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THE ECONOMIC JOURNAL

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Edited by R. F. HARROD *and* E. A. G. ROBINSON

Assisted by R. C. O. MATTHEWS

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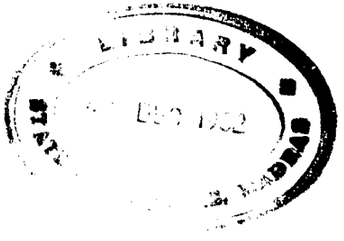
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STATE LEGISL...

THE ECONOMIC JOURNAL

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CAPITAL ACCUMULATION AND THE MAINTENANCE OF FULL EMPLOYMENT

I. Introduction

The subject of this article is a theoretical model of economic growth whose working is intended to throw light on some aspects only of the mechanism by which, when employment is already full, the supply of savings may be utilised for increasing productivity in such a way as to allow employment to remain full. Drastic simplification is necessary for three reasons:

(i) in order to compress the discussion into material for one article;
(ii) in order to make clear-cut conclusions available;
(iii) in order to focus attention on particular aspects of the problem.

No further apology will be made for imposing simplifying assumptions which imply neglect of many of the most important features of the real-world environment in which accumulation takes place.

But it may be a useful precaution to list at this stage some of the important influences which will be deliberately assumed away in the interests of brevity, clarity and focus.

(i) The effects of international trade.

(ii) Monetary effects arising from the fixing of contracts and wages in terms of money rather than in terms of consumption goods. In particular, the existence of a rentier class is ignored. (One aspect of cost-inflation will, however, be considered.)

(iii) Redistribution of income through taxation and government expenditure.

(iv) Bottlenecks arising from scarcity of *particular* grades of labour or particular materials or intermediate goods.

(v) Major errors of foresight.

(vi) Diminishing or increasing returns to scale in the economy as a whole. In particular, the limitations on the supply of land are ignored, and so are changes in the skill of the working force.

(vii) The effect of political events and other ingredients in the state of the news on the inducement to invest. In particular, we shall not

allow for the possibility that the expectation of the end of full employment, whether by stagnation or by inflation, may expedite that end.

(viii) We shall not inquire what happens once the state of full employment has come to an end.

It is probable that the model can be fairly easily modified to allow one at a time for most of these neglected influences; but for the reasons already given this will not be attempted here.

The influences which the model is intended to allow for are:

(i) The influence of: (*a*) investment; (*b*) population change; (*c*) technical progress in increasing productivity and modifying the marginal efficiency of capital.

(ii) The influence of: (*a*) the authorities; (*b*) the attitude of employers; (*c*) the marginal efficiency of capital in determining the rate of profit on capital and the profit ratio (ratio of profits to net output).

(iii) The influence of: (*a*) government policy; (*b*) the attitude of employers; (*c*) the price mechanism in allocating priorities as between different types of investment.

(iv) The influence of: (*a*) the marginal efficiency of capital; (*b*) the profit share; (*c*) the rate of profit on capital; (*d*) other restrictions on keeping the balance between total investment and savings.

(v) The efforts of wage-earners to secure a sufficient rate of growth of real wage-rates.

(vi) The need for adequate inducement to invest if stagnation crisis is to be avoided.

(vii) The influence of bias in technical progress on the rate of increase of productivity, the distribution of income and the dangers of inflation and stagnation respectively.

Particular questions on which it is hoped that a study of the model may throw light are:

(i) If the underlying influences are in some sense held constant, can the development settle down to a "dynamic equilibrium" path of growth?

(ii) If so, what conditions must be satisfied by the underlying influences?

(iii) What modifications are introduced if the conditions fluctuate?

(iv) How does bias in technical progress affect the solution?

It is clear that a careful discussion of these questions needs mathematical notation. On the other hand, a loose verbal discussion with diagrams may be more illuminating. The latter form of presentation will mainly be used except in Appendix II.

The subject matter has been arranged under the following headings:

II. Growth Rates under Conditions of Dynamic Equilibrium.
III. Conditions which May End Full Employment:
(i) Stagnation Crisis.
(ii) Inflation Crisis.
(iii) Lack of Balance between Supplies of Men and Machines.
IV. Influences Determining the Rate of Profit on Capital.
V. Unsteady Growth.
VI. Relation of Model to Those of Other Writers.
Appendix I: Definitions.
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Appendix III: The Quantity of Capital.

II. Growth Rates under Conditions of Dynamic Equilibrium

The purpose of this model is both to throw light on the conditions which must be satisfied if full employment is to be preserved and to discover what kind of growth is likely to result from various underlying conditions if full employment continues for a long time. In our model the pace of advance at any moment will largely depend on the savings which are available at full employment. But if the underlying conditions remain constant for a long time the demand for investment, as determined by the growth of population and the rate of technical progress, will also affect the rate of advance. The supply of savings available will be found to some extent to adapt itself to the demand for investment. In this section we shall investigate how the supply and demand for savings are adjusted when the underlying conditions remain unchanged for a long time: in this section we shall assume that full employment is preserved throughout the process and we shall examine the state of dynamic equilibrium which the system will reach if the underlying conditions remain constant.

We shall make use of the following assumptions and definitions, some of which are taken over from other writers.

We shall suppose that when employment is full, constant proportions α and β are saved out of the two categories, profits and wages, which together constitute the value of net output ($1 > \alpha > \beta \geqslant 0$).[1]

The savings ratio s means the ratio of net savings to net output: it must be a weighted average of α and β with weights π and $1 - \pi$, where π is the profit ratio, namely the ratio of profit to net output.

The rate of profit on capital, r, is defined as the ratio of the value of profits to the value of capital in the economy as a whole.

We shall suppose *all* values to be measured in money and to be deflated

[1] We thus assume the same savings function as that used by Mr Kaldor in "A Model of Economic Growth," Economic Journal, December 1957, p. 604, equation (1).

by a suitable price-index of consumption goods. They thus may be thought of as " values in terms of consumption goods." [1]

We shall suppose that in a given state of technical knowledge net output per head Y depends only on the value of capital per head K. We shall suppose that when the value of capital per head is increased the value of net output per head will be increased also but by a less proportion. We may thus write

$$Y = f(K) \quad (Y/K > df/dK > 0) \quad . \quad . \quad . \quad . \quad (2.1)$$

For brevity we shall usually refer to Y, the value of net output per head, as *productivity*.

We shall also suppose that as the value of capital per head, K, is increased, the rate or profit on capital must fall. Thus

$$r = g(K) \quad (dg/dK < 0) \quad . \quad . \quad . \quad . \quad . \quad (2.2)$$

If we regard K as a measure of the stage reached in the programme of capital accumulation, then we can illustrate the development possibilities in the given state of technical knowledge by the two curves shown in Fig. 1.

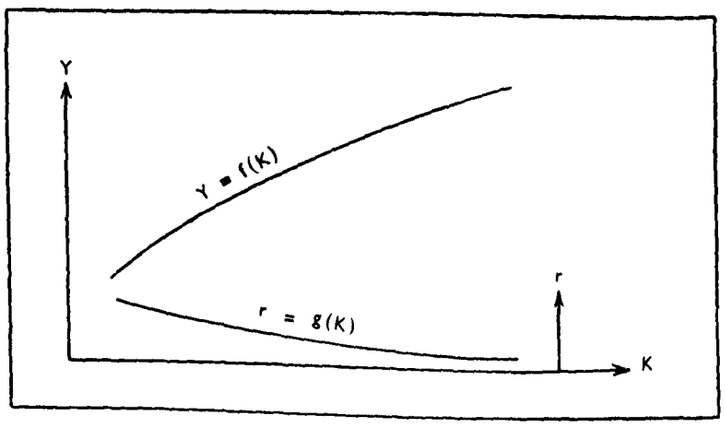


FIG. 1.—Dependence of Y and r on K.

We shall, however, find it more convenient to use as our measure of the stage of development reached, the level of the rate of profit on capital r: high values of r will indicate an early stage of development and low values a late stage.[2] Fig. 1 can obviously be rearranged so as to show the values of productivity Y and capital per head K corresponding to each level of the

[1] Values per head mean values per head of the working force: similarly, " the population " and its growth rate will refer to the fully employed working force. For further explanation see Appendix II.

[2] The reader is reminded that since wages and profits are assumed to be the only forms of income, profits include interest paid on loans.

rate of profit on capital r. A third curve can be added showing the capital–output ratio A, which is defined as the ratio of the value of capital to the value of net output taken over the whole economy.

We may write these relations as

$$Y = F(r, t) \quad (\partial F/\partial r < 0), \; A = G(r, t) \quad (\partial G/\partial r < 0)$$
$$K = F(r, t)\, G(r, t) \quad . \quad . \quad (2.3)$$

The symbol t is here inserted to denote that the functions relate to the state of technical knowledge at time t.

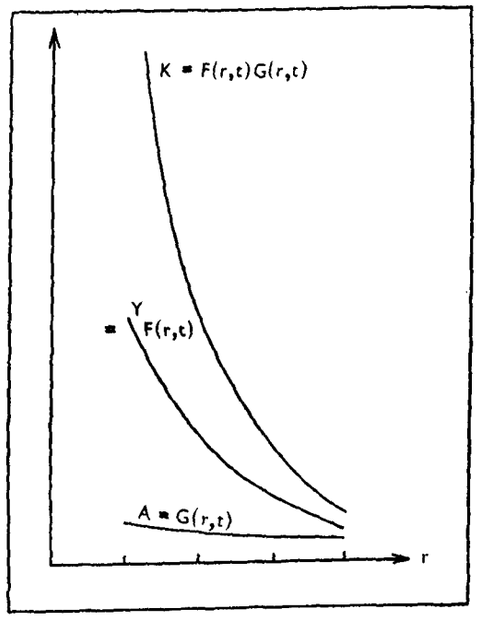


FIG. 2.—Relation of K, Y and A to r.

The question of how the form of the production function $Y = f(K)$ is determined is one concerning technical and engineering possibilities: we shall not inquire into this question, but will suppose this function to be given for each state of technical knowledge. The question of how the rate of profit r will fall as the value of capital per head rises is, however, far more our concern. There are various alternative economic theories available to answer it, and we shall consider this question later in Section IV. Until then we shall suppose that for each state of technical knowledge we are given the relation (2.2) of the rate of profit on capital to the value of capital per head. We may then take as given the functions (2.3) illustrated in Fig. 2 above.

Technical Progress, and Growth Rates of Population, Capital and Productivity

Technical progress in the sense of an advance of technical knowledge will be represented by an upward movement of the curve $Y = F(r, t)$; this progress will be called neutral if the curve of $A = G(r, t)$ remains stationary as t increases; it will be called labour saving if it moves upwards and capital saving if it moves downwards.

When employment is full, one of the important determinants of the rate of growth of net output is the rate of growth of capital. By this we shall mean the ratio of the value of net investment to the value of capital.[1] We assume the identity of net investment and savings, and it follows that the growth rate of capital is also the ratio of savings to the value of capital, and this can be found by dividing the savings ratio, s, by the capital–output ratio, A.

We may use our concept of the growth rate of capital in order to measure the rate of technical progress; indeed, we may define the rate of technical progress, T, to be that growth rate of capital which would leave the rate of profit on capital, r, unaffected, if population were stationary and financial policy were unaltered.[2] By the natural growth rate of capital, N, we shall mean that growth rate of capital which would similarly leave the rate of profit on capital r unaltered, in the general case, when population may be increasing. Since under our assumption of constant returns, a growth rate of population γ will require a growth rate of capital γ in the absence of technical progress, if the rate of profit on capital is to be unaffected, it is easily shown that the natural growth rate of capital is obtained by adding the rate of technical progress to the population growth rate: thus

$$N = T + \gamma \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2.4)$$

We shall assume that greater saving will always cause a more rapid increase in the value of capital and hence more increase in productivity and more fall in r. It follows that if the growth rate of capital exceeds the natural growth rate, the rate of profit r will fall, whereas if it is less than the natural growth rate, then r will rise. We may use this fact to establish the conditions of dynamic equilibrium.

Dynamic Equilibrium

We define the warranted growth rate of capital to be that growth rate which must be achieved if full employment is to be preserved. This must be given by the equation

$$W = \frac{s}{A} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2.5)$$

[1] We do *not* assume that the value of net investment is equal to the rate of increase of the value of capital.

[2] This amounts to measuring the rate of technical progress by the amount of investment in relation to the capital stock which will be needed in order to keep abreast of the progress.

where s is the savings ratio at full employment. It follows from our definition of neutral technical progress that W must be a fixed function of the rate of profit r when technical progress is neutral.[1] So long as full employment is being preserved, the actual growth rate of capital must equal the warranted growth rate of capital, and so the rate of profit r must be falling or rising according as the warranted growth rate of capital W exceeds or falls short of the natural growth rate of capital N. We may illustrate this conclusion by means of a scissors diagram showing the curves of the warranted and natural growth rates of capital plotted against the rate of profit r.

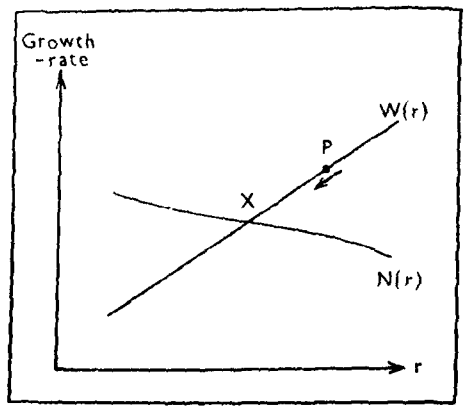


FIG. 3.—Growth-rate curves W and N.

Provided that the warranted growth-rate curve cuts the natural growth-rate curve from below on the left, it follows that the point P, whose co-ordinates represent the actual rate of profit and growth rate of capital, must lie on the warranted growth-rate curve, and that it will be moving to the left or to the right according as it lies above or below the natural growth-rate curve, that is according as it lies to the right or to the left of the point of intersection X of the two curves. It must therefore always be moving along the warranted growth-rate curve towards the point of intersection X of the two curves.

This point X may then be regarded as representing the equilibrium position of the point P, and provided the conditions are steady in the sense that the two curves remain fixed in position, the actual growth rate of capital and rate of profit r must settle to the two values represented by the co-ordinates of the point X. These co-ordinates tell us in fact the growth rate of capital and the rate of profit on capital that will be reached in conditions of dynamic equilibrium. For example, if the rate of technical progress remained constant at the level T and the rate of population growth remained constant at the level γ and provided full employment was successfully maintained, the growth rate of capital would settle down to the value

[1] See equation (2.6) below.

$T + \gamma$, which is its natural rate, and the rate of profit on capital would settle to that level which would make the warranted growth rate of capital also equal to $T + \gamma$. This warranted growth rate of capital can be expressed as

$$W = s/A = \{\pi\alpha + (1 - \pi)\beta\}/A = (\alpha - \beta)r + \beta/A \quad . \quad (2.6)$$

and in this formula the coefficient β is likely to be small. It follows that rate of profit on capital, r, in dynamic equilibrium must be at a level slightly less than $\frac{T + \gamma}{\alpha - \beta}$. This result to some extent confirms Mr. Kaldor's thesis that the distribution of income will be determined by the rate of technical progress at such a level as will enable adequate savings to be forthcoming and that the propensities to save out of wages and profits respectively will have very little influence on the rate of growth of capital once dynamic equilibrium has been reached. Whatever the respective propensities of workers and capitalists to save, profits will be adjusted eventually so that they will save the amount needed to keep abreast with technical progress.[1]

In the same way as we have defined a natural rate of growth of capital N, it is convenient to define a natural growth rate of productivity ν, by the property that productivity grows at its natural rate when capital is growing at its natural rate so that the rate of profit on capital is constant.[2] This natural growth rate of productivity ν is likely to be roughly equal to the rate of technical progress, but it need not be exactly the same: we shall describe the ratio of ν, the natural growth rate of productivity, to T, the rate of technical progress, as the technical progress coefficient θ. In a given state of technical knowledge, θ may be itself a function of r the rate of profit on capital. If this function remains unaltered during the process of technical advance, the rate of growth of productivity will itself settle down to the value $\theta_x T$, where θ_x denotes the value of the technical progress coefficient corresponding to the equilibrium value r_x of the rate of profit on capital.

So far we have regarded dynamic equilibrium as being the process of growth which will be established eventually if full employment is preserved and if the warranted growth-rate curve and the natural growth-rate curves both remain still. Unfortunately there are no good reasons for supposing that in the real world conditions will be those which in our model would cause the two curves to remain still. The diagram showing the two curves intersecting remains a useful tool, however, even when the two curves are moving about, for it is still true then that the point P will always be approaching the instantaneous position of the point of intersection of the two curves.

[1] Provided that full employment is not interrupted by inflation or stagnation crisis of the kinds discussed in Section III below.

[2] This natural rate ν may be thought of as the rate of upward movement of the curve of $\log F(r, t)$.

Biased Progress

An important special case is when the population growth rate and the rate of technical progress and the technical-progress coefficient all remain constant but technical progress itself is labour-saving or capital-saving. Suppose, for example, that under these conditions technical progress is labour saving, then the curve $A = G(r, t)$ will be moving upwards, and therefore the curve of the warranted growth rate of capital will be moving downwards. The point of intersection X of the warranted and natural growth-rate curves will therefore be moving slowly to the right. The eventual effect of this on the point P, representing the current situation, must be that P will lie on the moving warranted growth-rate curve just sufficiently far below the natural growth-rate line to enable it to move to the right at the same speed as the point of intersection X and just behind it. In consequence, the rate of profit will be constantly increasing in dynamic equilibrium, and the distribution of income will shift continuously in

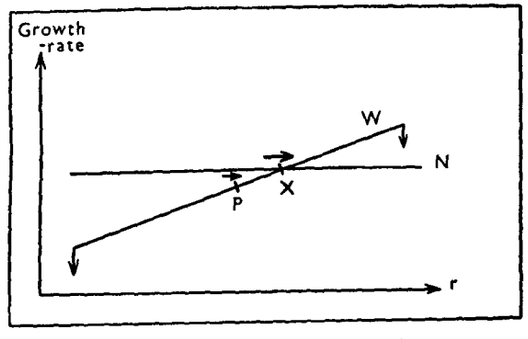


FIG. 4.—Effect of labour-saving bias.

favour of profits if labour-saving bias persists. We see also that in this case the actual growth rate of capital, which must equal the warranted growth of capital, will settle down to a level slightly less than $T + \gamma$, so that the effect of the labour-saving bias in technical progress is slightly to reduce the growth rate of capital corresponding to the state of dynamic equilibrium. It also follows with labour-saving technical progress, that since the actual growth rate of capital is always slightly less than the natural growth rate after dynamic equilibrium has been reached, the actual growth rate of productivity must be slightly less than the natural growth rate θT: the effect of the labour-saving bias is therefore to reduce the growth rate of productivity in dynamic equilibrium below the level it would have achieved with the same rate of technical progress without bias and the same technical progress coefficient and the same growth rate of population.

We may consider in the same way the effect of a labour-saving bias in

technical progress for a limited period only. If the technical-progress coefficient remains constant at the level θ and the rates of technical progress and the growth rate of population both remain constant at the levels T and γ, then the effect of a labour-saving bias in progress for a limited period will be to shift the warranted growth rate of capital curve to a lower position and to leave it fixed there. The point of intersection of the two curves X will therefore have moved somewhat to the right. However, if the rate of technical progress T and the growth rate of population are both independent of the rate of profit on capital, r, the natural growth-rate curve will be a horizontal straight line and the equilibrium growth rate of capital will remain unaffected at the level $T + \gamma$: and the equilibrium growth rate of productivity will remain unaffected at the level θT. But although these equilibrium growth rates are unaffected, the profit ratio π, the rate of profit on capital r and the capital–output ratio A will all be higher in the state of dynamic equilibrium than they would have been if there had not been a labour-saving bias in progress for a limited period.

It is clear that the converse results will hold when there is capital-saving bias in technical progress. For example, if progress remains capital-saving the rate of growth of both capital and productivity will be somewhat raised in dynamic equilibrium above what they would have been with neutral progress at the same rate and with the same growth rate of population and value of the technical progress coefficient. Similarly, if there is a capital-saving bias in technical progress for a limited period only, this will leave the dynamic equilibrium growth rates of capital and of productivity unaffected but will somewhat reduce the profit ratio, the rate of profit on capital and the capital–output ratio in dynamic equilibrium.

Summary of Conclusions of Section II

Provided full employment is not ended by crisis, a constant rate of neutral technical progress T and growth rate of population γ, in the face of constant savings propensities α and β, will lead to dynamic equilibrium with a growth rate of capital $T + \gamma$; the share of profits π will be constant and so will r, rate of profit on capital: productivity and the value of capital per head will each then have the growth rate θT, where θ is the technical-progress coefficient. But if there is labour-saving bias the growth rates in dynamic equilibrium will be slightly less and the distribution of income will be constantly shifting in favour of profits: the growth rate of productivity will then be slightly less than that of the value of capital per head.

III. Conditions Which May End Full Employment

Stagnation Crisis

Although we have discussed at some length what growth rates would result if dynamic equilibrium were reached, we have not yet considered what conditions must be satisfied if full employment is to be maintained until dynamic equilibrium is reached.

Of the many possible reasons why full employment may end we shall consider only three in this article:

(i) Stagnation Crisis.
(ii) Inflation Crisis.
(iii) Crisis due to lack of balance between "men" and "machines."

In the present section we shall consider only the danger of stagnation crisis. By this we mean a state of affairs when employers cannot be persuaded to undertake enough investment to keep the net investment up to the level of savings available at full employment. In order to examine the conditions for avoiding this state of affairs we need to make some assumption about the inducement to invest. There is very little reliable information about this, and a wide choice of assumptions is accordingly open to us. It seems reasonable to suppose that (at any given level of the capital–output ratio) when the average rate of profit on capital is high employers will be more ready to undertake investment than when it is low: at a given rate of profit on capital they will be more ready to invest if the profit ratio is high than if it is low. Given the rate of profit on capital and the profit ratio, there remain a variety of extraneous factors which can encourage or discourage investment. These include the financial cost of borrowing, which must discourage investment, other obstacles to borrowing, such as credit rationing, shortage of intermediate goods due to long order books and reluctance to face the risks associated with heavy borrowing.

We shall accordingly assume that there is an upper limit $m(r, \pi)$ $\frac{\partial m}{\partial \pi} > 0$ to the value of net investment in relation to that of capital (*i.e.*, to the growth rate of capital), depending on the rate of profit on capital and the profit ratio. Since $\pi = rA$, this can also be regarded as a function $M(r, A)$ of the rate of profit on capital, r, and of the capital–output ratio A $\left(\frac{\partial M}{\partial A} > 0 \ \frac{\partial M}{\partial r} > 0\right)$. This upper limit can be achieved (given the savings) if the monetary authorities do all in their power by easy credit, etc., to encourage investment, but the growth rate of capital can be kept below this limit, and in balance with the warranted growth rate, if the authorities take steps to make investment more difficult by making credit tighter, or by imposing controls and rationing of various kinds. Such action will adjust investment and savings into equality by restraining investment and

at the same time *raising* the rate of profit on capital (including interest paid to lenders), and hence the profit ratio and the savings ratio. This assumed success of the authorities in restraining investment down to the level of full-employment savings is one of the main factors determining the form of the function $r = g(K)$, which gives the rate of profit on capital corresponding to each level of the value of capital per head K, in a given state of technical knowledge.

We may call this upper limit to the growth rate of capital the *maximum* growth rate of capital $M(r, A)$. In a given state of technical knowledge $M(r, A)$ is a function of r, namely $M\{r, G(r, t)\}$, and may be represented on

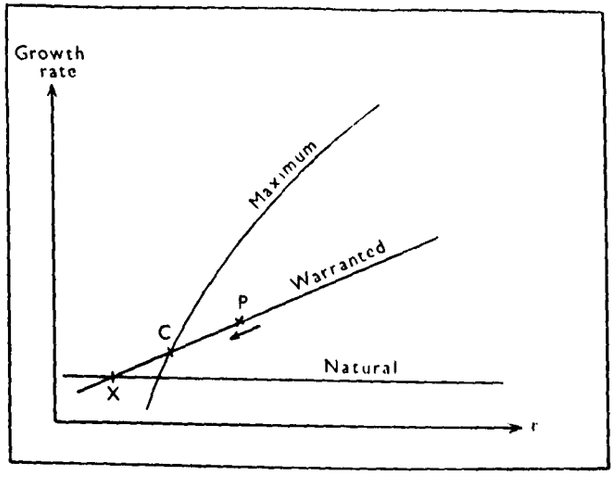


FIG. 5.—Maximum, Warranted and Natural Growth Rates.

the same diagram as the curves of natural and warranted growth rates. In Fig. 5 it is shown falling sharply to the left at the left-hand end. The idea underlying this is that if the rate of profit on capital r goes on falling, a point will be reached when this rate of profit is less than can be earned on gilt-edged securities—there being a lower limit to the level to which this latter rate can be reduced. It seems unlikely that employers can be induced to invest much when this point has been passed.

Fig. 5 illustrates conveniently the conditions which determine whether stagnation crisis will arise. The three curves will in general be moving about because each of the three growth rates shown will be changing functions of r, the rate of profit on capital. But let us first consider the case where the three curves are fixed.[1]

The point P whose co-ordinates give the actual growth rate of capital

[1] Sufficient conditions for this are that the rate of technical progress T and the growth rate of population and the maximum growth rate are all fixed functions of r and A, and that technical progress is neutral.

and rate of profit on capital will be moving to the left so long as full employment is preserved and it lies to the right of X, the point of intersection of the warranted and natural growth-rate curves. If it also lies to the right of C, the point where the maximum growth-rate curve cuts the warranted growth-rate curve, the inducement to invest can be made more than sufficient to absorb full-employment savings if the monetary and general economic policy is as encouraging as possible to investment: in order to keep the balance, some degree of credit restriction will therefore be appropriate—the exact degree depending on the gap between the maximum and warranted growth-rate curves. If, as in Fig. 5, C lies to the right of X, then the point P will eventually pass C, and when this happens, despite all encouragement

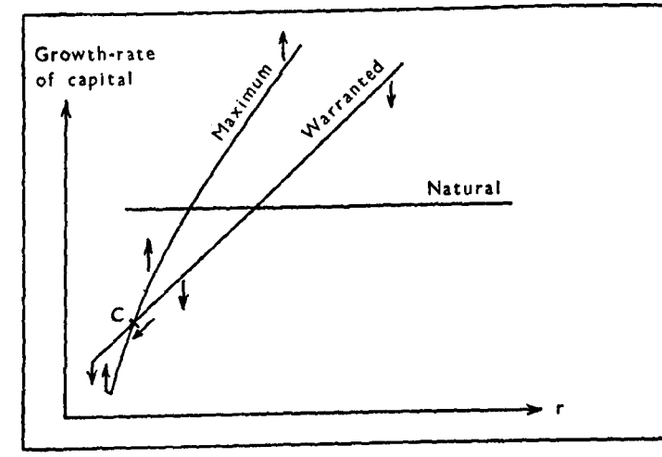


FIG. 6.—Effect of labour-saving bias on growth-rate curves.

from the authorities, investment will become insufficient to absorb the savings available at full employment: stagnation crisis will ensue.

Thus if the three curves are fixed the condition for avoiding stagnation crisis is that X should lie to the right of C—that is that the natural growth-rate curve should pass above the point of intersection C of the maximum and warranted growth-rate curves.

If the three curves are moving about, a sufficient condition is that the natural growth-rate curve should never pass below the point of intersection of the other two: a necessary and sufficient condition is that it should never do so for long enough to allow P to pass the point C.

When the rate of technical progress, the growth rate of population, the saving-propensities α and β, and the investment function $M(r, A)$ are all fixed, then a labour-saving bias in technical progress will always make stagnation crisis more remote. For then the natural growth-rate curve remains fixed and horizontal, and it can be seen that the point of intersection of the two other curves moves lower down as in Fig. 6.

This can be seen by considering its effect on the three curves of growth rate of capital. The curve of the natural growth rate will be unaffected: that of the maximum growth rate will be raised (because of our assumption $\frac{\partial M}{\partial A} > 0$ and of the effect of labour-saving bias which is to increase A for given r). The curve of the warranted growth rate of capital will fall on account of the same effect of the bias. The joint result is that the crisis point C falls farther to the left and farther below the natural growth-rate curve. We see therefore that the effect of labour-saving bias is to make stagnation crisis more remote. Capital-saving bias will have the opposite effect.

Inflation Crisis

A full treatment of the various possible causes of inflation will not be attempted. We shall suppose that employers will always adjust prices so as to maintain the correct relation between the rate of profit on capital r, and the value of capital per head: at any given moment this relation is expressed by the equation $r = g(K)$. We shall assume that workers will insist on rapid increases in money-wages if the rate of growth of real wages per head ever falls below some prescribed level ω. A spiral of rising money-wages and money-prices will thus result if the working of the model ever allows the growth rate of the real wage rate $(1 - \pi)\,\Upsilon$ to fall below ω: we shall call this state of affairs inflation crisis, and assume that it so disrupts the economy as to bring full employment to an end.

Let us first consider a state of dynamic equilibrium with constant growth rate of population γ, neutral technical progress at the constant rate $\mathcal{T}$, with a constant technical progress coefficient θ and with constant savings propensities α and β. The growth rate of productivity Υ will then be $\theta\mathcal{T}$, and π will be constant, since r will be constant. The growth rate of the real-wage rate $(1 - \pi)\Upsilon$ will thus also be $\theta\mathcal{T}$. Hence inflation crisis will be avoided provided

$$\theta\mathcal{T} > \omega \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3.1)$$

However, if there is a labour-saving bias in technical progress the rate of growth of productivity will, we have seen, be rather less than $\theta\mathcal{T}$, in dynamic equilibrium, and at the same time the rate of profit on capital will be increasing. The former effect will increase the danger of inflation crisis, given $\mathcal{T}$ and θ: the latter effect is likely to redistribute income in favour of profits (decreasing $1 - \pi$) and thus to increase the danger still more.

The above results relate only to the position of dynamic equilibrium. But even if this position allows the avoidance of inflation crisis, it may be impossible to reach it because inflation crisis occurs first. If technical progress is neutral and the rate and coefficient of technical progress $\mathcal{T}$ and θ, the population growth rate γ and the savings propensities α and β are

all constant, then provided the rate of profit on capital initially exceeds the equilibrium value r_x, the condition $\theta\mathcal{T} > \omega$ is likely to avert inflation crisis indefinitely. For in this case the growth rate of capital will exceed the natural rate $\mathcal{N}$, and hence the growth rate of productivity will exceed the natural growth rate $\theta\mathcal{T}$ and *a fortiori* it will exceed ω: at the same time the rate of profit on capital will be falling, and this is likely [1] to cause some redistribution of income in favour of labour (increased $1 - \pi$), and thus the growth rate of real wages will exceed the critical level ω by even more than will the growth rate of productivity.

However, the interesting case is that where with neutral technical progress $\mathcal{T}$, θ, α, β and γ are all constant, but initially the equilibrium level r_x of the rate of profit on capital exceeds the actual value r. For now the rate of profit on capital must rise, and this may cause a redistribution of income away from labour so violent as to offset the good effects of technical progress on real-wage rates.

Even in the most simple case, where both technical knowledge and population are fixed, inflation crisis can be avoided only if ω is sufficiently small. Under these circumstances the growth rate of capital will be at the warranted growth rate W, and this will provide a growth rate of real wages equal to a multiple θ' of W, where θ' may be termed *the redistributive coefficient*. (A discussion is provided at the end of Appendix II of how the redistributive coefficient depends on our other concepts.) In this simple case the growth rate of real wages being $\theta' W$, the condition for the avoidance of inflation crisis is simply

$$\omega \leqslant \theta' W \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3.2)$$

The further effects of population growth and technical progress on inflationary pressure require mathematical treatment, and this is provided in Appendix II. Population growth is inflationary (except in the extremely perverse case $\theta' < 0$), but neutral technical progress may be either inflationary or deflationary according as the good effects on productivity are or are not overwhelmed by the effect of redistributing income in favour of profits: this turns on whether the redistributive coefficient θ' is greater or less than the technical progress coefficient θ. It is shown in Appendix II that with population growth at rate γ and neutral technical progress at rate $\mathcal{T}$, the condition (3.2) must be modified to the form (36), namely

$$\omega \leqslant \theta'(W - \gamma) + (\theta - \theta')\mathcal{T} \quad . \quad . \quad . \quad . \quad (3.3)$$

and this places an upper limit on the rate of technical progress if $\theta' > \theta$ (the case where its effect is to increase inflationary pressure); but if $\theta' < \theta$, then the condition places a lower limit on the rate of technical progress; provided $W > \gamma$, however, this lower limit will be negative.

[1] This, however, is not strictly necessary under our assumptions. A perverse case can arise in which the capital–output ratio rises so fast when r falls as to cause redistribution in favour of profits.

The effect of labour-saving bias is shown always to be inflationary, both *en route* to dynamic equilibrium and after it has been reached. Conversely, capital-saving bias reduces inflationary pressure. These results presume that the rate of technical progress T and the coefficients θ, θ', α, β and γ are all given.

Crisis Due to Lack of Balance Between Men and Machines

Let us assume that the rates of interest on loans and other deterrents and controls on investment are just sufficient to keep the total volume of net investment in balance with the savings available at full employment. Can we then expect the " total number of machines " to remain in proper balance with the number of workers available to use them?

It is not widely misleading to think of the requirements for gross investment as falling into the following categories:

(a_1) replacement of machines which have come to the end of their life by new machines of the same type;

(b) adding to the number of machines of an existing type in order to cope with expanding demand;

(a_2) replacement of machines which have come to the end of their life by a more modern and efficient type;

(c) introducing machines to carry out processes which have previously been carried out by labour alone.

It is clear that if investment were only devoted to types (a_1) and (b) there would be great danger of creating over-capacity in the sense that there would be machines standing idle without workers to use them. At the opposite extreme, if all investment were devoted to type (c), there would develop a great strain on the available machines, so that in order to preserve full employment, it would become necessary to keep in use some machines which would normally have been scrapped and to work others with two or three shifts which would normally only have been worked with one.

But any tendency towards either of these errors would produce its own corrective, provided the interest rates and other deterrents were functioning so as to maintain the correct total of net investment. For if a surplus of capacity began to appear investment of types (a_1) and (b) would become far less attractive, and even investment of type (a_2) might be postponed so that investment of type (c) which had been awaiting a favourable opportunity would be undertaken as credit conditions were relaxed. On the other hand, if mechanisation of manual processes (*i.e.*, type (c) investment) had been using up too large a proportion of the available savings, the replacement of ageing machines would become more urgent, and as credit was restricted a larger proportion of savings would be devoted to that purpose. The movement of the *relative* prices of different commodities could be relied upon to reflect to some extent the shortages and excesses of machines in different parts of the economy, and thus to help in their correction. Provided employers were reasonably successful in foreseeing major developments and provided the variation of interest rates and other controls on investment succeeded in ensuring that the right amount was spent altogether on investment, one should be able to rely on the pricing mechanism and the individual decisions of employers to ensure that neither too much nor too little of this was spent on increased mechanisation (as opposed to the replacement and duplication of existing machines). In more technical language, provided monetary and other controls ensure just enough investment to preserve steady full employment, the pricing system and the profit motive should be sufficient under the influence of these controls to secure the right amount of capital deepening.

Summary of conclusions of Section III

If the natural warranted and maximum growth-rate curves all remain fixed, stagnation crisis will or will not eventually arise according as the natural growth-rate curve lies below or above the point of intersection of the other two curves: this, *ceteris paribus*, sets a lower limit to the rate of technical progress, if stagnation crisis is to be avoided.

Inflation crisis is assumed to occur if real wage-rates fail to rise with growth rate as high as ω: the effects of neutral technical progress on inflationary pressure depend on whether the technical progress coefficient θ is greater of less than the redistributive coefficient θ'. If $\theta < \theta'$ technical progress on balance is inflationary, and an upper limit is set on its rate if inflation is to be avoided; but if $\theta > \theta'$ it eases inflationary pressure and a lower limit (which may be negative) is set for the rate of technical progress if inflation is to be avoided. The effect of labour-saving bias is, *ceteris paribus*, to increase inflationary pressure and make stagnation crisis more remote; capital-saving bias has, *ceteris paribus*, the opposite effect.

Provided inflation crisis and stagnation crisis are avoided and provided the authorities keep an overall balance between investment and the supply of savings, it may be hoped that the profit motive and market mechanism will maintain a proper balance between the numbers of men and machines.

IV. The Rate of Profit on Capital

The most elegant theory of the determination of the rate of profit on capital is that which supposes that it must be equal to the marginal efficiency of capital. This latter concept may be defined as the value of the extra output due to net investment divided by the value of that net investment, technical knowledge and population being supposed constant. If we denote

this ratio by r' it will be seen that if it could be assumed that the value of net investment could be equated to the rate of increase of the value of capital, then r' is related to the production function by the relation

$$r' = \frac{df}{dK} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4.1)$$

where $Y = f(K)$ expresses the dependence of productivity on the value of capital per head in the given state of technical knowledge.

However, owing to the possibility that accumulation may alter the relation between the prices of capital and consumption goods, the equation (4.1) need not hold, and the marginal efficiency of capital will be given as some other function of capital per head $r' = h(K)$.[1]

The form of this function will depend not only on the productivity function $f(K)$ but also on the " time shape " of the production processes used at each stage of development.

