisconsin Press, 1955. Pp. 262. $4.75.)

THIS book is an attempt to deal with a problem which is of great importance to all those concerned with either housing problems or the finance of local government. Both in the United States and in Great Britain the fundamental problem of local finance is that of providing local authorities with a revenue which will expand with their expanding liabilities for municipal and social services. Subventions from State or Federal Government in the United States, or from the central government in Great Britain, imply at least some loss of independence and with it some of the local interest in local government. In the United States the chief source of local revenue is

the local tax on real property, similar in many ways to local rates in this country. It is commonly regarded as a bad tax, but as long as it was sufficiently low to constitute no serious burden, its alleged defects could be overlooked. By 1945, however, the total yield from the local property taxes was equivalent to 8·85% of all Federal, State and local taxes in the United States, and according to Mr. Morton's calculations was frequently as much as 25% of the annual cost of accommodation.

In *Housing Taxation* Mr. Morton tries to assess the validity of the criticisms of the property tax, and also to compare its effects with those of a local sales tax, which is often regarded as the only practicable alternative. The first six chapters are concerned with the effects of the property tax on housing. These are painstaking perhaps rather than analytically penetrating. Mr. Morton has no difficulty in demonstrating from published statistics the familiar fact that although annual expenditure on accommodation tends to increase absolutely with income, it does not increase so fast. Thus families in the higher-income groups tend to spend a smaller proportion of income on buying accommodation than those in lower-income groups. It follows, *ceteris paribus*, that a tax that is proportional to the annual value of accommodation, such as the property tax, tends to be regressive with income. Mr. Morton seems to consider, however, that the necessary condition is that the incidence is wholely on the occupier, except in so far as it has been capitalised in the value of sites. This, of course, is not so. The condition to be satisfied is less rigorous: that the proportionate divisions of the incidence of the tax between original site owner, building owner and occupier should, if not uniform for all dwellings, be such as not to offset the regressiveness of the nominal tax payment/income series. Although Mr. Morton discusses at some length the general theory of incidence of property tax, he does not investigate this question of variability; thus his analysis is of little use to him when he comes to evaluate the interesting statistical data he has collected later in the book. This is all the more unfortunate, as he might have been able to reach valid conclusions with regard to incidence with respect to sub-standard housing and/or occupiers with sub-standard income compared with the rest. Nevertheless this is the question in which he is particularly interested.

The result of analytical weaknesses in the earlier chapters is a lack of cohesion between them and the later chapters, for this earlier analysis provides Mr. Morton with no means of interpreting his facts. He has collected some very interesting data on the relation between property tax actually paid and incomes declared for income tax by owner-occupiers for a number of districts in the State of Wisconsin. He finds that actual percentage of income paid out in property tax increases to a marked extent as income decreases. Owing to the dead end into which his earlier analysis has led him, Mr. Morton is obliged to assume, in order to reach any general conclusions, that the extent to which all owner-occupiers took property tax into account in the price which they paid for their houses was the same so that real and nominal incidence is similarly regressive. He also assumes that the

regressiveness of tax with income shown for owner-occupiers is typical als for all tenants. While the first assumption may be reasonably plausible, th second is just one of those things which requires investigation. On thi basis he proceeds to compare the regressiveness of the property tax with tha of a hypothetical sales tax which would yield the same revenue. It is im possible in a brief review to do justice to the problems raised by Mr. Morton' discussion of the sales tax. For the reasons just given, however, it does no appear to me that he has established an adequate basis for his comparisor of incidence.

In short while Mr. Morton has provided some very interesting data abou owner-occupiers, I do not feel that he has added much to our knowledge o the effects of property taxes, particularly with respect to tenants, or as tc the comparative real incidence of property and sales taxes. While Mr Morton has perhaps not succeeded in the task he set himself, there is a grea deal of interesting information in the book and some penetrating comment on the house market and the cost of housing. The book as a whole demon strates both the difficulty of the subject, and the necessity of applying a most rigorous analysis to the conditions of the house market before attempting tc draw conclusions from statistical data.

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MARIAN BOWLEY

Henry George. By C. A. BARKER. (New York and London: Oxford University Press, 1955. Pp. vii + 696. 57*s.* 6*d.*)

THERE are nearly seven hundred pages of this massive biographical study; and a good many of them could have been omitted with advantage. This is not to say that Professor Barker has written a bad book: indeed, much of it is good and no part of it positively bad. Its defect is that it gives so great a mass of detail as to prevent anything from standing out with real clarity. Particularly, Professor Barker pays far too much attention to reviews of Henry George's writings by contemporary critics who had nothing of special interest to say about them; whereas he fails to render any clear account of what George himself did have to say even in his most famous book, *Progress and Poverty*.

As against this, Professor Barker does give a much better balanced account than most writers of George's general attitude and avoids the error, so often made, of treating him as if he had been almost exclusively the advocate of the Single Tax. Those very words, Single Tax, he points out, came into frequent use only at a quite late stage in Henry George's career and became the slogan of Henry Georgism less through any doing of George himself than through that of a particular group of his disciples, who stressed the purely fiscal aspects of his doctrine and were in many cases even opposed to him on other fundamental issues. George himself was never simply a Single Taxer; he put quite equal emphasis both on Free Trade as a matter of uni-

versal principle and on the need for public ownership and operation both public-utility services in general and of other undertakings in which it w impossible to avoid monopoly. Indeed, all through his earlier career, rig up to the final decade of his life, George stood for public ownership of t land and regarded the land nationalisers not as his opponents but as alli Professor Barker brings out very well the extent to which George, desp his consistent hostility to Marxism, was the ally of the Socialists in I missionary tours in Great Britain and had a notable influence on the develo ment of non-Marxian Socialism—above all, on Bernard Shaw and the ear Fabians. George was, however, separated from these Socialists because always refused to recognise that there was anything in common betwe the private appropriation of land rent and that of interest on capital; where the Fabians and other Socialists regarded both alike as unearned yields private monopoly.

Henry George was essentially an anti-monopolist who saw as anti-soci and contrary to the laws of God and nature all forms of income accruing individuals either from land ownership or from the holding of positions special economic privilege, such as the operation of monopolistic positio in railroad or other public-utility operations, or any form of tariff or simil protection. He held that, if these forms of privilege were done away wit the root cause of economic depressions would be removed and productic would so increase as to solve the entire problem of poverty throughout tl world and to ensure, through competition, a just distribution of the enlarg product. Holding this view, he was utterly opposed to Marxist conceptio of class-struggle between capitalists and workers and, while siding with tl workers and recognising that they were foully oppressed, saw as the enemies not their employers but the landholding and other monopolist grou which lived at their and the community's expense.

Henry George was, in effect, what Americans used to call a " Populist in his essential ideas, and perhaps most of all in his use of the conceptions natural law and divine providence as foundations for his social doctrin With these conceptions he made his onslaught on the orthodox economist except the Physiocrats, to whom he appealed against them; and with the same conceptions he assailed Herbert Spencer and the Social Darwinia and emphasised both his agreements and his disagreements with Pope L XIII in his reply to *Rerum Novarum*. He even invoked the immortality of t soul in support of his social precepts; and, while stressing the dependence political on economic forces in society, he continually attacked materialis and insisted on the need for approaching economic questions from the stan point of Christian ethics. In his latter days he dissociated himself fro Socialism mainly because of his hostility to Marxism and class-war: c Christian Socialism his influence was strong both in the United States and Great Britain.

All these points Professor Barker brings out well and convincingl though they tend to be obscured by the mass of detail about lectures, article minor private affairs and unimportant social contacts. This would be

good book if it were re-written at half the length, with most of these details left out. It is particularly good in those parts which relate to George's dealings with the Irish problem and with the Irish Catholics in the United States.

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Ulster under Home Rule. Edited by THOMAS WILSON. (London: Oxford University Press, 1955. Pp. xxiv + 229. 21*s.*)

THE Government of Ireland Act, 1920 was more than an interesting, if partly abortive, piece of legislation. It was the closing of a door on a long period of struggle whose memory was distasteful. Henceforth Britain felt free to suppose that the Irish question had been settled, and generations have grown up in complete ignorance of the condition and government of the sister island. There are now a large number of Englishmen who do not know that the six counties of the north are part of the United Kingdom—a fact which I recently had quaintly confirmed by the receipt of a letter from an eminent Professor and Fellow of the Royal Society who wrote in the belief that Belfast was in the Republic of Ireland. There must be few who can any longer state the issues dividing north and south, or who know that the depression now banished from Jarrow and the Rhondda still hangs heavy over Derry and Strabane.

An academic study of the present political and economic realities of Northern Ireland is therefore a welcome thing. But the book has a further interest. Northern Ireland is an experiment in the decentralisation of government. It is not a very far-reaching experiment, since autonomy is contained on one side by the reservation of most taxing powers to the Imperial (the Westminster) Government, and on the other by a political philosophy which takes a pride in the imitation of Britain. But even limited autonomy has some striking advantages, exploited or potential, and it is possible that other parts of the United Kingdom might benefit from a greater freedom of local experiment. Again, Northern Ireland is a test of the operation of democracy without effective opposition, for the Unionist Party has always had a majority, and apparently will continue to do so for a long time to come. At Westminster that party is always allied to the Conservatives, but at home it has done such disconcerting things as pioneering the nationalisation of road transport (1935) and passing a whole series of equivalents to the Labour measures of the 1945 Parliament. Finally, in the Six Counties the religious divisions, which in England have become of little significance in an age of unbelief, still enter into every detail of life. There is no more important question to ask about a man than "Which foot does he dig with?"; whatever the answer, he will almost certainly have an active connection with a church, and his church membership will determine his

residence, his companions, the games he plays and the shops he uses. This is a fascinating field for a sociologist.

Dr. Wilson's book opens with a brief general survey by Sir David Lindsay Keir—a trifle partisan in tone, but it must be remembered that the whole book is written by real or adopted Ulstermen who believe in the British connection. It is no use expecting a judicious neutrality in a treatment of the economics and politics of Ireland, for there are no well-informed Irishmen who are neutral. Mr. J. M. Mogey sketches the history and social divisions of the province, and Professor F. H. Newark the development of its interesting constitution. Mr. J. E. Sayers on the political parties is excellent in his discussion of the Unionists, but, perhaps naturally, weaker in describing the complexities of the Nationalist opposition and the curious position of the Northern Ireland Labour Party.

The central chapters are by Professor K. S. Isles, Mr. N. Cuthbert and Dr. Wilson himself on the economic structure and position of the province. These chapters are solid and authoritative, perhaps a little too restrained in pointing out the lessons of Ulster's experience. The greatest industries are agriculture, organised for historical reasons as a kind of peasant farming which is not easy to improve; linen, which has suffered a long decline; and shipbuilding, an uncertain industry. The province adds to its structural difficulties the fact that it lives for the most part by sea-borne trade, and has to bear high transport costs on many imports and exports. Since in addition workers are increasingly demanding parity of wages with the rest of the United Kingdom, the prospects for industrial expansion are not hopeful, except at times when labour is hard to get at any price in Great Britain. Northern Ireland would not have got as far as it has along the way of recovery without the singular and concealed generosity of the financial relations of the Imperial with the Northern Ireland government. But these relations, as Dr. Wilson clearly shows, need fresh thought.

Dr. Wilson, in his concluding chapter, offers an appropriately Irish conclusion, that Home Rule can be tried with most confidence in those regions where the majority of the people do not particularly want it. It is to be hoped that, despite this limitation, some of his English readers will fall victim to the fascination of an Irish problem which may well disturb once more the debates of Westminster, and will give it further study.

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Studies of Overseas Supply. By H. D. HALL and C. C. WRIGLEY. (H.M.S.O. and Longmans, Green, 1956. Pp. xi + 537. 37*s.* 6*d.*)

THIS volume is complementary to *North American Supply*, previously published in the War Production Series of the Civil Histories of the Second World War. It is not only, or even mainly, concerned with filling in details; it is rather a series of connected essays on particular topics of importance.

The essays fall naturally, by subject and by authorship, into two groups, with a couple of odd ones to complete the volume. There is an opening sentence which might well have been written by Churchill: " The drawing by the Island on supply from the seven seas is the theme of this book."

One group of studies, by Mr. Wrigley, is on the main developments, chronologically, in procurement from the United States: cash purchases, lend-lease, allocation of munitions. These are well-written and objective comments on the main events, with a shrewd insight into their nature and import. At the very least they serve to let us take a second look, in sharper focus than was possible at the time, at some of the problems of Anglo-American co-operation.

There is the sad tale of failure to agree on standard equipment and on British needs for non-common stores and components. It was unfortunate that it was seldom found possible to send specimen equipment to the United States; for the Americans, even more than most, seeing was believing. Again, looking backwards, we conclude regretfully that it was not always our most successful munitions which were pushed for production in North America, for example, Stirling bombers, Typhoon fighters, Napier and Liberty engines. Against this, there is the success story of the way in which British-inspired modifications were incorporated in American equipment (as on Sherman tanks) and of how Anglo-American co-operation produced such winners as the Mustang fighter.

Mr. Wrigley quotes from the history of the Ministry of Munitions in the First World War to the effect that concentration of buying was " achieved with difficulty owing to the reluctance of Government departments and private buyers to give up their usual channels of supply " (p. 71). Exactly the same difficulty was met twenty-five years later, in the United States as elsewhere, and it would certainly be met again. It is generally thought that British cash procurement petered out only because there were no dollars left. Mr. Wrigley maintains, with some justification, that " even if funds had been inexhaustible the system could not have continued very much longer, if its larger objectives were to be attained " (p. 112). The practical difficulties of placing contracts with suitable firms and of liaison with the United States Administration were so great that some joint project on the scale of lend-lease was inevitable.

The other group of studies, by Mr. Hall, is concerned with the Combined Boards and with the organisation of the British Missions in North America. These are good when Mr. Hall writes of the supply of raw materials, and his study of the Combined Raw Materials Board (C.R.M.B.) is excellent. In other respects, however, he tends to become discursive and at times confusing. He does rather less than justice to the Combined Production and Resources Board (C.P.R.B.). Admittedly, C.P.R.B. failed to follow up the grand conception of global planning of war production, largely because the American Services refused to play; but it turned with considerable success to the problems of non-military supplies, as evidenced by the experience of the committees (as on tyres and on textiles) set up in this field. Neither is

Mr. Hall very clear on the part played by Canada in the various types of combined action in Washington. The Canadian–American joint committees, set up in 1941 following the Ogdensburg and Hyde Park Agreements, were very active and conditioned the relations of Canada with the Combined Boards. They make only scattered appearances in Mr. Hall's text; even the names of the committees are confused, and the index is of little help in locating references. Some of Mr. Hall's comments, as on the " two-man pattern " of Combined Boards, seem to ignore the fact that Canada was a *member* of C.P.R.B. (from November 1942) and later of the Combined Food Board as well.

The two odd chapters are one (contributed by Mr. J. D. Scott) on scientific co-operation—with emphasis on such " fruits " of collaboration as radar, jet engines and atomic bombs—and one on war supplies from the Eastern Hemisphere. It is good to find some space devoted to the problems of war production in Australia, India and others in the Eastern Group. Though they never contributed more than 2% to total British supplies of munitions, these countries did make important contributions, for example, of rifles and small arms ammunition, at critical times and places.

The authors are always interesting and often very instructive in what they say about British forms of organisation in a foreign climate and in relation to the American forms. The gap between military and civilian groups on both sides was evident. It seemed to be easier for British and American civilians to get together (and similarly for the Services) than it was for the civilians and military on either side. Mr. Wrigley has a delightful passage (p. 157) in which he describes C.P.R.B. as erected " over the chasm that divided the military and civilian production planners in the United States, and in defiance of the law of gravity, from the top downwards." One difficulty was to get decisions taken by Generals to stick down the line among the Colonels and Majors, " at a lower altitude, where the atmosphere was always more oppressive " (p. 191). There was no " deliberate wrecking," only " a fairly prevalent feeling that Lend-lease business was a someWhat unwelcome addition to the main task of strengthening America's defences and could properly be relegated to a secondary place " (p. 127).

Mr. Hall contrasts British and American attitudes to overseas representatives. " The authority and influence of an American official abroad tended to be in inverse proportion to the length of his absence from Washington "; so Combined Boards were set up in Washington where " the American representative . . . could keep his place in the competitive struggle of the Washington agencies " (p. 237). Then there is the British habit, in the face of a conflict of interests, of appointing a Minister of State as co-ordinator, a device long resisted but eventually used in Washington in the guise of a Resident Minister for Supply. The British organisation did succeed in making full use of outstanding personalities—not only Arthur Purvis but also Sir Frederick Phillips, " whose influence on the supply side . . . was to be second only to that of Purvis " (p. 326). The comment here might well have gone farther, for it was the personal decision of Phillips to attach his

small Treasury team to the British Supply Council rather than the Embassy (where there was already a Treasury representative) which did so much to bolster up the essential power of the Supply Council in Washington.

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The History of Unilever. By CHARLES WILSON. (London: Cassell, 1954. 2 vols. Pp. xx + 335, and 480. 45*s.* per set.)

THIS work, in two volumes, presents the history of the Unilever concern, which in recent years " bought and processed more than a third of the whole tonnage of oils and fats which find their way into world commerce, which traded in more places and in more products than any other concern in the world, which employed nearly a quarter of a million people, represented capital supplied by about 300,000 investors, and counted its customers not in thousands but in millions " (I, p. xviii). It is a fascinating story of important events and developments, and it is well and skilfully told by Mr. Wilson. The clarity and fluency of the writing are enviable; and the author has displayed much-needed skill in tracing and presenting, sometimes successively and sometimes in interweaving narrative, the activities and growth of Lever's in England and abroad, Jurgens' and Van der Bergh's in Holland and abroad and, to a lesser extent, Schicht's in Central Europe.

The history reaches, as it were, a series of climaxes in 1927–29. In 1927 the two Dutch firms merged, after almost two decades of uneasy collaboration punctuated by sharp disputes and almost always subject to tension. The Schicht and other Central European interests joined the group in 1928, and early in 1929 the leading Dutch independents, Hartog's, followed suit. Finally, in September 1929, this vast amalgamation joined forces with the Lever organisation, which by then had extended from soap-making into the manufacture of edible fats and oils, merchandise distribution and produce-buying in West Africa, plantation enterprise in the Belgian Congo and elsewhere, shipowning and oil-milling—and, one is tempted to add, justifiably, " et cetera."

Mr. Wilson takes the story of the unified concern up to 1949. But after 1929 the treatment is more meagre. The reader will find little, for example, on developments in West Africa, where Unilever, through the United Africa Company, has vast and influential interests. Thus the " cocoa hold-up " of 1937, an event with far-reaching repercussions, has only eight lines (II, p. 324), and general price policy, also of great significance, is dealt with rather summarily in two paragraphs which confuse two separate points (II, pp. 322–3).

The first volume deals almost exclusively with the life and achievements of William Hesketh Lever and with the history of the organisation he founded taken up to 1929. The story is testimony to the initiative, ambitions and courage of a great business pioneer. Both his achievements and his failures are dealt with, the narrative often illumined with the pithy contemporary

comments of Lever himself. A character-study of Lever is skilfully worked into the record of events. It is an outstanding performance by Mr. Wilson, who successfully conveys the impression of vigorous, courageous and sometimes fool-hardy entrepreneurship without lapsing into uncritical adulation.

The second volume deals mainly with the histories of the three Continental firms, and to that extent the narrative is more diffused. But Mr. Wilson succeeds very well in keeping the story going, even though, for the reasons he gives in his preface, he can tell us less of the working of the minds of the principal actors.

The work contains a wealth of material on a wide range of subjects, such as the working of competition in different types of market, the forces making for or hindering mergers and amalgamations, organisation of large-scale enterprise, the rise of professional managers, the role of the banks in industrial growth, location of industry, industrial relations and the structure of the distributive trades. It is inevitable that on some issues the reader would like to have rather more detail or explanation, though readers will probably differ in their requests for supplementary material. In general, this is not a criticism of Mr. Wilson, for it would have enlarged the work unreasonably if he had tried to cater for the more specialised needs of particular groups of readers. But in some cases important topics receive scanty treatment. Thus a more detailed account of how Lever wooed and won the retail trade in England in the first twenty years of Sunlight soap would have been helpful. Mr. Wilson recognises the importance of this point, but has virtually nothing on it. This contrasts markedly with the treatment of the problem of introducing and distributing margarine. This is much fuller, though even here further elucidation might have enabled the reader to reconcile statements on branding and fixed retail prices (II, p. 70) and on the advantages of ownership interests by manufacturers in retail outlets (II, p. 92) with accounts of specific developments and events which do not seem to bear them out. Again, the impact of technological change on industrial structure is frequently mentioned, but there is too little detail to be convincing. For example, it is not explained how " technological development had made it necessary to regard the oil industry as one link in the total process of converting oleaginous materials into manufactured products rather than as the separate industrial process which it once had been " (II, p. 200). The precise meaning of this is not clear, and the process of vertical integration could, it seems, be explained in terms of the self-generating forces of an oligopoly market structure.

The emergence in 1929 of the Unilever colossus, the product of the merger of several smaller business giants, naturally provokes the question whether this sort of development is " desirable." In a brief epilogue of ten pages Mr. Wilson addresses himself to this question, among others—the historian, however tentatively, turns to questions of public policy. His comments, though of interest, do not always take the argument very far, and he does not go very deeply into the relevant issues. Thus he makes the point that active competition still remains. But it would be relevant to note that,

though history need not repeat itself, the story of the industry shows that competition between giants has been unstable in the past. Moreover, as history shows, there are all kinds of competition, and the question of public policy is which kind of competition is best. The issues and alternatives are not so simple as they are presented in the epilogue. The consumer, it is also said, " got the guarantees of consistent quality at prices that reflected the economies and the costs of large-scale production " (II, p. 393). The question, however, is whether the present high degree of concentration is necessary for guaranteeing quality or securing the economies of scale. It is obviously unnecessary for the former, and no evidence is advanced on the latter point.

It would give a wrong impression to end on this note of criticism, which refers to only a few pages which deal with issues going far beyond the Unilever story. This story was well worth telling, and Mr. Wilson has told it admirably. And he is surely right in stressing the great positive contributions made by a small number of enterprising pioneers and the feats of organisation accomplished by those who took over, consolidated and expanded the large firms which had been created at breath-taking speed. It is to be hoped that the initiative of Unilever's in making this study possible will encourage other firms to follow their lead. It would also be of great value and interest to economic historians and economists if Unilever's would find it possible to have more specialised monographs prepared on several of the many topics which Mr. Wilson could only touch upon, rather tantalisingly, in the broader treatment appropriate to the general history.