The theory can still be developed that the rate of profit on capital must equal the marginal efficiency of capital so determined.

The theory has to be based on very extreme assumptions about perfect competition and the readiness and ability of employers to seize every opportunity to " maximise their profits "; it also assumes away any differences between marginal private productivity and marginal social productivity.

Prices are assumed to be rapidly adjusted so that the level at which profits are maximised is just sufficient to cover interest costs.

Despite its elegance, this theory rules out more of the important influences actually found to affect profit rates than do some other theories.

A second theory regards the rate of profit on capital as being set at the level which equates the rate of investment and the rate of savings. When employment is full an increase in the rate of profit is likely to increase the rate of investment which employers are prepared to undertake. But this theory supposes that savings are even more sensitive to an increase in the profit rate, owing to the fact that the proportion saved out of profits is so much higher than that out of wages. The theory supposes that the distribution of income between wages and profits is so adjusted that the available savings and the investment undertaken are in balance. The theory is illustrated by Fig. 7: it will be understood that the theory allows for movements of the investment curve in response to changes in the value of capital per head. One difficulty about this theory is that one suspects the investment curve would in fact be steeper than the savings curve so that the equilibrium would be unstable. However, the theory can be refined so as to meet this and other objections.[2]

Another theory is that in an economy enjoying continuous full employment investment will tend to exceed the value of savings available but can

[1] For a fuller discussion of this point, see Appendix III.

[2] See Kaldor, *op. cit.*

be held down to their level by means of various restrictions and restraints. The economy on this view can be driven with the brakes on.

The rate of profit, on this view, is determined by the percentage which employers add on to direct costs when fixing prices.

The rate of growth of capital is determined by the flow of savings available at full employment when the rate of profit is at this level. The rate of investment, which tends to run ahead of this rate of savings, is kept down to

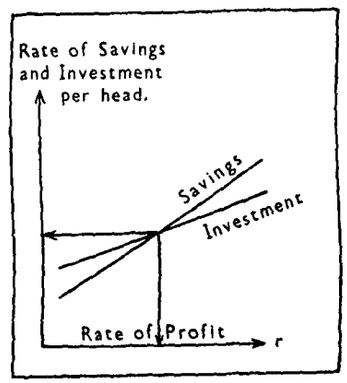


FIG. 7.—*Determination of r.*

equality with it by a whole set of restrictive influences, including some or all of the following:

(i) the deterrent effects of uncertainty on both borrowers and lenders;

(ii) shortages and supply delays in materials and intermediate goods required for investment;

(iii) deliberate restriction and rationing of credit by the authorities;

(iv) other more direct controls on investment.

There is an element of truth in each of these three theories. The marginal efficiency of capital no doubt exerts an influence, albeit a weak one, on the average rate of profit on capital, because given the possibilities and costs of borrowing, the rate at which employers wish to invest will be the higher the higher is the marginal efficiency of capital. Any such wish for more investment will increase the need for credit restriction and other curbs on investment: costs of borrowing will rise, and this combined with the boom conditions will encourage employers to charge rather higher percentage mark-ups on direct costs.

On the other hand, when the marginal efficiency of capital is low and stagnation crisis is being approached, an easy credit policy will be needed, stocks will begin to accumulate in some industries, and employers in these industries will lower their profit margins.

But although the rate of profit on capital will for these reasons fall and rise at the same time as the marginal efficiency of capital, as capital accumulation runs ahead of or falls behind technical opportunities, one should not overestimate this effect. Employers are not likely to drive prices up to the full extent possible in periods when investment opportunities run temporarily ahead of the full-employment savings available at normal profit levels. Nor, if employers were so inclined, would the authorities necessarily remain inactive: they might restrain the boom either by high interest rates and instructions to banks to ration credit or by more direct physical controls.

As a result of such restrictions and imperfections of competition it is quite possible for the marginal social efficiency of capital to stand very high without the average rate of profit on capital being driven to nearly such a high level. In such a situation real wages will be higher than they would have been in a perfect competition model, and the highest rates of profit will be obtainable in precisely those industries which offer the best opportunities of mechanisation. The *average* rate of profit on capital may be well below even the marginal rate of private profit on capital obtainable in these particular industries; and this marginal private rate of profit may itself stand well below the marginal social efficiency of capital because of the high marginal cost of labour to the firms which are expanding.

For these reasons the rate of profit on capital may be regarded as being influenced by the marginal social efficiency of capital to an extent dependent on:

(i) the degree of restraint of the employers in pushing up profit margins to the full extent possible;

(ii) the degree of restraint on investment imposed by the authorities and by caution and uncertainty.

Given the extent of these restraints, we may regard the rate of profit on capital as a function of r' the marginal social efficiency of capital, which itself depends in a given state of knowledge on the value of capital per head. It is for these reasons that the rate of profit on capital may, with given technical knowledge, and given the extent of the restraints, be represented as a function $g(K)$ of the value of capital per head. This function $g(K)$ will for given K be the lower the greater the degree of the restraints.

It is interesting to consider briefly the respective effects of high and low degrees of restraint, which appear in our model as low and high levels of the function $g(K)$.

Given the rate of technical progress T and the coefficient θ, and γ the growth rate of population, we know that if dynamic equilibrium is reached the growth rates of capital and productivity will be $T + \gamma$ and θT, whatever the level of the function $g(K)$. But a low level of the function $g(K)$ will lower the growth rates of capital and of productivity during the period of approach to that equilibrium. If the net effect of technical progress is inflationary ($\theta' > \theta$), then restraints causing a low level of $g(K)$ will greatly reduce the dangers of inflation. If these restraints were still imposed when stagnation crisis was approached they would similarly *increase* the danger of stagnation crisis; but we have supposed in our definition of the maximum growth rate of capital that any deliberate restraints would be abandoned in such circumstances; this supposition seems reasonable, and the danger of stagnation crisis is thus affected only by the degree of those restraints which are unavoidable.[1]

The method of analysis of the earlier sections is appropriate only if the degree of restraint is supposed constant in the sense that the rate of profit r corresponding to any given level r' of the marginal social efficiency of capital r remains roughly constant.

If policy were rapidly altering the relation of r to r', we could no longer regard the rate of profit r as a useful index of the degree to which capital accumulation was abreast of technical progress. In this case we should have to reconsider the definition of the rate of technical progress. Instead of defining it as that rate of growth of capital which (with constant population) would allow r to be constant, we should have to define it as that growth rate which would allow r', the marginal social efficiency of capital, to remain constant.[2] Provided, however, we confine our analysis to the case where the degree of restraint is constant in the sense that r is fixed for given r', the two definitions of the rate of technical progress are of course equivalent.

V. Unsteady Development

Most of our discussion so far has been concerned with the long-run effects of steady conditions. But it has been pointed out in Section II that there are really no good reasons to suppose that in the real world those influences which in our model determine the curves of warranted or natural growth rates of capital *will* remain steady. It is therefore desirable to consider what will be the result in our model if these two curves are constantly shifting about.

The danger of stagnation crisis is not greatly affected by such short-term movements, since this can result only from a gradual fall of the rate of profit on capital down to the crisis level r_c. It is true, however, that if stagnation crisis was already near, a falling off in the rate of technical progress or the growth of population could cause the rate of profit on capital to start falling and thus soon precipitate the crisis.

But the danger of inflation crisis could be greatly increased if technical advance was sporadic, especially if capital equipment was all fairly up to

[1] For example, caution and uncertainty due to extraneous factors.

[2] This definition has not been adopted, since its use would considerably confuse the exposition of the working of the model.

date and the marginal social efficiency of capital and the rate of profit on capital had begun to fall off rather sharply.

In these circumstances θ', our measure of the redistributive effects of technical progress, might be quite considerable, and a quick burst of technical progress could easily raise the marginal social efficiency quite sharply, and thus raise the rate of profit on capital so much as to absorb not only the immediate good effects of the progress on productivity but also the good effects of such savings as were still available for capital deepening after the needs of an increasing population had been met.

Increases of working population due to recent changes in fertility or mortality are perhaps unlikely to be sharp and sudden. But a sharp increase could result from a flood of immigrants: this might, in our model, cause an inflationary crisis if real wages were in any case almost stationary, either because the savings ratio, the marginal social efficiency of capital and the rate of technical progress were all small or, on the other hand, because θ' was large and rapid technological progress was having an inflationary effect on balance.

It is possible in principle to predict the entire course of the model from an initial position up to the point, if any, where full employment is lost, from a knowledge of the functions—

$\alpha(t)$ $\beta(t)$ = Savings propensities at time t.
$F(r, t)$ = Productivity function.
$G(r, t)$ = Capital-output ratio function.
$H(r)$ = Marginal social efficiency of capital.
$\gamma(t)$ = Growth rate of population at time t.
$T(t)$ = Rate of technical progress at time t.
$\theta(t)$ = Technical-progress coefficient.

This can either be done step by step with the aid of computing machinery or in cases where the functions concerned have artificially convenient forms, by evaluating r algebraically as a function of t.[1]

One must also know the maximum growth function M and the workers' demands ω in order to discover whether and when inflation crisis or stagnation crisis will arise.

VI. Relation of the Model to those of Other Writers

It will be obvious that many of the ideas underlying this article have been inspired by the work of Mr. R. F. Harrod. This became clear only at the stages of revising the drafts: until after submission of the article there had been no discussions of the subject matter with Mr. Harrod, and the initial inspiration to write the article arose from a discussion with Mr. N. Kaldor about the limitations imposed by some of the assumptions

[1] See Appendix II at end.

made in his recent article on capital accumulation.[1] I also owe a great debt to Professor R. F. Kahn for two brief but (for me) fruitful discussions of the topics dealt with by Mr. Kaldor. Finally, I have been greatly influenced by the various writings of Mrs. Joan Robinson on capital theory.

It is from Harrod's work that the idea of warranted and natural growth rates has been drawn. The results in this model suggest greater stability than he found, because it is supposed that the authorities are capable of rationing investment by suitable credit policy so as to keep it continuously in balance with full-employment savings, and because a greater power is attributed here than in his work to changes in income distribution to affect the savings ratio.

It is from Kaldor's work that the emphasis on this last regulator is taken. From his work also is taken the idea that technical progress can cause some increase in productivity even if (with fixed population) no net savings are performed. A discussion of the relation between the coefficients used in his and in this model is given in Appendix II. But the results here obtained differ from many of Kaldor's in that we do not find any reason to expect an easy passage to an age of uniform progress with a constant capital-output ratio and a constant rate of growth of productivity. On the contrary, these results will appear only if:

(a) technical progress is neutral and at a constant rate;[2]
(b) population growth rate is constant;
(c) the rate of technical progress is such as to avoid both stagnation crisis and inflation crisis.

The difference in results is, of course, due to avoiding some of his assumptions. In particular, we do not assume that employers try to make the capital-output ratio take a certain value (subject to profits on capital being normal); we do not assume that the growth rate of productivity depends only on the growth rate of capital and not also on its marginal social efficiency; nor do we dispose of the problem of the relation between the prices of capital goods and of consumption goods with quite the same conviction as he: we make allowance for the net effect on the value of capital of changes in real wages and profit rates.

It is perhaps at this point that this article derives most from the works of Mrs. Robinson. Some discussion of the relation between this model and hers will be found in Appendix III. On her work was built the underlying notion of a programme of accumulation with fixed technical knowledge, controlled by the simultaneous adjustment of real wage-rates and profit rates. Under perfect competition these adjustments would ensure that investment was always devoted to just that degree of capital deepening which the flow of savings and the rate of population growth justified. We have relied on a

[1] "A Model of Economic Growth," Economic Journal, December 1957.
[2] Or at a rate which is a constant function of the rate of profit on capital.

more rough-and-ready process of adjustment, but the governing principle is the same.

Again from the work of Mrs. Robinson are drawn many of the ideas about the potency of sudden changes and serious bias in technical progress endangering the continuance of full employment.

It is perhaps in the sections dealing with stagnation crisis and the inducement to invest that it becomes most obvious how heavily the author shares in the universal debt to the late Lord Keynes.

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APPENDIX I

Definitions

Among the basic concepts used in the model of capital growth are:

(i) value of net output per head $\mathcal{Y}$;
(ii) value of capital per head K;
(ii) value of net savings per head $s\mathcal{Y}$;
(iv) value of net profits per head $\pi\mathcal{Y}$.

In each of these four concepts the words " per head " are intended to convey " per head of the fully employed working population "; in each of them value is to be measured in terms of money, on the understanding that the price level of consumption goods (as measured by a current-weighted price-index number) remains constant through time; in each of them these values are to be measured net of depreciation and obsolescence.

We may assume that the gross value of output per head, with a given stock of capital equipment and given working population, is known and understood but that a more careful definition is required of the value of net output.

With fixed technical knowledge and given fixed working population and a given assortment of initial capital equipment, let $\mathcal{Z}$ be the gross value of output per head. In order to preserve the capital stock, including goods in progress, in a sufficiently constant state of repair and age-distribution to allow the gross output per head $\mathcal{Z}$ to continue indefinitely, it will be necessary to plough back a part $\mathcal{Z}'$, say, of this gross output per head $\mathcal{Z}$ for use as capital. The smallest level at which $\mathcal{Z}'$ can then in practice be maintained will be taken as the level of depreciation, and the value of net output per head $\mathcal{Y}$ is defined by

$$\mathcal{Y} = \mathcal{Z} - \mathcal{Z}'$$

The value of net income per head is defined to equal $\mathcal{Y}$, the value of net output per head.

The postulate of constant returns states that if in a given state of technical knowledge the working population and the outfit of capital equipment are both enlarged (or diminished) in the same proportion λ, then the value of net output per head will be unaltered. It is here to be understood that the capital outfit is as far as is reasonably possible, to be increased item by item in the same ratio λ, the age composition and state of repair for each kind of equipment remaining unaltered.

In order to define the value of capital we may now envisage a working population expanding at the growth rate γ. We now suppose that in addition to keeping the existing capital intact it is required to expand it, in the manner above described, at the same growth rate γ as the population. For this purpose it will be necessary to divert a further part of the gross output per head $\mathcal{Z}$, in addition to $\mathcal{Z}'$, above defined, for use as capital. Let this further part be $\mathcal{Z}''$. It is then reasonable to suppose that $\mathcal{Z}''$ will be proportional to the growth rate γ, at any rate for moderate values of γ. Accordingly, put

$$\frac{\mathcal{Z}''}{\gamma} = K$$

This value of K will be taken by definition to be the value of capital per head. So defined it has the property that if capital per head is to be maintained constant at the level K, then the net savings per head required are $\mathcal{Z}'' = \gamma K$, where net savings per head $s\mathcal{Y}$ are, as usual, defined as the excess of net income per head over consumption per head. s is by definition the savings ratio.

Finally, the value of profits per head $\pi\mathcal{Y}$ are defined as the excess of net income per head over wages per head.

The capital-output ratio is defined as $A = \frac{K}{\mathcal{Y}}$

The rate of net profit on capital is defined as $r = \frac{\pi}{A}$

We assume in the model that the output per head $\mathcal{Y}$ obtainable when the capital per head is K is in a given state of technical knowledge a fixed function $f(K)$. We shall refer to the graph of $f(K)$ as the productivity curve.

These definitions require supplementation directly we admit the possibility of technical progress.

Suppose, then, that at one given moment there is an advance in technical knowledge: the existing outfit of capital equipment is then likely to be inappropriate to the new conditions in various respects, and it is by no means obvious how the using-up and replacement of this old-fashioned equipment should be allowed for in calculating net investment and net savings.

The following solution is designed to ensure that the new productivity curve comes into operation immediately new technical knowledge is available without having to wait for the change-over of capital equipment.

Net savings should be regarded as the excess of net income over consumption, and this leaves net income to be defined at the moment when the new knowledge has become available but we are still saddled with old equipment.

Again we may suppose that a part $\mathcal{Z}'$ of gross income per head $\mathcal{Z}$ is ploughed back for replenishing the stock of capital. As a first approximation we might define net output per head to be the largest level of $(\mathcal{Z} - \mathcal{Z}')$ that could be maintained indefinitely. This corresponds well with our earlier definition, but it is not quite satisfactory, since if one were saddled with old-fashioned equipment the most profitable thing to do might well be to vary the rate of $(\mathcal{Z} - \mathcal{Z}')$ somewhat. The following definition is better: net output per head is the highest *eventual* value of $(\mathcal{Z} - \mathcal{Z}')$ that can be maintained after introducing modern equipment, subject to the condition that the *average* level of $(\mathcal{Z} - \mathcal{Z}')$ during conversion is no less than this *eventual* rate.

This definition implies that with constant population when the change-over is conducted in the most efficient manner subject to there being zero savings on average, and hence zero change in the quantity of capital during the change-over, there will be the same net output per head after the change-over as immediately after the new technical knowledge became available. It therefore enables

us to suppose that the productivity curve remains stationary during the change-over having jumped to its new position immediately the new technical knowledge became available.

Having defined net output per head Y at a moment following an advance in technical knowledge, we now use the productivity curve corresponding to the new state of technical knowledge to discover K, the value of capital per head. This curve tells us the value of capital per head that would be required to allow net output per head Y if the technical knowledge had been available for a long time. We *define* the value of capital per head *immediately* after the advance in knowledge to be this same value K, since although some of the equipment is old fashioned, it allows the same value Y of net output per head to be achieved.

Advances of technical knowledge may now be thought of as occurring every night, so that every day starts with the economy represented by a new point on a new production curve. It will be clear from these definitions that the new knowledge can increase net output per head and the value of capital per head overnight without any alteration being yet made to the capital equipment.

This possibility is allowed for in our model. Indeed, in Appendix II the situation where population is stationary and the growth rate of capital is zero but technical progress continues at the rate T is specifically considered, and it is supposed that productivity will then have the growth rate ρT. It is shown that the coefficient ρ is simply expressed in terms of the technical progress coefficient, the marginal social efficiency of capital and the capital output ratio by the equation

$$\rho = \theta \quad r'A$$

Appendix II

Mathematical Summary of the Text

Notation

K, Y	Values of capital per head and net output per head (productivity).
s, A, π	Ratios of the values of net saving, capital and net profits to net output per head.
α, β	Proportions saved out of net profits and wages, the two constituents of the value of net output if employment is full.
r	Ratio of net profits to value of capital.
γ	Growth rate of population.
W, N, M	Warranted, natural and maximum growth rates of capital.
T	Rate of technical progress $= N - \gamma$.
ν	Growth rate of productivity when growth rate of capital is N.
θ	Technical progress coefficient.
θ'	Ratio of growth rate of real wages to that of capital when population and technical knowledge are fixed.
ω	Growth rate of real wage-rates needed to avoid inflation crisis.
r'	Marginal social efficiency of capital.

We assume the following identities to hold:

$$A = K/Y \qquad s = \pi\alpha + (1 - \pi)\beta \qquad rA = \pi \quad . \quad . \quad . \quad (1)$$

$$W = s/A. \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

where W is the warranted growth rate of capital, namely that necessary if full employment is to be preserved.

The following functions denote the relation of Y and A to r given the technical knowledge available at time t

$$Y = F(r, t) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$

$$A = G(r, t) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$

Technical progress is labour saving, neutral or capital saving according as

$$\partial G/\partial t >, = \text{or} < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (5)$$

(it might thus be labour saving for some values of r and capital saving for others).

The natural growth rates of capital N and of productivity ν are defined to be those growth rates which are consistent with the condition

$$dr/dt = 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (6)$$

It is assumed that any higher (lower) growth rate of capital than N will cause r to decrease (increase).

The rate of technical progress T is defined by the equation

$$N = T + \gamma \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (7)$$

The technical progress coefficient θ is defined as

$$\theta = \nu/T \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (8)$$

When employment is full the growth rate of capital equals the warranted growth rate W. Hence by (6) and (7)

$$dr/dt < \text{or} > 0 \text{ according as } W > \text{or} < T + \gamma \quad . \quad . \quad . \quad (9)$$

Also
$$\frac{1}{Y}\frac{dY}{dt} = \nu + \frac{1}{Y}\frac{\partial F}{\partial r}\frac{dr}{dt} = \theta T + \frac{1}{Y}\frac{\partial F}{\partial r}\frac{dr}{dt} \quad . \quad . \quad . \quad (10)$$

Since
$$W = (\alpha - \beta)r + \beta/A \text{ and } A = G(r, t); \quad \frac{\partial G}{\partial r} < 0 \quad . \quad . \quad (11)$$

we may write
$$W = W(r, t) \quad \frac{\partial W}{\partial r} > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad (12)$$

$\partial W/\partial t <, = \text{or} > 0$ according as technical progess is labour saving, neutral or capital saving . . . . . (13)

If technical progress is neutral at the constant rate T and population has the constant growth rate γ, then we may write

$$G(r, t) = G(r) \qquad W(r, t) = W(r) \qquad dW/dr > 0 \quad . \quad . \quad (14)$$

and $dr/dt >, = \text{or} < 0$ according as $W(r) <, = \text{or} > T + \gamma$. (15)

that is according as

$$r <, = \text{or} > r_x \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (16)$$

where r_x is the root in r, if any of

$$(\alpha - \beta)r + \{\beta/G(r)\} = T + \gamma \quad . \quad . \quad . \quad . \quad . \quad (17)$$

The value of r will therefore continue to approach the level r_x for so long as full employment is preserved. In dynamic equilibrium

$$r = r_x; \quad A = G(r_x) \text{ and } W = T + \gamma \quad . \quad . \quad . \quad . \quad (18)$$

The growth rate of productivity will then be given by

$$\nu = \theta T \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (19)$$

where T is *by definition* the rate of growth of productivity when the growth rate of capital equals the natural growth rate. Thus with neutral progress the growth rate of productivity in dynamic equilibrium is affected by the savings propensities α and β and by the growth rate of population γ only in so far as these affect the rate of profit r and in so far as the coefficient 0 and rate T of technical progress may be affected one way or the other by changes in the rate of profit.

When technical progress is labour saving and T, α, β, γ remain constant, r_x the root in r of (17) must be constantly increasing, since $\partial G/\partial t > 0$.

Hence since $\frac{dr}{dt}$ has the same sign as $(r_x - r)$, this sign must eventually become, and thereafter remain, positive in common with that of $\frac{dr_x}{dt}$.

It follows from (3) and (10) that the growth rate of productivity eventually is less than θT, and hence, given full employment and γ and T, the effect of the labour-saving bias in technical progress must be to diminish the eventual growth rate of productivity. Conversely, the effect of capital-saving bias must be to increase the eventual growth rate of productivity.

Stagnation Crisis

We assume, given full employment, that the condition for the avoidance of stagnation crisis is

$$M(r, A) \geqslant W \quad \left(\frac{\partial M}{\partial A} > 0, \frac{\partial M}{\partial r} > 0\right) \quad . \quad . \quad . \quad . \quad (21)$$

where
$$W = (\alpha - \beta)r + \beta/\alpha \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (22)$$

and where at time t

$$A = G(r, t) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (23)$$

We may again write this condition in the form

$$\mathscr{M}(r, t) \geqslant W(r, t) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (24)$$

where
$$\mathscr{M}(r, t) = M\{r, G(r, t)\}$$

$$W(r, t) = (\alpha - \beta)r + \{\beta/G(r, t)\} \quad . \quad . \quad . \quad (25)$$

We *assume* that for all t, $\mathscr{M}(r, t) = 0$ for some sufficiently small positive r, and

$$\frac{\partial \mathscr{M}}{\partial r} > \frac{\partial W}{\partial r} \text{ for all } r \quad . \quad . \quad . \quad . \quad . \quad . \quad (26)$$

It follows that for given t there is a unique positive r_c such that $\mathscr{M}(r_c, t) = W(r_c, t)$ and that the condition for avoidance of stagnation crisis is

$$r \geqslant r_c \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (27)$$

In the case where T and γ are independent of r we have seen (15), (16) and (17) that

$$\frac{dr}{dt} >, = \text{or} < 0$$

according as
$$r <, = \text{or} > r_x \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (28)$$

where
$$W(r_x, t) = T + \gamma \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (29)$$

Hence if $r_x > r_c$ and *if r_c is not increasing*, $r - r_c > 0$ whenever $\frac{d}{dt}(r - r_c) < 0$, and hence r can never become less than r_c.

Hence the two conditions $r_x > r_c$ and $\frac{d}{dt} r_c \leqslant 0$ are sufficient to ensure the avoidance of stagnation crisis.

In particular, if technical progress is neutral, r_x and r_c will be constant and stagnation crisis will be avoided provided $r_x > r_c$.

If technical progress is labour saving r_c must be falling.

For differentiating with respect to t the equation

$$\mathscr{M}(r_c, t) - W(r_c, t) = 0$$

we obtain
$$\frac{\partial \mathscr{M}}{\partial t} - \frac{\partial W}{\partial t} + \frac{dr_c}{dt}\left\{\frac{\partial \mathscr{M}}{\partial r} - \frac{\partial W}{\partial r}\right\} = 0 \quad . \quad . \quad . \quad (30)$$

Hence since we have assumed

$$\frac{\partial \mathscr{M}}{\partial r} - \frac{\partial W}{\partial r} > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (31)$$

the sign of $\frac{dr_c}{dt}$ is that of

$$\left\{\frac{\partial W}{\partial t} - \frac{\partial \mathscr{M}}{\partial t}\right\} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (32)$$

Now if technical progress is labour saving $\partial G/\partial t > 0$, and hence $\partial W/\partial t$ is negative and $\partial \mathscr{M}/\partial t$ is positive: it follows from (32) that r_c is falling as stated above.

Thus the effect of labour-saving progress is to make the risk of stagnation crisis more remote. Conversely, capital-saving bias must bring the danger nearer.

Inflation Crisis

We assume that inflation crisis will be avoided only so long as real wages have a growth rate of at least ω. We may express this condition in the form

$$\frac{1}{(1-\pi)\Upsilon}\frac{d}{dt}\{(1-\pi)\Upsilon\} \geqslant \omega \quad . \quad . \quad . \quad . \quad . \quad (33)$$

We define θ' by the property that when technical knowledge and population are fixed and employment is full

$$\frac{1}{(1-\pi)\Upsilon}\frac{d}{dt}\{(1-\pi)\Upsilon\} = \theta' \quad . \quad . \quad . \quad . \quad . \quad (34)$$

where W is the warranted (and hence actual) growth rate of capital.

If, on the other hand, population has the growth rate γ and technical progress is at the rate T and is neutral

$$\frac{1}{(1-\pi)\Upsilon}\frac{dt}{d}\{(1-\pi)\Upsilon\} = \theta'\{W - T - \gamma\} + \theta T \quad . \quad . \quad (35)$$

Hence the condition for avoiding inflation crisis may be written

$$\omega \leqslant \theta'(W - \gamma) + (\theta - \theta')T \quad . \quad . \quad . \quad . \quad . \quad (36)$$

If dynamic equilibrium is reached $W - \gamma = T$, so that this condition then reduces to

$$\omega \leqslant \theta T \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (37)$$

But until equilibrium is reached the effect of technical progress depends on the sign of $(\theta - \theta')$. If $\theta > \theta'$ technical progress reduces inflationary pressure and the condition (36) may be expressed

$$T \geqslant \frac{\omega}{\theta - \theta'} + \frac{\theta'}{\theta - \theta'}(\gamma - W) \quad . \quad . \quad . \quad . \quad . \quad (38)$$

But if $\theta' > \theta$ technical progress has an inflationary effect and the condition (36) may be written

$$T \leqslant \frac{\theta'}{\theta' - \theta}(W - \gamma) - \frac{\omega}{\theta' - \theta} \quad . \quad . \quad . \quad . \quad . \quad (39)$$

When labour-saving bias is present (35) must be amended by the addition of a term representing the rate of growth of $(1 - \pi)$ with r held constant.

It becomes

$$\frac{1}{(1-\pi)\Upsilon}\frac{d}{dt}\{(1-\pi)\Upsilon\} = \theta'(W - T - \gamma) + \theta T - \frac{1}{1-\pi}\left(\frac{\partial \pi}{\partial t}\right)_{r \text{ const.}}$$

$$\therefore \quad \frac{1}{(1-\pi)\Upsilon}\frac{d}{dt}\{(1-\pi)\Upsilon\} = \theta'(W - T - \gamma) + \theta T - \frac{r}{1-\pi}\frac{\partial G}{\partial t} \quad . \quad (40)$$

The condition on ω thus becomes

$$\omega \leqslant \theta'(W - \gamma) + (\theta' - \theta)T - \frac{r}{1-\pi}\frac{\partial G}{\partial t} \quad . \quad . \quad . \quad (41)$$

Labour-saving progress makes $\partial G/\partial t$ positive, thus reducing the upper limit on ω: it thus increases inflationary pressure at any moment.

It also increases inflationary pressure in dynamic equilibrium: for we have seen that its effect then is to make $(W - \gamma - T)$ negative as well as to make $\partial G/\partial t$ positive; on both counts the upper limit in (41) is less than the corresponding upper limit θT of (37) that would apply if technical progress were neutral.

Similar proofs will establish that capital-saving bias reduces inflationary pressure both *en route* to and in dynamic equilibrium.

The Marginal Efficiency of Capital r' and the Basic Rate of Technical Progress ρ.

The marginal efficiency of capital r' may be defined by the property that with fixed population and zero rate of technical progress

$$\frac{1}{\Upsilon}\frac{d\Upsilon}{dt} = r's \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (42)$$

Provided there is full employment,

$$\frac{1}{\Upsilon}\frac{d\Upsilon}{dt} = r'AW \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (42a)$$

In the more general case where there is technical progress at rate T and population growth at rate γ

$$\frac{1}{\Upsilon}\frac{d\Upsilon}{dT} - \theta T = r'A(W - \gamma - T) \quad . \quad . \quad . \quad . \quad (43)$$

It follows that even if $W = \gamma$, so that all savings are absorbed into "capital-widening" to provide for the extra population, the technical progress may still increase productivity under the conditions of our model: for if $W = \gamma$,

$$\frac{1}{\Upsilon}\frac{d\Upsilon}{dt} = (\theta - r'A)T = \rho T \text{ (say)} \quad . \quad . \quad . \quad . \quad (44)$$

where ρ may be called the *basic rate of technical progress*. We may regard ρT as that growth rate of productivity which costs no savings, and is due to the effects of technical progress on the efficiency and economy with which existing equipment can be used and replaced. It is sometimes useful to regard the technical progress coefficient θ as determined by r', A and ρ, and to rewrite the right-hand part of (44) in the form

$$\theta = \rho + r'A \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (45)$$

This formulation shows the relation of our concepts to those employed in Mr. Kaldor's model in his equation (3). Thus ρT, the basic rate of technical progress, corresponds to his α'', and $r'A$ corresponds to his β'': our technical progress coefficient θ then is given, in terms of his α'' and β'' and our T, as

$$\theta = \beta'' + \alpha''/T \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (46)$$

The condition $(\theta' \leqslant \theta)$ that technical progress should not exert an inflationary influence can also be expressed in terms of ρ, r' and other concepts.

For
$$\theta' = r'A\left\{1 + \frac{\Upsilon}{1-\pi}\frac{d(1-\pi)}{d\Upsilon}\right\}_{t \text{ const.}} \quad . \quad . \quad . \quad . \quad (47)$$

Hence by (45) the condition $\theta' \leqslant \theta$ may also be written

$$\frac{\rho}{r'} \geqslant \frac{A\Upsilon}{1-\pi}\left\{\frac{d(1-\pi)}{d\Upsilon}\right\}^{1}_{t \text{ const.}} \quad . \quad . \quad . \quad . \quad (48)$$

which shows what critical level the ratio of the basic rate of technical progress to the marginal social efficiency of capital must achieve if the effect of technical progress is not on balance to be inflationary.

Working of Model: Algebraic Solution

A detailed specification of the values that the various economic variables, Υ, K, T, etc., will take for specified values of t would usually require very heavy computation, advancing step by step over small time-intervals Δt. However, if the various functions are sufficiently simple it is possible to obtain an algebraic solution with the aid of a desk calculating machine.

For example, suppose that α, β, ν and $\mathcal{N}(= T + \gamma)$ are all constants independent of t and r, and that $\log F(r)$, $G(r)$ and $H(r)$ are all polynomials of low degree in r, independent of t, where

$$\Upsilon = e^{rt}F(r),\ A = G(r),\ r' = H(r)$$

Then
$$\frac{1}{\Upsilon}\frac{d\Upsilon}{dt} = \nu + \frac{d}{dr}(\log F)\frac{dr}{dt}$$

and
$$\frac{1}{\Upsilon}\frac{d\Upsilon}{dt} = \nu + r'A(\mathcal{N} - W)$$

where
$$W = (\alpha - \beta)r + \beta/A$$

Hence
$$\frac{dr}{dt} = H(r)[G(r)\{\mathcal{N} - (\alpha - \beta)r\} - \beta]\Big/\frac{d}{dr}(\log F) \quad . \quad . \quad (49)$$

[1] $\frac{d(1-\pi)}{d\Upsilon}$ can also be expressed in terms of the functions F and G as $\left\{A + r\frac{\partial G}{\partial r}\right\} \Big/ \left\{-\frac{\partial F}{\partial r}\right\}$.

so that if $r = r_0$ when $t = 0$, the value of t when r achieves some other value r_1 is given by

$$t_1 = t(r_1) = \int_{r_0}^{r_1} \frac{\frac{d}{dr}(\log F)\,dr}{H(r)[G(r)\{N - (\alpha - \beta)r\} - \beta]} \qquad (50)$$

In the case where $\log F$, $G(r)$ and $H(r)$ are all polynomials of low degree in r the integrand can be expanded as the sum of partial fractions and $t(r)$ found algebraically. The value of the inverse function $r(t)$ may then be found by graphical or numerical methods for specific values of t, and hence also the values of the other economic variables at these dates.

A knowledge of ω and $M(A, r)$ will then be required as well, in order to check whether inflation crisis or stagnation crisis will interrupt the working of the model at any stage.

Appendix III

The Quantity of Capital

It is assumed in our model that, with fixed technical knowledge, net output per head Υ is a function $f(K)$ of the value of capital per head. Mrs. Robinson has examined [1] what happens when there are a series of discrete values Υ_γ, Υ_β, Υ_α . . . which the value of net output per head can take, corresponding to particular techniques γ, β, α . . . . Υ is made to increase from Υ_γ to Υ_β by varying the mixture of γ plants and β plants, and then from Υ_β to Υ_α, by varying the mixture of β and α plants. She shows that during the transition from Υ_γ to Υ_β profit rates and real wages will remain constant; but at Υ_β they will jump to new levels at which they will stay until Υ_α is reached. The result is that in this discontinuous case a productivity curve relating productivity to the value of capital per head will have the characteristics of the stepped curve in the following diagram.

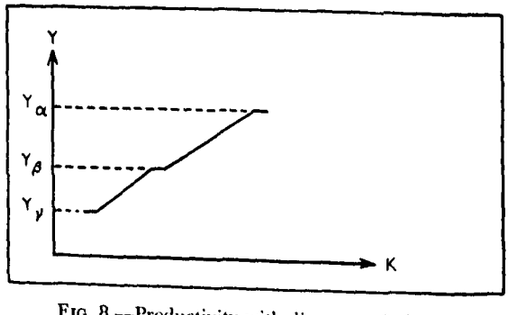


Fig. 8.—Productivity with discrete techniques.

The horizontal sections correspond to changes in the capital-output ratio due to the changes of real wages and interest rates at the levels Υ_γ, Υ_β, Υ_α . . . . But the function $\Upsilon = f(K)$ is best conceived as relating to a smoothed version of the stepped curve, as is suggested by the dotted curve drawn through the stepped curve.

Our definition of r', the marginal social efficiency of capital, was that it was the extra net output from net investment divided by the cost of that investment,

[1] *Review of Economic Studies*, Vol. XXI (2), No. 55, pp. 81–106.

population and technical knowledge being constant. In terms of our diagram, r', on this definition, is the gradient of one of the sloping sections of the stepped curve. But this is quite different from the *average* gradient of the value of net output per head with respect to the *value* of capital per head, which corresponds to the gradient of the dotted curve PQ.

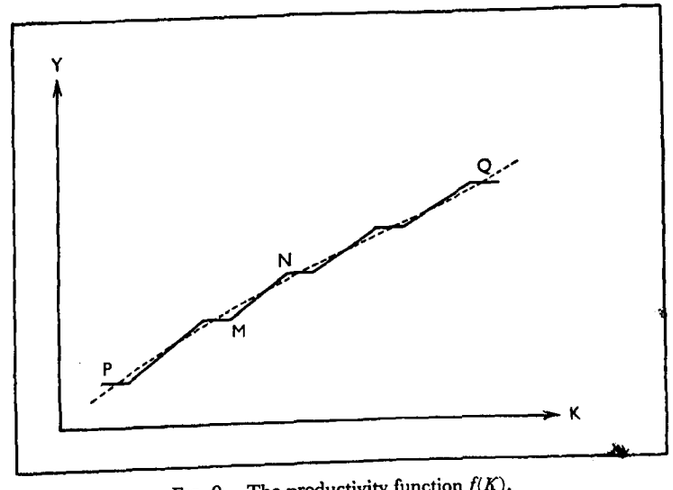


Fig. 9.—The productivity function $f(K)$.

In terms of our function $\Upsilon = f(K)$, this latter gradient is df/dK.

If it were not for the horizontal steps we should have $r' = \frac{df}{dK}$. Suppose in fact that $\zeta r' = df/dK$.

Then if $K_P\Upsilon_P$ and $K_Q\Upsilon_Q$ are the values of capital per head and net output per head corresponding to the points P and Q,

$$\Upsilon_Q - \Upsilon_P = \frac{df}{dK}(K_Q - K_P) = \zeta r'(K_Q - K_P)$$

But

$$\Upsilon_Q - \Upsilon_P = r'(K_Q - K_P - U)$$

where U is the total of the horizontal steps within PQ; hence $1 - \zeta$ is the proportion of U to $(K_Q - K_P)$.

Savings and investments are only needed for increasing K up the slanting parts of the solid curve: movement along the horizontal section merely represents price changes and requires no savings or investment. Hence with fixed population the value of net savings and investment per head bears the ratio ζ to the associated increase in the value of capital per head.

We can also express this by saying that the value of the increment of the quantity of capital per head is ζ times the increment of the value of capital per head. Hence the growth rate of the quantity of capital per head is ζ times the growth rate of the value of capital per head where

$$\zeta = \frac{df}{dK}\Big/ r'$$

Given the functions $Y = f(K)$ and $r' = h(K)$, an index L of the quantity of capital per head is therefore related to K the value of capital per head by the differential equation

$$\frac{K}{L}\frac{dL}{dK} = \frac{df}{dK}\Big/h(K)$$

whence

$$\log\left(\frac{L_1}{L_0}\right) = \int_{K_0}^{K_1} \frac{df/dK}{Kh(K)}\,dk$$

where K_0, K_1 and L_0, L_1 are the values and quantities of capital per head in the base-period and in the current period.

A knowledge of the functions $Y = f(K)$ and $r' = h(K)$ is thus sufficient for constructing an index of the quantity of capital. The index thus found will be equivalent to that described in a note on the measurement of capital by the present author.[1]

[1] *Review of Economic Studies*, Vol. XXI (2), No. 55, pp. 116 and 125.

FACTOR-PRICE RELATIONS UNDER FREE TRADE[1]

IN two well-known articles[2] Professor Samuelson showed that in conditions of free trade, and subject to certain assumptions, *either* the prices of factors in different countries would come to equality *or* there would be complete specialisation by country as regards goods capable of entering into international trade. This conclusion was rather shattering to many economists, and it seems to jar very badly with the manifest facts of the case. It was disturbing to mature economists who are trying to address their minds, with such tools of thought as our science has to offer, to current problems of no little moment, such as investment in under-developed countries, the lowering of trade barriers and migration policy. It was disturbing also to teachers, on whom it has endowed an uncomfortable *arrière pensée*, when they endeavour to convey to classes whatever the modern version may be of the old-time law of comparative costs, which rests essentially on the assumption of unequal returns to factors in different countries and has not been supposed to entail the unrealistic conclusion of 100% specialisation.

It is the purpose of this article to remove the *arrière pensée* and restore the *status quo*.

The reaction of many economists, after a vain struggle to escape from the toils of Professor Samuelson's main argument, was to take refuge in the opinion that his paradoxical results are not achieved in real life, because his more obvious assumptions are not realised, namely, free trade, absence of transport costs and perfect competition, including constant returns to scale. Tariff barriers (which do not exist in all cases) and transport costs appear, however, not to be sufficient to account for the big discrepancies between the facts and Professor Samuelson's theory. Imperfect competition seemed to open the door somewhat wider, if only because the theory of it remains imperfect, and within its ambit anything may happen, so to speak. From the outset I never believed that the disparity between the price pattern as formed under imperfect competition and the price pattern of perfect competition was nearly large enough to account for the observed inequality of factor rewards. Or again, one might take refuge in the idea that labour in low-wage countries was a very inferior kind of labour and a wholly different factor; yet when that same labour migrates to the United States it often seems quite capable of earning the higher wages prevailing there.

I have two comments. The first, which is also probably the more important, is quite straightforward. The second is more intricate and will occupy more space.

[1] Address delivered to the Association of University Teachers in Bristol, January 1957.

[2] ECONOMIC JOURNAL, June 1948 and June 1949.

1. Professor Samuelson claims that his conclusion holds, so long as the number of goods is not less than the number of factors.

> " When we add a third productive factor and retain but two commodities, then the whole presumption towards factor-price equalisation disappears. Suppose American labour and American land have more capital to work with than does European labour and land. It is then quite possible that the marginal physical productivities of labour and land might be double that of Europe in both commodities. Obviously, commodity-price *ratios* would still be equal, production of both commodities will be taking place, but none the less absolute factor prices (or relative for that matter) need not be moved towards equality. This is our general expectation wherever the number of factors exceeds the number of commodities " (p. 193, ECONOMIC JOURNAL, 1949).

This proviso probably suffices alone to account for the facts as they are. Commodities usually require some specific factor of production. This is obvious enough in the case of the minerals—the specific ores must be present; it is fairly obvious in the case of many crop products—rubber, cotton, champagne; more humdrum products, such as wheat and wool, are also favoured by specific qualities of soil; Britain, a great wool importer, also exports wool in substantial quantity owing to some of her wool having specific qualities not obtainable elsewhere. In the wide range of processing not only is man-power of diverse specific skills required, but also specific know-hows in technology. An under-developed country may have sufficient managerial and technological man-power to set up a few factories, but just cannot extend its industrialisation for lack of the right kind of personnel.

The condition that there must be more factors than commodities might be thought very stiff in view of the wide range of commodities that exist. Students of imperfect competition are aware of the quite genuine puzzle contained in the question—what is a commodity? It might be legitimate for purposes of international-trade theory to define a commodity as any class of similar objects which require at least one specific kind of factor not also required by any other objects. A commodity so defined will doubtless normally have sub-varieties: a linen manufacturer may produce sheets, pillow-cases, table napkins, etc.; we cannot suppose that specific factors are required for each of these sub-varieties separately. But then it is unlikely that there will be a great difference in the ratios of the generic factors (labour, capital, etc.) as between one variety of linen product and another, so that a nation will commonly enjoy a comparative advantage (or disadvantage) for the whole lot or for none. A nation which makes linen goods for itself and for export may also import certain specialities; but these will usually embody some traditional skills or designs, or rest on some specific know-how, including patents, and for this reason can be classed, by the above definition, as a separate commodity, without increasing the

number of commodities graded as different by more than the number of factors so graded. If there were some object requiring no specific factor but yet embodying quite a different capital/labour ratio from that of its nearest neighbour object, then in the case of such an object and its neighbour, one might allow Samuelson's complete specialisation; but this would surely be an exceptional case and not of much significance in the broad flow of international trade. Furthermore, when we are dealing with the minute sub-varieties of a commodity the doctrines of imperfect competition may indeed come to our aid to explain the failure to get 100% specialisation.

Since there are several generic factors, then, if we allow that commodities may be defined broadly enough to ensure that each commodity requires at least one specific factor, it will follow that there will always be more factors than commodities and we shall be saved from the Samuelson dilemma.

If the presence of specificity in at least one factor is as important as the foregoing argument suggests, this may lead us to doubt whether the approach which Professor Ohlin has popularised, and which, according to Professor Samuelson, was the departing point for his own thinking,[1] is really a helpful one. Professor Ohlin presented the inequality of the endowment of different countries with the generic factors (*e.g.*, capital and labour) as the prime cause of international trade. This approach has since become popular in text-books. I accordingly suspect that Professor Ohlin has shunted the theory of international values on to the wrong track—like other distinguished economists before him!

2. None the less, I propose to examine the two-factor, two-commodity case. The argument that I shall develop applies, I believe, also to all cases where the number of factors does not exceed the number of commodities, *i.e.*, to all cases to which the reasoning of the foregoing paragraphs does not apply. Indeed, the assumption that I propose to challenge is the more unplausible, the more factors there are.

Professor Samuelson assumes that " commodities differ in their 'labour and land intensities.' Thus, food is relatively 'land-using' or 'land-intensive,' while clothing is relatively 'labour-intensive.' This means that whatever the prevailing ratio of wages to rents, the optimal proportion of labour to land is greater in clothing than in food " (p. 182, ECONOMIC JOURNAL 1949).

Is it in general plausible to assume that, if a certain commodity X is A intensive relatively to commodity Y, given a certain ratio for the price of factor A to that of B, it will be so for *all* ratios of the price of A to that of B? Consider the use of labour and capital in the production of food and clothing. A country very short of capital has perforce to use much capital in food production; the processes of nature entail waiting between sowing and harvesting, and much cannot be done without implements and means of storage; clothing may in this phase be produced on simple spindles and

[1] ECONOMIC JOURNAL, 1948, June, p. 163 and ff.

hand-looms in the living-room; food may then be the more capital intensive. If the nation is better endowed it may establish power-driven textile machinery, while its agriculture proceeds on traditional lines; clothing is then more capital intensive. Still better endowed, it may thoroughly mechanise its agriculture, which then ranks as the more capital intensive of the two.

If we introduce more factors, the assumption of constancy in the pattern of factor intensity, whatever the relative prices of the factors, becomes more

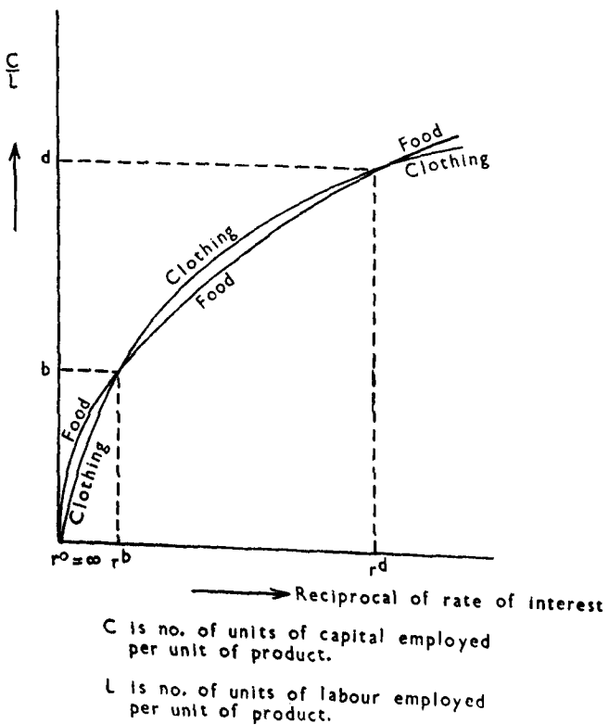


FIG. 1

unplausible. If we list labour, capital disposal, land, engineering ability, managerial ability, enterprise, we are still classifying factors by a very broad mesh. At the opening position we can say that ratio of the intensity of labour to capital is higher (+) or lower (−) for Y than for X; there are fifteen ratios of factor intensity, to which we have to assign plus or minus. Is it plausible to suppose that this whole array of fifteen pluses and minuses will remain unchanged, by however much the relative prices of the factors may vary?

In Fig. 1 curves are traced for two commodities, food and clothing. In the case of both, as the rate of interest falls, the capital intensity rises.

(The "rate of interest" gives a very artificial, and indeed inadequate, representation of the supply price of capital. The real cost of borrowing should often be represented by a much higher percentage figure than the rate of interest obtaining in a securities market, which may be narrow.[1])

The curvatures differ for the two commodities, as they must at some point, if, at any point, one commodity is to be more capital intensive than the other. At two points, namely, r^b and r^d, the curves are shown as intersecting. When the rate of interest is at either of these levels the optimum (cheapest) way of producing food requires an admixture of capital and labour which is the same as that required for the optimum way of producing clothing. When the rate of interest is above r^b (left-hand end of the diagram), then the ratio of capital to labour is higher in food than is clothing; when the rate is between r^b and r^d, then the ratio of capital to labour is higher in clothing than in food; when the rate is below r^d, then the ratio of capital to labour is higher in food. There is no *a priori* reason why these curves should intersect or why they should not intersect. If they do intersect, then we have scope, as I shall presently explain, for *free trade with unequal factor prices and incomplete specialisation*, even in a two-factor, two-commodity, two-country model. It is to be noted that Professor Samuelson is here challenged, not on the score of his proof, which is accepted, but on the propriety of one of his assumptions. The reader may think that, if we had a multi-dimensional diagram with fifteen pairs of factor ratios (derivable from five), the required postulate would be unacceptable as the foundation of a general theory, and perhaps unplausible. The required postulate is that, if the ratio between any two factors used in clothing exceeded (or fell short of) that used in food given one set of values for the six factors, it must also exceed (or fall short) for all sets of factor values whatever. Indeed, if it were not for the escape clause provided in the earlier section of this article relating to the specificity of factors, I would argue that the pattern of trade, as we find it in the world to-day, and have found it for many generations, *proves* that the required postulate is not realised in fact.

The consequences of the intersection of these curves for the theory of international trade are shown in Fig. 2. This shows in juxtaposition the

[1] The "rate of interest" is economical of wording in a discussion of this kind, since it dispenses with such a lengthy expression as "the ratio of the supply price of capital to the supply price of labour." The "rate of interest" comprises in one short expression a reference to the ratio between these two supply prices; thus "three per *cent*" means that £3 has to be paid for a year's waiting in respect of embodied labour *costing* £100 (or in respect of any other embodied factors). If the money value of a unit of labour goes up, the amount of money that has to be paid for a year's waiting in respect of a unit of labour goes up in the same proportion, *unless the rate of interest alters*. A change in the rate of interest thus involves a change in the supply price of a unit of waiting *relatively* to the supply price of a unit of labour; and there can be no change in the supply price of labour relative to that of waiting without a corresponding change in the rate of interest. Thus if one works with the rate of interest, no further reference to the supply price of the other factor is needed; the expression "rate of interest" itself stands for a ratio (x per y), one term of which is the supply price of some factor other than waiting.

situations of five countries, A, B, C, D and E, which have increasing capital endowments per unit of labour as we move downwards and to the right. We assume that different rates of interest are established in each, being lower in the countries with the higher capital endowment. In country A the rate of interest is above r^b; in country B it stands at r^b; in country C it is between r^b

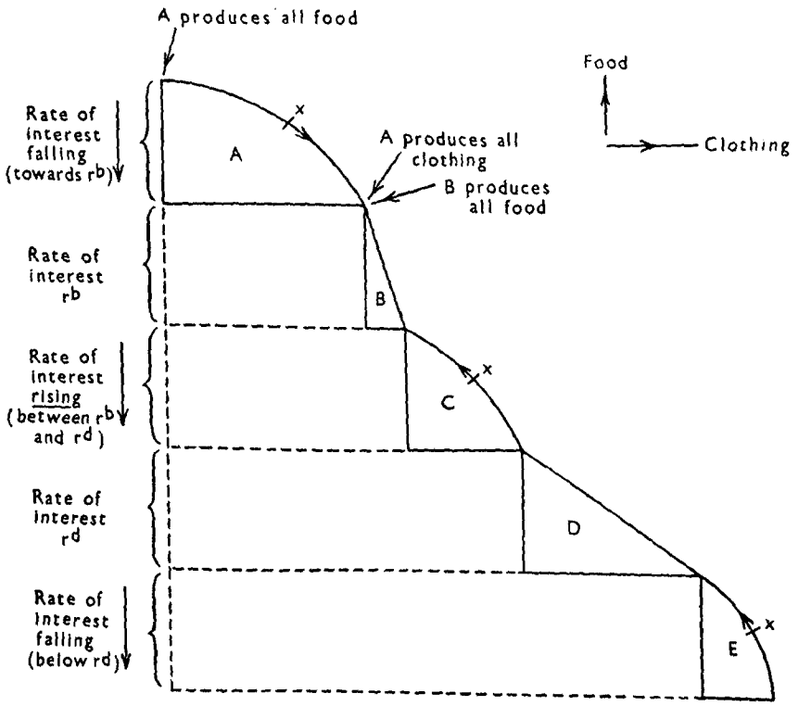


FIG. 2

and r^d; in country D it stands at r^d; and in country E (the most highly endowed with capital) it is below r^d. For each country separately a production-possibility function is shown, and in each country the top left-hand point of the curve represents a condition in which all productive resources are devoted to food, while the bottom right-hand point represents the position in which all productive resources are devoted to clothing.

Let us examine each country in turn. The diagram for country A exhibits the normal pattern. The production-possibility function is concave to the origin. As we move progressively over from the production of nothing but food to the production of nothing but clothing, the rate of interest falls, since clothing is less capital intensive. This fall stimulates the use of more capital-intensive methods, if such are available, in the production of both food and clothing. The distribution of resources between food and clothing will depend, if the economy is insulated, primarily on demand.

The rate of interest will stand at a level that induces methods of production, such that the cost of production (= price) of each commodity induces demands for amounts of each commodity, production of which is consistent with the rate of interest being at that level. Full employment of productive resources is assumed. For the sake of convenience (and the continuity of the graph) we may assume that when interest is at its lowest in A, viz., when all resources are devoted to clothing, the less capital intensive of the two commodities, it is almost as low as it is in B (r^b).

The condition of country B (like that of country D) is peculiar, and we need not suppose that any country is ever in fact precisely in this condition. It is inserted in the figure in order to clarify the argument. It appears from Fig. 1 that, if the rate of interest is at r^b, the optimum (cheapest) method of producing food requires the same ratio of capital to labour $\left(\text{call it } \frac{C_b}{L_b}\right)$ as does the optimum (cheapest) method of producing clothing. We suppose that the endowment of country B with capital and labour is in the ratio $\frac{C_b}{L_b}$. In such circumstances the rate of interest in country B is unequivocally fixed at r^b. Whatever proportions of its resources country B devotes to the production of food and clothing, the rate of interest will be the same, viz., r^b. For, since at this rate food and clothing are neither more capital intensive than the other, resources can be switched from food to clothing, or conversely, without making any difference to the requirements for capital and labour in the country. Normally the production-possibility function is concave to the origin. But in B it is a straight line. This is because the capital endowment of B happens to have a ratio of capital to labour which is equal to one of the ratios at which the capital intensity curves of food and clothing intersect, as shown in Fig. 1 (viz., the inter-section where the rate of interest $= r^b$). In this exceptional case both industries, food and clothing, are subject to *constant* costs in the strict sense. Neither industry has a greater capital intensity than the other, and consequently it is possible to switch resources and output between them without altering the value of capital relative to labour. Thus neither their methods of production nor the cost (nor price) ratios of their products will be altered as the switch occurs. The production-possibility function of a country is normally concave to the origin, because one or other of the two industries is normally more capital intensive.[1]

I hope that it is intuitively obvious that an intersection of the curves of Fig. 1 cannot lie within a range of other production possibilities in any single country. If a country can have a rate of interest at which these

[1] The reasons for the normal concavity of the production-possibility function and its linearity in exceptional cases are both explained fully in "Notes on Supply," pp. 240–1, by R. F. Harrod, in ECONOMIC JOURNAL, June 1930; reprinted in *Economic Essays*, pp. 86–8. The proof there given strikes me as conclusive, but I am told that mathematical economists prefer a greater proliferation of symbols in a proof. (Do *pure* mathematicians?)

curves intersect, then it can have no other; this will be its unique rate of interest, whatever combination of food and clothing production it chooses. The whole range of the production possibilities will be nothing more than an expansion of the single point of intersection of the curves in Fig. 1. Any country whose capital/labour endowment ratio is other than one represented by an intersection of the curves in Fig. 1 will *either* be more capital intensive in the production of food throughout its *whole* range of production possibilities *or* more capital intensive in the production of clothing, throughout its *whole* range of production possibilities. In either case the curve of its production possibilities will be concave to the origin.

It may be well to stress this point, since lack of thorough understanding of it could be a reason for failure to notice the possibility (even probability) of the same commodity being capital intensive in comparison with some other standard commodity in one country and labour intensive by comparison with that same (standard) commodity in another. If in any equilibrium position commodity Y is capital intensive by comparison with a (standard) commodity X in country A, it must be capital intensive for every possible equilibrium position whatever in country A, assuming, as is reasonable, continuity of the production-possibility function. If for one distribution of A's productive resources Y is capital intensive, Y must be capital intensive however A distributes its productive resources throughout the range of possible distributions, viz., from no production of X to no production of Y. Thus residents of country A, including even economists, seeing that Y is capital intensive at home, however much or little of Y is produced, may fall into the view that Y is *per se* more capital intensive than X. But this is a myopic view. Y may in fact be more labour intensive than X in some other country, say C, but, if it is, it must be more capital intensive throughout the range of C's production possibilities, so that the residents of C may fall into the opposite illusion that Y is *per se* more labour intensive.

The reason why each country is thus limited and must throughout its range show one or other commodity as uniformly capital intensive, although the commodity may not be uniformly capital intensive in the world as a whole, is that to get from a production pattern in which Y is more capital intensive to one in which it is more labour intensive, one has to pass a point at which Y is neither. But if Y were neither capital intensive nor labour intensive at any one point on the country's production-possibility function, it would necessarily be neither at all points on its function (as in B and D in Fig. 2). Thus this point creates an unbridgeable gulf between two countries. Only if factors of production were perfectly mobile internationally, would Y be *either* more labour intensive *or* more capital intensive throughout the world.

We now come to country C, the condition of which contains the key to the argument against Professor Samuelson. Its capital endowment is

such that, however much food or clothing it produces, its rate of interest will be between r^b and r^d. In all this range of interest rates the optimum method of producing clothing will be more capital intensive than the optimum method of producing food. Consequently, in diametrical opposition to the conditions in countries A and E, the interest rate in C will be lowest when it is producing all food. Whereas in countries A and E, when we proceed from the top left to the bottom right, the rate of interest falls, in country C, when we proceed from the top left to the bottom right, the rate of interest *rises*. When we go over from the production of food to the successive production of more clothing the rate of interest must rise, because in C clothing is the more capital intensive of the two commodities.

The gradient of the production-possibility curve at any point measures the cost of clothing in terms of food at that point, viz., the number of units of food that have to be surrendered to obtain one unit of clothing. If commodity cost ratios are to be equal in the two countries, A and C, and both countries are to produce some of each commodity, there must be some point (or points) on A's production-possibility curve where the gradient is equal to the gradient at some point (or points) on C's. Were it not for the intersection of the curves in Fig. 1 the gradient of the curve for country C would be greater, throughout its length, than the gradient of the curve for country A at any point; that would give Samuelson's 100% specialisation; the cost of clothing in terms of food would be higher in C, however much of food or clothing A and C produced. But, given the intersection, there will be a number of gradients on A's curve corresponding to which equal gradients may be found on C's curve. These are points of possible equilibrium with foreign trade.

Let us suppose that the two countries are insulated. Ordinary supply and demand analysis determines how much of food and clothing will be produced in each country (X in Fig. 2). Suppose that the cost (= price) of clothing in terms of food is greater in C than in A, when both are insulated. If trade is opened C purchasers will buy clothing from A, and its cost will rise in A while its cost in C (owing to diminished production) falls. At the same time the A purchasers will buy food from C, where its cost will rise in consequence, while that in A falls. The movement rightwards will proceed along the production-possibility curve of A (as shown in figure), which gets progressively steeper, and the movement leftwards will proceed along the production-possibility curve of C, which gets progressively flatter, until the two gradients come to equality.

It is to be observed that, wherever production settles down in the two countries in consequence of trade, the rate of interest will remain lower in C, since it is lower there however its resources are divided between food and clothing. We may be sure that wages (not shown in the diagram) will be higher in C than in A, since labour in C is more highly endowed with capital. Thus we have trade between the countries, causing an equalisation

of commodity prices, but no equalisation of factor prices. The trade will tend to lower interest and raise wages in *both* countries, since in both countries there is a movement towards the commodity which in its own country is less capital intensive. If in the no-trade position the gradient had been steeper in A, then A would have exported food in exchange for clothing, and interest rates would have risen and wages fallen in both countries. (These relations, be it noted, are very damaging to the Ohlin approach.)

There will also be opportunities of trade with E, as shown in the figure. But in E the consequence of trade will be a *rise* in the rate of interest.

The curves have been drawn so that almost all rates of interest are represented on the production functions of one or other of the countries. Thus as A goes over to clothing, the rate of interest falls almost to r^b. It cannot quite fall to r^b, since, if it did, A would be identical with B and its production function would be linear.

On the assumption that the rate of interest falls almost to r^b, as A goes over towards all clothing, the (linear) production function of B is almost parallel to the lowest portion of the production function of A. Making a similar assumption in regard to C, namely that her rate of interest *rises* almost to r^b as she goes over towards all clothing, the lowest portion of her production function is almost parallel to the (linear) function of B and to the lowest portion of the production function of A. By similar assumptions and reasoning the (linear) production function of D is almost parallel to the highest section of the production function of C and also to the highest section of the production function of E.

On these assumptions *either* there will be, for every point on the function of C, a point having an equal gradient on the function of A, *or* there will be, for every point on the function of A, a point having equal gradient on the function of C. Similarly, *either* there will be, for every point on the function of C, a point with equal gradient on the function of E *or* there will be, for every point on the function of E, a point having equal gradient on the function of C. Thus there will be plenty of opportunities for free trade without 100% specialisation, and, of course, equalisation of factor prices is, in the circumstances, not only not necessary, but also impossible.

It is not compulsory to draw the figure in this way. It might happen that there were gaps, with some rates of interest not represented on the production-possibility functions of any of the countries. There is no reason to suppose that this would reduce the opportunities for profitable trade with incomplete specialisation.

It need hardly be added that there is nothing in the essential nature of this analysis to lead to the conclusion that the poorest country is likely to export clothing, which happens to be the less-capital intensive of the two commodities for a very poor country. Which way the trade will flow between A and C depends on: (*a*) the comparative amounts of curvature of

their two production possibility curves, and (*b*) the ways in which the countries A and C divide their resources between food and clothing, when insulated. In my drawing the curve of A has more curvature than that of C, and that is why at approximately the mid-point of the curve the price of clothing is higher in C than in A. There is no *a priori* reason why the C curve should not have more curvature than that of A.

If there were such countries as B and D it seems that B would specialise completely in food and D in clothing; but it is unlikely that there will be any such countries.

If factors were perfectly mobile between countries, then the whole world would be in the position either of an A-type country or of a B-type country or of a C-type country. The rate of interest might be established for the world at a point of intersection of the capital-intensity curves of food and clothing, in which case both those commodities would (on the two-factor assumption) be subject to constant costs throughout the world. Otherwise the rate would either lie in a range in which food was more capital intensive or in one in which clothing was more capital intensive. Thus if, for one distribution of world productive effort between food and clothing, food was more capital intensive, it would be more capital intensive for every possible distribution—given, of course, the world capital and labour endowment and the state of technology that happened to prevail at the time. That is the Samuelson postulate that we have challenged in this article. For the world as a whole, if there is complete mobility of factors, the realisation of Samuelson's postulate is the *consequence* of factor-price equalisation (which is due to the complete mobility of factors) throughout the world; but the realisation, if there is not complete mobility, is improbable.

It may be that the foregoing demonstration is concerned with a condition, viz., the number of factors not more than the number of commodities, which is not likely to be realised. I believe that the true explanation of the flow of trade springs from the number of commodities, broadly defined, as is proper for this purpose, being less than the number of factors, owing to the existence of at least one specific factor for every commodity so defined. But it is satisfactory to know that, even on the wire-drawn hypothesis of two factors and two commodities, the Samuelson conclusion holds only on the unlikely assumption, which it is fair to say that he himself recognised as required, that the curves of factor intensity never intersect. This assumption is even less likely to be fulfilled if there are more than two factors and commodities.

I conclude that the Samuelson case of the alternatives of equal factor prices or 100% specialisation is a *curiosum* in international trade theory, and should be presented as such, rather than as a fundamental principle or as an analysis of any probable development.

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DYNAMIC DEMAND FUNCTIONS: SOME ECONOMETRIC RESULTS [1]

I. Introduction

The purpose of this article is to present some results of applying a dynamic model of consumers' behaviour. These applications relate mainly to the quarterly series of consumers' expenditure in the United Kingdom for the postwar period 1950–56, but it is also shown that these results may be combined with the information obtained from interwar time series and family budgets. Both durable and perishable commodities are treated, and some extensions of a model previously presented [2] are made.

The nature of this model may be broadly characterised in the following terms. It is evident that in the case of durable goods what consumers really demand is a stock of such goods which they can consume by using them. For example, we do not demand a daily purchase of new clothes, but the daily use of a given stock of clothes in our wardrobe. It may be said that consumers are in equilibrium when, at their given real income and at the given relationship between the price of this good and of other goods, they are content with holding the stock which they are in fact holding. When they are out of equilibrium, when, for example, the stock they hold is less than the stock which they would like to be holding, they will increase their current purchases of the good in order to build up their stock at a certain rate to the desired level; and it is probable that they will attempt to build up their stock the more quickly, the larger is the divergence between the stock which they are in fact holding and the stock which at current prices and real incomes they would like to hold. In the real world it is possible to observe only the current purchases of the good by consumers, and these purchases are partly for the replacement of their stocks as they are used up and partly for the expansion of their stocks. But it is the argument of the following sections of this paper that if reasonable assumptions are made about the durability of the good in question, then from the data of current purchases, prices and real incomes it is possible to derive estimates of the stocks held, of the stocks which consumers would like to hold and of the rate at which consumers adjust their actual stocks towards the level of their desired stocks. Estimates may be made for each durable good, first, of the effect which a change in real income or in relative prices would have upon the size of the equilibrium stock of that good which consumers would like to hold and, second, of the speed with which consumers attempt to adjust their

[1] In the preparation of this paper we have received a number of most helpful suggestions from Dr. S. J. Prais.

[2] Stone, Richard, and Rowe, D. A., "The Market Demand for Durable Goods," *Econometrica*, Vol. 25, No. 3, July 1957, pp. 423–43.

actual stocks to this equilibrium level when there is a discrepancy between the actual and the equilibrium levels of their stocks. In this way it is possible to construct demand functions which are based on the assumption that the consumers' purchases of such products are undertaken for the purpose of adjusting their stocks of the durable product at a certain rate to the stocks which, in current market conditions, they would wish to hold.

Purchases of perishable goods in this model are always used up immediately, and there is no possibility of accumulating stocks of these goods; that is, purchases and consumption are the same. Consumers are out of equilibrium in respect to their consumption of perishables when there is a discrepancy between their actual purchases of these goods and the purchases they would like to be making at the given levels of real income and relative prices. As for durable goods, it is reasonable to suppose that the speed of the adjustment will be in proportion to the size of the discrepancy. The demand function is then essentially the same as that for durables.

In the following section the model is given a specific form and the basic regression equations are derived. The actual regression results obtained for the postwar period are discussed in Section III. Comparisons with results for the interwar period are presented in Section IV, and a final section draws some conclusions from the analysis.

II. A Dynamic Model of Consumer Demand

The simple dynamic demand model to be applied in the following sections is formulated in terms of a durable commodity. A perfectly perishable commodity appears as a special limiting case in which the degree of durability is reduced to zero. The exposition takes the form of a period analysis; in any particular application the relevant period, whether a year, three months or one month, will be determined by the data.

It is supposed that for any durable commodity the purchases (or gross investment) of a period, q, may be regarded as the sum of two components representing an amount, u, of consumption (or depreciation) during the period, and an amount, v, of net investment:

$$q = u + v \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

The net investment, v, is by definition the net addition made to the opening stock, s, during the period, or

$$Es = s + v \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

where E is an operator such that $E^{\theta}x(t) = x(t + \theta)$. Es is thus the closing stock of the current period and, equally, the opening stock of the following period. Consumption is simply the using up of the available stock, and it is assumed that this proceeds at a constant proportionate rate. In each period, therefore, consumption is a certain proportion, $1/n$, of the opening stock

plus an equal or smaller proportion, $1/m$, of the purchases of the period. That is,

$$u = s/n + q/m \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$

If purchases are made only at the outset of the period, the rate of consumption out of purchases will be the same as for the opening stock, and in this case $m = n$. It is more reasonable to assume, however, that purchases will be spread through the period, with the result that a smaller proportion has been consumed by the end of it, that is $m > n$. The value of m will be given by some function of n, depending on the manner in which purchases are distributed over the period. For all practical purposes it may be assumed that purchases are spread evenly through the period, and in this case the value of m is given approximately by the formula

$$m = 2n - 1/3 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$

It may also be shown that, given the assumption of a uniform rate of purchase, the average level of stocks during the period, $\bar{s}$, is a simple weighted average of the opening and closing stocks:

$$\bar{s} = \frac{n}{m} Es + \left(1 - \frac{n}{m}\right)s \quad . \quad . \quad . \quad . \quad . \quad . \quad (5)$$

In this system of relationships the only quantities that may be actually observed are the purchases, q. The rest are implicit in the definitions. Given the value of n, it may readily be seen that these equations are sufficient to determine each of the other series. Combining equations (1) to (3), the opening stock may be expressed as a weighted sum of all past purchases; that is,

$$s = \frac{n(m-1)}{m(n-1)} \sum_{\theta=1}^{\infty} \left(\frac{n-1}{n}\right)^{\theta} E^{-\theta} q \quad . \quad . \quad . \quad . \quad (6)$$

If s is known, then u may be determined from (3) and, consequently, v from (1). Although equation (6) implies that all past purchases must be known to determine s, the weights become so small for the remoter values that in practice only a limited sequence is required.

The essentially dynamic character of the model derives from a distinction between the actual level of stocks and the desired or equilibrium level, s^*, depending on income and prices. It is assumed that consumers will seek to adjust their average level of stocks to the desired level but that in general this adjustment will not be accomplished in a single period. Different rates of adjustment will characterise different commodities. A specific form of this behaviour is expressed by the equation:

$$\bar{s} - s = r(s^* - s) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (7)$$

Here it is implied that in each period consumers will act so as to raise (lower) the average level of stocks, $\bar{s}$, above (below) the quantity actually

held, s, by a proportion, r, of the discrepancy between s and the desired level, s^*. If s^* remains constant the average level of stocks will approach closer to this desired level in each successive period. The speed of this process of adjustment will depend upon how near to unity is the value of the parameter r.

An alternative formulation of this same general pattern of behaviour may be obtained by replacing the absolute values of each of the variables in (7) by their logarithms. In absolute terms this is equivalent to

$$\frac{\bar{s}}{s} = \left(\frac{s^*}{s}\right)^r \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (8)$$

which is the form adopted for the present applications. Substituting for $\bar{s}$ from (5), equation (8) may be rearranged to give

$$v = \frac{ms}{n}\left\{\left(\frac{s^*}{s}\right)^r - 1\right\} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (9)$$

in which the net investment of the period, v, is shown explicitly. If this expression for v is substituted in the definitional equations (1) to (3), the comparable formulations of consumption and purchases are also obtained. That is,

$$u = \frac{m}{n(m-1)}(s^{*r}s^{1-r}) \quad . \quad . \quad . \quad . \quad . \quad . \quad (10)$$

and

$$q = \frac{m^2}{n(m-1)}(s^{*r}s^{1-r}) - \frac{ms}{n} \quad . \quad . \quad . \quad . \quad . \quad (11)$$

In equation (10) consumption is shown to be a certain proportion of a weighted geometric average of the equilibrium stock and the opening stock. This equation is the one most suitable for regression purposes, since it is of simple linear form when converted to logarithms.

To complete the model it is necessary to specify the dependence of s^* on income and prices. This may be written

$$s^* = a\rho^b(p/\pi)^c e^{gt} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (12)$$

where ρ is real income (or total expenditure), p/π is the relative price of the commodity and t is a linear trend. Equations (10) and (12) together give,

$$u = a'\rho^{br}(p/\pi)^{cr}e^{grt}s^{1-r} \quad . \quad . \quad . \quad . \quad . \quad (13)$$

which is taken as the basic form for the regressions of the following sections. In this equation the coefficients br and cr represent the short-period income and price (substitution) elasticities for consumption. They are termed short-period elasticities because they reflect the immediate adjustment to income and price changes within the unit period. If income and price levels remained unchanged in subsequent periods, consumers would ultimately adjust to the equilibrium position, where $s = s^*$ and, as may be seen

from (10), consumption is proportionate to s^*. Thus the coefficients b and c may be regarded as the long-period income and price (substitution) elasticities. It is also evident that in equilibrium net investment is nil and purchases are equal to consumption, so that the long-period elasticities for purchases are the same as those for consumption. The short-period elasticities for purchases take the form $brmu/q$ and $crmu/q$ with respect to income and prices respectively. For small variations from an equilibrium position, when the ratio of consumption to purchases is unity, they will have the constant values brm and crm.

The durability of a commodity determines the magnitude of the parameter n. Since the depreciation process involved is essentially of the reducing balance form, it is implied that no durable commodity is ever wholly used up. It is convenient to have a measure, n^*, of the number of periods taken for 90%, say, of a purchase to be consumed. This is given to a close approximation by the formula:

$$n^* = 2{\cdot}3n - 1{\cdot}2 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (14)$$

Perishable commodities are, by definition, always wholly consumed within the unit period ($m = n = 1$), and there is neither net investment nor stocks. This is the limiting case of zero durability, with consumption identically equal to purchases. It leads to a consumption equation very similar to (13), in which the opening stock is replaced by the consumption of the previous period. That is,

$$u = a\rho^{br}(p/\pi)^{cr}e^{grt}(E^{-1}u)^{1-r} \quad . \quad . \quad . \quad . \quad . \quad (15)$$

In practical applications it will usually be necessary to assume a value for n *a priori*, since little information is available on the depreciation of consumer goods, although in special cases it may be possible to determine this parameter directly from the data.[1] The value of m can then be calculated on the assumption that purchases are spread evenly through the unit period. The values of r and the other coefficients may be determined by regression analysis on the basis of equations (13) or (15).