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NOTES AND MEMORANDA

FACTOR SHARES AND THE SAVINGS FUNCTION

1. A RECENT article [1] in this JOURNAL by the late Richard Brumberg ;ented a very interesting savings function, which was used with some :ess to give a " conditional prediction " of savings in the United States ing and immediately after the Second World War. This short note gives mplification of Brumberg's function which registers a very slight gain in dictive power over the same period but whose main merit is to economise :he theoretical artillery and the data collection and processing required this model. A slightly different test of predictive power is also given er which both Brumberg's original function and its simplification do not d up quite so well, although they are still much better than the alternative ulations that he mentions.

2. Brumberg's macro-savings function is derived by aggregation from a er elaborate micro-theory, which is set out at length in other papers by and Modigliani. Its details need not concern us here, except to note he does not treat non-property income and property income as one able, as is usually the case. After some algebra and approximations, aggregate savings function is specified as

$$\Delta S = b_0 + b_1\Delta Y + b_2\Delta R + b_3 S_{-1} + b_4 G \quad . \quad . \quad (1)$$

Here ΔS is the increase in savings during the year, where savings is :ed from the usual definition of the national-income statisticians of the . Department of Commerce by: (i) including net additions to stocks of umers' durable goods during the year; (ii) using replacement cost :ad of original cost depreciation on fixed assets; and (iii) adding net ributions to, plus earnings of, social-insurance funds. Thus ΔS is an mpt to get at the change in the total net worth of consumers, rather than nges in monetary assets only. This point will be returned to later.

ΔY and ΔR are non-property (*i.e.*, wage and salary) disposable income property disposable income respectively. Since the factor division of *sable* income is not yet given in the U.S. national-income accounts, nberg used the estimates of Miss Frane and Dr. Klein,[2] with some stments. Property income is increased by earnings of the social- rance funds. S_{-1} is the level of (adjusted) savings in the preceding year,

R. E. Brumberg, " An Approximation to the Aggregate Savings Function," ECONOMIC IAL, Vol. LXVI, March 1956, pp. 66–72.

L. Frane and L. R. Klein, " The Estimation of Disposable Income by Distributive Shares," *of Economics and Statistics*, Vol. XXXV, November 1953, pp. 333–7.

and G is an index of share prices, used to provide some index of capital gains, which the micro-theory says may have some influence on savings.

3. This equation was first estimated for the period 1930–49, which gave a good fit with sensible magnitudes and signs for the parameters. The only explanatory variables that were at all highly inter-correlated were ΔY and ΔR with $r = 0{\cdot}51$. Brumberg then re-estimated the equation for the period 1930–41 and found that the coefficient for G was not significant.[1] The role that G plays is in any case difficult to assess statistically. If it is left in either the original function or the simplified function it improves the fit a good deal for both sample periods, but does not substantially lower the errors of prediction. Moreover, in a prediction situation one would have either to forecast the level of share prices as an endogenous variable or to treat it as exogenous, which are both hazardous undertakings. For these reasons I feel inclined to drop capital gains as an explanatory variable, at least in so far as it is measured by an index of share prices.

With G out, the equation estimated by Brumberg [2] becomes

$$\Delta S = \underset{(0{\cdot}16)}{0{\cdot}53}\Delta Y + \underset{(0{\cdot}34)}{0{\cdot}68}\Delta R - \underset{(0{\cdot}10)}{0{\cdot}14}S \qquad R^2 = 0{\cdot}906 \quad . \quad . \quad (2)$$

This may be rewritten as

$$S = 0{\cdot}53\Delta Y + 0{\cdot}68\Delta R + 0{\cdot}86S_{-1} \quad . \quad . \quad . \quad (3)$$

Equation (3) is then used to give a " conditional prediction " of the level of savings for the years 1942–49. A " conditional prediction " means that all the variables on the right-hand side of (3) are assumed to be at their true level in the forecasted year concerned, and the value of S is then calculated. On this test (3) does quite well, or at least much better than the models that Brumberg uses for comparison.[3]

4. If one looks at (3) it will be noticed that the coefficients of ΔY and ΔR are not markedly different, and in fact the correlation between ΔY and ΔR for 1930–41 is 0·85. It was only during the War that the two components of income moved in opposite directions. It seems natural therefore simply to amalgamate ΔY and ΔR, *i.e.*, add together property and non-property disposable income to obtain just total personal disposable income. If such a device would work, it would mean a considerable saving in the large number of arbitrary decisions needed to divide disposable income into the factor shares. In fact, it *does* work for the sample period 1930–41 and provides a slightly better conditional prediction than (3). The estimated equation reads

$$\Delta S = \underset{(0{\cdot}04)}{0{\cdot}58}(\Delta Y + \Delta R) - \underset{(0{\cdot}07)}{0{\cdot}15}S_{-1} \qquad R^2 = 0{\cdot}938 \quad . \quad . \quad (4)$$

which is rewritten as

$$S = 0{\cdot}58(\Delta Y + \Delta R) + 0{\cdot}85S_{-1} \quad . \quad . \quad . \quad . \quad . \quad (5)$$

The two series of residuals generated by (3) and (5) are compared below, where it is seen that (5) is very slightly the better, though not uniformly so. All figures are in billions of 1939 dollars.

	Eqn. (3).	Eqn. (5).		Eqn. (3).	Eqn. (5).
1942 . .	3·7	3·5	1946 . .	−3·5	−2·9
1943 . .	3·2	2·9	1947 . .	−1·0	−1·0
1944 . .	2·8	2·8	1948 . .	0·4	0·6
1945 . .	−1·2	−1·0	1949 . .	−0·9	−1·0

The mean squared error for (3) is 5·9 and for (5) is 5·0.

5. The simpler specification does not work quite so well—though nearly so—for the sample period 1930–49, since ΔY and ΔR moved in different directions during the War. This suggests that it is only when one has a good reason for expecting markedly different movements in the two components of income that the division is worthwhile. Such differing movements are rather rare; the results of the 1930–41 sample show that the severe depression of the 1930s was not enough to produce them.

It is probable that these last remarks apply only to the United States and countries with comparable real income, where the consumption patterns of wage and salary earners are not greatly different from those of rentiers. In countries with lower levels of real income, consumption patterns are likely to differ widely between these factors, and the division of income will probably be important. Recent investigations by Professor Stone and others suggest that the United Kingdom belongs to this latter category, though gradually moving out of it.

6. The test of " conditional prediction " that has been used can be made more stringent by recognising that one of the explanatory variables in (3) and (5) is S_{-1}, which is a lagged endogenous variable. Accordingly, I propose a modified " conditional prediction " which replaces the true value of S_{-1} by the value estimated by equations (3) and (5). If one were in a prediction situation this is the problem that one would be faced with (making the brave assumption that the rest of the model forecasts exactly at time t

[1] A minor point to notice is that in Brumberg's equations (7) and (8) the constant term is in the wrong units for the data given in the appendix, as is the coefficient for G in (7) which should be −0·027. For both the equations computed in this note the constant term was not significantly different from zero.

[2] Internal evidence suggests that Brumberg estimated the equations from data a little more detailed than that given in his appendix. Since the simplified function given in the text has had to be calculated from these data, the original equation has been recomputed using these data also. This explains the discrepancies (which are not very great) between (2) and Brumberg's original equation (7). The standard errors are given in brackets. R^2 is the square of the multiple correlation coefficient, corrected for the degrees of freedom available.

[3] These are: (i) a " naïve model " that says that next year's saving will be the same as this year's, *i.e.*, $S_t = S_{t-1}$; (ii) another " naïve " model which says that the difference between next year's saving and this year's saving will be the same as the difference between this year's saving and last year's saving, *i.e.*, $\Delta S_t = \Delta S_{t-1}$; and (iii) the saving function due independently to Modigliani and Duesenberry, where *per capita* real saving depends on current *per capita* real income and the highest level of income reached in earlier years. Brumberg fits (iii) to unadjusted Department of Commerce data.

even if incorrect forecasts are made of S_{t-1}).[1] Using this test we get the following series of residuals:

	Eqn. (3).	Eqn. (5).		Eqn. (3).	Eqn. (5).
1942 . .	3·7	3·5	1946 . .	1·5	1·9
1943 . .	6·4	5·9	1947 . .	0·3	0·5
1944 . .	8·3	7·8	1948 . .	0·7	1·0
1945 . .	5·9	5·6	1949 . .	0·3	0·1

The mean squared error of (3) is 20·2 and of (5) is 18·0.

Again (5) does very slightly better than (3), though not uniformly so. The errors are, of course, much larger than in the less stringent "conditional prediction," though it is interesting that in the latter part of the forecast period both equations do quite well, in fact rather better than if the true values of S_{-1} are used.[2]

7. Although I do not attach very great importance to the ability to forecast war-time levels of saving, it is interesting to inquire into the reasons why models of the Brumberg type should do so comparatively well. It has been shown that the division of income into factor shares is of little importance. This fact has implications for Brumberg's micro-theory which will not be examined here; in any case, the objection is probably only valid for advanced economies. The addition of lagged savings is certainly a help, in the sense that one gets considerably worse conditional predictions without it.

The most important reason[3] would seem to be the addition to net monetary savings of net investment in consumer durable goods. Monetary savings and expenditure on durable goods are probably rather strong substitutes at the margin, and their total shows greater stability than either taken separately. The variable that is estimated, *i.e.*, net additions to consumers' total assets, is one of undoubted economic meaning and importance. It is not a strategic variable for business cycle analysis however: for such analysis it is the form which this net accretion of assets takes that is crucial. In buying consumer durables, the consumer is making his own net investment. By accumulating monetary assets he is providing funds with which other people may implement investment decisions; and these funds may not be spent.

PETER NEWMAN

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[1] One has also to make the further assumption that S_{-1} does not appear as an explanatory variable anywhere else in the model.

[2] The naïve models provided by Brumberg are quite hopeless under this more stringent test. Naïve model (i) never gets away from the 1941 value, and naïve model (ii) gives a constant change of +6·4. Of the two, naïve model (ii) is by far the worst. Model (iii) is not affected by this test, since lagged savings is not one of the explanatory variables. Its error is still very large, however; the mean squared error is 161·6.

[3] It is probable that the use of replacement-cost depreciation rather than original-cost depreciation also helps, although I would judge its effect to be minor compared with that of treating monetary savings and net investment in consumer durables as one variable.

YET ANOTHER NOTE ON FOREIGN EXCHANGE RATES AND MONOPOLISTIC COMPETITION

IN the June 1953 issue of this JOURNAL I examined very briefly what I thought at that time to be a few typical partial equilibria of a British exporter and a British importer before and after devaluation. In the same issue my examination of the price-competition case of British exports was criticised by Mr. Harrod, and in the March 1956 issue of this JOURNAL Mr. Spraos adds further criticism. A short reply would not, perhaps, be entirely out of place.

I had assumed the British share of the United States market to be a small one, and in most industries this assumption seems sound enough. But I had also assumed, implicitly at least, that the British exporter was either alone in the United States market, competing with United States producers or with exporters from non-devaluing third countries. Or, if he was not alone, the British exporter would at least be part of a group of British exporters having an outspoken *esprit de corps*. In his comment to my paper, Mr. Harrod informs us that such *esprit* is frequently lacking. This information I took *ad notam*. Many of us in this country are biased, as Mr. Harrod puts it, "to assume that competition in Britain is moribund." I am sure we have profited from his reminder.