The parameters n, m and r are essentially time rates, and will vary with the length of the unit period adopted. Both annual and quarterly data are used in the present applications, but the results have been standardised to an annual basis for the comparisons made in Section IV. Similarly, attention is concentrated on the long-period elasticities with respect to income and prices, since these may be regarded as the basic structural parameters independent of the time scale.

[1] Cramer, J. S., " The Depreciation and Mortality of Motor Cars," paper read to the Royal Statistical Society, December 17, 1957, to be published in the *Journal of the Royal Statistical Society*.

III. Estimated Demand Functions for the Postwar Period

The estimated demand functions have been fitted to quarterly data for the period 1950–56.[1] Only the broad groups of consumers' expenditure are treated; sufficient information is not readily available to carry out the analysis on anything like a commodity basis. Although wholly free-market conditions never obtained, for the rationing of domestic coal persists to the present day, the period chosen excludes a large part of the disturbances connected with postwar shortages, rationing and price control. Even so, not all the commodity groups in the published statistics could be successfully analysed. The rationing of food continued into 1954, and it was not to be expected that an adequate demand equation could be fitted to the quarterly data for this period. The groups covering " travel " and " other goods and services " are both probably too heterogeneous to yield reasonable results from an aggregate analysis. No analysis was attempted for the group " housing," since the operation of rent control and the inadequacies of the data combine to render this item quite unsuitable for the present purpose. The eight groups for which reasonable results have been obtained are: beer, other alcoholic drink, tobacco, fuel and light, durable household goods, footwear, other clothing and entertainments. In addition, it has been possible to analyse separately the two component groups of household durables; that is, furniture and furnishings, and hardware, radio and electrical goods.

The fitting procedure adopted is that of ordinary least squares regression, which has been applied to the logarithmic forms of equations (13) and (15). To remove, as far as possible, any serial correlation in the observed residuals, the logarithmic series were converted to first-differences before fitting. A particular problem involved in the use of quarterly series is the presence of purely seasonal shifts in consumption. These are treated here as short-term, systematic changes in tastes, similar in character to the residual trend factor included in the specification of the equilibrium stock function (12). For the present purposes each of the regression variables, that is the first differences of the logarithmic series, has been adjusted by deducting from each observation the corresponding quarterly mean. Accordingly, no seasonal or trend coefficients are shown in the results of the analyses given below. The procedure is formally equivalent to the inclusion of " dummy " trend and seasonal variables in the basic equation, and is adopted for greater simplicity in computing.[2]

Much of the seasonal variation in consumption will be associated with changes in weather conditions. It is probable, therefore, that deviations from the average seasonal pattern of weather variation will also have a

[1] Central Statistical Office, *Monthly Digest of Statistics*, H.M.S.O., London.

[2] Stone, Richard, *Quantity and Price Indexes in National Accounts*, Organisation for European Economic Co-operation, 1956.

significant influence upon certain items of consumption. These effects, moreover, are much more likely to show up in quarterly data than they would in annual averages. To take account of this, three weather factors were introduced into the analysis: temperature, rainfall and sunshine. Specifically, the three variables used are: the daily mean air temperature at sea-level in degrees Fahrenheit, the average monthly rainfall in inches and the mean hours per day of sunshine. The quarterly averages for England and Wales, Scotland and Northern Ireland [1] were combined, using weights roughly proportional to the population. It was not thought necessary to convert these series to logarithms, but, as for the other regression variables, the seasonally adjusted first-differences were used.

A further possible extension to the specification of equilibrium stocks in equation (12) is the introduction of lagged variables. It is possible, for instance, that the desired level of stocks is determined not only by current income but also by the experience of the recent past. In the simplest case this would lead to the replacement of ρ by a new variable ρ^*, which is a weighted (geometric) average of income in the current and immediately preceding period. That is,

$$\rho^* = \rho^{\eta}(E^{-1}\rho)^{1-\eta} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (16)$$

The value of η may be determined from the regression. It will normally be some positive fraction, implying that the effective income level is a simple average of the two periods. It is possible, however, that it may take a value greater than unity, indicating that consumers are influenced by some extrapolation of past income experience. A similar treatment of prices is possible, which lends itself to an interpretation in terms of expectations. For the quarterly data analysed here, however, no significant reaction to lagged prices could be found.

The results of the analyses are set out in Table I, which shows the regression coefficients obtained for the basic equation (13) or (15), including the additional variables discussed in the preceding paragraphs where these proved to be significant. An initial column of this table shows the values of n assumed for the analyses. They are the reciprocals of the quarterly rates of depreciation and indicate that purchases of clothing and footwear are on average written down to 10% of their value in a little less than one year and a half, while the corresponding figure for household durables is approximately eight years. The values of n have simply been assumed *a priori* for the purpose of the present analysis, but there is some evidence from interwar data in support of the value chosen for household durables.[2] The other commodities, alcoholic drinks, tobacco, fuel and light and entertainments, are treated as being perfectly perishable. The goodness of fit obtained in each case is shown by the square of the multiple correlation

[1] Central Statistical Office, *Annual Abstract of Statistics*, H.M.S.O., London.

[2] Stone, Richard, and Rowe, D. A., "The Market Demand for Durable Goods," *Econometrica*, Vol. 25, No. 3, July 1957, pp. 423–43.

coefficient, R^2, in the last column but one. For the durable commodities a particularly high proportion of the observed variation has been explained, not less than 90% in each case. It must not be forgotten, however, that these figures apply to the derived series of consumption, u, and that for the actual purchases, q, the figures are necessarily lower. On the other hand, that part of the original variance due to seasonal factors has not been taken into account here, and this reduces the apparent degree of explanation obtained. The final column of the table gives the value of Durbin and Watson's

TABLE I

Consumption Functions for the United Kingdom, 1950–56

Commodity.	n.	Coefficient with respect to						R^2.	d.
		ρ.	$E^{-1}\rho$.	p/π.	$E^{-1}u$ or s.	Temperature.	Rainfall.		
1. Beer	1	0·68 (0·33)	—	−0·53 (0·22)	−0·31 (0·15)	0·79 (0·28)	−0·85 (0·43)	0·81	2·43
2. Other alcoholic drink	1	3·23 (0·81)	—	1·52 (0·95)	−0·47 (0·12)	—	—	0·74	2·40
3. Tobacco	1	1·00 (0·25)	—	−0·78 (0·35)	−0·20 (0·15)	—	—	0·48	1·85
4. Fuel and light	1	−0·06 (0·44)	—	−0·66 (0·33)	−0·10 (0·18)	−0·76 (0·33)	—	0·60	2·06
5. Durable household goods	14·41	0·15 (0·02)	0·05 (0·02)	−0·014 (0·021)	0·91 (0·05)	—	—	0·96	2·13
6. Furniture	14·41	0·16 (0·02)	0·05 (0·03)	−0·012 (0·023)	0·88 (0·05)	—	—	0·97	2·42
7. Hardware	14·41	0·10 (0·03)	0·02 (0·03)	−0·06 (0·02)	0·95 (0·07)	—	—	0·93	2·03
8. Footwear	3·02	0·25 (0·08)	0·24 (0·09)	−0·08 (0·06)	0·69 (0·07)	—	—	0·91	2·25
9. Other clothing	3·02	0·44 (0·08)	—	−0·09 (0·08)	0·73 (0·06)	—	—	0·90	1·57
10. Entertainments	1	(0·42) (0·35)	—	−0·33 (0·23)	(0·29) (0·20)	0·41 (0·25)	—	0·47	2·36

d-statistic [1] for each analysis, indicating the degree of serial correlation in the observed residuals. A value close to 2 for this statistic indicates a relative absence of serial correlation, but there are at present no precise tests of significance readily available for analyses employing the number of determining variables used here.

Estimates of personal disposable income are not available on a quarterly basis for this period, and the series for ρ used in the analysis is total expenditure at constant prices. The coefficients of ρ, $E^{-1}\rho$, and p/π shown in the table are the short-period (quarterly) elasticities with respect to total expenditure in the current and preceding period and the relative price, respectively. For the perishable commodities only the level of current expenditure is relevant, that is, $\eta = 1$. For each of the durable commodity groups except clothing, however, a value of η less than unity is obtained. The short-period elasticity with respect to ρ^* is given by the sum of the coefficients for ρ and $E^{-1}\rho$, and the estimate of η is the ratio of the coefficient for ρ to this sum. For the household durables values of approximately

[1] Durbin, J., and Watson, G. S., "Testing for Serial Correlation in Least Squares Regression," *Biometrika*, Vol. 37, Parts 3/4, December 1950, pp. 409–28, and Vol. 38, Parts 1/2, June 1957, pp. 159–78.

three-quarters are found; for footwear it is one-half. If these values are considered as indications of lag, the magnitudes involved are quite small, being no more than three weeks and six weeks respectively. It is unlikely that small lags of this order could be satisfactorily estimated from annual data. The reactions involved are nevertheless of some importance for the short-term forecasting of sales.

The short-period elasticities given here are, of course, only consumption elasticities. For durable goods, as was shown in the preceding section, the elasticities of demand, or purchases, are different, and in general are not constant. For positions near to equilibrium, however, they approximate to a simple multiple of the consumption elasticities. The multiplying factor is the parameter m, which will normally be quite large; in the present case it is 5·7 for clothing and footwear and 28·2 for household durables. The short-period demand elasticities are therefore fairly considerable, particularly with respect to total expenditure. The marked difference between the demand and consumption elasticities is due to the fact that it requires a large initial purchase to increase the rate of consumption by even a small proportion for a good of any considerable durability.

The coefficients of $E^{-1}u$, or s, shown in the table are equal to $(1 - r)$, where the parameter r is associated with the rate of adjustment to the equilibrium position. For each of the durable groups the value of r is found to be a relatively small fraction, indicating that the rate of adjustment to an equilibrium position is fairly slow for these goods. For perishable goods, r is much closer to unity, and adjustment is correspondingly more rapid. In fact, except for beer and other alcoholic drink, the values do not differ significantly from unity, and it might be reasonable to assume that for most perishables there was practically no delay in adjusting to the equilibrium position. In so far as there is a divergence, it would seem that the immediate reaction tends to be in excess of the required adjustment ($r > 1$). This pattern of behaviour is not necessarily implausible. It suggests that with a rise in real income, for example, the demand for certain readily consumed perishable commodities increases temporarily to a higher level than is subsequently maintained, when consumers have adjusted to a new standard of living involving the maintenance of a larger stock of durable goods. Conversely, for a decrease in income, immediate cuts in the consumption of perishable goods are more easily made.

A significant effect due to variations in temperature or rainfall is found for each of the perishable commodities except tobacco. The coefficients are not elasticities in this case, but represent, approximately, the percentage change in consumption associated with a unit change in the weather variable. In the present analysis the changes in both cases relate to deviations from the seasonal average. The results are plausible, and for beer and for fuel and light the factors included account for a considerable proportion of the observed variation.

IV. Comparisons with the Interwar Period

The demand equations for the postwar period presented here are based on the data for seven years only. Although the use of quarterly data increases the number of observations fourfold, the amount of significant variation is not necessarily proportionately enlarged. There is a double interest in making a comparison with the results obtained from interwar data. It may be asked how far the structural parameters of demand are stable over a period of some forty years, and whether they can be adequately determined from a short span of only seven years.

The structural stability of demand may be considered in a number of different aspects. It will be examined here in terms of the long-period elasticities with respect to total expenditure and prices, the parameters b and c of the regression equation, and also with respect to the adjustment parameter r. An apparent stability in these elements alone is no proof that there have not been considerable shifts in consumers' patterns of response. There may have been, for instance, systematic changes of tastes only apparent as long-term trends, or variations of seasonal behaviour, or even marked discontinuities in the average level of consumption as a result of war-time experience, which have left unchanged the particular factors to be considered here.

Comparable results for the earlier period are obtained from two sources: the annual time series of consumers' expenditure for the years 1920–38,[1] and the family budget data collected for the working-class [2] and middle-class [3] inquiries of 1937–39. Estimates of the three parameters, b, c and r, were obtained from the time series; from the budget data only an estimate of the expenditure elasticity, b, was available. The estimates from each of the three sources are shown together in Table II. For this purpose the values of the parameter r obtained from the postwar quarterly series have been adjusted to an annual rate.

The methods of estimation employed for the earlier period need only be briefly outlined here. Dynamic equations of the same basic forms as those derived in Section II were applied to the time series, and the same rates of depreciation as for the postwar period were assumed for the durable commodities. It would have been of interest to discover whether there was any evidence of a change in these rates, but this did not seem possible with the data available. It seems unlikely that the changes would be large for the aggregate groups treated here. The auxiliary variables

[1] Stone, Richard, and Rowe, D. A., *The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920–1938, Vol. II*, Studies in the National Income and Expenditure of the United Kingdom, 2, Cambridge University Press, forthcoming.

[2] Ministry of Labour, *Weekly Expenditure of Working-Class Households in the United Kingdom in 1937–38*, mimeographed, July 1949.

[3] Massey, Philip, "The Expenditure of 1360 British Middle-Class Households in 1938–39," *Journal of the Royal Statistical Society*, Vol. CV, 1942, Part III, pp. 159–96.

specified in the analyses were not always the same. Neither the influence of the weather variables nor the small lags in the effective level of expenditure could be detected with the annual data.

The Engel curves fitted to the budget data were of the common double-logarithmic form, implying a constant elasticity throughout the whole range of expenditure. A simple "dummy" discontinuity variable was included to take account of differences between the average levels of expenditure in the two social classes.

TABLE II

Alternative Estimates of the Structural Parameters

Commodity.	*b*.				*c*.			*r*.		
	1950–56.	1921–38.	1937–39.	Combined.	1950–56.	1921–38.	Combined.	1950–56.	1921–38.	Combined.
1. Beer	0·52 (0·26)	−0·07 (0·29)	2·31 * (0·21)	—	−0·40 (0·20)	−1·11 (0·11)	—	1·06 (0·02)	0·87 (0·07)	—
2. Other alcoholic drink	2·18 (0·61)	1·93 (0·47)	2·31 * (0·21)	2·24 (0·20)	1·05 (0·67)	−1·05 (0·14)	—	1·08 (0·01)	1·45 (0·21)	1·08 (0·01)
3. Tobacco	0·83 (0·24)	0·74 (0·13)	0·65 (0·13)	0·71 (0·09)	−0·65 (0·28)	−0·65 (0·14)	−0·65 (0·13)	1·04 (0·03)	1·02 (0·11)	1·04 (0·03)
4. Fuel and light	−0·05 (0·40)	1·50 (0·41)	0·39 (0·04)	—	−0·61 (0·27)	−0·09 (0·15)	−0·21 (0·13)	1·02 (0·04)	1·28 (0·07)	—
5. Durable household goods	2·21 (1·31)	2·42 (1·18)	2·35 (0·27)	2·35 (0·26)	−0·16 (0·30)	−0·97 (0·48)	−0·39 (0·27)	0·30 (0·15)	0·15 (0·07)	0·18 (0·07)
6. Furniture	1·76 (0·81)	2·08 (0·63)	2·49 (0·29)	2·35 (0·27)	−0·11 (0·23)	−1·18 (0·30)	—	0·38 (0·13)	0·16 (0·05)	0·19 (0·05)
7. Hardware	2·36 (3·25)	2·33 (0·84)	1·64 (0·24)	1·70 (0·24)	−1·24 (1·82)	−0·21 (0·18)	−0·23 (0·18)	0·19 (0·23)	0·23 (0·07)	0·22 (0·07)
8. Footwear	1·60 (0·44)	0·51 (0·48)	0·77 (0·07)	0·79 (0·07)	−0·26 (0·21)	−0·19 (0·21)	−0·22 (0·16)	0·71 (0·08)	0·65 (0·16)	0·69 (0·08)
9. Other clothing	1·65 (0·47)	1·52 (0·25)	1·41 (0·08)	1·43 (0·08)	−0·34 (0·34)	−0·40 (0·14)	−0·39 (0·13)	0·66 (0·09)	0·62 (0·05)	0·63 (0·05)
10. Entertainments	0·33 (0·30)	0·78 (0·88)	1·82 (0·13)	—	−0·25 (0·19)	−0·81 (0·26)	−0·52 (0·19)	1·06 (0·03)	0·92 (0·21)	1·05 (0·03)

* All drink.

The coverage of the interwar groups does not always coincide exactly with the classification of the postwar data. In particular, the composition of the two sub-groups of durable household goods differs slightly between the two periods. In the interwar analyses gramophones, radios and television sets are included in the furniture group, while for the postwar series they are included with hardware. In other groups the differences involve merely marginal items and can be the cause of only small discrepancies.

For each of the estimates shown in Table II the sampling error involved has been calculated and is indicated in the usual way by the standard error, which is included in brackets beneath the estimated value of the parameter. The degree of precision attained differs significantly for the different sources of information. The expenditure elasticity, b, is generally determined much more exactly from the budget data than from the time series. This is a natural consequence of the greater range of expenditure covered by the budget information. The annual time series usually give the better estimate of the price (substitution) elasticity, c, while the adjustment parameter, r, appears to be more accurately known from the quarterly series.

It is an assumption of the present approach that the estimates of the long-

period expenditure elasticities obtained from the time series and from the budget data are theoretically equivalent; that is, both measure the long-run dependence of consumption on the level of total expenditure. Similarly an estimate of the long-period price (substitution) elasticity or of the adjustment parameter r may be made equally from annual or quarterly data. These alternative estimates may be compared by testing the hypothesis that the observed differences could have arisen as merely sampling errors. If the estimates are found to be significantly different, it may be concluded that the magnitude of the parameter has changed in the course of time or, possibly, that there is some underlying theoretical incompatibility between the different measures. Where there is no significant difference between the alternative estimates a single combined value of increased precision may be calculated using the information available from all sources. The statistical procedures required have been set out by Cochran.[1]

The combined values of the parameters are also shown in Table II. In the eight instances where the original estimates were found to be significantly different no combined value has been given. In all other cases it is reasonable to assume that the differences between the estimates are due to sampling errors and that the underlying consumer reactions have remained unchanged. In many cases, of course, these sampling errors are large, and it is possible that if more accurate measurements could be made significant differences would be revealed. From the evidence of the present analyses, however, the predominant impression is one of general uniformity. In a few instances, tobacco and clothing, for example, the agreement between the alternative estimates is striking.

In only one instance, beer, is it found that all three parameters are significantly different in the two periods. For this commodity, however, the interwar results are unsatisfactory for a number of reasons. The total expenditure elasticity obtained from the time series has an improbable negative value, which is, however, much smaller than its standard error. The budget elasticity, moreover, relates to expenditure not only on beer but on all alcoholic drinks. Budget information on the consumption of alcoholic drink is notoriously inadequate, and it is probable that this figure is more representative of other drinks than of beer, which was more rarely consumed in the home. Furthermore, the adjustment parameter, r, obtains a value significantly less than unity in this period, contrary to all other findings for perishable goods in the present analysis. In contrast, the results obtained for the postwar period are altogether more plausible.

The estimated total expenditure elasticities for fuel and light show a similar discrepancy. There is a significant difference between the two periods and also between the two estimates, from time series and budgets, for the interwar period. The postwar results are undoubtedly influenced

[1] Cochran, W. G., "The Combination of Estimates from Different Experiments," *Biometrics*, Vol. 10, No. 1, March 1954, pp. 101–29.

by the restrictions on domestic coal consumption. It is also possible that the budget figure reflects the use of more efficient apparatus at higher income levels.

The three values of b obtained for entertainments are open to conflicting interpretations. While they are found to be significantly different if all three are taken together, on the same statistical tests it would be permissible to combine either the two time series values, 0·33 and 0·78, or the two interwar values, 0·78 and 1·82. This series is largely dominated by cinema receipts, and the more reasonable hypothesis is, perhaps, that with changes in tastes and social habits there has been a shift in the value of this parameter between the two periods. In this case the combined value for the interwar period alone would be $1{\cdot}80 \pm 0{\cdot}13$, and there is a clearly marked change to the relatively inelastic postwar value, $0{\cdot}33 \pm 0{\cdot}30$.

It is doubtful whether the significant differences between the price (substitution) elasticities in the two periods for other alcoholic drink, and also for furniture, indicate a similar shift in consumer reactions. Although not significantly different from zero, the large positive coefficient for alcoholic drink obtained in the postwar period points to the presence of some unidentified disturbing factor closely correlated with the price movements. For furniture, some part of the difference may reflect the changed composition of the group. A converse movement is observable in the values for hardware.

An interesting feature of the results for durable household goods is the higher value of the adjustment parameter obtained for the postwar period, $r = 0{\cdot}30 \pm 0{\cdot}15$, compared with $0{\cdot}15 \pm 0{\cdot}07$ for the interwar period. Since the standard error is relatively large for the postwar figure, the two values are not significantly different, but the increase is nevertheless quite marked. This increase for the group as a whole can be seen to be mainly associated with furniture and furnishings; for the other sub-group, hardware, the value of r is slightly lower for the postwar period. It is tempting to relate this change to the greater prevalence of hire-purchase schemes in the postwar period. When expensive durable goods can be acquired by an initial payment which is only a proportion of the total cost, clearly the speed of adjustment to a new equilibrium position is likely to be more rapid. A much more precise analysis would be needed to confirm this conjecture. In particular, it would be desirable to relate changes in the adjustment parameter within the postwar period to the varying hire-purchase requirements that have been imposed at different times.

The combined values, which have been obtained in the majority of cases, represent the most precise estimates of the structural demand parameters that can be made from the data available. They are not necessarily the best for all purposes. If it were desired to make short-term forecasts of demand, for instance, it would not be advisable to recalculate the coefficients of Table I on the basis of these combined values. The first criterion of a forecasting equation is goodness of fit, and for this purpose it may not be necessary to uncover the fundamental structure. If the temporary distortions and interrelations with extraneous factors are likely to persist into the immediate future, the regression coefficients based on the most recent experience form the best basis for extrapolation. Only as the range of the forecast is extended into the future does it become increasingly desirable to distinguish the underlying structure from the temporary disturbances.

For long-term forecasts it might be sufficient to establish simply the future equilibrium position of consumption, which depends only on the long-period elasticities and the future levels of income and prices. It is one implication of the dynamic formulation of the demand equation, however, that to determine the actual level of demand in the future it is necessary to specify also the intermediate course of income and prices.

V. Conclusions

The results obtained in this paper may be briefly summarised in the following conclusions.

(1) A simple dynamic formulation of consumers' behaviour has been put forward which relates to both durable and perishable goods. Its principal features are a distinction between purchases and consumption of durables, and variable rates of adjustment to equilibrium levels of consumption for all commodities. The theory has been applied to the quarterly series of consumers' expenditure for the period 1950–56. Ten principal groups and subgroups of expenditure are covered, and the results are set out in Table I. The degree of explanation obtained is generally high, and the coefficients are mostly plausible.

(2) A few special features of these results may be noted. A short lag in the effective level of total expenditure appears to be characteristic of durables. Exogenous weather factors are observed to have an important influence on the demand for a number of perishable commodities. The relative importance of both these effects, however, decreases as the length of the unit time period is extended. Support for the dynamic hypothesis is found in the plausible pattern of behaviour which emerges from the observed adjustment rates.

(3) Comparisons with results for the interwar period suggest that for many commodity groups an important part of the demand structure remains relatively stable over time; relative, that is, to the accuracy with which this part of the structure can be determined with the observations available. As is shown in Table II, significant differences were found in only eight of the thirty comparisons made for the three structural parameters considered.

(4) A consequence of this underlying stability is that data from both periods may be combined to provide estimates of the parameters. The

results of family budget inquiries may also be combined with those of the time series analysis to estimate the long-period total expenditure elasticities. The combined values obtained in this way are also shown in Table II.

(5) Taken alone, the data for the short postwar period of only seven years often yield estimates of the structural parameters which are subject to wide margins of error. Nevertheless, the observed regression equations are likely to provide the best basis for short-term forecasts.

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BANK CREDIT AND GOLD IN THE UNITED KINGDOM

THE Radcliffe Committee has been appointed to inquire into "the working of the monetary and credit system," and it could be described as a new version of the Macmillan Committee which reported in 1931. A survey of the credit position at the end of 1956 might usefully be compared with that at the end of 1930 and with certain intermediate dates.

It would be helpful to examine definitions of "money" and "credit." Continental writers [1] have for a long time complained that English writers have confused the terms "money" and "credit." Since Keynes wrote in 1936 English writers have come to include in a definition of "money" certain types of bank credit. For example, the definition of "money supply" used by the International Monetary Fund consists of bank-notes and demand deposits owned by the public. It is strange that the items covered by the definition of "money supply" should not appear on the same side of Bank Balance Sheets as Gold, which has historically been known as "money." [2] Writers such as Keynes seemed uncertain what exactly to regard as money, and somewhat uncertainly he suggested that the line could be drawn to include bank credit with a tenor of less than three months, three days, three hours, etc.,[3] while other writers talk about "near money." To avoid confusion the present notes will refer to Bank Credit as consisting of liabilities owed by the banks to the public whatever the tenor of such debts. It is recognised that in the United Kingdom (and indeed generally in the Sterling Area) individuals are not allowed to use the commodity money, gold, for what was the normal purpose of settling debts, and the process of debt settlement now proceeds through the transfer of bank liabilities (usually those due at sight) from one individual to another. At the same time the International Monetary Fund arrangements envisage a par value in gold for the national currencies of its members, and in terms of its rules gold can be used as a solvent of international debts at the prescribed rates. Given the prohibition on the internal circulation of gold,

[1] See, for example, the remarks by Charles Rist in his *History of Monetary and Credit Theory*.

[2] As Mr. H. V. Morton in his *A Traveller in Rome* has recently reminded English readers, the word "*moneta*," of which the modern English form is "money," was applied to Roman coins because the Roman mint was originally in the temple of Juno Moneta. It is quite clear that in the historical sense the word "money" applies to metallic material—to what modern Americans would call "rolling money" and not to what they would call "folding money."

[3] On p. 167 of his *General Theory of Employment, Interest and Money*, Keynes, in defining the rate of interest as "the inverse proportion between a sum of money and what can be obtained for parting with control over the money in exchange for a debt for a stated period of time," says that the line between money and debt can be drawn "at whatever point is most convenient for handling a particular problem." He continued that as a rule he would "assume that money is co-extensive with bank deposits," which would presumably include both current and time deposits.

bank credit is used within the United Kingdom as if it were " money," and in international transactions the Central Banks among themselves use gold in the historical manner as " money." Despite what writers in recent decades have said, gold remains the final means of settlement of international debts, and the Western World, with its problems of international payment, may be said to be on an imperfect gold standard.

By adding together the Balance Sheets of the London Clearing Banks and the Bank of England and, as it were, putting the figures through a sieve, one may obtain an overall picture of the banking system. The omission of the " outside " banks is not serious, because of the relative insignificance of their figures. It is necessary to bring in the Gold held by the United Kingdom Government, and this has been done by offsetting the amounts against Government Stock held by the Bank of England. Because the United States will when requested by Central Banks sell gold against dollars acquired in official transactions, dollars are regarded as the equivalent of gold for the purposes of these notes. Inter-bank debts, as between the Central and Commercial Banks, are cancelled out. The figures for Bank Premises are set off against Capital and Reserves to give Net Capital and Reserves.[1] With certain other somewhat arbitrary assumptions, some approximation and a little guessing, the Balance Sheets of the banking system at the end of 1930 and at the end of 1956 come out as follows:

TABLE I

*Banking System of the United Kingdom—Consolidated Balance Sheets * at end of* 1930 *and end of* 1956

(Figures in £ million)

	1930.	1956.	Increase above 1930.	Percentage increase.		1930.	1956.	Increase above 1930.	Percentage increase.
Net Capital and Reserves	111	148	+37	33%	Gold (including dollars)	155	762	+607	392%
Bank Credit in Hands of Public (including bank-notes)	2,124	8,256	+6,132	289%	Private Debts	1,165	2,841	+1,676	144%
					State Debts	915	4,801	+3,886	425%
	2,235	8,404	+6,169	276%		2,235	8,404	+6,169	276%

* See the Appendix below for the sources of the figures and the build-up of the items.

It will be seen that Bank Credit at the end of 1956 is almost four times what it was at the end of 1930, and that the main source of this increase was the increase in the debts owed by the State to the banking system, the total of

[1] Banks usually grossly undervalue their premises, and on a proper valuation both Bank Premises and Capital and Reserves should be increased by the amount of excess depreciation. The set-off as above removes the difficulty, and the figure of Net Capital and Reserves is closer to the capital employed in the banking business as distinct from that of property owners in the same way as it would be if the banks all used rented premises.

which was over five times what it was at the end of 1930.[1] The amount of Net Capital and Reserves would on a proper revaluation have to be increased by the amount of excessive depreciation employed by the Banks in the valuation of Government Stocks included in State Debts, which latter item would then have to be increased by a similar amount. In order to assess the increase in the size of the total of Bank Credit, it will be assumed that the price of Gold had not been changed and that the figure of Net Capital and Reserves had also not varied. On these assumptions the consequent adjustments would mean an increase in Bank Credit of £6,169 million, which would have been created against increases as follows:

	£ million.
Gold	104
State Debts	4,389
Private Debts	1,676

On this basis over 70% of the increase in Bank Credit arose from the increase in the State's debt to the banking system.

The items in the Balance Sheets are only approximate figures, and are not the exact balances on the accounts. As, however, all the tables representing Balance Sheets have been drawn up on a comparable basis, they should be useful indicators of trends and of orders of magnitude.

In considering these figures, some of the older generation might recall some words of Lord Bradbury in his Memorandum of Dissent to the Macmillan Committee's Report. He then, in discussing the growth of treasury bills, said:

> " We might reach a state of affairs in which the whole of the trade and industry of the country would be carried on on the basis of credit balances against which the banks would hold cash, treasury bills and securities only. High money rates would then be powerless to check expansion unless and until a point was reached at which it would be more profitable to the industrial concerns to keep their balances on deposit than to employ them in industry, or prices had risen so high that they not only had to employ the whole of them but borrow as well.
>
> " The former stituation would be an impossible one for the banks except in so far as the deposits to be immobilised did not exceed their own short-date assets—otherwise they would lose money heavily, while the latter would not arise until inflation had gone far enough to disorganise the whole financial structure."

[1] As shown in the Appendix, Bills Discounted in the Balance Sheets of the London Clearing Banks are regarded as State Debts. This treatment overstates the amount of State Debts to the extent that Bills Discounted include the bills discounted for the private sector. The error involved here would not appear to be large, for example, of the total of £1,416 million for Bills Discounted at the end of 1956 only £140 million related to bills other than Treasury Bills. The Macmillan Report gives a figure for Treasury Bills discounted at the end of 1930 as £181·8 million. No figures are unfortunately available for the intervening years, but it is clear that the magnitudes involved are not large enough to disturb the general picture presented in the Balance Sheets.

The ratio of Gold to Bank Credit at the end of 1930 was 7·3% and at the end of 1956 it was 9·2%. It is known that in order to protect its Gold—its reserve of internationally usable money—the Bank of England was in 1930 following a credit policy which led to a restriction of activity in Britain and that the Macmillan Committee did not foresee that the legal requirements regarding gold conversion could not long be maintained. The ratio of 7·3% was in the circumstances proved to be totally inadequate, and the question arises whether, at present when there exist considerable restrictions on convertibility, the ratio of something under 9% is also not totally inadequate.

The Balance Sheets above are, as it were, snapshots taken at different times of the train of events, and it is desirable to look at some additional ones taken at other points of time in order to bring out certain significant changes through the flow of time. For selected dates, the relevant figures are:

TABLE II

Banking System of the United Kingdom—Balance Sheets at end of Years Stated

(Figures in £ million)

	1930.	1938.	1946.	1948.	1956.
Gold (including Dollars)	155	550	642	457	762
Private Debts *	1,165	1,230	1,713	2,210	2,841
State Debts	915	971	4,623	4,822	4,801
	2,235	2,751	6,978	7,489	8,404
Net Capital and Reserves	111	112	126	131	148
Bank Credit	2,124	2,639	6,852	7,358	8,256
	2,235	2,751	6,978	7,489	8,404
Ratio of Gold to Bank Credit	7·3%	20·8%	9·4%	6·2%	9·2%

* Included in this item are the following figures for Advances by the Clearing Banks in £ million:

1930.	1938.	1946.	1948.	1956.
929	966	980	1,378	1,912

The widening difference between these figures and the total of Private Credit would appear largely to depend on extra-bank borrowing and related transactions.

In order to see more clearly the origins of the increase in Bank Credit, one may assume that the Net Capital and Reserves are employed first in holding Gold, and that the balance of Gold, State Debts and Private Debts are the sources of Bank Credit.[1] This arrangement results in the figures shown in Table III.

[1] This assumption is quite arbitrary, but is necessary in the attempt to isolate the effect of the increase in State Debts on the total of Bank Credit. Other assumptions could be used in this attempt, *e.g.*, if Net Capital and Reserves were set off against State Debts the influence of the increase in State Debts on the growth of Bank Credit would still be quite obvious.

TABLE III

Banking System of the United Kingdom—Sources of Bank Credit at end of Years Stated

(Figures in £ million)

	1930.	1938.	1946.	1948.	1956.
Gold held against Net Capital and Reserves	111	112	126	131	148
Balance of Gold	44	438	516	326	614
Private Debts	1,165	1,230	1,713	2,210	2,841
State Debts	915	971	4,623	4,822	4,801
Bank Credit	2,124	2,639	6,852	7,358	8,256
Ratio of State Debts to Bank Credit	43%	37%	68%	66%	58%

In a comparison of the figures of 1930 and 1938, the latter show the greater liquidity in the international sense because of the greater gold holding, viz., in the increase of £395 million (from £155 million to £550 million), of which increase about £236 million could be ascribed to a change in price and £159 million to the change in physical quantity. The devaluation of sterling in terms of gold from September 1931 onwards meant that the transfer out of sterling into foreign currencies of given amounts expressed in pounds sterling resulted in a smaller loss of physical gold than would have been the case in 1930. As compared with 1930, the figures of unemployment were diminished, and the national net product had increased. In this process private enterprise had no doubt been assisted in increasing its activity by the increase in Private Debts (by £65 million from £1,165 million to £1,230 million). In any event 1938 was more nearly normal (with any of the three preceding years) than any of the other years after 1915.

The comparison between 1938 and 1946 shows the full force of war finance. The item Bank Credit increased by 160%, while State Debts and Private Debts showed increases of 376% and 39%, respectively. The gold price had changed from £7 8*s.* 10½*d.* to £8 12*s.* 6*d.*, so that the increase in gold holdings of £92 million could be said to be made up of £88 million from an increase in value and £4 million from an increase in physical quantity. The ratio of Gold to Bank Credit had decreased from 20·8% in 1938 to 9·4%. The latter figure was somewhat above that of 7·3% in 1930, but withdrawals by foreigners or United Kingdom Nationals were now restricted, and if the same freedom of transfer existed then as did exist in 1930 the ratio would probably have been much worse.

By 1948 the ratio of Gold to Bank Credit had dropped to 6·2%, *i.e.*, well below the low figure of 7·3% in 1930. Bank Credit had increased by £506 million over the 1946 figure primarily because of an increase in Private Debts of £497 million. State Debts showed an increase over the same period of £199 million, while the figure for Gold showed a large decline of £185 million. (If the devaluation of September 1949 had occurred at this point

Gold would have been increased by £105 million over the figure shown for 1948.)

The devaluation of September 1949 increased the price of gold by approximately 45% (from 172*s.* 6*d.* to 250*s.* per ounce fine). The figure of £762 million for Gold at the end of 1956 shows an increase over 1948 of £305 million, of which £237 million could be ascribed to the writing-up of gold. In terms of liquidity (as measured by the Gold/Bank Credit ratio) this position represented a considerable decline from the improved position prevailing immediately after the devaluation of September 1949. The main reason for this was the increase in Private Debts by £631 million. State Debts showed a slight decrease of £21 million. However, with all the changes that had taken place the banking position at this time was highly illiquid in the international sense, while the trade position was such that it was not clear whether activity would show an increase or decrease.

The above analysis is by its nature a partial one, since the Consolidated Banking Balance Sheets represent only a portion of the total credit picture. While the banking system shows a slight decline in State Debts, the total of Government Debt had in fact increased from £25,168 million at the end of 1948 to £29,919 million at the end of 1956, although the figures for the Floating Debt had over the same dates been brought down from £6,355 million to £5,198 million. This mass of debt, to the extent to which it is not already held by the Banks or Government Departments and could be offered for discount to the banking system, contains a latent threat of considerable magnitude to the international liquidity of the banking system. Such discounting could be made the subject of the withdrawal of funds out of sterling, with consequent pressure on the Gold Reserves.[1] The partial picture of the credit system given above represents an enormous pledging by the State of the public credit. To preserve the security of the State, much of this was necessary, but the process has proceeded beyond this to an extent that the public use of credit might be better described as the public abuse of credit.

It is desirable to relate the partial picture above to other movements in the community's economic life, and in this more attention will be paid to the more recent dates. As the banking position in 1938 showed a more normal position than that of 1930, a clearer picture of the abnormality of the recent positions can be obtained by comparing them with the position in 1938. In order to keep the Balance Sheets simple it was desirable to work with the item of Bank Credit. The relationship between this figure and what the International Monetary Fund calls Money Supply is fairly constant, as shown in Table IV below, the differences arising mainly from the exclusion from the latter figure of Time Deposits. The Demand Deposits of the Clearing Banks appear also to form a fairly constant proportion of between two-thirds and three-quarters of Money Supply.

[1] The reader is reminded that here, as elsewhere in these notes, " Gold Reserves " cover both the physical gold and the dollars held in the reserves.

The purpose of credit is to facilitate production and/or consumption. Essentially credit is a process whereunder money or money's worth passes and the compensation required from the transferee is delayed in time. It is the delay in time of settlement that facilitates production and/or consumption, and hence the effect of credit on the generation of income and the growth of capital requires a study of the entire credit system, within and

TABLE IV

Bank Credit and Money Supply

(Money figures in £ million rounded off to nearest £10 million)

Year end.	Bank Credit, £ million.	Money Supply, £ million.	Money Supply as percentage of Bank Credit.
1938	2,640	1,640	62
1946	6,850	4,950	72
1948	7,360	5,110	69
1956	8,260	5,760	70

without the banking system. The ability of the banking system to control the use of its own deposits is limited. For example, if as the result of a " credit squeeze " certain would-be borrowers are refused Advances which would have led to an increase in the total of Bank Credit, the same result in relation to the generation of income would be secured if those requiring accommodation were given the use of bank deposits (via private loans) which deposits would otherwise have been kept idle by the lenders.

A complete survey of the national economy would in a national balance sheet have to take account of all credit net positions within and without the banking system. In a sense everyone who is owed and owes acts like a banker, and the amount of credit granted by credit-giving institutions which are not normally called banks is known to be large. In the flow of transactions the credit operations outside the banks inevitably have repercussions on the banking system and on the volume of the bank credit that can be made the subject of a withdrawal of gold. Similarly, the transactions outside the banks have a considerable influence on the generation of income and the stock of capital and, hence, on prices. It would, however, appear probable that on this broader basis the basic argument in these notes would be strengthened rather than weakened.

The inadequacy of the Gold in the banking system can be seen also in its relationship to the total of United Kingdom trade, as shown in Table V.

It will be seen from this that only relatively slight fluctuations in the trading figures can make considerable inroads into the Gold Reserves. On the basis of the figures at the end of 1956, changes which were the equivalent of an 11% drop in exports and of a similar rise in imports would together be more than sufficient to exhaust the whole of the Gold Reserves. Recent experience has shown how the equivalent of forward transactions can still

take place despite all kinds of restrictions by changing dates of payment (" leads " and " lags "). If imports and exports were assumed to continue at the 1956 rates, then the Gold Reserve would be exhausted by importers having paid in advance of normal due dates for six weeks' imports, and at the same date having delayed receipts beyond the usual dates of settlement for six weeks' exports.

TABLE V

External Trade and Gold

(Figures in £ million)

Year.	Imports.	Exports.	Total External Trade.	Gold.	Gold as percentage of External Trade.
1938	919	533	1,452	550	38
1946	1,301	966	2,267	642	28
1948	2,075	1,639	3,714	457	12
1956	3,889	3,318	7,207	762	11

The liquidity ratio can be improved by any act which reduces Private Debts or State Debts with a counterpart reduction in Bank Credit. On the figures at the end of 1956 if it were desired to re-establish a ratio of Gold to Bank Credit of, say, 20%, this would imply reducing the total of Bank Credit to £3,810 million, that is, a figure considerably in excess of the then existing total of Private Debts, namely, £2,841 million. If the desired ratio were taken as only 15%, then the total of Bank Credit should not exceed £5,080 million, a reduction of £3,176 million, which is still a reduction greater than the then existing amount of Private Debt. The determination of what is a " safe " ratio would require a detailed and laborious series of calculations and must, as explained later, take into account the time dimensions of the existing debts. On the basis of the United Kingdom's experience in this century, it does not appear that anything less than 15% could be regarded as " safe."

The pressures which can arise to drain away a gold reserve do not, however, come only from the net results of external trade transactions, but also of financial transactions. What is relevant is the size of the drain which would follow a loss of confidence. A full analysis would require the adding of time dimensions to the credit items in the banking balance sheets which above represent flat pictures. A comprehensive assessment in time would require a statement of fluctuations in the net reserve position, *i.e.*, how the gold holdings will fluctuate through time with the addition of foreign debts receivable and the subtraction of foreign debts payable as the two sets of debts run off in time. This could perhaps be termed the " run off " position, but decisions in practice will be made on the basis of the " expected " reserve position, *i.e.*, how the " run off " position will be altered by transactions expected to occur in the future. While a full analysis would require such statements and no doubt the Radcliffe Committee will attempt such an analysis, it is the possibility of withdrawals from the large total of Bank Credit against the slim figure of Gold that causes outside observers to view the United Kingdom's Banking Balance Sheet with continuing dismay and fear for the future.

The relative scarcity of Gold in the British banking system can also be seen from other sets of figures. The figures of depreciation used as a deduction in computing the Net National Income are accounting provisions required to assess net income, but are not the subject of banking transactions. The Gross National Product is, therefore, a more suitable figure to represent the money value of current activity which (to the extent that in the process net debts are created in favour of foreigners) has reference to the possible loss of gold. The increasing scarcity of gold in this relationship can be seen from the following table:

TABLE VI

Gold and Gross National Product

(Figures in £ million)

Year.	Gold.	Gross National Product.	Gold as percentage of Gross National Product.
1938	550	5,175	10·6
1946	642	8,787	7·3
1948	457	10,368	4·4
1956	762	18,117	4·2

This decline has occurred despite the fact that the price of gold has increased in sterling by two-thirds since 1938.[1]

The effect of Government financing can be seen from the following table, which shows how the Gold equivalent of the National Debt has increased at different year-end dates:

TABLE VII

National Debt in Ounces of Gold

Year.	National Debt, £ million.	Price of Gold, £ per oz.	Ounces of Gold equivalent to National Debt.
1938	7,131	7·4438	958 million
1948	25,168	8·1562	3,086 ,,
1956	29,919	12·5	2,394 ,,

[1] The relative scarcity in terms of physical gold is much greater. For example, at the end of 1938 there existed £36 of Bank Credit against every ounce of gold held, and at the end of 1956 the similar figure for Bank Credit had increased to £135. It has also to be remembered that while £762 million for Gold at the end of 1956 appears to be a suitable enhancement of the figure of £550 million at the end of 1938, the 1938 figure actually related to a greater quantity of physical gold (74 million ounces for 1938 as against 61 million ounces for 1956).

While it is not possible to construct the National Banking Balance Sheet as at September 30, 1957, an idea of how its face is likely to have changed can be obtained from the movement of some of the figures which it would embody.

A rough approximation of the Consolidated Banking Balance Sheet as at September 30, 1957, can be obtained by incorporating in it the changes in certain items between the end of 1956 and at the end of September 1957. The main changes are:

	£ million.	
GOLD	−101	(Official Figure)
PRIVATE DEBTS		
Money at Call and Short Notice	− 75	(London Clearing Banks)
Advances	+ 42	" " "
Discounts and Advances	− 4	(Bank of England)
	− 37	
STATE DEBTS		
Investments	+ 39	(London Clearing Banks)
Bills Discounted	− 102	" " "
Government Securities	+ 91	(Bank of England)
Other Securities	+ 2	" "
	+ 30	
Less		
Public Deposits	− 2	" "
	+ 32	

The approximate Balance Sheet, with no adjustment to the Capital Accounts and with Bank Credit as the residual item, would be as follows:

BANKING SYSTEM OF THE UNITED KINGDOM

Approximate Balance Sheet at September 30, 1957

(Figures in £ million.)

Net Capital and Reserves	148	Gold (762 − 101)	661
		Private Debts (2841 − 37)	2,804
Bank Credit	8,150	State Debts (4801 + 32)	4,833
	8,298		8,298

Ratio of Gold to Bank Credit: 8·1%

With Bank Credit still at a figure in excess of £8,000 million and Gold below £800 million the system is still highly illiquid, and the transactions which took place over the first nine months of 1957 have in their total effect withdrawn may come back if disappointed overseas speculators come to replenish sterling working balances on which they drew and if British and/or other operators of the " leads and lags " techniques reverse their procedure. It is, however, also clear that the relationship between Gold and Bank Credit is such that a critical point could quite easily be reached beyond

which point residents of the sterling area as well as non-residents may decide to " get out of sterling." It might in such circumstances be that a further devaluation would not be either right or wrong, but simply inevitable.

Some South African economists (including the writer) have for a long time been advocating that the only answer to this problem of international illiquidity for the United Kingdom and many other countries is a general increase in the price of gold, which is something quite different from a separate unilateral devaluation which means an exchange depreciation. Under the general devaluation exchange rates *ipso facto* would remain unchanged despite the change in the price of gold expressed in the different national currencies, although as a separate act some realignment of rates might at the same or later date be desirable.

Despite what the critics who dislike gold have written in this century, the national treasuries still scramble for gold or currencies backed by substantial gold reserves. Where, however, the majority of them are illiquid and, therefore, " gold hungry," the attempt by one or some to replenish their gold reserves would simply put further pressure on their already illiquid neighbours. In this connection if one compares the rise in the gold reserves of Western Germany with the declines in the reserves of neighbours such as the United Kingdom, France, Holland and Belgium, one obtains the impression that the growth of Western Germany's reserves has occurred simply by drawing gold away from the others. Within the system of the imperfect gold bullion standards now existing any current redistribution of gold leaves untouched the basic problem of the overall illiquidity of the system. For Paul to increase his holding of money, Peter's holding has to fall. It is clear to anyone who examines the figures that, given general illiquidity, the cure cannot come by mere transfers as between the countries included in the system. (One of Britain's problems is that of obtaining a relationship between its Bank Credit and its Gold such that it will be liquid enough to withstand periodic attacks on its till.)

On the statistical evidence given above the British Gold Reserves are inadequate for the needs of Britain as an international banker. All that has been said here supports the many statements by the United Kingdom authorities on the gravity of the problem. It is not, however, contended that Britain's position has suddenly and seriously deteriorated in relation to neighbours, who are in a stronger position of international liquidity, and that a further unilateral devaluation of sterling must follow. If one accepts that it is important that Britain retains its position as international banker, then it follows that she must act responsibly. If Britain simply sought to build up her own reserves by policies designed to draw gold from the reserves of other Western countries the overall illiquidity would not be removed—the pressures would simply be redistributed. For the moment the individual members of the system can find some protection in the fact that their fellow members also have weak positions. Any attempt, therefore,

to introduce what used in the thirties to be called " beggar-my-neighbour policies " will simply cause the damage, known to be great, arising from competitive exchange depreciations. If Britain is to keep leadership in the field, the United Kingdom authorities cannot selfishly seek remedies to improve temporarily Britain's position at the expense of her neighbours and friends. On the other hand, to retain her leadership Britain should lead the endeavour to obtain through international agreement and action overall relief by a general enhancement of liquidity.

These notes have not been concerned with the mechanics of credit management. Open-market operations and similar methods can, however, easily be related, *e.g.*, purchases or sales of Government Securities initiated by the Central Bank would by changing the Clearing Banks' balances with the Central Bank affect the Consolidated Balance Sheet through the changes induced in Private Debts and/or State Debts and, hence, Bank Credit would be affected.

In dealing with the problem recent policy has been directed to improving the liquidity of the system by the contraction of Bank Credit. The British authorities at the same time are politically committed to maintaining a high level of employment and activity. The policy of protecting the reserves through credit contraction may, therefore, easily lead (as happened in the 1930s) to a recession with considerable unemployment. On the other hand, the reserves are so slender that any further drop might mean that the critical point would soon be reached. It would appear, therefore, that the authorities are faced with a dilemma, and the problem would appear to be such that it cannot be solved by national action alone but requires international co-operation.

It can, of course, be argued that there are the " second line " reserves and that even if gold reserves fell to almost nothing, this fall would matter little. The latter contention ignores the danger of going beyond the critical point, while the former ignores Britain's special position as an international banker. The " secondary reserves " do not become liquid reserves simply because the word " reserves " is applied to them—certainly they do not represent the reserves which Britain's foreign banking customers would choose to regard as making sterling safe. Furthermore, if things were to slide beyond the critical point it is doubtful even if they would be sufficient.

The proposition of a general rise in the price of gold now has many supporters in the City of London, and is also supported by a number of reputable academic economists. In its examination of the problem it would also be very desirable for the Radcliffe Committee to pay much attention to it. Britain and the Commonwealth have a large stake in the matter for various reasons, the most important of which are:

(i) A substantial increase in the price of gold would so improve the liquidity of the United Kingdom's banking position that it could, without danger to its position as banker, pursue the credit policies appropriate to maintaining a high level of employment while avoiding inflation. The same consideration applies to all the other illiquid currencies, but is proportionately more important to the United Kingdom because of sterling's role as the premier currency used in world trade. The peoples of the Commonwealth as a whole have an interest in wishing that sterling should be strong and that Britain's position as international banker should be maintained.

(ii) The weight of the external debt would be greatly reduced when expressed in terms of gold. Britain's debt to the Colonial Empire alone is greater than her Gold Reserve at its present currency value. If an all-round change in the price of gold were made, Britain's creditors would not be prejudiced in terms of the purchasing power of the payments, but the drain on the Gold Reserves occasioned by debt payments would be greatly reduced.

(iii) On the figures for 1956 the Commonwealth produces something like seven-tenths of current world production (about 23 million ounces worth £288 million sterling).

(iv) The United Kingdom's holdings of gold-mining shares are substantial. On a rough estimate the market value of its holdings in South African gold-mining companies alone (valued at the present depressed prices) appears to be in the order of £230 million. According to Bank of England figures the United Kingdom's dividends from gold mining in 1956 were in excess of £8½ million. Britain's gain from a substantial rise in the price of gold would be significant both in relation to its capital assets and its overseas income.

In brief, a rise in the price of gold would perhaps do more than any other conceivable act to restore on a sound basis Britain's position as international banker.

The writer believes that much nonsense has been talked in recent years about the historical workings of the Gold Standard, in particular about so-called " rules of the game." Unfortunately those who operated the system did not write text-books regarding their operations and largely ignored the writings of critics who had imperfect and distorted ideas regarding their operations. Unfortunately, the ideas of the critics have survived as a kind of folklore—a myth in which the Gold Standard is a monster living on the miseries of the unemployed. The Gold Standard was never a thing defined. For a relatively short time in history a substantial number of civilised countries had currencies which could be converted into gold, internally and externally, and these countries could be said to represent a system of gold currencies to which the loose term of International Gold Standard could be applied. The monetary authorities within the countries did, in framing their credit policies, take into account the international

repercussions of their actions, but as they themselves vigorously asserted, they did not follow automatic rules. Their actions regarding credit policy did, in fact, have to take account of many factors, and involved much judgment. They were concerned also with internal political influences, and in the thirties they were anxious to secure greater international co-operation. None of this adds up to action in terms of set " rules of the game." At the time the Macmillan Committee was sitting the attempt to provide greater liquidity through control of bank credit did lead to unemployment, but neither the Macmillan Committee nor the then Governor of the Bank of England appeared to realise that the least harmful way to restore liquidity was to change the price of gold through international action.[1] To-day the Western World can still be said to be on a kind of Gold Standard, and it would surely be desirable to deal with its present deficiencies. To-day, as in the thirties, the choice is confined to:

(i) A series of successive separate devaluations with all the disturbances of competitive exchange depreciation until all-round liquidity of the system is restored, or

(ii) An all-round increase in the price of gold by international agreement.

If the price of gold were increased there would still be need for international co-operation[2] and the United Kingdom would still have many problems to contend with, including problems of wages, productivity, etc., but many of these would largely disappear if credit policy sought to avoid both inflation and deflation. In the course of history more than one empire has suffered a severe decrease in its commodity money reserve, and the attempt to rebuild its treasure could not be secured by simple single measures —many hard tasks had to be undertaken.

To-day when some appear to believe that the sterling problem is simple and requires nothing more than flexibility of interest rates and floating exchange rates, perhaps others will remember some words used by Lord Bradbury in his Memorandum of Dissent to the Report of the Macmillan Committee. In dealing with how investors could and would be hoodwinked by credit manipulations, he said:

" If currency ' management ' is to be used to facilitate manœuvres of this type, the sooner we return to an ' automatic ' system the better. Honesty, even if stupid, is a better foundation for credit than the most adroit finesse."

The writer would submit that a higher price of gold through international action by writing down bank money in terms of gold is the honest, albeit drastic, remedy which history has shown to be the proper answer to the problem of international banking illiquidity.

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[1] Sir Henry Clay's autobiography of Lord Norman has thrown new light on the discussions held on the subject at that time. As Sir Theodore Gregory has, however, pointed out in an article in *Lloyds Bank Review* for October 1957, the discussion at that time, by confusing the effects of a particular parity and choosing to return to gold, has ever since gravely prejudiced monetary debate in the United Kingdom.

[2] For details see the writer's Presidential Address to the Economic Society of South Africa, entitled " The Need for Currency Stabilization," published in *The South African Journal of Economics* for September 1956.

Appendix

The Content of Items in Tables I, II and III

Schedule I

Net Capital and Reserves

(Figures in £ million)

		1930.	1938.	1946.	1948.	1956.
Proprietors' Capital	Bank of England	14·5	14·5	14·5	14·5	14·5
Rest		3·5	3·5	3·9	3·9	3·9
Plus						
Capital Paid-up	London Clearing Banks	74·3	78·2	78·2	78·2	90·5
Reserve Fund		60·8	60·5	69·6	74·5	94·4
		153·1	156·7	166·2	171·1	203·3
Less						
Bank Premises Account minus Reduction of Bank Premises Account *	London Clearing Banks	41·7	44·6	40·5	40·3	55·5
		111·4	112·1	125·7	130·8	147·8

* £0·2 million in 1930 and £0·3 million in 1938.

Schedule II

Bank Credit in Hands of Public

(Figures in £ million)

		1930.	1938.	1946.	1948.	1956.
Bankers' Deposits	Bank of England	65·0	106·2	254·7	304·6	228·0
Other ,,		35·5	36·2	55·1	103·5	73·3
Notes in Circulation		358·3	485·6	1357·8	1253·7	1875·1
Plus						
Current Accounts	London Clearing Banks	1875·8	2253·8	5685·4	6199·5	6655·8
Deposit ,,		1·3	1·4	1·1	1·0	0·6
Other ,,						
Notes in Circulation						
		2335·9	2883·2	7354·1	7862·3	8832·8
Less						
Silver Coin—Bank of England		4·5	0·2	2·2	2·3	5·0
Coin, Bank and Currency Notes and Balances with Bank of England (London Clearing Banks)		207·5	243·4	499·4	501·4	571·4
		2123·9	2639·6	6852·5	7358·6	8256·4

SCHEDULE III

PRIVATE DEBTS

(Figures in £ million)

	1930.	1938.	1946.	1948.	1956.
Balances with and cheques in course of collection on other banks in the United Kingdom (London Clearing Banks)	54·0	65·9	246·7	286·5	350·9
Items in Transit (London Clearing Banks)	3·8	5·0	14·2	18·0	15·6
Money at call and short notice (London Clearing Banks)	144·0	159·5	431·8	485·0	504·6
	201·8	230·4	692·7	789·5	871·1
Plus					
Advances to Customers and Other Accounts (London Clearing Banks)	928·7	966·2	980·2	1377·9	1912·5
Investments in Affiliated Banks (London Clearing Banks)	26·3	24·0	24·6	27·7	34·9
	1156·8	1220·6	1697·5	2195·1	2818·5
Plus					
Discounts and Advances—Bank of England	8·5	9·6	15·6	15·0	22·7
	1165·3	1230·2	1713·1	2210·1	2841·2

SCHEDULE IV

STATE DEBTS

(Figures in £ million)

	1930.	1938.	1946.	1948.	1956.
Government Securities (Bank of England)	293·3	305·9	1662·3	1652·5	2165·1
Other Securities (Bank of England)	30·2	22·1	18·3	24·2	17·7
	323·5	328·0	1680·6	1676·7	2182·8
Less					
Gold held by Exchange Equalisation Fund	—	223·8	642·0	457·0	762·0
	323·5	104·2	1038·6	1219·7	1420·8
Less					
Public Deposits—Bank of England	14·8	18·2	12·6	14·0	16·1
	308·7	86·0	1026·0	1205·7	1404·7
Plus					
Investments—London Clearing Banks	284·7	635·0	1427·0	1478·2	1980·4
	593·4	721·0	2453·0	2683·9	3385·1
Plus					
Treasury Deposit Receipts (London Clearing Banks)	—	—	1559·5	1397·0	—
Bills Discounted: Treasury Bills (London Clearing Banks)	321·5	250·3	610·4	741·2	1275·4
Other Bills (London Clearing Banks)					140·1
	914·9	971·3	4622·9	4822·1	4800·6

SOURCE OF INFORMATION

London Clearing Banks—*Bankers' Magazine* for February 1931, February 1939, March 1947, March 1949, February 1957 and October 1957.

Bank of England—Macmillan Report

Statistical Summary of the Bank of England for January 1939.

Bank of England Balance Sheets at February 28, 1947, February 28, 1949 and February 28, 1957.

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Bank of England Weekly Returns for September 1957.

RATE OF CHANGE APPROACHES TO FORECASTING —DIFFUSION INDEXES AND FIRST DIFFERENCES[1]

A DIFFUSION index for any time period and for any group of time series is simply the number of series in the group that are rising in that time period expressed as a percentage of the total number of series in the group. An *historical* diffusion index is one in which a series is classed as rising or falling by reference to its own peaks and troughs, identified well after the event. Consequently, even though a series is rising from month to month over a certain period, it may still be classed as falling if the period is part of a downswing as identified subsequently.

Historical diffusion indexes have been shown by Geoffrey Moore[2] consistently to lead the turning points of the general business cycle, typically by eight months or so in the case of peaks, 1919–37. This lead holds in the post-war period also.

The object of the present inquiry is to find whether a similar *current* measure can be constructed which also displays a long and unambiguous lead over business-cycle turning points. To this end we may ask which of the operations involved in the construction of a diffusion index are critically important for the forecasting value of a diffusion index, and which are irrelevant. Can the important ones successfully be performed currently, that is, with a lag that is small relative to the lead time of the diffusion index over business-cycle turns?

A diffusion index is constructed by the following operations:

1. A *smoothing* operation, either on the individual series or on the final index, to iron out fluctuations which are not cyclical in the business-cycle sense.
2. A *differencing* operation on the individual series.

[1] The statistical work underlying this paper was supported by the Sloan Research Fund of the School of Industrial Management at M.I.T.

[2] *Statistical Indicators of Cyclical Revivals and Recessions* (Occasional Paper 31), National Bureau of Economic Research, 1950, henceforth referred to as *S.I.*; "Analyzing Business Cycles," *American Statistician*, April–May 1954, "The Diffusion of Business Cycles," *Economics and the Public Interest*, R. A. Solo, ed. (Rutgers University Press, 1955); *Twenty-sixth, Thirtieth, Thirty-third,* and *Thirty-seventh Annual Reports of the National Bureau of Economic Research*; Thor Hultgren, *Cyclical Diversities in the Fortunes of Industrial Corporations* (Occasional Paper 32), National Bureau of Economic Research, 1950; Milton Lipton, National Industrial Conference Board, *Business Record*, June 1954, pp. 227–33, and June 1955, pp. 212–17; and NICB Technical Paper No. 5, *Cyclical Diffusion: A New Tool for Business Analysis*, 1956. For more critical approaches see Arthur L. Broida, "Diffusion Indexes," *American Statistician*, June 1955, pp. 7–16, and reply by Moore, *American Statistician*, October 1955, pp. 13–18, and John E. Maher, "Forecasting Industrial Production," *Journal of Political Economy*, LXV, No. 2, April 1957, pp. 158–65. Broida anticipated many of the negative findings of this paper, and Maher's findings with respect to the leading-series approach closely parallel those of this paper with respect to the diffusion-index approach.

3. A *transformation* of the differences to a two-valued system of attributes: rising and falling.
4. An *equally weighted count* of the number of series rising, expressed as a percentage of the total number of series in the group.

A test of the predictive power of a current diffusion index based on fifteen to twenty-six of the components of the Federal Reserve Board Index of Industrial Production, as compared with the first differences of the F.R.B. Index itself, leads to the following conclusions:

1. The *smoothing* operation is necessary, but it may be performed currently with a loss in lead time that is small compared to the length of lead time involved. A currently smoothed diffusion index of the F.R.B. Index components led business-cycle peaks, in the inter-war and post-war period, by six to twelve months.
2. The *differencing* operation is also fundamental, but it may be performed currently on an aggregate, such as the F.R.B. Index, about as effectively as on the components.
3. The *transformation* of the quantitative differences to a two-valued system of attributes, rising and falling, is not essential to the lead over turning points. The first difference of the F.R.B. Index, which preserves quantitative relations, leads turning points just about as well as does the corresponding current diffusion index. A diffusion index based on a large number of series may be somewhat smoother than the first difference of the corresponding aggregate, however.
4. Nor is the *weighting* operation fundamental, since the equally weighted diffusion index and the unequally weighted first difference of the F.R.B. Index behave similarly with respect to their leads over business-cycle turning points.
5. While the use of *hindsight* is not fundamental to the lead over business-cycle turns, hindsight *is* of fundamental importance in avoiding false forecasts, or more accurately, in distinguishing forecasts of minor fluctuations from those of fluctuations large enough to be called business cycles.

In short, a currently smoothed first difference of the F.R.B. Index has about the same predictive value as a currently smoothed diffusion index based on the components of the F.R.B. Index. Both lead all recognised business-cycle peaks in the F.R.B. Index (1919–37 and 1947–56) by six to twelve months, but both also reflect numerous minor intermediate fluctuations with a lead close to zero. The signals for a minor fluctuation do not seem to be contemporaneously distinguishable from those for a "real" business-cycle turning point.

A current rate of change measure, either first difference or diffusion, does, nevertheless, have a genuine predictive value, even though it falls far short of an historical diffusion index. First, it has the negative predictive

value that unless a slow down of the rate of growth has taken place, no business-cycle downturn is to be expected. Second, there appears to be sufficient stability in the sign, the level and possibly in the direction of movement of the smoothed rate of change to make it a useful short-term predictor of itself, and hence of the short-term future movements of the smoothed aggregate index. There is hope, therefore, of predicting, from the trend of first differences or of diffusion measures, the ups and downs of a smooth curve through the F.R.B. Index, but not of distinguishing, at the outset of a change of direction, whether it is a major or minor swing.

Whatever its limitations in forecasting what is going to happen, a diffusion index, particularly when cumulated, does furnish a valuable measure of what *is* happening. Because a current cumulated diffusion index can probably be made available some weeks earlier than the corresponding weighted aggregate index, and because it appears to be slightly smoother and to have substantially better defined turning points, it may be found to be a most valuable tool for the interpretation of current developments, possibly superior even to the F.R.B. Index.

The National Bureau Approach to Forecasting

In *Statistical Indicators of Cyclical Revivals and Recessions* Moore explored two approaches to business-cycle forecasting arising out of the work of the National Bureau of Economic Research. One, the leading series approach, an extension of the work of Burns and Mitchell,[1] consists of a search for series which characteristically lead turning points of the business cycle, as clouds precede a storm.[2] A second approach, similar in spirit to a forecasting technique developed by C. Ashley Wright,[3] depends on the assumption, not that a particular series or set of series will characteristically lead business-cycle turning points, but that some series will always lead. That is, the leading series, or Burns and Mitchell, approach always looks to the same series to lead; the diffusion index, or Ashley Wright approach, depends on the empirical observation that all series do not turn simultaneously at a cyclical turning point, but there is a gradual build-up of the number of series that have turned as a turning point is approached, a build-up that reaches a peak at the turning point itself. It may accordingly be possible to predict the imminence of a turning point, and its timing as well, by a projection of the rate of build-up of a cluster of turning points in individual series in the early stage of the build-up.

Wright actually fitted the tail of a normal curve to the build-up in its early stages and predicted the turning point as the central point of the

[1] Wesley C. Mitchell and Arthur F. Burns, *Statistical Indicators of Cyclical Revivals* (Bulletin 69), National Bureau of Economic Research, 1938.

[2] For a constructively critical contribution to the leading series approach, see Maher, *op. cit.*

[3] " Business Cycle Research and Business Policy," *Conference on Business Cycles*, National Bureau of Economic Research (New York, 1951), pp. 339–74.

curve so fitted. Moore's approach is to construct a diffusion index, a measure of the percentage of a specified group of economic series that is rising at any time. A broadly based diffusion index will characteristically reach a peak well before the peak of the business cycle, and will cross the 50% line in the neighbourhood of a business-cycle turning point.

One such diffusion index (based on 404 economic time series with " acceptable conformity ") was found to lead peaks and troughs of the general business cycle, in different periods, on the average by eight to thirteen months, and others behaved similarly.[1] This historical diffusion index led every business cycle by a substantial lead time, it skipped none, and it indicated no turning points (except 1933–35) that did not occur. " Hence the intriguing possibility presents itself that we may be able to recognize the clusters [of turning points] well before the peak or trough in aggregate economic activity." [2]

Current Smoothing

One major hurdle must be leaped over, or cleared away, before this technique can be used for forecasting, however. The diffusion indexes which give such early and unambiguous forecasts of business-cycle turning points are *historical* diffusion indexes. A component series is counted as rising in any month, irrespective of whether it is moving up or down in that month, so long as it follows a trough and precedes a peak, as determined many months, or even years, later. It is very hard, currently, to say whether a series is rising or falling in this historical sense. That is itself a forecast.

Of course, a diffusion index can be constructed on the basis of current month-to-month movements. Such an index is shown as the thin line fluctuating around curve *B* in the chart. It is based on fifteen to twenty-six components of the Federal Reserve Board Index of Industrial Production.[3] It clearly does not exhibit the one-to-one relation of its own turning points with those of business cycles that is characteristic of Moore's historical diffusion indexes. The use of the historical definition of rising or falling involves, obviously, an heroic act of smoothing.

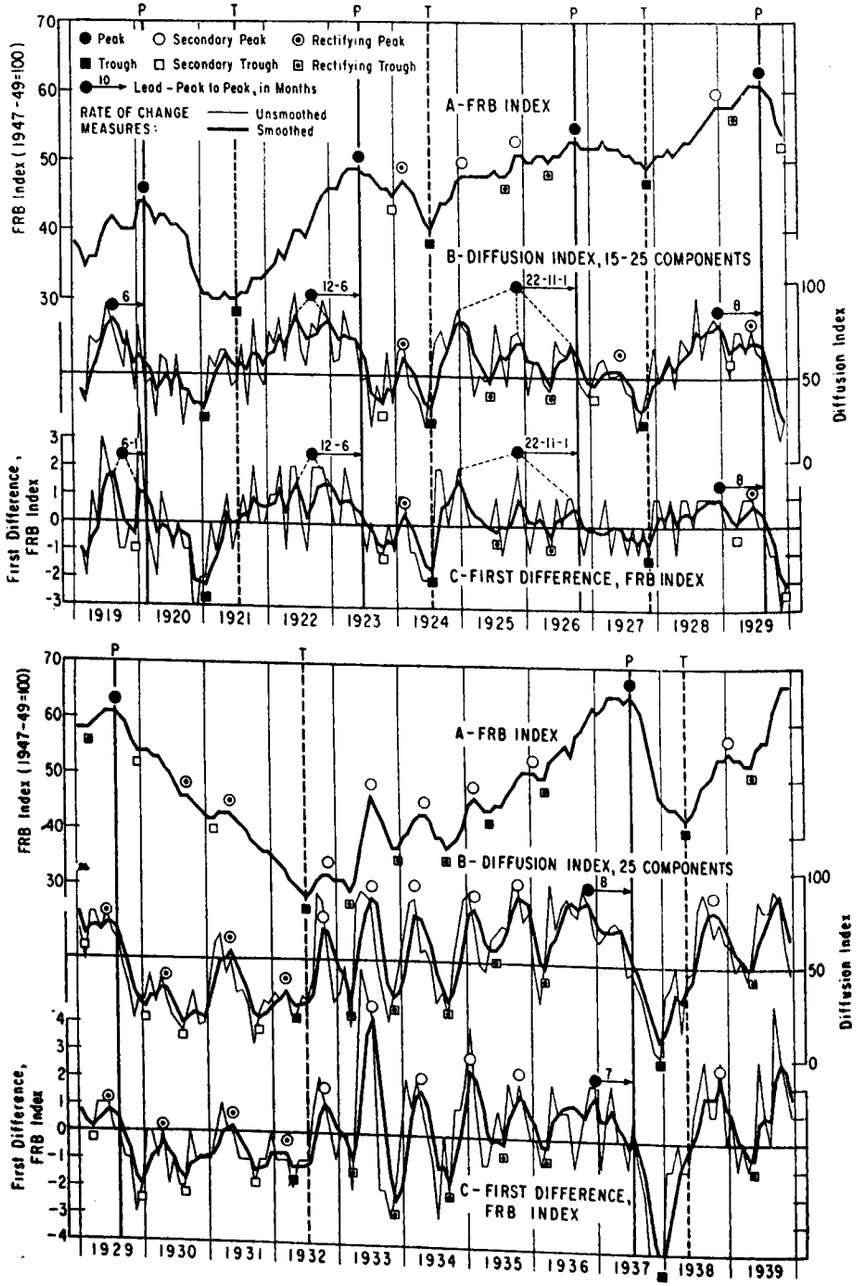
Smoothing introduces a lag. Thus, if either the individual series or the diffusion index itself is smoothed by a twelve-month equally weighted moving average, a five-and-a-half-month lag will be introduced. Moore has experimented in this manner, and his conclusion is that even with this reduction in lead time the results are still useful in forecasting. He also uses shorter moving averages and tries to interpret the rather erratic results. But cannot a smoothing be achieved that gets rid of most of the erratic fluctuation in the current month-to-month diffusion index and still leaves a substantial lead time?

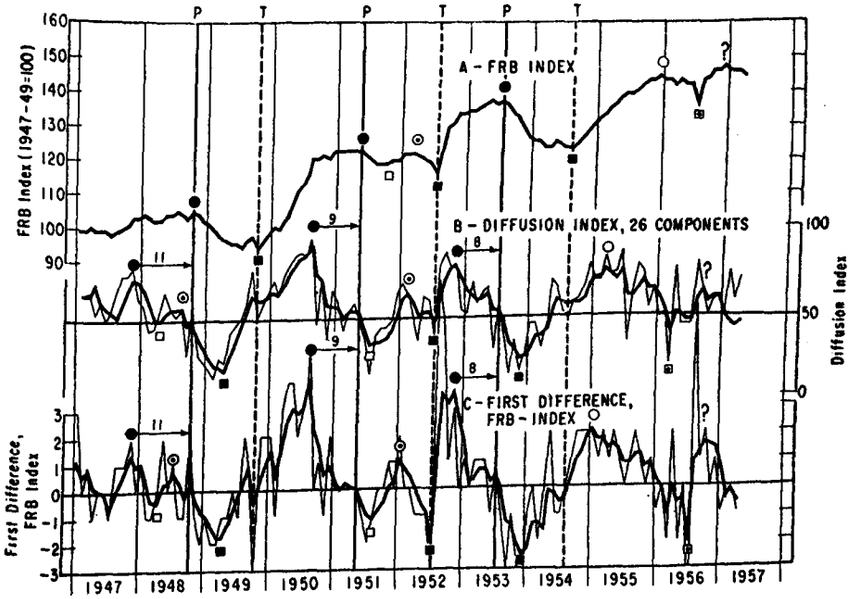
[1] *S.I.*, Table 10, pp. 46–7. [2] *S.I.*, p. 45.

[3] Kindly furnished by Moore, whose splendid co-operation should not go unmentioned.

FRB INDEX OF INDUSTRIAL PRODUCTION AND ASSOCIATED RATE OF CHANGE MEASURES

(Solid vertical lines indicate peaks, broken vertical lines, troughs, of FRB index)





The answer seems to be yes. Curve *B* in the chart shows a currently smoothed version of the diffusion index based on fifteen to twenty-six components of the F.R.B. Index, plotted contemporaneously.[1] That is, the smoothed value plotted for June 1935 is the value that can be computed the day that the F.R.B. Index for June 1935 becomes available. From an historical point of view it would be more appropriate to center this smoothed curve one month earlier, but that is not done in the present forecasting context because it is not actually available one month earlier. The turning points of the smoothed curve may accordingly lag about a month or so behind the turning-point dates of the unsmoothed series that can be identified by hindsight. Of course, if greater smoothness is required a longer lag must be accepted.

The currently smoothed diffusion index has quite definite peaks and troughs, although there are frequent one- and two-month interruptions of the main fluctuations. A little more smoothing, certainly introducing no more than another month's lag, would eliminate most of these interruptions.

[1] The smoothing formula used was: $14Y_t = 5x_t + 4x_{t-1} + 3x_{t-2} + 2x_{t-3} + x_{t-4} - x_{t-6}$, where Y_t is the smoothed value and x_t the original observation. This corresponds to fitting a second-degree polynomial to each set of seven successive observations and reading off the value corresponding to the next to the last observation. The value corresponding to the last observation was not chosen because it would involve greater computational complexity. This general type of smoothing was chosen because, based on a second-degree parabola, it would preserve curvilinearity that an equally weighted moving average would iron out. Secondly, the steadily declining weights give this smoothing formula the advantage of a substantially shorter lag at the turning points than that of an equally weighted moving average of comparable smoothing power.

And the peaks and troughs of the smoothed contemporaneous diffusion index certainly lead the corresponding peaks and troughs of the general business cycle.

For simplicity, let us confine our attention to the peaks. Similar findings also apply to the troughs, with some qualifications, principally that the leads are shorter.