In his recent note, Mr. Spraos adds a criticism for which he claims logical precedence over Mr. Harrod's in the sense that it would hold even if the British export firm were small and were entirely alone among its United States competitors. The criticism is that my equality between marginal cost and marginal revenue *obtained from the foreign market* will normally imply price discrimination between the foreign and the domestic market, and Mr. Spraos cannot believe that such discrimination is widely practised. If in the absence of such discrimination the American demand elasticity would be low and the home demand elasticity would be high, both being measured in the neighbourhood of the common price, then a devaluation of the pound would reduce the dollar earnings of the British exporter. True, it would be tempting to discriminate by raising the foreign price and reducing the domestic price to the points where the marginal revenues in the two markets were equal; this would raise the foreign price up to a point where foreign demand would be elastic. But Mr. Spraos makes the surprising statement that nothing less than the shield of a statutory export monopoly is adequate for the maintenance of such an export premium. What he must have had in mind here is pure, not monopolistic competition.

I plead absolutely guilty of having assumed that marginal cost equals marginal revenue obtained from the foreign market. Is this tantamount to price discrimination? Whether it is or not is a matter of semantics. I was thinking of monopolistic competition, compare my title. For years American missions to Western Europe and American hosts to Western European productivity teams have been preaching that in the United States goods are sold a different way. Higher selling costs are involved, and less

price resistance can be expected at the consumer level. To the extent the British exporters heed the American advice and engage in aggressive, high-price selling, are they discriminating? (Here is where my analysis of the non-price competition case, pp. 291–3, not commented upon by my critics, should be quite realistic.) Why should they not be discriminating? The more highly differentiated the products, the less need for a statutory export monopoly. *Differentiation itself is a shield.* The United States port-of-entry retail price of a British MG-A is $2,195. The United Kingdom list price of the same vehicle is £595. I do not know whether these prices are discriminatory or not, but I do not see anything which would make it impossible for them to be so. Unauthorised American dealers might well find it impossible to obtain delivery for sale in districts already having an authorised dealership. Without authorisation, without stocks of spare parts, they might not even be able to sell successfully at the retail level, anyway. Few Americans would pick up their MG's in Britain and ship them over. And substitutes for the MG-A are few and far between. The Austin-Healey is produced by the same company as the MG, and can hardly be expected to pull the carpet from under the latter. The Jaguar XK-140 sells in a price bracket twice as high; and its price, too, may have been adjusted to the United States kind of market. In short: the shield seems to be there even in the absence of a statutory export monopoly.

Quite a different matter is that the shield may not be exploited. In fact, Mr. Harrod's report on his experience with British manufacturers reveals their marked disinclination to soak foreign markets. Again, this is information to be taken *ad notam*.

When all this has been said and done, new and serious doubts could be raised about the usefulness of partial-equilibrium analysis as applied to the case of devaluation. The macro-economic approach would seem more promising, but that is a different story.[1]

HANS BREMS

University of Illinois.

COMMENT ON HANS BREMS' "STABILITY AND GROWTH"[2]

PROFESSOR HANS BREMS' conclusion in his article in the December 1955 issue of this JOURNAL that "the notion of an equilibrium rate of growth thus assumes new importance" because "the instability of a growth model of the Harrod–Domar type can be made to shade over into stability by simply lengthening the time unit on which investment planning is based . . ." leaves some lingering uncertainties in this reader's mind.

(1) Brems' interesting results seem to differ from the Harrod–Domar models not so much because of the time unit chosen as because of the shape

[1] To be further explored in the writer's forthcoming "Devaluation, A Marriage of the Elasticity and the Absorption Approaches" in this JOURNAL.

[2] ECONOMIC JOURNAL, December 1955.

of the assumed consumption function. If a linear consumption function with identical average and marginal propensities to save had been used, as in the Harrod–Domar models, then regardless of the time element in investment planning an unstable equilibrium would have resulted (analogous to Brems' Fig. 4).

(2) In Brems' model, stability is gained only in the special case of an investment planning period of approximately nine years or more—with a period any less than this, no stable equilibrium would be possible. Alternatively, a marginal propensity to consume of 0·75 (with a capital coefficient of 3) would require an investment planning period of about sixteen years to provide a stable solution, and a capital coefficient of 4 (with marginal propensity to consume remaining at 0·6) would necessitate a thirteen-year period for stable equilibrium. If, with realistic values for the capital coefficient and the marginal propensity to consume, an investment planning period of roughly nine to fifteen years is needed for stable growth, stability seems to have been gained only at the price of realism.

(3) More importantly, Brems appears to have shifted the shoe of stability on to another and less familiar foot, so that rigorous demands are put upon consumption rather than investment for the maintenance of stable growth. In the Harrod–Domar models, at any level of output there is only one level of investment which will be compatible with equilibrium growth (or, in Harrod's terminology, only one "actual" capital coefficient which will produce equilibrium growth, and that is one precisely equal to the "warranted" capital coefficient). Any divergence causes an explosive movement away from the current level of output. In Brems' model, however, investment demand from one period to the next is a stable function of the change of current net real national output, while the consumption function must make precise periodic shifts. These shifts must be such that the autonomous element in consumption grows at precisely the same rate as does the equilibrium net real national output.

This last condition, which Brems suggests "it is reasonable to assume," leads to two conclusions. First, if this in fact does occur, then the actual level of consumption at every equilibrium level of output will, if plotted, lie on a straight line passing through the origin of a familiar consumption-function diagram, so that the long-run consumption function is actually the same as the Harrod–Domar function.[1] Thus Brems' model appears to differ from its predecessors in that for the duration of each decade there is a mirage effect; that is, the consumption function temporarily appears flatter than it really is in the long-run.

Secondly, as regards the shift in the consumption function, if households should decide not to increase the autonomous element in consumption by the precise amount $[A(t) = (1 + g)A(t - 1)]$, then instability will result. If consumers constantly over-shoot the mark, explosive growth occurs; if they constantly under-shoot it, income falls toward zero over a number of

[1] For the sample values Brems gives in note 1, p. 622, the equilibrium level of consumption would always be 88·46% of national output.

decades.[1] If consumers have successfully over-shot the mark once, with its resulting increasing rate of growth, they are just as likely to remain overly-optimistic as are investors who have over-shot the mark profitably in the Harrod–Domar models.

If these conclusions can be drawn from the Brems' model, then stability is equally precarious, although consumers rather than investors are to blame. It is undoubtedly fruitful to build models based on secular shifts in the consumption function for a change (instead of fluctuating investment demand), but it would hardly seem fair to endorse Professor Brems' final conclusion that " unstable equilibria are rather uninteresting."

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A COMMENT ON MEEK'S "NOTES ON THE TRANSFORMATION PROBLEM"

I WOULD like to suggest that, in their handling of the " transformation problem," Bortkiewicz, Sweezy, Winternitz, Meek and others are introducing unnecessary complications, due to their pursuing a will-o'-the-wisp. Having obtained three equations with four unknowns (the second set of equations on p. 101 of Meek's article), they then look round for a fourth condition in order to make the problem determinate. But the problem *is* in the nature of reality, indeterminate. For x, y and z are not three different, independent variables. Only their ratios are significant, and need to be determined. Values and prices are quantities of different dimensions, measured in different units. Values are measured in quantities of labour-time. Prices are measured in terms of money. In each of the three different departments of production values are converted into prices by means of a multiplier x, y or z. Each multiplier implies a factor relating labour-time to money. The absolute value of this factor is of no significance. It does not matter whether an hour of labour-time corresponds to 1 franc, 10 francs or 100 francs. Only the *ratios* of x, y and z are relevant to the transformation problem. Given the ratios, the actual prices can be arrived at by the use of a *numéraire*, the magnitude of which is immaterial.

Thus there are really only three unknowns, the rate of profit and the two ratios $x : y : z$. These can be determined from the three equations. No fourth condition is needed.

The idea of equating the sum of the prices (or of any prices) to the sum of the values (or of any values) is nonsense. To equate a ratio of prices to a ratio of values might make sense.

H. D. DICKINSON

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[1] Any variation in the value of $y\left(\frac{A(t)}{Y(t)} = \frac{A(t-1)}{Y(t-1)} \cdot \cdot = y\right)$ from one period to the next makes the system unstable, just as any change in the savings propensity (without a corresponding adjustment in the capital coefficient) produces explosive growth or contraction in the Harrod model. If output has been growing at the equilibrium rate of 48% per decade, but beginning in period $t + 1$ the autonomous element in consumption increases by only 36%, given the other parameters of the consumption and investment functions, stable growth at this new lower rate is impossible. The rates of growth in Brems' equation 3(*b*) and equation II (pp. 616 and 620) diverge (analogous to Harrod's " warranted " rate of growth exceeding the " actual " rate of growth) and output contracts. Diagramatically, in his Fig. VII, the consumption function in $t + 1$ does not shift upward sufficiently to lie above the scale line at $Y(t)$. Alternatively, if $A(t + 1)$ is 60% greater than $A(t)$, then g as determined by equation II is almost 125%, while g in equation 3(*b*) is only 60%, and growth occurs at a more than proportionate rate.

OBITUARY

FEODORA STONE, 1909–56

FEODORA STONE, whose early death occurred, to the sorrow of all who knew and admired her, on June 28, 1956, had made a special place for herself in the evolution of economic research in the United Kingdom during the past fifteen years. As Secretary of the National Institute of Economic and Social Research she played, from 1939 onwards, a central and important part in the war-time and post-war expansion of research in applied economics. The Institute itself had been created through the energies of Lord Stamp, Sir Henry Clay, Sir Hubert Henderson and others in the years just before the war. When war broke out it already had a small and active staff, under the Directorship of Noel Hall. This was absorbed, lock, stock and barrel—into the Ministry of Economic Warfare at the outbreak of war, and the task of caretaking what remained of it was entrusted, under the general guidance of Geoffrey Crowther, to Feodora Leontinoff, as she then was, a young assistant lecturer in the Department of Philosophy at University College, London.

After the original premises in Gordon Square had been bombed, the headquarters of the National Institute (and there was precious little else) were given a temporary and very welcome refuge in Chatham House. From that unpromising beginning, under the inspiration of Henry Clay and Geoffrey Crowther, but more than anything through her abundant energies the National Institute was gradually re-animated. Research work was started again, with Laci Rostas, Herman Levy, Alexander Baykov, Phyllis Deane and others busily occupied. More of us who were in White-hall offices enjoyed the opportunities of putting in a few hours work at something that smacked of the academic life. As a major task, Richard Stone started a project of national-income studies, designed to fill in and extend over the inter-war years the knowledge of the main components of national income that he was currently compiling in Whitehall. New premises were found in Westminster. Work started before the war was finished and published. Under Feodora's hand the Institute came back

to life. Another bomb in 1944 diminished its amenities, but could not break its newly found spirit.

She would never for one moment have claimed for herself that she was an economist. She had her own professional standards of competence in her own discipline, and was fully aware of her limitations outside it. But she carried into her work of organising economic research the consciousness of what ought to be the required standards of scholarship, accuracy and clarity of thought, and she was devastatingly critical—at least in private—of slip-shod work and of muddy thinking and writing. She could be intolerant and sometimes rightly intolerant—as well as the most devoted of friends. As secretary of an Institute that lives by eternally raising funds, she had all the qualities that make for success. She was interested in administration and prepared to take infinite trouble over detail. She had, without the need to learn by mistakes, the capacity to visualise the problems of the grant-giving Foundations and to present a case in a form that would both appeal to them and satisfy their necessary conditions. With them, she was patient and infinitely insistent. Above all, she could fill the overworked members of her Executive Committee with something of her own enthusiasm and extort work from them far beyond their own intentions to give it. She had an instinctive and wholly feminine understanding of when good food and pleasant surroundings would make the difference between success and failure.