Table I shows the leads of the relevant peaks of this contemporaneously smoothed diffusion index of the fifteen to twenty-six components of the F.R.B. Index over the peaks of the Index itself, 1919–39 and 1947–56. The corresponding leads of Moore's historical diffusion index of 403 conforming series over the National Bureau's turning points, 1919–37, are shown in Table I. The difference in peak dates reflects principally the difference in

TABLE I

Leads of Predicting Series over Business-cycle Peaks 1919–39 and 1947–55

Year of peak.	Predicted series peak.		Lead of Predictor (months)			Drop in (2) up to predicted peak. (points)
	N.B.E.R. reference cycle.	F.R.B. Index.	(1) Moore's diffusion index.[a]	(2) Current diffusion index,[b]	(3) First difference.[c]	
1920	January	February	6	6	6-1[d]	24
1923	May	June	9	6–12[d]	6–12[d]	16–19[d]
1926	October	October	21	22–11–1[d]	22–11–1[d]	17–6–3[d]
1929	June	August	8	8[f]	8[f]	11
1937	May	July	8	8	7	29
1948	November	October		11[f]	11[f]	24
1951[e]	—	May		9	9	37
1953	July	July		8	8	25

[a] 404 series with acceptable conformity; *S.I.*, Table 10, pp. 46–7.
[b] 1919–22, 15 components F.R.B. Index; 1923–40, 25 components; 1947–56, 26 components; smoothed by formula of footnote 1, p. 293. Curve B on chart.
[c] First difference of F.R.B. Index, smoothed by formula of footnote 1, p. 293. Curve C.
[d] Multiple peaks in predicting series.
[e] Possibly should not be considered a " real " business-cycle peak, cf. footnote 2 p. 299.
[f] This prediction impaired by a false trough in the predictor before the predicted series actually peaked.

timing of the F.R.B. Index peaks from those of the general business cycle as dated by the National Bureau, since the National Bureau's general criteria for dating peaks and troughs were followed in both cases.[1] The National Bureau's measures indicate a one-month average lag of the F.R.B. Index behind general business-cycle peaks, 1919–38.[2]

The smoothed-current diffusion index had substantially the same leads

[1] Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles*, National Bureau of Economic Research (New York, 1947), p. 58. Substantially, the peak month is the last month before lower levels are encountered.
[2] *S.I.*, Table 2, p. 7.

over cycle peaks in the F.R.B. Index as Moore's historical diffusion index had over peaks in the general business cycle.[1] It must certainly be considered a highly satisfactory forecasting device if it is not vitiated by disadvantages in other respects. It may accordingly be concluded that the current smoothing problem is surmountable, at least in the sense that a turning point in the predicting series can be recognised some six months to a year before the corresponding turning point can be recognised in the predicted series.[2]

IS THE DIFFUSION INDEX NECESSARY?

But is the diffusion index necessary, or is there a more easily obtained measure that will forecast as satisfactorily? Aside from the smoothing operation, the three characteristic operations involved in a diffusion index are:

1. *Differencing* the individual series.
2. *Transforming* the differences into a two-valued system: rising or falling.
3. *Weighting* the resulting binary values equally as among series.

Differencing the Aggregate versus Differencing the Components

Broida [3] has pointed out that a measure of the rate of change in an aggregate would often lead turning points just as a diffusion index does. " In periods of expansion, for example, the rate of increase in industrial production frequently would decline before the peak is reached, and be near zero around the peak. In periods of contraction, as the trough is approached, the rate of decline would tend to fall off and be near zero

[1] The only conspicuous difference is possibly with respect to the 1926 peak. There are three peaks in each predicting series, each of which might be matched with the peak in the predicted series. Their leads are twenty-two, eleven and one months, respectively. The predicting peak with the largest lead corresponds almost exactly to Moore's lead of 21 months. (Actually, the predicting peak being almost flat, its lead could be dated 21 months as appropriately as twenty-two months.) The predicting peak with the shortest lead leads the predicted peak by only one month, although the flat predicted peak might reasonably be dated five months later, so that the shortest lead would then be six months.

[2] It might be argued, in view of the lag of the availability of the data behind the months to which they refer, and the fact that it takes at least one and possibly two or three months beyond the turning point to identify it, that the forecasting lead of the currently smoothed diffusion index is too short to be useful. But whatever lag in the appearance of the data or in the interpretation thereof applies to the predictor series also applies to the predicted series. Thus, if the peak, clearly defined, of the predictor series leads the peak, equally well defined, of the predicted series by six months, and if there is a lag of two months in the availability of the data and another two months are required to recognise a turning point clearly, the corresponding total four-month lag applies to both predictor and predicted, and it will still be true that the turning point can be recognised six months earlier from the predictor series than from the predicted series. In short, the peak-to-peak lead is an appropriate measure of the effective lead for forecasting purposes if the two series are equally smooth.

[3] *Op. cit.*, p. 13.

around the trough." Moore agrees " that certain types of diffusion indexes, namely those computed by taking directions of change over identical intervals in the components of economic aggregates, are closely correlated with the rates of change in the corresponding aggregate." [1] But he claims that there is a fundamental difference in that the diffusion index focuses attention on the components of the aggregate rather than on the aggregate itself.

It is hard to see why a diffusion index, a count of the relative frequency of positive first differences of the components, should put a stronger focus on the components than a conventional index which is a weighted average of the quantitative levels of the components. In either case the final index depends upon a weighted sum of the movements of individual components and has lost sight of the individuality of those components. The fact is that the diffusion index will differ from the first difference of a corresponding aggregate only because of the transformation and weighting operations. Broida doubts that anything is gained by the transformation of quantitative information into the two-valued attributes of rising and falling. He also argues that equal weighting is likely to be inferior to weighting by importance.

A comparison of the smoothed current diffusion index based on fifteen to twenty-six components of the F.R.B. Index (curve *B*) with a comparably smoothed first difference of the F.R.B. Index (curve *C*) indicates that little is lost by the two-valued transformation and equal weighting, but little is gained either. Nothing can be inferred from either of the curves *B* and *C* that cannot be inferred from the other. The only substantial difference is the superior performance of the diffusion index in 1919–20, when some ambiguity arose in the direction of movement of the first difference just before the downturn. Otherwise, the two curves are closely comparable, with the leads evenly balanced (see Table I).

The choice between a diffusion index and the first difference of the aggregate, therefore, is almost purely one of convenience, so far as predicting turning points is concerned.

Weighting and Transformation Effects

The practical equivalence of curves *B* and *C*, for forecasting business-cycle turning points of curve *A*, also resolves the weighting and transformation problems. Obviously, neither the weighting nor the transformation makes critical difference, since the equally weighted and two-valued transformed diffusion index yields substantially the same information as the first difference of the carefully weighted F.R.B. Index with the quantitative differences preserved.

We may conclude, then, that the smoothing and the differencing are

[1] *American Statistician*, October 1955, p. 13.

essential to the forecasting value of these predictors, while the weighting and the transformation are not.

The Agreement is Empirical

A diffusion index and the first difference of a weighted aggregate index do not necessarily have to agree in their turning points. They will agree in certain circumstances, but not in others.

They can generally be expected to agree, however. When an increasing number of series is rising the average rise will usually also be increasing, and the two measures will move together. This should be our normal expectation, and it is, in fact, found to be the usual case in the data here under review.

But it is possible for the diffusion index to rise while the first difference falls. If, as the number of series rising increases, the rising series rise by declining amounts and the falling series fall by increasing amounts, the two measures may diverge. In this case the peak of the first difference can lead that of the diffusion index.

Of more interest to those who favour the use of the diffusion index is the possibility that the diffusion index may lead the first difference of the aggregate index. If, as the number of series rising decreases, the series still rising increase their rates of rise, the first difference may continue to rise even though the diffusion index is falling.

These theoretically possible differences in behaviour of the two measures do not seem to be encountered in practice, except in the form of occasional month-to-month divergences that must be considered erratic fluctuations.

Another type of divergence occurs when there is a highly intense disturbance localised in a single sector of the economy, such as a steel strike. In such cases the first difference of the aggregate is more severely affected than is the diffusion index.

In view of the high frequency of extreme items in economic time series, a diffusion index, taken over a very large number of components, can be expected to be smoother than the corresponding first difference of aggregates. The transformation operation, which cuts all quantitative variations down to the same size, can produce a smoother movement, especially when a very large number of components enter into the diffusion index, than that of the first difference of the weighted aggregate. The latter is more strongly affected by large disturbances in a small number of series, especially if they are heavily weighted.

It does appear that the same smoothing operator applied to the two predictors yields a slightly smoother curve for the diffusion index than for the first difference, especially over that period when the diffusion index is based on twenty-five or twenty-six components rather than fifteen. (Compare curves *B* and *C* from 1923 on.) It can be inferred that, were the diffusion index based on many more series, say the 175 monthly series

underlying the F.R.B. Index, it would have a substantial advantage in smoothness.[1]

A simple, early and relatively smooth approximation to the F.R.B. Index can be made by cumulating an unweighted diffusion index. It should be possible, even before the end of each month, to get for many of the 175 component activities underlying the F.R.B. Index a judgment as to whether they are moving up or down for the month. The resulting diffusion index, cumulated, will closely agree with the F.R.B. Index itself, which would become available only several weeks later. Such differences as may be observed in the two measures, and they are slight, give the advantage, for forecasting purposes, to the cumulated diffusion index.[2] The latter's small advantage in smoothness is particularly evident in the neighbourhood of turning points, so that its turning points are more sharply defined. Whatever the forecasting value of a diffusion index may be, a cumulated diffusion index clearly has a substantial value as a smooth and prompt measure of current developments, a value possibly superior to the best measures now in general use, such as the F.R.B. Index.

While the diffusion index is somewhat smoother than the first difference of an aggregate, this advantage is insignificant, so far as forecasting turning points is concerned, compared to a disadvantage common to both predictors, a tendency to produce false leads.[3]

False Leads

Moore's historical diffusion index not only called all the cyclical turning points correctly and with a substantial lead, it never called a wrong turn, except in 1933–35. The current diffusion index, and the first differences, as shown in the chart, unfortunately call a large number of wrong turns. More accurately, there are a number of peaks and troughs in the two smoothed current predictors that do not correspond to the conventionally recognised turning points in the business cycle. Each false lead is given by both predictors, which agree as well on the false peaks and troughs as on the true ones.

As shown in Table II there were eleven "false peaks" [4] indicated on

[1] See Moore, *American Statistician*, October 1955, Chart 1, p. 15, for a dramatic illustration of the smoothing power of the diffusion index based on 225 new orders series, National Association of Purchasing Agents, as compared with the corresponding aggregate. That chart also compares the F.R.B. Index with a cumulated diffusion index based on twenty-six components of the F.R.B. Index.

[2] As can be inferred from reference of preceding footnote.

[3] The leading series approach is also subject to the same major shortcoming. See Maher, *op. cit.*

[4] Very short false leads of one to three months' duration were not counted, since they could presumably be smoothed away without introducing a lag that is long relative to the true leads. A subjective element enters into this count of false leads which could be removed only by precisely specifying the smoothing to be applied and the criteria of peak identification to be used. That is, more false leads could be identified, but not fewer, unless true leads are also to be destroyed.

upswings [1] in the period 1919–39, and 1947–56, in addition to the eight true peaks.[2] Ten of them were related to short downswings, and one to a flattening out in the rate of increase. The ten secondary half-cycles and one plateau lasted from one to ten months, except for one which lasted twenty-four months. The predicting series did not lead these downturns by more than three months, except in one recent case, and the median lead was only one month.

Table II

Secondary Peaks or Plateaus Associated with "False Leads" in Current Diffusion Index

F.R.B. Index components [a]

Date of secondary peak or plateau.[b]	Lead of current diffusion index, months.	Length of secondary half-cycle plateau, months.[c]	Drop in F.R.B. index, %	Drop in current diffusion index, points.
Plateau 1/25	1[d]	8	0	32
Peak 11/25	−1[d]	6	2	23
Peak 10/32	0	7	10	41
Peak 7/33	0	24	20	53
Peak 4/34	1	9	14	46
Peak 2/35	0	6	2	22
Peak 11/35	1	5	2	38
Peak 1/39	3	5	4	30
Peak 11/39	1	10	9	35
Peak 1/52	−1	7	2–4[e]	15
Peak 12/55	6–9	9	3–6[e]	35

[a] Cf. footnote *a*, Table I.
[b] Dated as first month high is reached, not last as in Table I.
[c] Number of months before high is surpassed.
[d] Can also be interpreted as a longer lead over true peak.
[e] Lesser figure implies rough adjustment to eliminate effect of steel strike.

A comparison of the drops in the currently smoothed diffusion index that are associated with the false leads (final column, Table II) with the drops associated with the true business-cycle peaks up to the point where the peak appears (final column, Table I) suggests that any smoothing which could eliminate the false leads would be likely also to eliminate the leads over the true business-cycle peaks. It is true that the potentialities for smoothing depend not only on the size of the drop but also on the entire configuration of the series in the neighbourhood of the false peak. But there

[1] False peaks indicated on downswings are not counted here because they would be relevant to the preceding false troughs. They occur when one is looking for a trough, and so are merely corrections of false indications of a trough. Such peaks are indicated as "rectifying peaks" in the chart, and similarly, false troughs on upswings are called "rectifying troughs."

[2] Assuming that May 1951 was a genuine business-cycle peak. Even under the contrary assumption, the corresponding peak in the predicting series should not be counted as a false lead because the decline in the rate of increase was clearly related to governmental measures, and would not have been contemporaneously interpreted as a prediction of a recession. By the same token, 1951 might be deleted from the list of successfully predicted peaks in Table I.

is no clear difference in configuration of the predictors as between true and false peaks such as to suggest the possibility of currently smoothing out the false peaks without destroying the lead of the predictors over true peaks.

The " false leads " shown by the two predictors reflect more than merely random fluctuations in the data. They are related to genuine hesitations in the upward movements of the F.R.B. Index, hesitations which usually reflect developments that pervade the entire economy. Similar false leads are also shown by many other current diffusion indexes. Thus, Lipton's diffusion index based upon twelve statistical indicators, only five or six of which relate directly to industrial production, shows a pattern of false leads over the period 1921–39 almost identical with that shown by curves *B* and *C*.[1] An average duration of run measure applied to fifteen broadly heterogeneous statistical indicators also shows identical false leads.[2] This measure is based on month-to-month changes, and so behaves like a current, rather than an historical, diffusion index. Maher's regression of the F.R.B. Index on various leading series demonstrates not only a similar tendency to generate false leads but also a substantially similar pattern of the occurrence of the false leads.[3]

The one feature of the historical diffusion index that cannot be satisfactorily matched in a current diffusion index is, therefore, the smoothing out of false leads. Because these false leads cannot be eliminated in a current measure, the current predictors fall far short of the forecasting potential suggested by the crisp one-to-one leads of the historical diffusion indexes over business-cycle turning points.

The simple fact of the matter is that there are frequent hesitations in business-cycle upswings and downswings. A broad class of statistical indicators, which are either measures of rates of change or activities which are sensitive to rates of change, reflect these hesitations. It is not a mathematically necessary condition that every business-cycle turning point be preceded by a turning point in the rate of change, but empirically it seems to be so. Consequently, these indicators, sensitive to rates of change, generally lead business-cycle turning points; the ones considered in this paper do so without exception.

But not every hesitation *need* be followed by a business-cycle turning point, so many false leads are given. Consequently, a peak in one of these indicators can tell us that we *may* be heading into a downturn, but the chances, derived from the inter-war and post-war period, are about three to two that any particular hesitation will furnish a false rather than a true lead.[4]

[1] N.I.C.B., *Business Record*, June 1955, pp. 214–15. [2] *S.I.*, Chart 7, p. 84.

[3] *Op. cit.*, especially Chart I. Maher's regression, being less smooth, gives many more false leads, but it is clear that after some smoothing it would show many of the false leads shown by curves *B* and *C*.

[4] The chances are three to two on the assumption that the predictions are based on data smoothed to an extent consistent with the determination of the eleven false peaks of Table II. A lesser degree of smoothing would yield more false peaks.

That is, the chances are three to two that a peak in the smoothed predicting series will be associated with a secondary peak or plateau in the predicted series rather than a " real " business-cycle peak.

Length of Lead as a Discriminant

Some forecasting value can possibly be derived from the fact that the predictors led the predicted series by six months or more in all cases of genuine business-cycle peaks, while, with only one exception, they had substantially zero lead over the downswings and plateau which must be regarded as false peaks. If, then, three months after a peak in the predictors no peak appears in the predicted series, the probability would seem to be high that the predicted downturn will actually turn out to be a significant business cycle and not a secondary peak or plateau.

The outstanding failure of this criterion in the period under review is, unfortunately, the most recent " false peak " that of December 1955 (see Table II). This " false peak " was predicted from six to nine months in advance by the smoothed current-diffusion index, and eleven months in advance by the first difference.

Even if we are prepared to dismiss this one exception as not disproving a rule which seems to apply to the ten other cases of false peaks and to all eight cases of true peaks listed in Table I, further scrutiny reveals that the proposed discriminant would have little value in practical operation. While, as indicated in Table I, the peaks of the predictors led those of the predicted series by six to twelve months, they would not have been recognised contemporaneously as leading by so long a time. In all of the cases of true turning points listed in Table I, with the possible exception of 1953, there was, within a month or two of the peak of the predicting series, a preliminary small downturn, or at least a short plateau, in the predicted series, which was soon thereafter surpassed.

Consequently, a contemporaneous attempt to apply the proposed discriminant would have led, in at least seven out of the eight cases of true peaks, to the matching of the peak in the predicting series with preliminary false peaks which were practically simultaneous with the peaks in the predictors. It would then be concluded, erroneously, that a secondary or false peak was being forecast. The difference in lead time that we are considering as a potential contemporaneous discriminant between true and false leads turns out, therefore, to be one that can be established, in all but one case, only by hindsight.

We cannot get away from the fact that while peaks are always led by slowdowns, slowdowns do not always lead to a business-cycle peak.

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THE EUROPEAN COMMON MARKET AND BRITISH INDUSTRY[1]

IN 1955 the six countries constituting the European Coal and Steel Community—Belgium and Luxembourg, France, Germany, Italy and the Netherlands—decided to examine the possibility of freeing the whole of their mutual trade from all artificial barriers. Roughly a year later, when concrete proposals in this direction had emerged in the shape of the Spaak Report, Britain declared her intention of participating in the free-trade scheme. Since then, negotiations have been carried on about the precise form which this participation should take; as the British approach differs from that of her continental neighbours in many important respects, it is not yet certain that the United Kingdom will in fact enter a common market in Western Europe.[2] However, this does not appear to preclude discussion of one very important issue which is raised by the present proposals—the effects on particular British industries of freeing intra-European trade. This is the subject of the present paper.

As a result of removing tariffs and other impediments to the free movement of goods, a country will tend to specialise on those commodities in which it has a comparative advantage, and it will tend to give up other lines of production in which it is, by comparison, at a disadvantage. In other words, the abolition of trade barriers will induce a movement of resources from the relatively less efficient to the relatively more efficient industries. The subject matter of this paper may therefore be described more precisely as an attempt to divide the commodities produced by British industry into two groups—the first comprising those commodities which have a comparative cost advantage, and the second those which are at a comparative cost disadvantage. In other words, the first group comprises goods which can be produced more cheaply in Britain, relative to the goods in the second group, than on the Continent, and the second group comprises goods which can be produced only at a higher cost in Britain, relative to the cost of producing the goods in the first group, than they can in Western Europe. Commodities found in the first category are therefore likely to do well in a common market—viz., not only will the particular industries concerned retain their home market, but they would also be expected to increase their exports to the Continent; on the other hand, industries

[1] This is a slightly amended version of a paper read before Section F of the British Association for the Advancement of Science at its 1957 annual meeting in Dublin. I am deeply indebted to Mr. Rodney Crossley for compiling most of the statistics, and to Professor J. E. Meade for suggesting a number of important changes in the exposition. My wife rendered valuable assistance at every stage of the work.

[2] The terms "common market," "free trade area," etc., will be used interchangeably in this paper, as the distinctions which exist do not matter for our purposes.

producing commodities found in the second category would probably find it increasingly difficult to retain a substantial share of their internal market, and would also tend to lose any continental sales which they might at present enjoy.[1]

One point, closely related to the above, deserves particular emphasis, because it appears to have been the subject of much confusion. It has been suggested in some quarters—which are not usually very amiably disposed towards the common-market project—that free trade in Western Europe would have depressing effects on British industry in general and that it would lead to balance-of-payments difficulties, unemployment and social losses, although a few lines of production, such as the manufacture of aircraft and atomic-energy equipment, might benefit. On the other hand, enthusiastic supporters of the project have predicted that, apart from a few exceptions, such as the cotton sector, firms in this country could easily stand up to unfettered foreign competition and would, in fact, register substantial gains in European markets.

It is true that these propositions represent possible alternative short-term situations, although they both fail to impress one as realistic forecasts; however, they cannot in general be regarded as possible long-term equilibrium positions. It is one of the essential tenets of the law of comparative costs on which any discussion of this issue is ultimately based that if the free trade countries maintain balance-of-payments equilibrium any increase of output and of exports in some lines of production, brought about by the institution of free trade, will be accompanied by a decrease of output and an increase of imports in other lines. Professor Meade's paper "The Balance-of-payments Problems of a European Free-trade Area" (cf. ECONOMIC JOURNAL, September 1957) dealt with the methods by which chronic balance-of-payments surpluses and deficits may be avoided in a free-trade area, and therefore I do not propose to discuss this matter further; in this paper I shall merely assume that in the long-run balances of payments will more or less be kept in equilibrium. In such a situation it is not possible for all or nearly all industries to expand or to contract; if Britain has a comparative advantage in some industries, which therefore tend to expand, she will *ipso facto* have a comparative disadvantage in some other industries, which will therefore tend to contract.

It may appear unnecessary to give such emphasis to what most people will regard as very obvious points, but they do need to be clearly understood

[1] It may be asked how it is at present possible for Britain to export to the Continent those goods in which she is, relatively speaking, at a comparative cost disadvantage, as such a disadvantage should theoretically tell against the products concerned when they are sold abroad. Two main reasons may be advanced for the existence of such exports. First, the export goods concerned may be highly specialised, and secondly, the industries concerned may pursue discriminatory pricing policies. In so far as the first point holds, exports may continue even if the internal market is invaded, but if—as the author believes—the second reason is the more important one, then the loss of the home market would obviously also reduce exports to the Continent.

not only for the purpose of this paper, as will become clear below, but also for a correct appreciation of the whole common-market project.

I now come to the main part of this paper—the prospects for the different commodities produced by British industry, or technically speaking, a study of comparative costs in Britain relative to those on the Continent. It will hardly be necessary for me to point out the enormous difficulties which any attempt to make a reliable forecast cannot fail to encounter. Much water will flow under Europe's bridges before free trade in Western Europe is established, and many important aspects of the whole problem may well change in the meantime. Nevertheless, it should at least be possible to give an indication of likely trends, and this is what I have tried to do.

There appear to be at least three ways of ascertaining the position here. First of all, there is the European census of production. If it were possible to hold a detailed statistical inquiry into the whole of industry in each of the member countries of a common market, using the same methods of investigation, comparable material could be collected which should serve as a fairly accurate guide as to what would happen once trade barriers have been abolished. Evidently, such a census of production, if it were to be undertaken at all, could be staged only by an authoritative international body which could command the necessary funds; it would obviously be far beyond the reach of an individual investigator like myself. One might attempt to use the existing national censuses of production for our purposes, but even then the work involved would very likely be enormous; moreover, the additional pitfalls which such a course of action would entail might well render the results a good deal less reliable.

Secondly, one might approach firms and industries in Britain and perhaps also on the Continent and ask them how they expect their particular products to be affected by the common-market project. As most enterprises should be able to evaluate the relative position of their Continental competitors, this method is also likely to yield fairly sound results. Difficulties may, however, arise because the crucial assessments are being made by different people, probably on the basis of different kinds of information, and possibly relating to different aspects of the effects of the common-market venture.

This second way has been followed by all the inquiries which I personally know of, and this is the main reason why I decided against it. Instead, I have attempted to judge the prospects of different British products by their relative success (or failure) in export markets in the last few years. The basis of my argument, therefore, is the assumption that Britain has a comparative cost advantage in those products which in the recent past have enjoyed relatively large sales in markets where they are in direct competition with rival products from the Continent, and that she is, by comparison, at a disadvantage with regard to those products which, relatively speaking, have been outdone by exports from Britain's European competitors. On

the whole, this appears to be a reasonable hypothesis, although there are a number of difficulties connected with this approach which will be discussed below.

My first task is to describe in somewhat greater detail the investigations which I have carried out. I began by comparing the absolute level of British exports of sixty manufactured commodities to Western Europe with those of each of the six European Coal and Steel Community countries and of Sweden during the period 1953–56. In many cases a test of this nature will yield reliable results, but there are dangers in using absolute export levels only; it is possible that although some British industries enjoyed relatively large sales during these years they rapidly lost ground over the period, and vice versa. Hence the above set of data was supplemented with the rate of increase of exports in each group from each of the countries to Western Europe between 1953 and 1956. The absolute levels of sales and the rates of increase formed the basic material. In addition, the ratio of British exports of each item to Western Europe to British imports of the same item from Western Europe was examined.

The sixty commodities chosen include nearly the whole range of manufactured goods. I have attempted to make the items as homogeneous as the basic data will allow, but there are a few instances in which the existing statistics do not provide a detailed breakdown, with the result that the composition of such items may vary substantially from country to country. Thus if one takes a first preliminary glance at the table it will be found that only two entries are available for electrical goods—" other electrical goods " and " electric generators, transformers, etc.," ranked as Nos. 30 and 31 respectively. The first group may comprise such different commodities as electric-light bulbs and radio equipment, electronic apparatus and automatic toasters. Therefore, generators apart, my data cannot help me to assess the prospects for different branches of the electrical industry, although I can say something about electrical goods as a whole. Likewise for Nos. 21 and 54.

The countries to be considered in this comparison really chose themselves, except perhaps Sweden, but as her exports of manufactures are quite large in some lines, and as she may well become a member of a free European market, it seemed wise to include her.

The choice of years was likewise a straightforward matter. What I required was a recent period, not so short as to give undue emphasis to the effects of random disturbances, and in general representing as closely as possible " normal " trading relationships. The period from 1953 to 1956 appeared to be by far the best choice.

A brief word also about the market selected for the comparisons. The choice naturally fell on Western Europe, or, in terms of the trade statistics, the " remaining O.E.E.C. member countries combined," although, for a number of reasons, this could lead to distorted results. Perhaps the most

serious difficulty arose because for each single country's exports the destination "remaining O.E.E.C. countries combined" includes all the other competitors. This means that when one is, for example, comparing the United Kingdom with Western Germany, British exports include sales to Western Germany, but not, of course, sales to the United Kingdom, and German exports include sales to Britain, but not, of course, to Western Germany, with the result that one is not in fact contrasting the performance of German and of British exports in the same market. If one could generally assume that in the two countries market conditions for the other's products, including tariffs and other trade restrictions, were fairly similar, this would not matter much, but there is probably little justification for such an assumption. The best solution would be the exclusion of all mutual trade, but there was no time for the heavy additional work involved, and therefore the export figures do include the mutual exchange in each product group. However, a wide sample indicated that this imperfection in the basic data affects our analysis only to a very minor extent, and hence it does not appear that the validity of the investigation is greatly impaired in consequence.

A second, related difficulty springs from the remnants of discrimination in the O.E.E.C. market. It is true that as a result of the O.E.E.C. liberalisation programme and of the multilateral payments mechanism of the European Payments Union most of the trade in Western Europe is now free from discriminatory influences. However, many O.E.E.C. countries still maintain a hard core of import restrictions, some of which favour certain suppliers more than others; also, nearly all British products enjoy preferential treatment in Ireland; and finally, the institution of the European Coal and Steel Community has created a free trade area with regard to certain products in Western Europe from which the United Kingdom is at present excluded. In this last case the effects upon relative exports are very noticeable, and therefore the comparison of sales of iron and steel products (No. 54 in the table) is not very meaningful, but how far the other divergences from a non-discriminatory market are important is difficult to establish offhand, though the probability of major distortions arising appears to be small.

I have devoted some attention to the details of my approach so as to put the analysis into its proper setting. I shall now move on to the results of the investigation presented in the table. This is rather a long and complex table, because I thought it appropriate to provide as much information as possible, but nevertheless it should not prove too difficult. In any case, if one does not intend to probe into the facts lying behind the results, one need go no further than column 1, which ranks the sixty commodities in the order of their relative success in Western European markets, beginning with the best and ending with the worst performers.

Column 2 contains the annual average of the absolute value of United Kingdom exports of each product to Western Europe during 1953–56, and the figure underneath shows British exports of each item in 1956 as a per-

centage of those in 1953. We will call this the index of growth of British exports. Thus during 1953–56 British exports of aircraft to Europe averaged $40·7 m., and the index of growth was 157%.

Column 3 contains the data relating to Britain's three most important competitors, from which the ranking of the sixty product groups is derived. The figures are expressed as percentages of the relevant British figures, and the capital letter denotes the particular country concerned. Taking the case of aircraft again, the top row indicates that exports from Italy, Britain's nearest rival, were only 10·3% or about one-tenth of the British total; next came the Netherlands, with 8·9%, and then Belgium/Luxembourg, with 3·6%. We will call these figures the indices of relative levels. The second row shows the indices of growth of exports of aircraft from Italy and Belgium/Luxembourg as percentages of the index of growth of British exports of aircraft.[1] Thus, the index of growth of Italian exports of aircraft (not given in this table) was 203·5%, which is 129·8% of the British index of growth, and the index of growth of exports from Belgium/Luxembourg (again not given in this table) was 690%, which is 440% of the index of growth of British exports. We will call these figures the indices of relative growth.

The table therefore contains one set of absolute figures—the annual average of the value of United Kingdom exports—and three sets of indices: the indices of growth of British exports—exports in 1956 as a percentage of those in 1953; the indices of relative levels—the absolute value of exports sold by Britain's rivals expressed as a percentage of absolute British exports; and the indices of relative growth—the index of growth of exports of Britain's main rivals expressed as a percentage of the British index of growth.

I do not propose to go through the results commodity by commodity, for this would take up far too much space; rather, I shall comment on some of the more general aspects of the table, using particular items as examples wherever appropriate.

As a brief examination of column 3 will show, the figures relating to Britain's competitors present anything but a clear-cut picture. In particular, the indices of relative levels and the indices of relative growth often give conflicting results. Compare, for example, Nos. 10 and 18—woollen and worsted fabrics, and aluminium. Taking aluminium first, Germany exported slightly more to Western Europe than did Britain, and France as much; the third competitor—Belgium/Luxembourg—was relatively unimportant. On the other hand, both Germany and France, especially the latter, lagged behind the United Kingdom's rate of increase. In the case of woollen and worsted fabrics, the position is more or less the reverse. The absolute value of British exports was larger than that of any competitor, the nearest rivals being Italy and Belgium/Luxembourg. In contrast, the index of growth of British exports is very much lower than those for her

[1] The Dutch figure is not available in this particular case.

chief rivals, the figure for Italy being particularly high. In other words, aluminium shows up worse than woollen fabrics as regards the indices of relative levels, but shows up better as regards the indices of relative growth. There appears to be no *a priori* way of settling the question as to which of these two products should be regarded as the more successful line, it all depends upon the relative weights accorded to absolute values and rates of change respectively by individual examiners, and here opinions will very likely differ. In my view, the absolute values are on the whole somewhat more telling than the rates of change, largely because rates of change are of necessity calculated from two single years, and are therefore much more liable to be distorted by random shifts in the pattern of trade than are averages. In addition, the significance of a rate of change very much depends upon the relative size of a country's exports; a doubling of your sales abroad is very much easier if you start with only a small share of the market than it is if you are already the dominant exporter.

For these reasons, I made the following adjustments. In order to meet the last point above, the indices of relative growth were weighted with the indices of relative levels; the resulting figures were then divided by 2 so as to give less emphasis to the rates of change, and finally added to the indices of relative levels themselves. With one figure only for each country, the ranking presented little further difficulty—by adding the results for the three countries together, all the information about each product was reduced to one single figure.[1]

Of necessity, these adjustments have been rather arbitrary, and one might equally well have followed another procedure, with different results emerging. However, the precise order in which the commodities are ranked is not really of great importance for our purposes. All that really matters is the overall positioning of any product in the table, and in view of the marked decline in the standard of performance as one moves down the table this is much more rigidly circumscribed. In other words, unless one changed the whole approach—*e.g.*, by giving to the indices of relative growth substantially greater emphasis than to the indices of relative levels—the ranking of our sixty products is likely to be much the same as that shown in the table whatever the precise procedure adopted.[2]

[1] *E.g.*, the ranking number for group (2)—tractors—is derived as follows. The relative performance of German exports is $\frac{190{\cdot}8 \times 0{\cdot}712}{2} + 71{\cdot}2 = 139{\cdot}1$; that of Italian exports is $\frac{397{\cdot}0 \times 0{\cdot}05}{2} + 5{\cdot}0 = 17{\cdot}9$; and that of Swedish exports is $\frac{191{\cdot}0 \times 0{\cdot}057}{2} + 5{\cdot}7 = 11{\cdot}1$. The ranking number for tractors, therefore, is 168·1. In four instances the rate of increase of exports is not available for one of the three competitors, and therefore it is impossible to calculate indices of relative growth. As all four cases are only of small quantitative significance, a "likely" rate of growth was simply guessed at when the ranking number was calculated.

[2] Two alternative methods of ranking were tried by the author. The first consisted of dividing the unadjusted indices of relative growth by 2 and then adding them to the indices of relative levels; in the second instance, the weighted indices of relative growth were added to the indices of relative levels without the division. In both cases results very closely approximated those in the table.

Further support for the ranking shown in the table comes from the following test. Unless the less-efficient industries in Britain are protected more strongly than the more progressive lines of production, one would expect present imports of those commodities in which Britain has a comparative advantage to be smaller, relative to export sales of the same commodity, than imports of those goods in which she is comparatively less efficient. I therefore calculated the ratio of the exports of each product group to Western Europe over the imports of the same product group from Western Europe during the average of our four years 1953–56, and then ranked the results. The list of commodities which emerges bears a fairly close resemblance to that presented in the table, and the rank correlation coefficient works out at 0·725. This is quite a satisfactory result, especially as a rough examination of the tariff indicated that the less-efficient industries in fact enjoy a somewhat higher level of protection than those in which Britain appears to have a comparative advantage.

The other major comment on the table which I think should be made relates to the fact that in general the United Kingdom's record in the Western European market is worse than that of her competitors. As a closer glance at column 3 will show, in the great majority of cases average British exports have been lower in absolute value than those of Germany, the most important exceptions being aircraft (No. 1), tractors (No. 2) and woollen fabrics (No. 10), and frequently the United Kingdom takes only a third or fourth place; moreover, the rates at which her sales have expanded are nearly always lower than those of several of her rivals. There are, of course, explanations for these facts; for example, Germany's predominance in Western Europe is more than offset by heavier British sales elsewhere, especially in the Commonwealth, and the relatively slow growth of British exports of manufactures is at least partly due to the degree of inflationary pressure in Britain, which exceeded that in most Continental countries. However, the reasons for Britain's failure to show up well are not really very significant for this analysis; what is much more important is to remind oneself that a relatively poor performance on the part of most British exports does not mean that by and large British industry will be affected adversely by the creation of a common market. As I pointed out at the beginning of this paper, it is highly unlikely that either the extreme optimists or the extreme pessimists will be correct, unless we allow for chronic and marked balance-of-payments disequilibria; if we assume that trade will be roughly balanced,[1]

[1] This, of course, does not mean that there must be a balanced exchange of manufactures between Britain and Western Europe; as Professor Meade points out (cf. ECONOMIC JOURNAL, September 1957, pp. 378–80), the object of balance-of-payments policy for a member of a free-trade area will be the same as that for any other country—*i.e.*, an overall balancing of international payments. However, it is hardly feasible that this object could be attained if there were any radical changes in the overall economic structures of the participating countries (*e.g.*, in the distribution of resources as between industry and agriculture), such as are implied in the more extremely optimistic or pessimistic views concerning the effects of free trade on British industry.

then the dividing line between promising and suspect industries will probably lie somewhere half-way down the order, though for a number of reasons which I will mention below, it is impossible to predict its exact position. What the table is intended to do is to indicate the position of different British export goods relative to one another, by means of comparing the performance of each product with that achieved by the corresponding exports of other countries; whether from some absolute point of view British products have on the whole been successful in Western Europe or not is quite a different question, and one of little concern to us here. In other words, our chief interest lies in the comparative-cost position in Britain, *i.e.*, the costs of different products relative to one another, as compared to the situation with regard to the same goods on the Continent, and it is on this point that we look for guidance from our table. If we were to concentrate on the absolute performance of British goods we would be moving along the same channels of thought as the person who reasons about international trade in terms of absolute and not comparative costs, thereby disregarding the whole of the theoretical development of this subject since Ricardo.