She was born in New Zealand in 1909 of a family that came originally from Russia and more recently from England. They moved to the United States, and part of her education was in Los Angeles High School. She later made her own way to London and worked first as an undergraduate and later as a junior lecturer in University College. Her interests were varied. She read widely. She enjoyed modern painting. She loved travel and good food. She was never happier than in creating a beautiful and well-designed environment for work in the Institute and in finding the furniture and decorations which would make it worthy of her concept of it. She married in 1941 Richard Stone, whom she had come to know through his work at the Institute, and their daughter Caroline was born in 1945. She took the running of her home and her family in her stride and did it all with the skill and zest that we had come to expect of her.

But if there is one characteristic that one will specially remember, it is her loyalty to all that touched the Institute she had done so much to create. It was typical of Feodora Stone that, only a month before her death, and when already in hospital, she insisted on returning to the Institute for a critical meeting of its Executive Committee to see through to the end a plan for its financial strengthening that she had been helping to prepare. That gesture of indomitable courage and of devotion to the Institute will remain for some of us an enduring last memory of her.

Sidney Sussex College,
Cambridge.

AUSTIN ROBINSON

CURRENT TOPICS

THE International Economic Association held its first Congress in Rome at the beginning of September 1956. Each of the five days of sessions was devoted to one aspect of the general theme of Stability and Progress in the World Economy; a main address was followed by discussions, opened by two selected speakers. The five main addresses were given by Professor Sir Dennis Robertson, Professor Jacob Viner, Professor François Perroux, Professor Gottfried Haberler and Professor Erik Lundberg. Each of them in his own and very distinct way provided something that will long remain in the memories of those privileged to hear it. The Congress was attended by nearly five hundred economists, representing almost every country in the world. For its success and the admirable arrangements made for it in the University of Rome, the greatest thanks are due to the Rector of the University, Professor Ugo Papi, himself one of the most distinguished of Italian economists. The discussions, translated simultaneously into English and French, were lively and protracted. Messrs. Macmillan will be publishing a volume containing the papers and the contributions of the discussion openers, together with a summary of the subsequent discussions. On the Sunday which fell in the middle of the Congress a large number were received in private audience by His Holiness the Pope, who delivered to them an address which it is hoped to include in the volume. At a meeting of the Council of the Association, Professor Erik Lindahl was elected President for the next three years in succession to Professor Howard Ellis; Professor Louis Baudin was elected Vice-President. Professor Austin Robinson was re-elected as Treasurer. At the same time Sir Dennis Robertson and Professor Albert Aftalion were made Honorary Presidents of the Association.

WE record with great regret the sudden death of Mr. A. A. Adams at the early age of thirty-four. For eight years he had held a research post at the Department of Applied Economics, Cambridge, where he had acquired a unique reputation by his capacity for clear and original thinking and his inexhaustible patience and thoroughness in seeing complex statistical jobs through to the end. For the last three years he had also been statistician to the London and Cambridge Economic Service, and his overhaul of the basic statistical tables in their *Bulletin* put users heavily in his debt. His work as an economic statistician was largely on estimates of the national product in real terms and related matters, on which he wrote many articles for the *London and Cambridge Economic Bulletin*. Immediately before his death he was in the middle of an article giving quarterly figures for the total supply and disposal of goods and services in the United Kingdom; fortunately (and typically) his papers were in sufficiently good order for this to be completed, and this pioneer work stands as the climax of his long fight against difficulties—including the paralysis which followed from an attack

of poliomyelitis when he was eighteen. We extend our deepest sympathy to his widow and two children, the younger of whom was born two days after his death.

Houblon-Norman Awards. The Trustees of the Houblon-Norman Fund invite applications for Fellowships or Grants in aid of Research into the working of industry and finance in Great Britain and elsewhere and the economic conditions affecting them. Fellowships, which are intended for experienced research workers, are awarded for full-time research for one year, which may be renewed for a second year. Grants are awarded for either full-time or part-time work. The amount of the awards, which will take effect from the October 1, 1957, will depend upon the circumstances of the candidate and the probable expenses of his work. Candidates must be British subjects normally resident in the United Kingdom. Forms of application, which may be obtained from the Secretary of the Fund, c/o the Bank of England, London, E.C.2, should be returned not later than March 1.

The Trustees, on the recommendation of their Advisory Committee, have made the following awards for 1956/57:

Research Grants

Mr. J. D. Bailey, Graduate Student, University of Oxford.	British Investment in Australasian Financial Companies, 1870–1900.
Mrs. C. R. Fulop, Lecturer. (Renewal.)	Buying Practices of Retailers.
Mr. J. K. Horsefield.	Investigation into the connection between the Land-Bank Schemes of 1690–1720, the development of banking theory, and particularly the Recoinage of 1696.
Mr. J. Jewkes, Professor of Economic Organisation, University of Oxford.	Inventions and the Development of Inventions in the Aircraft Industry, 1900–1950.
Mr. R. V. Lennard, Historian. (Renewal.)	Rural England in the Feudal Age.
Miss C. A. P. Leubuscher.	Shipping Facilities available to the Overseas Trade of Colonial Territories.
Mr. A. L. Minkes, Tutor, Department of Extra-Mural Studies, University of Birmingham. (Renewal.)	The Economic Structure of the British Paint and Varnish Industry.
Miss J. E. Mitchell, Lecturer, University of Nottingham.	The Balance of Payments Crisis of 1951.
Mrs. C. S. Orwin	English Farming, 1846–1913.
Mr. R. A. C. Parker, Lecturer, University of Manchester. (Renewal.)	18th and Early 19th Century Landed Estates.
Mr. H. W. Parris, W.E.A. Tutor, Northamptonshire. (Renewal.)	Board of Trade Railway Department and its influence on the Development of the Railway System in Great Britain.
Mr. A. J. Youngson, Fellow of Emmanuel College, Cambridge.	Comparative Study of Economic Development.

THE following have been admitted to Life Fellowship of the Society:

Agarwala, J. S.	Dufty, N. F.	Mitra, A.
Druiff, P. D. J.	Fels, E. M.	

THE following have been admitted to Fellowship of the Society:

Abou-Hindia, M. E.	Ghosh, Dr. A. K.	Ozbekhan, H.
Agyemang, T. K. O.	Graham, Mrs. A.	Pitchai Thamby, M. K. M.
Anupke, W. J.	Gupta, D. K.	Quli, S. Z.
Asare, K. A.	Harboort, J.	Rama Rao, K. S.
Azam, K. M.	Hayford, S. A.	Rathnam, T. V.
Barton, W.	Heath, K. L.	Rechter, I.
Beckington, K. G.	Hershlag, Dr. Z. Y.	Rubner-Raviv, A.
Belok, F. C.	Joaquim, L. A.	Samy, A. H. A.
Bhatt, A. S.	John, P. D.	Sen-Gupta, N. M.
Bhatt, D. P.	Johnson, G. B.	Shah, R. R.
Bishop, G. C.	Kaysen, C.	Shonibare, M. O.
Bixley, B. D.	Kessler, S.	Siddiqi, A. A.
Brahmanandan, J.	Kolo, S.	Somwaru, J. P.
Brown, S. A.	Levin, H. J.	Soper, T. P.
Chapman, A. E.	Liesner, H. H.	Taiwo, B. B.
Chakravarty, G. C.	Lindley, W. B.	Talwar, S. R.
Chowdhury, M.	Lokapur, P. S.	Tan, D.
Clark, D. A.	Lorente, D. J.	Tether, C. A.
Consin, J. O.	Mankhand, L. C.	Thompson, R. H.
Constantinides, C. E.	Mathur, S. M.	Topping, S. G.
Corina, J. G.	Maxcy, G. E.	Trivedi, M. A.
Cukelu, E. N.	Nabers, Prof. L.	Usman, M.
Dangi, S. P. S.	Nallusamy, A.	Vind, K.
Desai, N. R.	Neagus, R. H.	White, G. E.
Djanie, S. K.	Olleson, J. D. S.	Williams, M. K. A.
Duncan, H. L.	Onuora, G. I.	
Forman, R.		

THE following have been admitted to Library Membership of the Society:

Barnett House Library, Oxford.
British Information Services, New York.
Department of Economics, University of California, U.S.A.
Djakarta Economics Project, Indonesia.
Foreign Trade Research Institute, Belgrade.
International Christian University Library, Tokyo.
Iowa State Teachers College, Cedar Falls, U.S.A.
Leeds College of Commerce.
Naess & Thomas, New York.
Planning Research & Action Institute, Lucknow.
Rensselaer Polytechnic Institute Library, New York.
Sveriges Riksbank, Stockholm.

RECENT PERIODICALS AND NEW BOOKS

Journal of the Royal Statistical Society

VOL. 119, PART 2, 1956. *Some Aspects of the Geometry of Statistics: The Use of Visual Presen*
tion in Understanding the Theory and Application of Mathematical Statistics: E. S. PEARSC
The Analysis of Business Concentration: A Statistical Approach: P. E. HART and S. J. PRA
Richard Jones: A Reappraisal: R. GLENDAY.

Applied Statistics

VOL. V, NO. 2, JUNE 1956. *Examples of Interviewer Variability taken from Two Sample Survey*
P. G. GRAY. *Some Sampling Problems in Connection with Accounting Records:* S. F. JAMI
A Tasting Experiment: N. T. GRIDGEMAN. *Are Correlations any Guide to Predictive Value*
R. FERBER. *A 2^4 Factorial Experiment in Four Blocks of Eight: A Study in Radioactive L*
contamination: M. K. BARNETT and F. C. MEAD. *An Extension of the Use of the χ^2-Tes*
E. K. LEANDER and D. J. FINNEY.

Economica

VOL. XXIII, NO. 91, AUGUST 1956. *Benelux: The Formation of the Common Customs:* J.
MEADE. *Risk and Rank or Safety First Generalised:* A. D. ROY. *Inflation and Deflation*
1694–1696: J. K. HORSEFIELD. *The United States National Income à la Russe:* A. NOV
Leisure and International Trade: V. C. WALSH. *Charles Davenant and the East India Co*
pany: D. WADDELL. *Multiplier and Velocity Analysis: An Annulment:* G. C. ARCHIBAL
On the Calculation of Tax Burdens: A Rejoinder: A. R. PREST.

The Review of Economic Studies

VOL. XXIII, NO. 62, 1955–56. *Myopia and Inconsistency in Dynamic Utility Maximizatio*
R. H. STROTZ. *The Estimation of Capital Consumption in National Accounting:* G. STUVE
The Trader's Behaviour in the Market Periods: S. STYKOLT and A. SCOTT. *Economic E*
pansion and International Trade: A Marshallian Approach: J. BLACK. *The Colonial Develo*
ment Corporation, 1948–54: E. R. WICKER. *A Note on the Colonial Development Corporatio*
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O. 2, 1956. *An Historic Congress. The XXth Party Congress and the Tasks of Soviet Statistics:*
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VOL. I, No. 1, 1956. *The Building of Socialism and the Tasks of Economics. Under the Sign of Lenin. The Raising of Labour Productivity at the Current State of Our Development:* E. MATEEV. *Ways to Cut M.T.S. Costs:* G. MINCHEV. *The Fundamental Problems of Increasing Fodder Supplies:* D. BAKARDZHIEV. *The Productivity and Intensity of Labour in Capitalist Countries:* S. SUKMANDZHIEV.

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MAY 1956. *Remarks on the Economic Survey of Europe in 1955 Published by the Secretariat of Economic Commission for Europe:* J. ZALA. *The Functioning of the Hungarian Credit Syst as it Relates to Profitability:* G. LANG. *The Regional Distribution of Purchasing Power and Measurement:* I. FENYÖ and F. ZALA. *Some New Methods of Standardization:* G. PÁRNICZK *Inland Migration of Population in Hungary:* G. ACSÁDI.

JUNE 1956. *The System of Central Authorisation of Statistical Questionnaires:* I. PÁLOS. *serves in the Socialist Sector of Agriculture:* M. BARABÁS. *On the Logical Basis of Statisti Grouping:* D. NAGY. *The Discussion on Indicators of Short-term Economic Changes at Working Group of the Conference of European Statisticians:* J. RÉDEI. *The Methodology National Income Statistics in Capitalist Countries:* Z. KENESSY, V. NEMÉNY and J. SIMC *Aggregation of the Output of the Ministry of Metallurgy and Engineering:* J. PALIK. *Retail Shop Network in Suburban Budapest:* E. RUBIN.

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No. 5, 1956. *The Workers' Party Struggle for Strengthening the Alliance between Workers Working Peasants. Towards an Improvement in Research in Agricultural Economics.* *Main Problems of Stockbreeding in the Second Five-year Plan:* V. GLIGOR. *Experience of Galats Region in Collectivisation:* G. VÎLCEANU and I. STAN. *The Regional Distribution Agriculture and State Farm Specialisation:* V. PASCOVSCHI. *Labour Organisation in Agricultu Working Association:* D. DUMITRIU. *The Economic Importance of Maize:* S. HARTIA a O. GHEORGHIU. *Agricultural Location in Bulgaria:* T. CERNOKOLEV. *Shortcomings in Use of Agricultural Technology under Capitalism:* P. DAN.

No. 6, 1956. *On the Location of Industry under Socialism:* N. STERN and M. COSTACI *The Coal Industry in the Second Five-year Plan:* M. PÎRJOL. *Agricultural Collectivisation the Constanza Region:* S. HARTIJA and O. GHEORGHIU. *Some Problems in the Developm of Public Catering:* C. FLORESCU and D. DIMA. *The Deterioration of Urban–Rural Relati under Contemporary Capitalism:* I. BESTELIU. *Bălcescu's Interpretations of Serfdom as stituted by Michael the Brave:* V. IONESCU. *On the General Law of Capitalist Accumulatio* GH. DOLGU.

NEW BOOKS

British

ALEXANDERSSON (G.). The Industrial Structure of American Cities. A geographic udy of urban economy in the United States. London: Allen & Unwin (Stockholm: lmqvist & Wicksell; Lincoln, Nebraska: University of Nebraska Press), 1956. 10″.). 133. 40*s*.

[This volume is built around its maps and diagrams. Maps of the United States are given owing the number of workers in each major industry in each town of 10,000 or more inhabitants ere 200 or more workers are engaged in that industry. These are supplemented by further aps and cumulative distribution diagrams showing the number and size of the towns in which the dustry in question provides employment for more than a specified proportion of the working ce. The purpose is largely to provide measures of the city-forming potentialities of industries. running commentary accompanies the maps and diagrams and discusses their salient features d the probable explanations of them. The book is of interest both as a source of detailed in- mation for reference and as an experiment in cartographic methods.]

BARKER (G. R.). Some Problems of Incentives and Labour Productivity in Soviet dustry. A contribution to the study of the planning of labour in the U.S.S.R. Oxford: sil Blackwell, for the Department of Economics and Institutions of the U.S.S.R. of the niversity of Birmingham, 1956. 9″. Pp. 129. 14*s*.

[Reviewed in this issue.]

BELL (P. W.). The Sterling Area in the Postwar World. Internal mechanism and hesion, 1946–52. *London:* Oxford University Press, 1956. 9″. Pp. 478. 63*s*.

[To be reviewed.]

BELSHAW (H.). Population Growth and Levels of Consumption, with special reference countries in Asia. Issued under the auspices of the International Secretariat, Institute Pacific Relations. London: Allen & Unwin, 1956. 9″. Pp. vii + 223. 25*s*.

[To be reviewed.]

CROSLAND (C. A. R.). The Future of Socialism. London: Jonathan Cape, 1956. Pp. 540. 42*s*.

[To be reviewed.]

DARBY (H. C.). The Draining of the Fens. Second Edition. London: Cambridge iiversity Press, 1956. 8½″. Pp. 314. 35*s*.

[The first edition of this book was reviewed by Mr. C. R. Fay in the ECONOMIC JOURNAL of e–September 1940, p. 301. It is here re-issued with some minor corrections and a brief account levelopments since 1940.]

DEPARTMENT OF AGRICULTURAL ECONOMICS, UNIVERSITY OF BRISTOL. Three Year mmary of the Broccoli Investigation in West Cornwall, 1952–55, by H. M. COLE; port No. 89; 10½″; pp. 10; 1*s*. 6*d*. Some Economic Aspects of the Early Potato Crop Cornwall, Three-year Investigation, 1952–54, by H. M. COLE; Report No. 91; 9″; . 32; 2*s*. 6*d*. Milk Production on the Small Farm; Dairy Research Study, 1953–55, rt III; Report No. 92; 9″; pp. 47; 3*s*. An Economic Analysis of Pig Production South Western Farms, 1954–55, by E. BURNSIDE and W. W. STRONG; Report No. 93; ; pp. 47; 2*s*. 6*d*. Some Economic Aspects of Seasonality in Milk Production, by H. BEYNON and J. A. LANGLEY; Report No. 94; 10½″; pp. 26; 2*s*. 6*d*. Tractor erating Costs and Performances on a Sample of Farms in South West England 1955; port No. 95; 10½″; pp. 26; 2*s*. Farm Organisation and Incomes in South West gland, 1954; Report No. 96; 9″; pp. 62; 5*s*. Newton Abbot: Department of onomics, University of Bristol, 1956.

DEPARTMENT OF AGRICULTURAL ECONOMICS, UNIVERSITY OF MANCHESTER. Rearing iry Herd Replacements: Does it Pay? by J. E. HOLT and T. W. GARDNER; Bulletin . 82; 10″; pp. 23; 3*s*. A Study of Farm Organisation and Management in the rth West 1953/54 and 1954/55; Bulletin No. 83; 10″; pp. 121; 5*s*. *Manchester:* partment of Agricultural Economics, University of Manchester, 1956.

DEPARTMENT OF AGRICULTURAL ECONOMICS, UNIVERSITY OF READING. Financial Results on Farms in the Southern Province in 1952/53 and 1953/54, by G. B. BISSET; Farm Management Survey Report No. 5; 9½″; pp. 31; 5*s*. The Milk-selling Farms of Buckinghamshire, by R. S. COOK and A. H. GILL; Miscellaneous Studies, No. 9; 9½″; pp. 80; 8*s*. 6*d*. Reading: Department of Agricultural Economics, University of Reading, 1956.

DEVONS (E.). An Introduction to British Economic Statistics. London: Cambridge University Press, 1956. 7½″. Pp. 255. 22*s*. 6*d*.

[Reviewed in this issue.]

DEWAR (M.). Labour Policy in the U.S.S.R., 1917–1928. London: Royal Institute of International Affairs, 1956. 9½″. Pp. 286. 45*s*.

[Reviewed in this issue.]

EINZIG (P.). The Economic Consequences of Automation. London: Secker & Warburg, 1956. 9″. Pp. vii + 226. 21*s*.

[To be reviewed.]

GARDNER (R. N.). Sterling–Dollar Diplomacy. Anglo-American collaboration in the reconstruction of multilateral trade. London: Oxford University Press, 1956. 9″. Pp. vii + 423. 42*s*.

[To be reviewed.]

INTERNATIONAL ECONOMIC ASSOCIATION. International Economic Papers, No. 6. Edited by A. T. Peacock, R. Turvey, W. Stolper and E. Henderson. London: Macmillan (New York: The Macmillan Co.), 1956. 10″. Pp. 211. 15*s*.

[To be reviewed.]

KURIHARA (K. K.). Introduction to Keynesian Dynamics. London: Allen & Unwin, 1956. 9″. Pp. 222. 21*s*.

[To be reviewed.]

MUNBY (D. L.). Christianity and Economic Problems. London: Macmillan, 1956. 8½″. Pp. 290. 25*s*.

[To be reviewed.]

THE NUFFIELD FOUNDATION. Report for the Year Ended 31 March 1956. London: The Nuffield Foundation, 1956. 9″. Pp. 160.

[This includes the usual full account of research activities supported by the Foundation.]

PLANT (SIR A.). The Substance and the Shadow: Reflections on Prosperity. Third Fawley Foundation Lecture. Southampton: University of Southampton, 1956. 8½″. Pp. 22. 2*s*. 6*d*.

[In this lecture Sir Arnold Plant suggests that the precarious element in our present prosperity is a large one. Chief among the sources of this precariousness is inflation. Not merely does inflation discourage saving and threaten our balance of payments; in addition, it has a distorting effect on the conduct of business, especially when taken in conjunction with the high rates of taxation that are at least partly dictated by the desire to repress it. Sir Arnold devotes particular attention to the effects of profits tax. He suggests that the present operation of this tax encourages the growth of existing firms at the expense of the formation of new ones, and this, he holds, tends to reduce efficiency by preventing the necessary specialisation of function between firms.]

Readings in Market Research. A selection of papers by British authors. London: British Market Research Bureau, 1956. 10″. Pp. ix + 235. 35*s*.

[To be reviewed.]

RISK (J. M. S.). The Classification and Coding of Accounts. Institute of Cost and Works Accountants, Occasional Paper No. 2. London: Copies obtainable from the distributors, Gee & Co., 1956. 9½″. Pp. 79. 7*s*. 6*d*.

[The first half of this discusses in general terms the principles of classification and descriptive coding of classes, as applied in many branches of work, for example, librarianship. The author then goes on to apply these principles to the preparation of accounts.]

ROBERTSON (SIR DENNIS). Economic Commentaries. London: Staples, 1956. 8″. Pp. 174. 16*s*.

[To be reviewed.]

ROSSITER (C.). Conservatism in America. London: Heinemann, 1956. 7½″. Pp. 330. 21*s*.

[This book is a brave attempt to rally the intellectual elements of American conservatism in order to provide an appropriate statement of beliefs for Americans during this undoubted period of conservative, nationalistic temper. Mr. Rossiter leans heavily on the classics of European conservatism, as well as on those of his own country. But a European observer cannot help being sceptical of the relevance of the innate conservatism of England for a State which is the child of revolution and a people whose instinctive tradition has been radically progressive in society and politics.]

STRACHEY (J.). Contemporary Capitalism. London: Gollancz, 1956. 9″. Pp. 302. 25*s*.

[Reviewed in this issue.]

WILES (P. J. D.). Price, Cost and Output. Oxford: Basil Blackwell, 1956. 9″. Pp. 302. 30*s*.

[To be reviewed.]

Australian

VARGOVIC (C. A.). A Survey of Structural Changes in the Western Australian Economy. A statistical interpretation. Nedlands: The University of Western Australia Press, 1956. 10″. Pp. 109. 8*s*. 6*d*.

[Census and other data are used to show trends in relative employment and output in different industries and industry groups in Western Australia since before the War and since 1921. These trends are compared with the corresponding ones for Australia as a whole. Some interesting information is included on capital formation and its relation to productivity.]

South African

ARNDT (E. H. D.). The Union's Gold Reserve. Pretoria: South African Reserve Bank, 1956. 8½″. Pp. 63.

[This contains two separate addresses, one in Afrikaans with an English summary, the other in English. The author is Deputy Governor of the South African Reserve Bank. The first is concerned mainly with the interpretation of the published figures relating to the Union's gold reserve, which are often not properly understood. The second deals with the Reserve Bank's gold policy.]