There are, however, a number of reasons why the figures in the table may fail to indicate the comparative-cost position correctly. One factor in particular should be mentioned. Above I touched upon the probable influence of inflationary pressure upon the various countries' exports. If one could assume that the degree of this pressure had been more or less the same as far as any one counry's exports are concerned, the relative position of our sixty commodities would not be disturbed. However, such an assumption can hardly be made; *e.g.*, it would be difficult to find much support for the hypothesis that because of excess demand at home all British industries had in equal measure been prevented from maintaining their export sales, and likewise for the other countries. This means that the relative position of our sixty commodities may be influenced not only by comparative costs in Britain and in Western Europe, but also by the incidence of inflationary pressure in Britain and on the Continent, with the result that our findings may be distorted. To some extent one may be able to assume that on the Continent and in Britain the same commodities were in short supply, and then our figures stand, but a great deal of effort would be required to prove or disprove this hypothesis.

Let me give an example of the kind of problem I am talking about. No. 55 in the table is cement. As its position in the table indicates, the performance of this commodity was poor. Moreover, it also shows up badly in the second test, which is the relation of British exports to O.E.E.C. countries to imports from O.E.E.C. countries. The conclusion is that the cement industry will do badly in a European common market. However, suppose that cement were particularly scarce in Britain during our period, whereas it would relatively easily have been obtained on the Continent. Such supply conditions would lead to low exports from Britain, although cement might in fact be a commodity in which this country had a comparative advantage. Given a few years in which to investigate internal markets for each of our products, this kind of error could be narrowed down; all I can do here is to hope that distortions are not too serious.

It is not difficult to think of further reasons why my results may not give a correct picture of the comparative cost position. Therefore I would again point out that the precise order in which the commodities are arranged must not be taken as anything very definite; all that I think can be claimed for my data is that, allowing for some exceptions, they probably indicate the overall position of the different commodities correctly.

There is one final aspect of the figures in the table which is worth mentioning. There do not appear to be any very definite results which emerge with regard to broad sectors of industry. *E.g.*, one cannot say that Britain has a definite comparative advantage in engineering products, for it will be found that whilst aircraft, tractors and power-generating machinery occupy the first three places in the table, passenger cars, commercial vehicles, office machinery and machine tools are placed very much farther down in the order. It is true that engineering goods are on the whole to be found in the upper half of the table, but the spread is still remarkable. Likewise for chemicals—inorganic and especially organic chemicals are placed a long way down the list, whereas chemical products, such as paints and varnishes, or cosmetics, soaps and polishes, are in a very much better position. The same again holds for the textile industry; woollen fabrics show up well, and cotton and woollen yarns also appear in the upper half of the table, whereas cotton fabrics and synthetic yarns are placed farther down in the ranking order, and synthetic fabrics are among the last ten commodities. The upshot is that if the table does rank our sixty products more or less accurately, the prospect is one of relative gains and losses within each industry; thus soaps will do better than organic chemicals, tractors better than office machinery, etc. On the whole, this seems to be a rather plausible result. For different industrial groupings—say " new products " and " old products "—one may be able to obtain more systematic results.

It may have been noticed that I expressed myself in rather vague terms above when I discussed the prospects for different industries—I talked about " relative " gains and losses, and about some products " doing better " than others. This was done quite deliberately, for as it stands the table does not allow one to say anything else. The results of the investigation so far indicate the relative position of any one of sixty products; *e.g.*, No. 24—agricultural machinery—should do better than any of the goods farther down the list, but worse than any of the preceding items. This, however, does not imply anything definite with regard to the absolute prospects of any commodity; thus, we still do not know whether production and

exports of agricultural machinery will expand rapidly, or whether there will be little change, or whether imports will exert a steadily mounting pressure, assuming again that total trade is balanced. In other words, there has as yet been no attempt to divide the sixty commodities into the two groups mentioned at the beginning of this paper; as I then indicated, those commodities placed above the dividing line would do well in a common market, and those below would find life increasingly difficult. In many ways, this is the sixty-four-thousand-dollar question, but unfortunately it cannot be answered, and therefore I shall not win the sixty-four thousand dollars. Nor will anybody else, I will hasten to add, because a number of factors make it impossible to solve this problem without a great deal more information about our economy than is ever likely to be available.

Let me indicate the kind of difficulties which I have in mind by means of an example. Suppose the common market becomes established. Tariffs and other trade barriers are reduced all round, and in consequence some British products, such as tyres or power-generating machinery, will do increasingly well on the Continent; other British industries—say, cars and buses—may not be affected much either way, because there may not be any great comparative cost advantage or disadvantage; and yet other products, such as synthetic fabrics, may feel the pinch of increased competition on the home market. In other words, I am arbitrarily assuming that initially the dividing line lies more or less across the middle of my table. However, it is quite possible that the additional imports which the freeing of trade stimulates exceed the additional exports; a lower price for British tyres on the Continent may lead to smaller increases in exports than the expansion in British imports of rayon goods following the fall in the import price, and likewise for other products. If the British balance of payments was initially in balance,[1] it will now show a deficit, and this deficit will have to be removed by exporting more and/or importing less. In the long run this can be achieved only by a lowering of money prices in Britain relative to those on the Continent, *i.e.*, by inflation on the Continent, deflation in Britain, or an alteration in the exchange rate. In terms of my table this would mean that those goods doing well already would be doing better still; some of those so far in an indifferent position would begin to do well, and the number of those in acute difficulties would decline. In other words, the group comprising commodities in a relatively strong position would reach farther down the table, and that comprising those in a relatively weak position would contract. Needless to add, the opposite process—Britain's balance-of-payments position becoming a surplus one following the removal of trade barriers, and the dividing line being pushed up in consequence—is equally possible. Thus the reactions on the demand side to the freeing of trade will

[1] Viz., Britain's overall payments *vis-à-vis* the whole world. Britain's trade with Europe, of course, need not balance either before or after the creation of a common market. Cf. also p. 309 footnote 1, above.

help to determine at which point in our table we leave the industries which are likely to expand and reach those which are likely to decline.

But it is, of course, impossible to forecast demand reactions; moreover, many other difficulties, no less formidable, are bound to arise. For these reasons, all that one can say is that this division is not likely to occur at either extreme end of the table; in other words, the products at the top of our table—say the first fifteen—certainly look like doing well, and those at the bottom—say the last fifteen—will very probably find themselves in a difficult spot. Therefore, such commodities as tractors, soaps, tyres, plastics and bicycles will probably be able to expand their output and exports, whilst such items as glass and glassware, pottery, travel goods and, perhaps not surprisingly, watches and clocks may well be affected adversely. The fate of the thirty commodities in the middle is much less predictable, except that the probability of success declines as one moves down the table. An unsatisfactory outcome, I know—but as I pointed out before, this is not the fault of my particular approach; none of the methods I have mentioned can get around this difficulty.

It only remains for me to point to one other feature of my findings. I mentioned above, in another context, that there is a good deal of difference between the best and the worst performers. In other words, some British products were very much more successful on the Western European market than others. This is not a result one could have predicted with any degree of certainty; it would have been quite possible to find that on the whole there was little to choose between different British goods.

What is the significance of this definite spread of our results? Although this is not the only interpretation one could advance, I would suggest that the marked rate of decline in the standard of performance as one moves down the table at least partly reflects a similarly marked difference in comparative cost conditions as between this country and the Continent. In other words, the figures in the table seem to me to indicate that there is a substantial difference between British industries as regards efficiency as compared with the position on the Continent. If this interpretation is accepted, important conclusions follow with regard to the desirability of the whole common-market venture. The United Kingdom will gain from participation in the common market by specialising on those lines of production she is relatively good at, and giving up other lines in which she is relatively inefficient. Although the size of this gain is determined by a number of factors, amongst them the availability of further economies of scale in Britain and on the Continent, it will to a large extent depend on the difference in comparative costs in Britain as compared with those on the Continent; the larger the difference in comparative costs, the greater the gain will probably be, and vice versa. Therefore, if my findings are correct, and if my interpretation is not mistaken, free trade in Europe may well be able to contribute substantially to a higher standard of living in Britain.

British Exports of Manufactures to Western European Markets Ranked in the Order of their Success Relative to the Exports of Main Competitors (1953–56)

Ranking order.	Commodity (S.I.T.C. numbers in brackets).	U.K. exports: absolute levels and indices of growth,* $ m. and %.	Britain's three strongest competitors (indices of relative level and indices of relative growth) †		
1	Aircraft (734)	40·7 *157·0*	I 10·3 *129·8*	N 8·9 *n.a.*	B/L 3·6 *440·0*
2	Tractors (713)	53·5 *99·5*	G 71·2 *190·8*	I 6·0 *397·0*	S 5·7 *191·0*
3	Power-generating (excluding electric) machinery (711)	70·1 *193·0*	G 107·0 *64·2*	I 18·1 *73·2*	N 14·8 *97·4*
4	Cosmetics, soaps and polishes (552)	16·0 *207·4*	G 53·1 *107·4*	F 46·2 *62·8*	N 34·0 *31·1*
5	Rubber tyres and tubes (629 01)	18·3 *112·2*	G 50·0 *198·2*	I 40·8 *119·6*	B/L 40·5 *122·9*
6	Paints and varnishes (533)	13·5 *160·0*	G 111·9 *120·8*	N 34·6 *105·5*	S 11·2 *180·6*
7	Nickel (683)	20·3 *114·3*	G 18·2 *432·0*	F 9·8 *2,950·0*	S 1·0 *942·0*
8	Mineral tar and related crude chemicals (521)	3·8 *103·8*	N 71·5 *156·8*	G 70·8 *107·8*	B/L 46·9 *59·2*
9	Textile machinery and accessories (716 01)	44·7 *97·8*	G 124·6 *179·6*	B/L 21·1 *167·6*	F 19·2 *126·9*
10	Woollen and worsted fabrics (653 02)	55·1 *108·9*	I 82·6 *229·5*	B/L 47·8 *135·4*	N 36·6 *89·1*
11	Plastics (599 01)	26·2 *177·9*	G 149·2 *143·6*	N 28·4 *140·2*	B/L 27·0 *90·0*
12	Road vehicles other than motor (mainly bicycles) (733)	8·8 *109·8*	G 149·9 *180·5*	F 26·4 *94·9*	N 24·3 *65·8*
13	Leather (611)	19·0 *105·3*	F 114·0 *116·9*	G 70·1 *142·1*	B/L 37·4 *99·4*
14	Ships and boats (735)	67·2 *223·4*	G 108·8 *111·5*	S 107·9 *59·5*	N 46·0 *22·6*
15	Articles made of pulp and paper (642)	6·1 *149·2*	G 106·0 *188·2*	N 76·8 *98·7*	F 38·3 *119·2*
16	Railway vehicles (731)	12·8 *191·2*	G 149·1 *56·2*	F 85·0 *146·4*	B/L 34·6 *71·3*
17	Road construction and mining machinery (716 03)	30·0 *108·8*	G 202·1 *134·5*	F 17·5 *115·2*	S 13·3 *144·0*
18	Aluminium (684)	9·2 *145·9*	G 128·2 *91·4*	F 99·4 *39·4*	B/L 38·7 *236·6*
19	Medicinal and pharmaceutical products (541)	16·5 *111·9*	G 125·7 *146·0*	F 75·3 *96·5*	N 46·9 *207·2*
20	Miscellaneous non-ferrous base metals (689)	3·9 *163·7*	B/L 143·8 *126·3*	I 62·1 *175·2*	G 44·3 *114·4*

* The indices of growth of British exports (in italics) represent exports in 1956 as a percentage of those in 1953.

† The indices of relative level (in normal type) represent the absolute level of exports of each item sold by Britain's rivals as a percentage of the absolute level of British exports of the commodities concerned. The indices of relative growth (in italics) represent the indices of growth of exports of each item (exports in 1956 as a percentage of those in 1953) from each of the competitors concerned as a percentage of the index of growth of the corresponding British exports. Cf. also p. 307 in the text.

British Exports of Manufactures to Western European Markets Ranked in the Order of their Success Relative to the Exports of Main Competitors (1953–56)

Ranking order.	Commodity (S.I.T.C. numbers in brackets).	U.K. exports: absolute levels and indices of growth, $ m. and %.	Britian's three strongest competitors (indices of relative level and indices of relative growth).		
21	Other industrial machinery (716 *other*)	112·3 *125·1*	G 218·9 *133·3*	S 40·5 *114·0*	F 25·3 *133·3*
22	Cotton yarn and thread, grey, etc. (651 03)	10·9 *52·9*	B/L 137·0 *155·2*	N 43·5 *249·3*	I 25·6 *85·4*
23	Photographic and cinematographic supplies (862)	8·8 *116·4*	B/L 199·4 *94·8*	G 80·6 *176·4*	F 34·5 *120·6*
24	Agricultural machinery and implements (712)	15·7 *99·6*	G 208·2 *190·6*	S 59·9 *123·5*	F 24·8 *80·3*
25	Coal-tar dyes and natural indigo (531)	7·2 *110·2*	G 307·9 *117·0*	F 40·5 *135·2*	I 9·6 *133·2*
26	Cotton yarn and thread, bleached, etc. (651 04)	5·9 *77·0*	B/L 195·0 *164·2*	F 83·3 *n.a.*	I 63·8 *235·5*
27	Yarn of wool and hair (651 02)	22·8 *233·8*	F 264·4 *55·8*	B/L 199·0 *46·3*	G 32·6 *57·7*
28	Buses, trucks and lorries (732 03)	14·4 *97·0*	G 216·7 *199·9*	F 57·0 *89·7*	B/L 45·7 *273·5*
29	Passenger cars (732 01)	83·1 *104·8*	G 217·7 *219·0*	F 55·3 *178·8*	I 38·3 *176·5*
30	Other electrical goods (721 *other*)	82·1 *138·4*	G 220·4 *163·1*	N 108·2 *101·0*	B/L 42·1 *152·0*
31	Electric generators, transformers, etc. (721 01)	18·4 *101·5*	G 316·4 *148·2*	F 40·1 *143·2*	B/L 36·5 *112·6*
32	Copper (682)	38·8 *234·2*	B/L 312·6 *63·0*	G 127·5 *71·3*	S 73·8 *62·6*
33	Office machinery (714)	10·6 *135·9*	G 228·5 *140·4*	I 110·2 *140·3*	S 88·8 *111·9*
34	Inorganic chemicals (511)	25·2 *111·6*	G 246·8 *149·1*	F 111·3 *132·6*	B/L 77·5 *117·4*
35	Cotton fabrics (standard type) (652)	25·5 *67·2*	G 201·1 *172·5*	B/L 122·7 *165·9*	N 80·4 *192·9*
36	Yarn and thread of synthetic fibres (651 06)	8·8 *126·8*	G 204·0 *103·6*	F 180·0 *119·2*	I 133·0 *82·2*
37	Paper and paper board (641)	10·5 *165·5*	N 250·2 *91·8*	G 160·2 *106·7*	B/L 133·0 *81·8*
38	Dyeing and tanning materials (532)	1·0 *110·4*	F 185·7 *106·3*	I 135·4 *320·4*	G 109·5 *114·0*
39	Machine tools for working metals (715 01)	15·8 *111·1*	G 454·6 *108·7*	F 49·6 *40·2*	I 37·9 *105·0*
40	Footwear (851)	4·1 *108·5*	I 163·7 *353·9*	G 126·8 *235·0*	N 106·6 *n.a.*
41	Scientific and other instruments (861)	15·0 *141·2*	G 411·4 *127·3*	F 60·6 *93·5*	N 48·4 *274·8*
42	Leather manufactures (612)	1·1 *97·4*	G 246·3 *192·5*	B/L 116·8 *137·0*	N 113·9 *169·6*
43	Organic chemicals (512)	24·6 *80·0*	G 345·0 *174·8*	F 69·1 *208·0*	N 39·3 *330·2*

British Exports of Manufactures to Western European Markets Ranked in the Order of their Success Relative to the Exports of Main Competitors (1953–56)

Ranking order.	Commodity (S.I.T.C. numbers in brackets).	U.K. exports: absolute levels and indices of growth, $ m. and %.	Britain's three strongest competitors (indices of relative level and indices of relative growth).		
44	Sanitary, heating and lighting fixtures (812)	5·1 *100·1*	G 294·0 *220·7*	F 87·7 *139·5*	N 79·1 *164·2*
45	Furniture and fixtures (821)	3·0 *129·2*	G 317·1 *240·7*	N 148·7 *68·7*	F 48·7 *88·7*
46	Prefabricated buildings (811)	0·3 *418·9*	G 909·6 *7·1*	S 76·8 *3·5*	N 45·7 *32·0*
47	Glassware (665)	3·3 *147·3*	G 419·4 *141·2*	B/L 170·1 *135·4*	F 154·6 *106·4*
48	Fabrics of jute (653 04)	0·6 *93·6*	G 345·3 *68·4*	B/L 313·0 *190·2*	F 107·5 *156·8*
49	Glass (664)	3·8 *170·6*	B/L 527·0 *96·7*	G 222·9 *97·2*	N 147·5 *85·0*
50	Essential oils (551)	2·0 *177·0*	F 546·5 *78·1*	I 368·9 *67·1*	N 158·9 *n.a.*
51	Fabrics of synthetic fibres (653 05)	7·6 *76·2*	G 511·2 *161·0*	I 191·8 *99·3*	F 135·8 *173·6*
52	Pottery (666)	2·5 *118·3*	G 848·2 *115·3*	F 68·2 *98·1*	N 63·2 *110·9*
53	Tin (687)	7·4 *50·7*	N 459·7 *362·0*	B/L 61·1 *605·1*	G 15·3 *79·2*
54	Iron and steel (681)	91·1 *90·6*	B/L 382·3 *181·5*	F 300·8 *202·5*	G 270·8 *211·4*
55	Cement (661 02)	1·4 *60·3*	B/L 882·7 *142·0*	G 623·7 *116·7*	F 131·6 *117·7*
56	Travel goods (831)	0·6 *111·7*	G 1,434·0 *209·8*	F 125·8 *144·7*	N 69·4 *87·4*
57	Lead (685)	1·1 *97·0*	B/L 1,485·0 *173·5*	G 705·7 *110·4*	F 204·5 *209·2*
58	Wood and cork manufactures (63)	1·7 *111·9*	S 1,469·0 *139·8*	F 1,222·0 *108·9*	G 855·3 *240·4*
59	Watches and clocks (864)	0·6 *117·5*	G 3,944·0 *119·9*	F 354·5 *84·1*	N 28·1 *168·1*
60	Zinc (686)	0·7 *115·6*	B/L 4,062·0 *106·5*	G 884·9 *116·7*	N 401·9 *124·0*

Source: *O.E.E.C. Foreign Trade Statistics*, Series IV, and *Annual Statement of the Trade of the United Kingdom.*

It is true that a marked difference in comparative-cost conditions also means greater difficulties of adjustment when trade barriers are abolished, but in my view that would be a small price to pay for the lasting benefits that would accrue to Britain from the establishment of a European free-trade area.

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THE "CLASSICAL THEORY" OF INTERNATIONAL TRADE AND THE UNDERDEVELOPED COUNTRIES[1]

THERE has recently been a considerable amount of controversy concerning the applicability of the "classical theory" of international trade to the underdeveloped countries.[2] The twists in this controversy may be set out as follows. The critics start with the intention of showing that the "nineteenth-century pattern" of international trade, whereby the underdeveloped countries export raw materials and import manufactured goods, has been unfavourable to the economic development of these countries. But instead of trying to show this directly, they concentrate their attacks on the "classical theory," which they believe to be responsible for the unfavourable pattern of trade. The orthodox economists then come to the defence of the classical theory by reiterating the principle of comparative costs which they claim to be applicable both to the developed and the underdeveloped countries. After this, the controversy shifts from the primary question whether or not the nineteenth-century pattern of international trade, as a historical reality, has been unfavourable to the underdeveloped countries to the different question whether or not the theoretical model assumed in the comparative-costs analysis is applicable to these countries. Both sides then tend to conduct their argument as though the two questions were the same and to identify the "classical theory" with the comparative-costs theory.

It will be argued in this paper that this has led to the neglect of those other elements in the classical theory of international trade which are much nearer to the realities and ideologies of the nineteenth-century expansion of international trade to the underdeveloped countries. In Sections I and II we shall outline these elements and show that they are traceable to Adam Smith and to some extent to J. S. Mill. In Section III we shall show how one of Adam Smith's lines of approach can be fruitfully developed to throw a more illuminating light on the past and present patterns of the international trade of the underdeveloped countries than the conventional theory. In Section IV we shall touch upon some policy implications of our analysis and show certain weaknesses in the position both of the orthodox economists and of their critics.

[1] This paper has benefited from comments by Sir Donald MacDougall, Professor H. G. Johnson, R. M. Sundrum and G. M. Meier.

[2] Of the very extensive literature on the subject, we may refer to two notable recent works, the first stating the orthodox position and the second the position of the critics: J. Viner, *International Trade and Economic Development*, and G. Myrdal, *An International Economy*.

I

The neglected elements in the classical theory of international trade may be traced to Adam Smith, particularly to the following key passage in the *Wealth of Nations*:

> " Between whatever places foreign trade is carried on, they all of them derive two distinct benefits from it. It carries out that surplus part of the produce of their land and labour for which there is no demand among them, and brings back in return for it something else for which there is a demand. It gives a value to their superfluities, by exchanging them for something else, which may satisfy a part of their wants, and increase their enjoyments. By means of it, the narrowness of the home market does not hinder the division of labour in any particular branch of art or manufacture from being carried to the highest perfection. By opening a more extensive market for whatever part of the produce of their labour may exceed the home consumption, it encourages them to improve its productive powers, and to augment its annual produce to the utmost, and thereby to increase the real revenue and wealth of society " (Vol. I, Cannan ed., p. 413).

There are two leading ideas here. (i) International trade overcomes the narrowness of the home market and provides an outlet for the surplus product above domestic requirements. This develops into what may be called the " vent for surplus " [1] theory of international trade. Later we hope to remove some of the prejudice aroused by this " mercantilist " sounding phrase. (ii) By widening the extent of the market, international trade also improves the division of labour and raises the general level of productivity within the country. This develops into what may be called the " productivity " theory. We shall be mainly concerned with the " vent for surplus " theory and the light it throws upon the growth of international trade in the underdeveloped countries in the nineteenth century. But first it is necessary to consider the " productivity " theory briefly.

The " productivity " doctrine differs from the comparative-costs doctrine in the interpretation of " specialisation " for international trade. (*a*) In the comparative costs theory " specialisation " merely means a movement along a static " production possibility curve " constructed on the given resources and the *given techniques* of the trading country. In contrast, the " productivity " doctrine looks upon international trade as a dynamic force which, by widening the extent of the market and the scope of the division of labour, raises the skill and dexterity of the workmen, encourages technical innovations, overcomes technical indivisibilities and generally enables the trading country to enjoy increasing returns and economic development.[1] This distinction was clearly realised by J. S. Mill, who regarded the gains in terms of comparative-costs theory as direct gains and the gains in terms of Adam Smithian increases in productivity as " indirect effects, which must be counted as benefits of a high order." Mill even went on to extend this doctrine to countries at " an early stage of industrial advancement," where international trade by introducing new wants " sometimes works a sort of industrial revolution " (*Principles*, Ashley ed., p. 581). (*b*) In the comparative costs theory " specialisation," conceived as a reallocation of resources, is a completely reversible process. The Adam Smithian process of specialisation, however, involves adapting and reshaping the productive structure of a country to meet the export demand, and is therefore not easily reversible. This means that a country specialising for the export market is more vulnerable to changes in the terms of trade than is allowed for in the comparative-costs theory. We shall come back to this point later.

In the expansive mental climate of the late nineteenth century the " productivity " aspect of international specialisation completely dominated the " vulnerability " aspect. At a semi-popular level, and particularly in its application to the underdeveloped countries, Smith's " productivity " doctrine developed beyond a free-trade argument into an export-drive argument. It was contended that since international trade was so beneficial in raising productivity and stimulating economic development, the State should go beyond a neutral and negative policy of removing barriers to trade and embark on a positive policy of encouraging international trade and economic development. Under its influence, many colonial governments went far beyond the strict *laissez-faire* policy in their attempts to promote the export trade of the colonies.[2] Further, although these governments were frequently obliged to use " unclassical " methods, such as the granting of monopolistic privileges to the chartered companies or the taxing of the indigenous people to force them to take up wage labour or grow cash crops, they nevertheless sought to justify their policy by invoking the Adam Smithian doctrine of the benefits of international division of labour. This partly explains why some critics have associated the " classical theory " with " colonialism " and why they have frequently singled out Adam Smith for attack instead of Ricardo, the founder of the official classical free-trade theory.

It is fair to say that Smith's " productivity " doctrine is instructive more

[1] This term is borrowed from Professor J. H. Williams, who in turn quoted it from a passage in J. S. Mill's *Principles*, in which Mill was criticising this particular aspect of Smith's theory of international trade. Professor Williams is the only modern economist to sponsor this " crude " doctrine. While he is mainly concerned with the loss to a country on being deprived of the export market for its surplus product, we shall pay special attention to the gain to a hitherto isolated underdeveloped country on obtaining a " vent " for its surplus productive capacity. Cf. J. H. Williams, " The Theory of International Trade Reconsidered," ECONOMIC JOURNAL, June 1929, pp. 195–209.

[1] Cf. *op. cit.*, Chapters II and III, Book I. This aspect of Smith's theory has been made familiar by Professor Allyn Young's article on " Increasing Returns and Economic Progress," ECONOMIC JOURNAL, December 1928, pp. 527–42.

[2] See for instance, L. C. A. Knowles, *The Economic Development of the British Overseas Empire*, Vol. I, pp. 119–20, 248–9 and 486–7. However, in Section IV below we shall argue that, in spite of the attention they have received, these export-drive policies were not successful enough to cause a significant " export-bias."

in relation to the ideological than to the actual economic forces which characterised the nineteenth-century expansion of international trade to the underdeveloped countries. It is true, as we shall see later,[1] that both the total value and the physical output of the exports of these countries expanded rapidly. In many cases the rate of increase in export production was well above any possible rate of increase in population, resulting in a considerable rise in output per head. But it is still true to say that this was achieved not quite in the way envisaged by Smith, viz., a better division of labour and specialisation leading on to innovations and cumulative improvements in skills and productivity per man-hour. Rather, the increase in output per head seems to have been due: (i) to once-for-all increases in productivity accompanying the transfer of labour from the subsistence economy to the mines and plantations, and (ii) what is more important, as we shall see later, to an increase in working hours and in the proportion of gainfully employed labour relatively to the semi-idle labour of the subsistence economy.

The transfer of labour from the subsistence economy to the mines and plantations with their much higher capital–output ratio and skilled management undoubtedly resulted in a considerable increase in productivity. But this was mostly of a once-for-all character for a number of reasons. To begin with, the indigenous labour emerging from the subsistence economy was raw and technically backward. Moreover, it was subject to high rates of turnover, and therefore not amenable to attempts to raise productivity. Unfortunately, this initial experience gave rise to or hardened the convention of "cheap labour," which regarded indigenous labour merely as an undifferentiated mass of low-grade man-power to be used with a minimum of capital outlay.[2] Thus when the local labour supply was exhausted the typical reaction was not to try to economise labour by installing more machinery and by reorganising methods of production but to seek farther afield for additional supplies of cheap labour. This is why the nineteenth-century process of international trade in the underdeveloped countries was characterised by large-scale movements of cheap labour from India and China.[3] This tendency was reinforced by the way in which the world-market demand for raw materials expanded in a series of waves. During the booms output had to be expanded as quickly as possible along existing lines, and there was no time to introduce new techniques or reorganise production; during the slumps it was difficult to raise capital for such purposes.

[1] See footnotes on pp. 324 and 327 below. See also Sir Donald MacDougall's *The World Dollar Problem*, pp. 134–43. Sir Donald's argument that the productivity of labour in the underdeveloped countries has been rising faster than is generally assumed is mainly based on figures for productivity *per capita*. These figures are not inconsistent with our argument that on the whole the expansion of the export production has been achieved on more or less constant techniques and skills of indigenous labour, by increasing working hours and the proportion of gainfully employed labour rather than by a continuous rise in productivity per man-hour.

[2] Cf. S. H. Frankel, *Capital Investment in Africa*, pp. 142–6, and W. M. Macmillan, *Europe and West Africa*, pp. 48–50.

[3] Cf. Knowles, *op. cit.*, pp. viii and 182–201.

This failure to achieve Adam Smith's ideal of specialisation leading on to continuous improvements in skills can also be observed in the peasant export sectors. Where the export crop happened to be a traditional crop (*e.g.*, rice in South-East Asia), the expansion in export production was achieved simply by bringing more land under cultivation with the same methods of cultivation used in the subsistence economy. Even where new export crops were introduced, the essence of their success as peasant export crops was that they could be produced by fairly simple methods involving no radical departure from the traditional techniques of production employed in subsistence agriculture.[1]

Thus instead of a process of economic growth based on continuous improvements in skills, more productive recombinations of factors and increasing returns, the nineteenth-century expansion of international trade in the underdeveloped countries seems to approximate to a simpler process based on constant returns and fairly rigid combinations of factors. Such a process of expansion could continue smoothly only if it could feed on *additional* supplies of factors in the required proportions.

II

Let us now turn to Smith's "vent for surplus" theory of international trade. It may be contrasted with the comparative-costs theory in two ways.

(*a*) The comparative-costs theory assumes that the resources of a country are given and fully employed before it enters into international trade. The function of trade is then to reallocate its given resources more efficiently between domestic and export production in the light of the new set of relative prices now open to the country. With given techniques and full employment, export production can be increased only at the cost of reducing the domestic production. In contrast, the "vent for surplus" theory assumes that a previously isolated country about to enter into international trade possesses a surplus productive capacity[2] of some sort or another. The function of trade here is not so much to reallocate the given resources as to provide the new effective demand for the output of the surplus resources which would have remained unused in the absence of trade. It follows that export production can be increased without necessarily reducing domestic production.

[1] Thus A. McPhee wrote about the palm-oil and ground-nut exports of West Africa: "They made little demand on the energy and thought of the natives and they effected no revolution in the society of West Africa. That was why they were so readily grafted on the old economy and grew as they did" (*The Economic Revolution in West Africa*, pp. 39–40). Some writers argue that there was a studied neglect of technical improvements in the peasant sector to facilitate the supply of cheap labour to other sectors. Cf., for example, W. A. Lewis, "Economic Development with Unlimited Supplies of Labour," *Manchester School*, May 1954, pp. 149–50. For a description of imperfect specialisation in economic activity in West Africa see P. T. Bauer and B. S. Yamey, "Economic Progress and Occupational Distribution," ECONOMIC JOURNAL, December 1951, p. 743.

[2] A surplus over domestic requirements and *not* a surplus of exports over imports.

(*b*) The concept of a surplus productive capacity above the requirements of domestic consumption implies an inelastic domestic demand for the exportable commodity and/or a considerable degree of internal immobility and specificness of resources. In contrast, the comparative-costs theory assumes either a perfect or, at least, a much greater degree of internal mobility of factors and/or a greater degree of flexibility or elasticity both on the side of production and of consumption. Thus the resources not required for export production will not remain as a surplus productive capacity, but will be reabsorbed into domestic production, although this might take some time and entail a loss to the country.

These two points bring out clearly a peculiarity of the " vent-for-surplus " theory which may be used either as a free-trade argument or as an anti-trade argument, depending on the point of view adopted. (*a*) From the point of view of a previously isolated country, about to enter into trade, a surplus productive capacity suitable for the export market appears as a virtually " costless " means of acquiring imports and expanding domestic economic activity. This was how Adam Smith used it as a free-trade argument. (*b*) From the point of view of an established trading country faced with a fluctuating world market, a sizeable surplus productive capacity which cannot be easily switched from export to domestic production makes it " vulnerable " to external economic disturbances. This is in fact how the present-day writers on the underdeveloped countries use the same situation depicted by Smith's theory as a criticism of the nineteenth-century pattern of international trade. This concept of vulnerability may be distinguished from that which we have come across in discussing the " productivity " theory of trade. There, a country is considered " vulnerable " because it has adapted and reshaped its productive structure to meet the requirements of the export market through a genuine process of " specialisation." Here, the country is considered " vulnerable " simply because it happens to possess a sizeable surplus productive capacity which (even without any improvements and extensions) it cannot use for domestic production. This distinction may be blurred in border-line cases, particularly in underdeveloped countries with a large mining sector. But we hope to show that, on the whole, while the " vulnerability " of the advanced countries, such as those in Western Europe which have succeeded in building up large export trades to maintain their large populations, is of the first kind, the " vulnerability " of most of the underdeveloped countries is of the second kind.

Let us now consider the " vent-for-surplus " approach purely as a theoretical tool. There is a considerable amount of prejudice among economists against the " vent-for-surplus " theory, partly because of its technical crudeness and partly because of its mercantilist associations. This may be traced to J. S. Mill, who regarded Smith's " vent-for-surplus " doctrine as " a surviving relic of the Mercantile Theory " (*Principles*, p. 579).

The crux of the matter here is the question: why should a country isolated from international trade have a surplus productive capacity? The answer which suggests itself is that, given its random combination of natural resources, techniques of production, tastes and population, such an isolated country is bound to suffer from a certain imbalance or disproportion between its productive and consumption capacities. Thus, take the case of a country which starts with a sparse population in relation to its natural resources. This was broadly true not only of Western countries during their mercantilist period but also of the underdeveloped countries of South-East Asia, Latin America and Africa when they were opened up to international trade in the nineteenth century. Given this situation, the conventional international-trade theory (in its Ohlin version) would say that this initial disproportion between land and labour would have been equilibrated away by appropriate price adjustments: *i.e.*, rents would be low and relatively land-using commodities would have low prices, whereas wages would be high and relatively labour-using commodities would have high prices. In equilibrium there would be no surplus productive capacity (although there might be surplus land by itself) because the scarce factor, labour, would have been fully employed. Thus when this country enters into international trade it can produce the exports only by drawing labour away from domestic production. Now this result is obtained only by introducing a highly developed price mechanism and economic organisation into a country which is supposed to have had no previous economic contacts with the outside world. This procedure may be instructive while dealing with the isolated economy as a theoretical model. But it is misleading when we are dealing with genuinely isolated economies in their proper historical setting; it is misleading, in particular, when we are dealing with the underdeveloped countries, many of which were subsistence economies when they were opened to international trade. In fact, it was the growth of international trade itself which introduced or extended the money economy in these countries. Given the genuine historical setting of an isolated economy, might not its initial disproportion between its resources, techniques, tastes and population show itself in the form of surplus productive capacity?

Adam Smith himself thought that the pre-existence of a surplus productive capacity in an isolated economy was such a matter of common observation that he assumed it implicitly without elaborating upon it. But he did give some hints suggesting how the " narrowness of the home market," which causes the surplus capacity, is bound up with the underdeveloped economic organisation of an isolated country, particularly the lack of a good internal transport system and of suitable investment opportunities.[1] Further his concept of surplus productive capacity is not merely a matter of surplus land by itself but surplus land combined with surplus labour; and the

[1] *Op. cit.*, Vol. I, pp. 21 and 383. This is similar to what Mrs. J. Robinson has described as " primitive stagnation." Cf. *The Accumulation of Capital*, pp. 256–8.

surplus labour is then linked up with his concept of " unproductive " labour. To avoid confusion, this latter should not be identified with the modern concept of " disguised unemployment " caused by an acute shortage of land in overpopulated countries. Although Smith described some cases of genuine " disguised unemployment " in the modern sense, particularly with reference to China, " unproductive " labour in his sense can arise even in thinly populated countries, provided their internal economic organisation is sufficiently underdeveloped. In fact, it is especially in relation to those underdeveloped countries which started off with sparse populations in relation to their natural resources that we shall find Smith's " vent-for-surplus " approach very illuminating.

III

Let us now try to relate the " vent-for-surplus " theory to the nineteenth-century process of expansion of international trade to the underdeveloped countries. Even from the somewhat meagre historical information about these countries, two broad features stand out very clearly. First the underdeveloped countries of South-East Asia, Latin America and Africa, which were to develop into important export economies, started off with sparse populations relatively to their natural resources. If North America and Australia could then be described as " empty," these countries were at least " semi-empty." Secondly, once the opening-up process had got into its stride, the export production of these countries expanded very rapidly, along a typical growth curve,[1] rising very sharply to begin with and tapering off afterwards. By the Great Depression of the 1930s, the expansion process seems to have come to a stop in many countries; in others, which had a later start, the expansion process may still be continuing after the Second World War.

There are three reasons why the " vent-for-surplus " theory offers a more effective approach than the conventional theory to this type of expansion of international trade in the underdeveloped countries.

(i) The characteristically high rates of expansion which can be observed in the export production of many underdeveloped countries cannot really be explained in terms of the comparative-costs theory based on the assumption of given resources and given techniques. Nor can we attribute any significant part of the expansion to revolutionary changes in techniques and increases in productivity. As we have seen in Section I, peasant export

[1] For instance, the annual value of Burma's exports, taking years of high and low prices, increased at a constant proportional rate of 5% per annum on the average between 1870 and 1900. Similar rates of expansion can be observed for Siam and Indonesia (Cf. J. S. Furnivall, *Colonial Policy and Practice*, Appendix I; J. H. Boeke, *The Structure of Netherlands Indian Economy*, p. 184; and J. C. Ingram, *Economic Change in Thailand since 1850*, Appendix C). African export economies started their expansion phase after 1900, and the official trade returns for the Gold Coast, Nigeria and Uganda show similar rates of increase after that date, although the expansion process was arrested by the depression of the 1930s.

production expanded by extension of cultivation using traditional methods of production, while mining and plantation sectors expanded on the basis of increasing supplies of cheap labour with a minimum of capital outlay. Thus the contributions of Western enterprise to the expansion process are mainly to be found in two spheres: the improvements of transport and communications [1] and the discoveries of new mineral resources. Both are methods of increasing the total volume of resources rather than methods of making the given volume of resources more productive. All these factors suggest an expansion process which kept itself going by drawing an increasing volume of hitherto unused or surplus resources into export production.