VAN WAASDIJK (T.). Hire Purchase Credit in South Africa. An economic survey. Johannesburg: Witwatersrand University Press, 1956. Pp. 174. 21*s*.

[This is an extremely thorough and detailed study based on inquiries among dealers and others directly concerned with hire purchase in South Africa. The author's chief aim has been to collect information, but a good deal of interesting discussion and interpretation of the data is also included. The scope and importance of hire purchase in the Union are broadly similar to what they are in England, but there are some marked differences in organisation and finance. In the Union dealers play a much larger part in the finance of hire purchase and specialised finance houses a smaller one than is the case in most other countries.]

Indian

DANDEKAR (V. M.). Use of Food Surpluses for Economic Development. Gokhale Institute of Politics and Economics, Publication No. 33. Poona: Gokhale Institute of Politics and Economics, 1956. 9½″. Pp. 153. 7*s*. 6*d*.

[This report was drawn up to provide background information for the Indian Pilot Study undertaken by the Food and Agriculture Organisation of the United Nations in connection with their study on the uses of agricultural surpluses. (The F.A.O. report was noted in the ECONOMIC JOURNAL, March 1956, p. 210.) In it Dr. Dandekar reviews the evidence on nutrition and the standard of living generally in India at the present time and considers the extent to which recent development schemes have created employment opportunities and otherwise improved the situation.]

VAKIL (C. N.) and BRAHMANAND (P. R.). Planning for an Expanding Economy Accumulation, employment and technical progress in underdeveloped countries. Bombay Vora, 1956. 9″. Pp. xv + 404. 20*s*.

[To be reviewed.]

American

ABRAMOVITZ (M.). Resource and Output Trends in the United States since 187(National Bureau of Economic Research, Occasional Paper 52. New York: Nationa Bureau of Economic Research, 1956. 9½″. Pp. 23. $0.50.

[In the first part of this brief paper the author compares the rates of growth of output, population man-hours, capital and *some other similar magnitudes in the United States between 1869–78 an* 1944–53. The results are used to point to some tentative conclusions about the relative importanc of increased factor inputs and increased productivity in bringing about the increase in output Some of these conclusions must be interpreted in the light of the author's practice of measurin resource input as a weighted average of man-hours and capital, a practice which to some reader may appear not too meaningful. The second section reviews the evidence bearing on whethe the rate of growth has tended to diminish, and the interesting conclusion is reached that if there ha been any such diminution, it has resulted from a fall in the total input of resources *per capita* rathe than from a decline in the rate of growth of output per unit of input. The third section discusse the question of secular fluctuations in the rate of growth.]

ALDERFER (H. F.). American Local Government and Administration. New Yorl and London: The Macmillan Company, 1956. 8½″. Pp. 662. 41*s*. 6*d*.

[This text-book is designed to provide a comprehensive survey of its field. It is primarily concerned with questions of political organisation, but two chapters are devoted to the economic aspects of local government.]

BENSON (L.). Merchants, Farmers and Railroads. Railroad regulation and New York politics, 1850–1887. Cambridge, Mass.: Harvard University Press (London Geoffrey Cumberlege), 1955. 9½″. Pp. 310. 45*s*.

[This volume is a scholarly contribution to the growing corpus of monographs on American railway history. It is concerned with the shifts in public opinion in New York State about the trunk lines, largely in the period after 1873, which culminated in the Inter-State Commerce Act of 1887. Using as evidence a variety of new sources, such as the proceedings of trade, farmers' and railway reform associations, as well as State papers and newspapers, the author reveals the multiplicity o interests which lay behind the drive for railway regulation. In New York State, at any rate, the movement represented no simple agrarian crusade. Upstate farmers, it is true, added the force of their agitation against through-rates from the prairies which discriminated against their produce; but important groups of merchants in New York City took exception to favouritism and corruption, and especially to the practice of charging higher rates to New York than to her rivals in order to compensate for the greater natural advantages of that port; and a more diffused public opinion joined in the growing demand for regulation, from do-gooders and doctrinaires of *laissez-faire*, to railway stockholders anxious to insure against bad or corrupt management. There seems no reason to take issue with Mr. Benson's conclusion that this attack on *laissez-faire* was concerned to preserve rather than undermine property rights and private enterprise.]

The Changing Environment of International Relations. Brookings Lectures, 1956. Washington, D.C.; The Brookings Institution, 1956. 8½″. Pp. 158. $2.50.

[The six lectures contained are: "Mass Aspirations and International Relations," by Grayson Kirk; "Science, Technology and International Relations," by Harrison S. Brown; "Conflicts Arising out of Differing Governmental and Political Institutions," by Denis W. Brogan; "Emerging Requirements for an Expanding World Economy," by Edward S. Mason; "Asian Co-operation with the West," by Harold H. Fisher; and "American Interest in Asian Development," by Willard L. Thorp.]

CROTEAU (J. T.). The Federal Credit Union. Policy and practice. New York: Harper & Brothers, 1956. 8½″. Pp. 210. $4.00.

[Credit unions are a form of friendly society which has shown rapid growth in the United States in the last twenty years. Slightly more than half of them operate under state charters; the remainder, with which alone this book is concerned, under federal charters. The union provides its members with facilities for saving money and for obtaining loans. It caters mainly for middle- and lower-income groups. Loans for the purchase of consumer durables and in order to meet emergency needs (medical expenses, etc.) are of about equal importance and comprise the bulk of the loans made. The author analyses the assets and liabilities of federal-chartered credit unions, their financial results, their operating policies and the government regulations to which they are subject. He concludes with some suggestions of how to increase their usefulness.]

DePODWIN (H. J.). Discharging Business Tax Liabilities. New Brunswick, New ey: Rutgers University Press, 1956. 9″. Pp. 167. $4.00.

This is an interesting study of an aspect of public finance that has not hitherto received much matic attention—the effect on the financial position of firms of regulations governing the time method of discharging their tax liabilities. As the author points out, changes in these regula- have *sometimes* been more important to business than changes in rates of tax. The two cts of the question are represented by excise duties payable *in advance of* sales, which require icing, on the one hand, and corporate income taxes payable in arrears, which provide a source iance, on the other. The author traces the historical development of regulations on this subject e United States, and analyses their effects on different sizes of firm. He suggests that the need orking capital imposed by the prepayment of excises in such industries as liquor and tobacco naterially contributed to the trend towards concentration in these industries by putting pressure rms with limited resources. Dr. DePodwin concludes by examining the likely effects of recent ative changes designed to speed up corporate income-tax payments.]

EDWARDS (CORWIN D.). Big Business and the Policy of Competition. Cleveland,): Western Reserve University Press, 1956. 9″. Pp. 180. $3.50.

To be reviewed.]

GREENHUT (M. L.). Plant Location in Theory and Practise. The economics of e. Chapel Hill, North Carolina: The University of North Carolina Press, 1956. Pp. v + 338. $7.50.

To be reviewed.]

HALM (G. N.). Economics of Money and Banking. Homewood, Illinois: Richard D. n, 1956. 9½″. Pp. 577. $7.20.

To be reviewed.]

HARRIS (C. L.). The American Economy. Principles, practices and policies. Re- l edition. Homewood, Illinois: Richard D. Irwin, 1956. 9″. Pp. 816. $7.20.

The first edition of this appeared in 1953. It has now been thoroughly revised. Its purpose serve as a general introductory text-book for American students, and it sets out to provide the tial tools of economic analysis as well as descriptive material.]

HAYES (D. A.). Appraisal and Management of Securities. New York and London: Macmillan Company, 1956. 8½″. Pp. 383. 31*s*. 6*d*.

Most of this book is devoted to methods of assessing the investment characteristics of particular anies and particular classes of shares in them. Briefer treatment is given to the problem of to make up an investment portfolio suitable to the individual needs of the investor.]

KNIGHT (F. H.). On the History and Method of Economics. Selected essays. ago, Illinois: University of Chicago Press (London: Cambridge University Press), . 9½″. Pp. 309. 45*s*.

To be reviewed.]

The Kress Library of Business and Economics. Catalogue Supplement, covering rial published through 1776 with data upon cognate items in other Harvard Libraries. n, Mass.: Baker Library, Harvard Graduate School of Business Administration, . 11½″. Pp. 175.

The Kress Library was established through the generosity of Mr. E. W. Kress and greatly hed by the acquisition in 1936 of Professor H. S. Foxwell's second collection of rare economics s and pamphlets. (Foxwell's first collection was purchased by the Goldsmith's Company in and presented by them to the University of London.) It has since been extensively enlarged fts and transfers *from* various sources. A catalogue was published in 1940, which included tems of similar interest in other Harvard libraries. The present supplement lists acquisitions 1940. This very handsome volume has been printed in England by the Cambridge University .]

McMURRY (D. L.). The Great Burlington Strike of 1888. A case history in labor ions. Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), . 9½″. Pp. v + 377. 48*s*.

The important strike of drivers and firemen against the powerful Chicago, Burlington and cy Railroad in 1888, hitherto neglected, has been fortunate in its historian. Professor urry has achieved the rare success of transforming a specific and limited subject into an

important historical study, with a depth and suggestiveness which illuminate not merely the circumstances of the strike, but the enveloping social and economic environment. Working from the Burlington records in the Newberry Library, he has written a vivid and masterly account which should be as interesting to the general reader with a penchant for railways as it is to the specialist. It brings out the complexity of an industrial dispute; for there were conflicts among different unions and trades, as well as among railroad operators. The characters of the leaders on both sides clearly emerge from their correspondence, and such human factors as the personalities of general manager and president are given due weight in the developing conflict. The revelations, especially, concerning railroading methods, assumptions about company loyalties, business ethics and attitudes towards labour, make the book a valuable adjunct to the work of Professors Overton, Cochran and others, and help to modify the stereotyped accounts of late-nineteenth-century industrial relations.]

MANNE (A. S.). Scheduling of Petroleum Refinery Operations. Harvard Economic Studies, Volume XCVIII. Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 1956. 8½″. Pp. 185. 40*s*.

[The purpose of this book is to apply the techniques of mathematical economics to the complex problems of joint supply and such-like conditions that arise in petroleum refining. Four case studies are analysed, the first three relating to individual elements in scheduling and the last dealing with the more general problem of co-ordinating the operations of an integrated company. A variety of mathematical techniques are used for handling these problems, including graphical methods, the calculus, linear programming and several species of non-linear programming.]

PETERSEN (W.) (Ed.). American Social Patterns. New York: Doubleday, 1956. 7″. Pp. 263. $0.95.

[This contains five items. The second and fourth are reprints and the others are abridgements of previously published works. The titles and authors are: "Interracial Housing," by M. Deutsch and M. E. Collins; "Biographies in Popular Magazines," by L. Lowenthal; "The People's Choice," by P. F. Lazarsfeld, B. Berelson and H. Gaudet; "Union Democracy and Secondary Organisation," by S. M. Lipset, M. A. Trow and J. S. Coleman; and "The Dynamics of Bureaucracy," by P. M. Blau.]

PIGOU (A. C.) (Ed.). Memorials of Alfred Marshall. Reprints of Economic Classics. New York: Kelley & Millman, 1956. 8½″. Pp. 518. $8.50.

[*Memorials of Alfred Marshall*, containing selections from Marshall's occasional writings, together with Keynes' famous memoir and a group of other personal reminiscences, was first published in 1925 and has now been out of print for many years. The present welcome re-issue is in Messrs. Kelley and Millman's series of photographic reprints.]

REMER (C. F.) and KAWAI (S.). Japanese Economics. A guide to Japanese reference and research materials. University of Michigan, Centre for Japanese Studies, Bibliographical Series, No. 5. Ann Arbor, Michigan: University of Michigan Press (London: Geoffrey Cumberlege), 1956. 11″. Pp. 91. 40*s*.

[This is a selected and classified list of writings in Japanese, designed to introduce foreign scholars to the Japanese research material. Brief introductions to each chapter survey the scope of the particular field dealt with in it and indicate the chief topics on which research has been done. The title and author of each item are given in both Japanese and Roman letters, and the titles are translated into English, with short notes added in many cases.]

ROBERTSON (R. M.). History of the American Economy. New York: Harcourt, Brace & Co., 1955. 9½″. Pp. 593.

[This text-book was written for American freshman students in economics and business. Constructed on the sub-heading-and-inset principle, it is built up of short sections, each judiciously summarising the chief known facts and written in an easy, sometimes breezy, style. There is a wealth of useful figures and tables correctly deployed by an economist who recognises the limits of his methods in historical situations. But no student who did not already know some American history would make much of it, and it would be inadequate as an historical guide for an English sixth-former, at whose level it is pitched. This is a utility volume without much appeal to the export trade.]

SENNHOLZ (H. F.). How Can Europe Survive? Princeton, New Jersey and London: Van Nostrand, 1956. 9″. Pp. 336.

[To be reviewed.]

SENNHOLZ (M.) (Ed.). On Freedom and Free Enterprise. Essays in honor of Ludwig von Mises. Princeton, New Jersey: Van Nostrand, 1956. 9½″. Pp. ix + 333. $3.50.

[To be reviewed.]

SUTTON (F. X.), HARRIS (S. E.), KAYSEN (C.) and TOBIN (J.). The American Business reed. Cambridge, Mass.: Harvard University Press (London: Geoffrey Cumberlege), 956. 9½″. Pp. 414. 55*s*.

[To be reviewed.]

Technical Co-operation in Latin America. Recommendations for the future, by the pecial Policy Committee on Technical Co-operation of the National Planning Association. Vashington, D.C.: National Planning Association, 1956. 9″. Pp. 189. $2.50.

[This report is the result of a considerable programme of research into the working of technical o-operation in Latin America at the present time. Descriptions are given of the various forms of chnical co-operation currently in practice, and recommendations are made both in relation to ecific fields of activity and in relation to more general questions of administration by governments nd other agencies.]

Russian

RICARDO (D.). Sochinenia. Translated under the editorship of M. N. SMIT, in three olumes. Moscow: State Publishing House of Political Literature, 1955. 9″. Vol. I: p. 360; 6 r. 75 k. Vol. II: pp. 392; 6 r. 50 k. Vol. III: pp. 295; 5 r. 85 k.

[Before the War a new Russian edition of the works of Ricardo was in preparation, to consist f five volumes: the first consisting of the *Principles*; the second of collected articles and speeches n questions of money and banking; the third of writings "on questions of agriculture, rent and ne critique of Malthus"; the fourth of letters; and the fifth of his Parliamentary speeches. Various old English editions" were used for this translation. The first two volumes appeared 1941, with a print of 20,000 copies; but the outbreak of war interrupted the publication of the emaining volumes. The publisher's foreword to the new edition of 1955 announces that since hese two volumes "have become by now a bibliographical rarity" they are being re-issued (again a print of 20,000 copies), together with the third volume, which, in addition to the *Essay on Profits* nd *Protection to Agriculture*, contains the *Notes on Malthus* ("published for the first time in the Russian anguage"). For this third volume the Royal Economic Society's edition of the *Works and Corre-bondence* of 1951–55 has been utilised, and acknowledgment is made thereto in the editor's fore-vord to the *Notes on Malthus* and in footnotes to the text when these are taken from the Royal Economic Society edition. There is no mention of the other two volumes originally planned.]

Danish

KJAER-HANSEN (M.). Selling Costs and Advertising Expenditure in Scandinavia. Federation of Nordic Marketing Associations Publication No. 1. Copenhagen: Federation of Nordic Marketing Associations, 1956. 10″. Pp. 40.

[This presents the conclusions derived from a substantial project of statistical research. Information on selling costs in the broader sense is naturally more difficult to gather and interpret than information on advertising, and most of the report is concerned with advertising expenditure. Data are provided on total expenditure on advertising in the four countries and on its division between different media. As a percentage of gross national product, advertising expenditure (defined for this purpose to exclude retail-store advertising) is about the same in Sweden and Denmark as in Great Britain, viz., 1%. In Norway it is 0·6% and in Finland 0·5%.]

Dutch

BOS (H. C.). A Discussion on Methods of Monetary Analysis and Norms for Monetary Policy. Schiedam: Royal Netherlands Printing Office for the Netherlands Economic Institute, 1956. 9″. Pp. 52.

[This is a summary and clarification of a debate that has recently been conducted in the columns of the weekly *Economisch-Statistische Berichten* between Dr. M. W. Holtrop and Professor H. J. Witteveen. Professor Witteveen's approach was, broadly speaking, a Keynesian one, while Dr. Holtrop's had more in common with classical doctrines. Differences between them arose partly from disagreements on causal relationships and partly from divergent definitions of "monetary equilibrium," a concept used sometimes in a descriptive sense and sometimes in a normative one by both authors.]

Italian

Scritti nei quali si fa riferimento al pensiero economico di Luigi Einaudi e recensioni di sue opere. Rome: Banca d'Italia, 1954. 9½″. Pp. 158.

[This contains a list of books and articles in learned journals in which reference is made to Dr. Einaudi's works. Each item is accompanied by an indication of the passage or passages in Dr. Einaudi's writings to which the reference in question relates. This is followed by a list of published reviews of Dr. Einaudi's works.]

Official

BRITISH

HALL (H. D.) and WRIGLEY (C. C.). Studies of Overseas Supply. History of the Second World War, United Kingdom Civil Series, edited by Sir Keith Hancock. London: H.M. Stationery Office and Longmans, 1956. 9½″. Pp. 537. 37*s.* 6*d.*

[Reviewed in this issue.]

HAMMOND (R. J.). Food. Volume II: Studies in Administration and Control. History of the Second World War, United Kingdom Civil Series, edited by Sir Keith Hancock. London: H.M. Stationery Office and Longmans, 1956. 9½″. Pp. 835. 50*s.*

[To be reviewed.]

SAYERS (R. S.). Financial Policy, 1939–45. History of the Second World War, United Kingdom Civil Series, edited by Sir Keith Hancock. London: H.M. Stationery Office and Longmans, 1956. 9½″. Pp. xi + 608. 37*s.* 6*d.*

[To be reviewed.]

CANADIAN

RESTRICTIVE TRADE PRACTICES COMMISSION, DEPARTMENT OF JUSTICE, OTTAWA. Report Concerning the Manufacture, Distribution and Sale of Boxboard Grades of Paperboard. Ottawa: Department of Justice, 1956. 9½″. Pp. 243.

[Producers in the Canadian boxboard manufacturing industry, which is of considerable magnitude, have over a long period of years had their prices and other conditions of sale controlled by incorporated organisations of which they and their representatives have been the shareholders. This report is concerned to describe the methods and extent by which competition has thereby been lessened and to appraise the defences of the arrangements that have been put forward on behalf of the manufacturers.]

RESTRICTIVE TRADE PRACTICES COMMISSION, DEPARTMENT OF JUSTICE, OTTAWA. Report Concerning the Manufacture, Distribution and Sale of Quilted Goods, Quilting Materials and Related Products. Ottawa: Department of Justice, 1956. 10″. Pp. 78.

[The combine complained of was effective for only a short period because of the strength of competitive tendencies in the industry, but it is found that during that period it operated price-fixing arrangements, a quota system and restrictions on entry.]

AMERICAN

JOINT COMMITTEE ON THE ECONOMIC REPORT. Characteristics of the Low-income Population and Related Federal Programs. A report prepared by the staff of the Subcommittee on Low-income Families. Washington, D.C.: U.S. Government Printing Office, 1956. 9″. Pp. 240.

JOINT COMMITTEE ON THE ECONOMIC REPORT. Program for the Low-income Population at Substandard Levels of Living. Washington, D.C.: U.S. Government Printing Office, 1956. 9″. Pp. 14.

[Information is given of the number of low-income families and individuals in the United States in 1948 and 1954 and their distribution between different types. Comparatively little progress was made between these dates in eliminating the problem, despite the rise in national income. The characteristics of the chief types of low-income receivers—the elderly, the disabled, etc.—are further analysed in a series of special memoranda. The Program suggests remedial measures along three main lines: the extension of social-security benefits, the improvement of educational and training facilities, and aid to depressed industries and areas.]

JOINT COMMITTEE ON THE ECONOMIC REPORT. Trends in Economic Growth. A comarison of the western powers and the Soviet bloc. A study prepared by the Legislative eference Service of the Library of Congress. Washington, D.C.: U.S. Government inting Office, 1955. 9″. Pp. 339.

[This contains a variety of data on growth trends in the United States, Canada, Western Europe, e U.S.S.R. and the other East European countries. The chief indices considered are those lating to population and man-power, agriculture and food supply, raw materials, steel, power ources, transportation and foreign trade. While much useful information is given, the pervasive sire to disparage the performance of the communist countries gives a very partisan tone to the port.]

TERNATIONAL

INTERNATIONAL MONETARY FUND. Seventh Annual Report on Exchange Restrictions 56. Washington, D.C.: International Monetary Fund, 1956. 9″. Pp. 371.

[The detailed account of regulations in individual countries is preceded by a brief general survey the progress made towards reducing exchange restrictions during the period under review.]

ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION. Europe's Growing Needs r Energy. How Can They be Met? A report prepared by a group of experts. Paris: .E.E.C., 1956. 9½″. Pp. 120. 8*s.*

[The present position with regard to production and consumption of energy in Europe is alysed, and forecasts are given of probable trends in the next twenty years. It is estimated that e proportion of net imports of primary energy to total consumption, which is at present around)%, is likely to rise to nearly twice that figure by 1975. More detailed analysis follows of ways which this situation can be met.]

ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION. Liberalisation of Europe's ollar Trade. Paris: O.E.E.C., 1956. 9½″. Pp. 135. 8*s.*

[This report describes the measures that have been taken by O.E.E.C. countries to relax restrictions on commodity trade and invisible transactions with the dollar world. Steps taken by e United States and Canada affecting their trade relations with O.E.E.C. are also dealt with. n attempt is made to assess the effects of the measures so far taken and to consider future prospects. is suggested that the marked increase in dollar imports of raw materials and basic commodities the last few years has been not so much the result of liberalisation itself as of increased economic tivity in the importing countries. The authors recognise that the danger of capital outflow riously influences many countries in retaining control over invisible items, but they suggest that e success with which this control has been relaxed in some countries might justify others in llowing suit to a limited extent as an experiment.]

UNITED NATIONS FOOD AND AGRICULTURE ORGANISATION. Yearbook of Food and gricultural Statistics, 1955: Production. Rome: F.A.O., 1956. 10½″. Pp. 427. 7*s.* 6*d.*

[The greater part of this yearbook is devoted to statistics relating to crop production and livestock numbers and products. Other topics treated include the use of fertilisers, farm machinery nd insecticides, and prices of agricultural commodities. An innovation in this year's issue of e yearbook is the inclusion throughout of data for the post-war average 1948–52. Figures re also given where available of the pre-war average 1934–38, and most data are carried up to 954.]

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