(ii) International trade between the tropical underdeveloped countries and the advanced countries of the temperate zone has grown out of sharp differences in geography and climate resulting in absolute differences of costs. In this context, the older comparative-costs theory, which is usually formulated in terms of qualitative differences [2] in the resources of the trading countries, tends to stress the obvious geographical differences to the neglect of the more interesting quantitative differences in the factor endowments of countries possessing approximately the same type of climate and geography. Thus while it is true enough to say that Burma is an exporter of rice because of her climate and geography, the more interesting question is why Burma should develop into a major rice exporter while the neighbouring South India, with approximately the same type of climate and geography, should develop into a net importer of rice. Here the " vent-for-surplus " approach which directs our attention to population density as a major determinant of export capacity has an advantage over the conventional theory.[3]

(iii) Granted the importance of quantitative differences in factor endowments, there still remains the question why Smith's cruder " vent-for-surplus " approach should be preferable to the modern Ohlin variant of the comparative-costs theory. The main reason is that, according to the Ohlin theory, a country about to enter into international trade is supposed already to possess a highly developed and flexible economic system which can adjust its methods of production and factor combinations to cope with a wide range of possible variations in relative factor supplies (see Section II above). But in fact the economic framework of the underdeveloped countries is a

[1] This is what Professor L. C. A. Knowles described as the " *Unlocking* of the Tropics " (*op. cit.*, pp. 138–52).

[2] Cf. J. Viner, *International Trade and Economic Development*, pp. 14–16.

[3] Those who are used to handling the problem in terms of qualitative differences in factors and differential rent may ask: why not treat the surplus productive capacity as an extreme instance of " differential rent " where the transfer cost of the factors from the domestic to export production is zero? But this does not accurately portray the situation here. The transfer cost of the factors is zero, not because land which is used for the export crop is not at all usable for domestic subsistence production but because with the sparse population in the early phase there is no demand for the surplus food which could have been produced on the land used for the export crop. As we shall see, at a later stage when population pressure begins to grow, as in Java, land which has been used for export is encroached upon by subsistence production.

much cruder apparatus which can make only rough-and-ready adjustments. In particular, with their meagre technical and capital resources, the underdeveloped countries operate under conditions nearer to those of fixed technical coefficients than of variable technical coefficients. Nor can they make important adjustments through changes in the outputs of different commodities requiring different proportions of factors because of the inelastic demand both for their domestic production, mainly consisting of basic foodstuff, and for their exportable commodities, mainly consisting of industrial raw materials. Here again the cruder "vent-for-surplus" approach turns out to be more suitable.

Our argument that, in general, the "vent-for-surplus" theory provides a more effective approach than the comparative-costs theory to the international trade of the underdeveloped countries does not mean that the "vent-for-surplus" theory will provide an exact fit to all the particular patterns of development in different types of export economies. No simple theoretical approach can be expected to do this. Thus if we interpret the concept of the surplus productive capacity strictly as pre-existing surplus productive capacity arising out of the original endowments of the factors, it needs to be qualified, especially in relation to the mining and plantation sectors of the underdeveloped countries. Here the surplus productive capacity which may have existed to some extent before the country was opened to international trade is usually greatly increased by the discovery of new mineral resources and by a considerable inflow of foreign capital and immigrant labour. While immigrant labour is the surplus population of other underdeveloped countries, notably India and China, the term "surplus" in the strict sense cannot be applied to foreign capital. But, of course, the existence of suitable surplus natural resources in an underdeveloped country is a pre-condition of attracting foreign investment into it. Two points may be noted here. First, the complication of foreign investment is not as damaging to the surplus-productive-capacity approach as it appears at first sight, because the inflow of foreign investment into the tropical and semi-tropical underdeveloped countries has been relatively small both in the nineteenth century and the inter-war period.[1] Second, the nineteenth-century phenomenon of international mobility of capital and labour has been largely neglected by the comparative-costs theory, which is based on the assumption of perfect mobility of factors within a country and their imperfect mobility between different countries. The surplus-productive-capacity approach at least serves to remind us that the output of mining and plantation sectors can expand without necessarily contracting domestic subsistence output.

The use of the surplus-productive-capacity approach may prove in particular to be extremely treacherous in relation to certain parts of Africa,

[1] Cf. R. Nurkse, "International Investment To-day in the Light of Nineteenth Century Experience," ECONOMIC JOURNAL, December 1954, pp. 744–58, and the United Nations Report on *International Capital Movements during the Inter-war Period.*

where mines, plantations and other European enterprises have taken away from the tribal economies the so-called "surplus" land and labour, which, on a closer analysis, prove to be no surplus at all. Here the extraction of these so-called "surplus" resources, by various forcible methods in which normal economic incentives play only a part, entails not merely a reduction in the subsistence output but also much heavier social costs in the form of the disruption of the tribal societies.[1]

When we turn to the peasant export sectors, however, the application of the "vent-for-surplus" theory is fairly straightforward. Here, unlike the mining and plantation sectors, there has not been a significant inflow of foreign investment and immigrant labour. The main function of the foreign export–import firms has been to act as middlemen between the world market and the peasants, and perhaps also to stimulate the peasants' wants for the new imported consumers' goods. As we have seen, peasant export production expanded by using methods of production more or less on the same technical level as those employed in the traditional subsistence culture. Thus the main effect of the innovations, such as improvements in transport and communications [2] and the introduction of the new crops, was to bring a greater area of surplus land under cultivation rather than to raise the physical productivity per unit of land and labour. Yet peasant export production usually managed to expand as rapidly as that of the other sectors while remaining self-sufficient with respect to basic food crops. Here, then, we have a fairly close approximation to the concept of a pre-existing surplus productive capacity which can be tapped by the world-market demand with a minimum addition of external resources.

Even here, of course, there is room for differences in interpretation. For instance, there is evidence to suggest that, in the early decades of expansion, the rates of increase in peasant export production in South-East Asian and West African countries were well above the possible rates of growth in their working population.[3] Given the conditions of constant techniques, no significant inflow of immigrant foreign labour and continuing self-sufficiency with respect to the basic food crops, we are left with the question how these peasant economies managed to obtain the extra labour required to

[1] Cf. The United Nations Report on the *Enlargement of the Exchange Economy in Tropical Africa*, pp. 37 and 49–51.

[2] It may be noted that the expansion of some peasant export crops, notably rice in South-East Asia, depended to a much greater extent on pre-existing indigenous transport facilities, such as river boats and bullock carts, than is generally realised.

[3] For instance, cocoa output of the Gold Coast expanded over forty times during the twenty-five year period 1905–30. Even higher rates of expansion in cocoa production can be observed in Nigeria combined with a considerable expansion in the output of other export crops. Both have managed to remain self-sufficient with regard to basic food crops (cf. West African Institute of Economic Research, *Annual Conference*, Economic Section, Achimota, 1953, especially the chart between pp. 96 and 98; *The Native Economies of Nigeria*, ed. M. Perham, Vol. I, Part II). In Lower Burma, for the thirty-year period 1870–1900, the area under rice cultivation increased by more than three times, while the population, including immigrants from Upper Burma, doubled. (Cf. also, Furnivall, *op. cit.*, pp. 84–5.)

expand their export production so rapidly. A part of this labour may have been released by the decline in cottage industries and by the introduction of modern labour-saving forms of transport in place of porterage, but the gap in the explanation cannot be satisfactorily filled until we postulate that even those peasant economies which started off with abundant land relatively to their population must have had initially a considerable amount of under-employed or surplus labour. This surplus labour existed, not because of a shortage of co-operating factors, but because in the subsistence economies, with poor transport and little specialisation in production, each self-sufficient economic unit could not find any market outlet to dispose of its potential surplus output, and had therefore no incentive to produce more than its own requirements. Here, then, we have the archetypal form of Smith's "unproductive" labour locked up in a semi-idle state in the underdeveloped economy of a country isolated from outside economic contacts. In most peasant economies this surplus labour was mobilised, however, not by the spread of the money-wage system of employment, but by peasant economic units with their complement of "family" labour moving *en bloc* into the money economy and export production.

The need to postulate a surplus productive capacity to explain the rapid expansion in peasant export production is further strengthened when we reflect on the implications of the fact that this expansion process is inextricably bound up with the introduction of the money economy into the subsistence sectors. To the peasant on the threshold of international trade, the question whether or not to take up export production was not merely a question of growing a different type of crop but a far-reaching decision to step into the new and unfamiliar ways of the money economy.

Thus let us consider a community of self-sufficient peasants who, with their existing techniques, have just sufficient land and labour to produce their minimum subsistence requirements, so that any export production can be achieved only by reducing the subsistence output below the minimum level. Now, according to the conventional economic theory, there is no reason why these peasants should not turn to export production if they have a differential advantage there, so that they could more than make up for their food deficit by purchases out of their cash income from the export crop. But, in practice, the peasants in this situation are unlikely to turn to export production so readily. Nor is this "conservatism" entirely irrational, for by taking up export production on such a slender margin of reserves, the peasants would be facing the risk of a possible food shortage for the sake of some gain in the form of imported consumers' goods which are "luxuries" to them. Moreover, this gain might be wiped off by unfavourable changes in the prices of both the export crop they would sell and the foodstuffs they would have to buy and by the market imperfections, which would be considerable at this early stage. Thus, where the margin of resources is very small above that required for the minimum subsistence output, we

should expect the spread of export production to be inhibited or very slow, even if there were some genuine possibilities of gains on the comparative costs principle.[1]

In contrast, the transition from subsistence agriculture to export production is made much easier when we assume that our peasants start with some surplus resources which enable them to produce the export crop *in addition* to their subsistence production. Here the surplus resources perform two functions: first they enable the peasants to hedge their position completely and secure their subsistence minimum before entering into the risks of trading; and secondly, they enable them to look upon the imported goods they obtain from trade in the nature of a clear net gain obtainable merely for the effort of the extra labour in growing the export crop. Both of these considerations are important in giving the peasants just that extra push to facilitate their first plunge into the money economy.

Starting from this first group of peasants, we may picture the growth of export production and the money economy taking place in two ways. Firstly, the money economy may grow extensively, with improvements in transport and communications and law and order, bringing in more and more groups of peasants with their complements of family labour into export production on the same "part-time" basis as the first group of peasants. Secondly, the money economy may grow intensively by turning the first group of peasants from "part-time" into "whole-time" producers of the export crop.[2] In the first case, surplus resources are necessary as a lubricant to push more peasants into export production at each round of the widening circle of the money economy. Even in the second case, surplus resources are necessary if the whole-time export producers buy their food requirements locally from other peasants, who must then have surplus resources to produce the food crops above their own requirements. Logically, there is no reason why the first group of peasants who are now whole-time producers of the

[1] Of course, this argument can be countered by assuming the differences in comparative costs to be very wide. But, so long as export production requires withdrawing some resources from subsistence production, some risks are unavoidable. Further, remembering that the middlemen also require high profit margins at this stage, the gains large enough to overcome the obstacles are likely to arise out of surplus resources rather than from the differential advantages of the given fully employed resources. The risk of crop-failure is, of course, present both in subsistence and export production.

[2] In either case the expansion process may be looked upon as proceeding under conditions approximating to constant techniques and fixed combinations between land and labour once equilibrium is reached. The distinctive feature of peasant export economies is their failure to develop new and larger-scale or extensive methods of farming. It is true that in subsistence agriculture "fixed factors," such as a plough and a pair of bullocks, were frequently used below capacity, and one important effect of cash production was to increase the size of the holding to the full capacity of these "fixed factors." But this may be properly looked upon as equilibrium adjustments to make full use of surplus capacity rather than as the adoption of new and more land-using methods of production. Increasing the size of holding to make a more effective use of a pair of bullocks is different from the introduction of a tractor! Our assumption of constant techniques does not preclude the development of large-scale ownership of land as distinct from large-scale farming.

export crop should buy their food requirements locally instead of importing them. But, as it happens, few peasant export economies have specialised in export production to such an extent as to import their basic food requirements.

The average economist's reaction to our picture of discrete blocks of surplus productive capacity being drawn into a widening circle of money economy and international trade is to say that while this " crude " analysis may be good enough for the transition phase, the conventional analysis in terms of differential advantages and continuous marginal productivity curves must come into its own once the transition phase is over. Here it is necessary to distinguish between the expansion phase and the transition phase. It is true that in most peasant export economies the expansion process is tapering off or has come to a stop, as most of the surplus land suitable for the export crop has been brought under cultivation. This, of course, brings back the problem of allocating a fixed amount of resources, as we shall see in the next section when we consider issues of economic policy. But even so, the surplus-productive-capacity approach is not entirely superseded so long as the transition from a subsistence to a fully developed money economy remains incomplete. In most underdeveloped countries of Asia and Africa [1] this transition seems not likely to be over until they cease to be underdeveloped.

The continuing relevance of the surplus-productive-capacity approach may be most clearly seen in the typical case of a peasant export economy which with its natural resources and methods of production has reached the limit of expansion in production while its population continues to grow rapidly. According to the surplus-productive-capacity approach, we should expect the export capacity of such a country to fall roughly in proportion as the domestic requirement of resources to feed a larger population increases. This common-sense result may, however, be contrasted with that obtainable from the conventional theory as formulated by Ohlin. First, it appears that the Ohlin theory puts to the forefront of the picture the *type* of export, *i.e.*, whether it is more labour-using or land-using as distinct from the total export capacity measured by the ratio of total exports to the total national output of the trading country. Secondly, in the Ohlin theory there is no reason why a thickly populated country should not also possess a high ratio of (labour-intensive) exports to its total output.

The ideal pattern of trade suggested by the Ohlin theory has a real counterpart in the thickly populated advanced countries of Europe, which for that very reason are obliged to build up a large export trade in manufactures or even in agriculture as in the case of Holland. But when we turn to the thickly populated underdeveloped countries, however, the ideal

[1] Cf. the United Nations Report cited above on the *Enlargement of the Exchange Economy*. Even in the most developed peasant export economies the money economy has not spread to the same extent in the market for factors of production as in the market for products.

and the actual patterns of international trade diverge widely from each other. Indeed, we may say that these countries remain underdeveloped precisely because they have not succeeded in building up a labour-intensive export trade to cope with their growing population. The ratio of their export to total production could, of course, be maintained at the same level and the pressure of population met in some other way. But given the existing conditions, even this neutral pattern may not be possible in many underdeveloped countries. Thus, in Indonesia there is some evidence to suggest that the volume of agricultural exports from the thickly populated Java and Madura is declining absolutely and also relatively to those of the Outer Islands, which are still sparsely populated.[1] Of course, there are other causes of this decline, but population pressure reducing the surplus productive capacity of Java seems to be a fundamental economic factor; and the decline spreads from peasant to plantation exports as more of the plantation lands, which were under sugar and rubber, are encroached upon by the peasants for subsistence production.[2] In general, given the social and economic conditions prevailing in many underdeveloped countries, it seems fair to conclude that the trend in their export trade is likely to be nearer to that suggested by the surplus-productive-capacity approach than to that suggested by the theory of comparative costs.[3]

IV

This paper is mainly concerned with interpretation and analysis, but we may round off our argument by touching briefly upon some of its policy implications.

(i) We have seen that the effect of population pressure on many underdeveloped countries, given their existing social and economic organisation, is likely to reduce their export capacity by diverting natural resources from export to subsistence production. If we assume that these natural resources have a genuine differential advantage in export production, then population pressure inflicts a double loss: first, through simple diminishing returns, and secondly, by diverting resources from more to less productive use.

[1] Cf. J. H. Boeke, *Ontwikkelingsgang en toekomst van bevolkings-en ondernemingslandbouw in Nederlandsch-Indie* (Leiden, 1948), p. 91. I owe this reference to an unpublished thesis by Mr. M. Kidron.

[2] The same tendency to transfer land from plantation to subsistence agriculture may be observed in Fiji with the growing population pressure created by the Indian immigrant labour originally introduced to work in the sugar plantations. The outline is blurred here by the decline in the sugar industry. The reason why this tendency does not seem to operate in the West Indies is complex. But it may be partly attributable to the tourist industry, which helps to pay for the food imports of some of the islands.

[3] The surplus-productive-capacity approach also partly helps to explain why underdeveloped countries, such as India, which started off with a thick population tend to retain large and persistent pockets of subsistence sectors in spite of their longer contacts with the world economy, while the subsistence sectors in thinly populated countries, such as those in West Africa, tend to disappear at a faster rate in spite of their much later start in international trade.

Thus, if Java has a genuine differential advantage in growing rubber and sugar, she would obtain a greater amount of rice by maintaining her plantation estates instead of allowing them to be encroached upon by peasants for subsistence rice cultivation. The orthodox liberal economists, confronted with this situation, would, of course, strongly urge the removal of artificial obstacles to a more systematic development of the money economy and the price system. Now there are still many underdeveloped countries which are suffering acutely from the economic rigidities arising out of their traditional social structure and/or from discriminatory policies based on differences in race, religion and class. Here the removal of barriers, for instance, to the horizontal and vertical mobility of labour, freedom to own land and to enter any occupation, etc., may well prove to be a great liberating force.[1] But our analysis has suggested that it is much easier to promote the growth of the money economy in the early stage when a country is newly opened up to international trade and still has plenty of surplus land and labour rather than at a later stage, when there are no more surplus resources, particularly land, to feed the growth of the money economy. Thus in a country like Java there is a considerable amount of artificial restriction, customary or newly introduced, which the liberal economists can criticise, *e.g.*, restriction on land ownership. But given the combination of population pressure, large pockets of subsistence economy and traditional methods of production which can no longer be made more labour-intensive, it seems very doubtful whether the mere removal of artificial restrictions can do much by itself without a more vigorous policy of state interference. The truth of the matter is that in the underdeveloped countries where, for various reasons described above, the exchange economy is still an extremely crude and imperfect apparatus which can make only rough-and-ready responses to economic differentials, it may require a considerable amount of state interference to move toward the comparative-costs equilibrium. Thus given that Java has genuine differential advantages in the production of rubber and sugar, a more optimal reallocation of her resources may require, for instance, the removal of her surplus population either to the thinly populated Outer Islands or to industries within Java and a vigorous export-drive policy supplemented by bulk purchase and subsidies on the imported rice. Here we come to a fundamental dilemma which is particularly acute for the orthodox liberal economists. On a closer examination it turns out that their free-trade argument, although ostensibly based on the comparative-costs principle, is buttressed by certain broad classical presumptions against protection and state interference:[2] *e.g.*, the difficulty of selecting the right

[1] This is why the case for the "liberal" solution is strong in places such as East and Central Africa, where due both to the general backwardness of the indigenous population and the presence of a white settler population, both types of rigidity prevail (cf. *The Royal Commission Report on East Africa*).

[2] Cf. J. Viner, *International Trade and Economic Development*, pp. 41–2. See also Sidgwick, *Principles of Political Economy*, Book III, Chapter V.

industry to protect, the virtual impossibility of withdrawing protection once given, the tendency of controls to spread promiscuously throughout the economic system strangling growth, and so on. These presumptions gain an added strength from the well-known administrative inefficiency and sometimes corruption of the governments of some underdeveloped countries. Thus even if we believe in the "nineteenth-century pattern" of international trade based on natural advantages, how can we be sure that the state is competent enough to select the right commodities for its export-drive policy when it is considered incompetent to select the right industry for protection?

(ii) We have seen that the rapid expansion in the export production of the underdeveloped countries in the nineteenth century cannot be satisfactorily explained without postulating that these countries started off with a considerable amount of surplus productive capacity consisting both of unused natural resources and under-employed labour. This gives us a common-sense argument for free trade which is especially relevant for the underdeveloped countries in the nineteenth century: the surplus productive capacity provided these countries with a virtually "costless" means of acquiring imports which did not require a withdrawal of resources from domestic production but merely a fuller employment for their semi-idle labour. Of course, one may point to the real cost incurred by the indigenous peoples in the form of extra effort and sacrifice of the traditional leisurely life[1] and also to the various social costs not normally considered in the comparative-costs theory, such as being sometimes subject to the pressure of taxation and even compulsory labour and frequently of having to accommodate a considerable inflow of immigrant labour creating difficult social and political problems later on. One may also point to a different type of cost which arises with the wasteful exploitation of natural resources.[2] But for the most part it is still true to say that the indigenous peoples of the underdeveloped countries took to export production on a voluntary basis and enjoyed a clear gain by being able to satisfy their developing wants for the new imported commodities. Thus our special argument for free trade in this particular context still remains largely intact. The orthodox economists, by rigidly insisting on applying the comparative-costs theory to the underdeveloped countries in the nineteenth century, have therefore missed this simpler and more powerful argument.

[1] It may be formally possible to subsume the surplus-productive-capacity approach under the opportunity-cost theory, by treating leisure instead of foregone output as the main element of cost. But this would obscure the important fact that the underdeveloped countries have been able to expand their production very rapidly, not merely because the indigenous peoples were willing to sacrifice leisure but also because there were also surplus natural resources to work upon.

[2] The social cost of soil erosion can be very great, but this may be caused not merely by an expansion of export production but also by bad methods of cultivation and population pressure. The problem of adequately compensating the underdeveloped countries for the exploitation of their non-replaceable mineral resources belongs to the problem of the distribution of gains from trade. Here we are merely concerned with establishing that the indigenous peoples do obtain some gains from trade.

(iii) We have seen in Section I that the deep-rooted hostility of the critics towards the " classical theory " and the nineteenth-century pattern of international trade may be partly traced back to the time when Western colonial powers attempted to introduce export-drive policies in the tropical underdeveloped countries; and tried to justify these policies by invoking the " classical theory " of free trade and the Adam Smithian doctrine of international trade as a dynamic force generating a great upward surge in the general level of productivity of the trading countries. To the critics, this appears as a thinly disguised rationalisation of the advanced countries' desire for the markets for their manufactured products and for raw materials. Thus it has become a standard argument with the critics to say that the nineteenth-century process of international trade has introduced a large " export bias " into the economic structure of the underdeveloped countries which has increased their " vulnerability " to international economic fluctuations.

In Section II we have seen that once we leave the ideal world of the comparative costs theory in which the resources not required for the export market can be re-absorbed into domestic production, every country with a substantial export trade may be considered " vulnerable." Thus a country may be said to be vulnerable because it has built up a large ratio of export to its total production simply by making use of its pre-existing surplus productive capacity. *A fortiori*, it is vulnerable when it has genuinely improved upon its original surplus productive capacity. How does the idea of " export bias " fit into our picture?

The term " export bias " presumably means that the resources of the underdeveloped countries which could have been used for domestic production have been effectively diverted into export production by deliberate policy. The implication of our surplus-productive-capacity approach is to discount this notion of " export bias." In the peasant export sectors, at the early stage with sparse populations and plenty of surplus land, the real choice was not so much between using the resources for export production or for domestic production as between giving employment to the surplus resources in export production or leaving them idle. In the later stage, when the population pressure begins to increase as in the case of Java, we have seen that the bias is likely to develop against, rather than in favour of, the export sector. Even when we turn to the mining and plantation sectors, it is difficult to establish a significant " export bias " in the strict sense. Here the crucial question is: how far would it have been possible to divert the foreign capital and technical resources which have gone into these sectors into the domestic sector? The answer is clear. For a variety of reasons, notably the smallness of domestic markets, few governments of the underdeveloped countries, whether colonial or independent, have so far succeeded in attracting a significant amount of foreign investment away from the extractive export industries to the domestic industries. In criticising the

colonial governments it should be remembered that the only choice open to them was whether to attract a greater or a smaller amount of foreign investment within the export sector and not whether to attract investment for the domestic or the export sector.

This is not to deny that the colonial governments had a strong motive for promoting export production. Apart from the interests of the mother country, the individual colonial governments themselves had a vested interest in the expansion of foreign trade because they derived the bulk of their revenues from it.[1] In their search for revenue they have pursued various policies designed to attract foreign investment to the mining and plantation sectors, such as granting favourable concessions and leases, favourable tariff rates for rail transport, taxation policy designed to facilitate the supply of labour, provision of various technical services, etc.[2] But on the whole it is still true to say that the most important contribution of the colonial governments towards the expansion of the colonial exports is to be found, not in these export-drive policies, but in their basic services, such as the establishment of law and order and the introduction of modern transport, which enabled the pre-existing surplus productive capacity of the colonies to be tapped by the world market demand. If we wish to criticise the export-drive policies of the colonial governments it would be more appropriate to do so, not on the ground of " export bias " but on the ground that they may have diverted too great a share of the gains from international trade and of the public services of the colonies to the foreign-owned mines and plantations at the expense of indigenous labour and peasant export producers.

It may be argued that we have given too strict an interpretation of the " export-bias " doctrine which is merely meant to convey the general proposition that, whatever the exact cause, the nineteenth-century process of international trade has landed many underdeveloped countries with a large ratio of raw materials exports to their total national products, making it desirable to reduce their " vulnerability " to international economic fluctuations. But the trouble is that the " export bias " doctrine tends to suggest that the raw-materials export production of the underdeveloped countries has been artificially over-expanded, not merely in relation to their domestic sector, but absolutely. Given the strong feelings of economic nationalism and anti-colonialism in the underdeveloped countries, this can be a very mischievous doctrine strengthening the widespread belief that to go on producing raw materials for the export market is tantamount to preserving the " colonial " pattern of trade. Thus already many underdeveloped countries are giving too little encouragement to their peasant

[1] This is true for the governments of most underdeveloped countries, whether colonial or independent, past or present.

[2] For a discussion of the question of the possible export bias through the operation of the 100% sterling exchange system of the colonies, see A. D. Hazlewood, " Economics of Colonial Monetary Arrangements," *Social and Economic Studies*, Jamaica, December 1954.

export sectors by diverting too much of their capital and technical resources to industrial-development projects, and are also crippling their mining and plantation export sectors by actual or threatened nationalisation and various restrictions and regulations. The effect is to reduce their foreign-exchange earnings so urgently needed for their economic development. Of course, no competent critic of the nineteenth-century pattern of international trade would ever suggest the drastic step of reducing exports absolutely; some would even concede the need for vigorous export drive policies.[1] But having built up a pervasive feeling of hostility and suspicion against the " nineteenth-century " or the " colonial " pattern of international trade, they are not in a position to ram home the obvious truths: (*a*) that, even on an optimistic estimate of the possibilities of international aid, the underdeveloped countries will have to pay for the larger part of the cost of their economic plans aiming either at a greater national self-sufficiency or at the export of manufactured goods; (*b*) that the necessary foreign exchange for these development plans can be earned by the underdeveloped countries at the present moment only by the export of raw materials (though not necessarily the same commodities for which they were supposed to have a differential advantage in the nineteenth century); and (*c*) that therefore to pursue their development plans successfully it is vitally important for them to carry out the " export-drive " policies, which in their technical properties may not be very different from those of the colonial governments in the past.[2] In trying to carry out their development plans on the foreign-exchange earnings from raw-materials export they would, of course, still be " vulnerable "; but this should be considered separately as a problem in short-term economic stability[3] and not as a criticism of the nineteenth-century pattern of international trade in relation to the long-term development of the underdeveloped countries. From a long-term point of view, even countries which have successfully industrialised themselves and are therefore able to maintain their population at a higher standard of living by building up a large export trade in manufactures, such as Japan or the

[1] Cf., for example, Gunnar Myrdal, *An International Economy*, p. 274.

[2] Colonial governments have frequently defended their export-drive policies as the means of taxing foreign trade to finance services needed for internal development. But because they were colonial governments, their motives were suspect. At first sight we might imagine that the new independent governments of the underdeveloped countries would be free from this disability. But unfortunately, given the atmosphere of intense nationalism and anti-colonialism, this is not true. In some cases the hands of the newly independent governments seem to be tied even more tightly, and economic policies admitted to be desirable are turned down as " politically impossible." Here those economists who regard themselves as the critics of the classical theory and the nineteenth-century pattern of international trade have a special responsibility. Instead of dealing tenderly with the " understandable " emotional reactions which they have partly helped to create, they ought to be emphatic in pointing out the conflicts between rational considerations and " understandable " mental attitudes. The underdeveloped countries are too poor to enjoy the luxury of harbouring their emotional resentments.

[3] Cf. the United Nations Report on *Measures for International Economic Stability* and Myrdal's comments on it, *op. cit.*, pp. 238–53.

thickly populated countries of Western Europe, will continue to be " vulnerable." [1]

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[1] It is particularly in relation to the thickly populated advanced countries of Western Europe which have specialised and adapted their economic structure to the requirements of the export market that Professor J. H. Williams found Adam Smith's " vent-for-surplus " approach illuminating. We have, in this paper, interpreted the " surplus " more strictly in its pre-existing form without the improvements and augmentation in productive capacity due to genuine " specialisation." (Cf. J. H. Williams, " International Trade Theory and Policy—Some Current Issues," *American Economic Review, Papers and Proceedings*, 1951, pp. 426–7.)

A NOTE ON THE ECONOMICS OF NATIONAL SUPERANNUATION

1. THIS article is written in the light of the recent discussion of the desirability and possibility of making more adequate provision for retirement incomes for the portions of the working population not at present included in private superannuation schemes; and especially with reference to the Labour Party's plan "National Superannuation. Labour's Policy for Security in Old Age" (1957). It will concentrate attention on the macro-economics of any national scheme; thus it will deal with total and average incomes, to the exclusion of any consideration of the equity or expediency of the redistributive aspects of such a scheme.

2. In order to bring out clearly the basic economic facts behind a national superannuation scheme, it has been found necessary to make certain simplifying assumptions. First, it has been assumed that a national scheme would include all the population; this is done because of the absence of either life tables or population forecasts for the members of private schemes and the rest of the population taken separately. The second simplifying assumption is that all calculations of contributions and benefits have been made in units equal to one year's average personal income. Calculations have been made on various possible assumptions to determine the contributions necessary to provide two types of benefit: first, of retirement incomes equal to 50% of the average personal income of those in the contributing age-groups; and second, of lump-sum benefits, payable on death, equal to one year's average personal income. The calculations concerning the cost of lump-sum benefits are intended to relate not to national life-insurance (which nobody has yet proposed, though it might make a good election gambit) but to the cost to the social-security system of providing benefits such as orphans' allowances following the death of the parents. Larger or smaller pensions or lump-sum benefits would require proportionately larger or smaller contributions.

3. The calculations are based on three methods. The first section deals with the actuarial approach, by which pensions and lump-sum benefits are fully paid for out of a fund built up in advance by premiums. The question of how the payment of premiums is allocated between individuals, their employers and the Exchequer is not discussed here. The second section takes the opposite extreme, the assessment approach, under which current benefits are paid for out of current contributions, and no funds are built up. The third section deals with an intermediate approach, where contributions are paid into a fund which, although not actuarially sufficient to meet all future benefits, may for some period, or indeed permanently, be increasing

owing to an excess of current contributions plus income from accumulated funds over current payments of benefits.

4. Within the framework of these three general approaches it is possible to examine the effects of alternative assumptions about the details of the systems involved. Those considered here include variations in the age at which contributions begin, and in the retiring age at which contributions cease and the drawing of pensions begins; the effects of a gradual approach to the target of 50% pensions; and variations in the rate of interest at which accumulated funds increase, and in the rate of increase of average personal incomes. In the calculations the rate of interest and the rate of increase of average incomes have been considered together in the following manner. It is assumed that all benefits and contributions will increase over time at the same proportional rate as average personal incomes. This is slightly more generous to pensioners than the Labour Party's plan (*op. cit.*, p. 97), but it is assumed that pensioners will receive increases of pension after retirement to keep up their real income relative to the national average, both because this is politically so attractive that it is almost bound to find its way into any actual scheme and because it simplifies the calculations. As the average pensioner does not survive very long, it makes very little difference to the total bill for pensions.

5. With benefits increasing in step with the average personal income, part of the return on the accumulated funds of any scheme will be needed to increase the fund by the same proportion as the increase in the benefits which it is due to pay in the future. Thus if average personal incomes increase by x% in a given year the total discounted liabilities of the scheme will also increase by x%, and to keep the fund actuarially solvent, or to keep a non-actuarial fund in the same proportion to the size required for actuarial solvency, it is necessary to devote the first x% of the fund's income to this purpose. The effect of doing this is the same as if personal incomes had remained constant, and the rate of return on the accumulated funds had been x% lower than the amount in fact earned.

6. It is also necessary to make some simplifying assumptions about the behaviour of prices during the period of the fund's operation. Thus it is assumed below either that prices are stable or that the funds are invested in such a manner that the real income on them is unaffected by inflation, by the investment of some (undiscussed) proportion of them in equities. The calculations can thus still be carried on in terms of units of average income, the rate of increase of prices being deducted from the rate of return in money terms on the accumulated funds. If the funds were not in fact invested in an inflation-proof manner, then even a scheme which would have been actuarially sound given constant prices would incur an actuarial deficit under conditions of increasing prices. If such a scheme gave rise to extra real savings at the time when the contributions were made, however, then it could be argued that the provision of subsidies to compensate it for the

effects of inflation was a transfer placing no real burden on the rest of the economy.

7. In a purely current scheme, where there are no accumulated funds, the rate of return does not come into the calculations; but the nearer a scheme moves to the opposite extreme of actuarial solvency, the more important the rate of return becomes. In the discussion below the " rate of return " is defined as the gross rate of return in money terms, including capital appreciation, minus the rate of increase of prices, and minus the rate of increase of real average incomes. It is also net of administrative costs. It is not proposed to discuss how large the rate of return, as thus defined, is likely to be over as long ahead as a working lifetime of forty-five or fifty years, but calculations have been made on the alternative hypotheses of 3, 4 and 5%. The assumption that a constant rate of return prevails throughout is itself made purely for simplicity, and is unlikely to be realised in practice.

I. The Actuarial Approach

8. The method used here is to consider the contributions necessary, measured as a percentage of the average personal incomes of contributing age-groups, to provide funds actuarially sufficient to pay for retirement pensions equal on average to 50% of the average incomes of contributors, and lump-sum payments on death equal to one year's average income of contributors. The basis of these calculations is the Registrar General's current Life Tables [1] for England and Wales. The calculations have been made separately for men and women; if, under an actual scheme, it was decided to combine the sexes and levy equal contributions on both, this would involve a redistribution from men to women in the case of pensions, since women survive longer to draw them, but from women to men in the case of lump-sum payments, since as men die sooner, the value of payments to them on death, discounted to any given date, is greater. Contributions to a combined scheme would lie between the values found for the two sexes separately, but will tend to lie nearer to the mens' rates so long as men's average incomes remain greater. Proposals involving the relating of pensions to the joint incomes of husband and wife also involve a tendency to raise the premiums necessary to provide 50% pensions if these are taken to relate what the individual gets to his own income before retirement, relative to the national average; this complication does not arise with the definition of " 50% pensions " used here. In the calculations below the sexes have not been combined, in order to keep clear the actuarial methods used.

9. A further reason for relating 50% pensions to the average incomes of contributors and not of the pensioners themselves before retirement is that the latter definition would require that the correlation between level of income during work, and expectation of life on retirement, should be known. This information is not available; but if there is a positive correlation between income and longevity, then heavier premiums would be required for 50% pensions on the alternative definition. Similar complications arise, and have to be avoided for similar reasons, in considering the levels of contributions necessary if the contributions are related to individual incomes, since the individual's income will tend to vary with age, while the calculations are based on the assumption that the average individual earns the average income throughout his working life. If contributions were actually evenly spread over the working life of the average individual this would involve a crushing burden on the youngest age-groups. One method of avoiding this would be for a larger proportion of the contributions of younger age-groups to be paid by the State, and less by themselves, than in the case of the older age-groups. The alternative would be the levying of equal proportional contributions at all ages, but with higher rates of contribution than those calculated below to allow for the fact that it is the earliest contributions which earn most income during the life of an actuarially based pension fund.

10. It is suggested, however, that the simplest method of considering the effects of lower contributions from younger workers is by analogy with the effects of late entry into the scheme. For example, contributions from 15 to 21 at half the average adult rate are slightly actuarially superior to contributions from 18 to 21 at the full rate; accordingly, the earliest date of entry below is taken to be 18. In the case of the professional and business classes, where incomes may rise markedly for from twenty to thirty years after a late entry to work, such a correction is obviously inadequate; but as there is bound to be some redistributive element about any national scheme, and as the classes concerned are in any case relatively likely to opt out of it, it did not appear to be worth while attempting to allow for this case.

11. With all these provisos in mind, the tables below should give at least some idea of the order of magnitude of the contributions required for various types of benefit, and the effects of varying certain of the assumptions. Table I shows the contributions, expressed as percentages of the average incomes of persons of contributing age, needed to provide, for contributors entering the scheme at various ages, pensions after 65 at a level equal on average to half the personal incomes of those of contributing age. It will be seen that while women's contributions are always about a third greater than men's, age of entry and the rate of return making very little difference to this, the effects of changes in the age of entry, and in the rate of return, are very large. For men, the necessary contributions rise rapidly with age on entry, until with a rate of return of 3% necessary contributions from 35 are 103% above those needed from 20, and with a rate of return of 5%, necessary contributions from 35 are 151% above those needed from 20. Also, a rise in the rate of return makes pensions markedly cheaper, especially for younger entrants; from 20, the premiums necessary

[1] *The Registrar General's Decennial Supplement, England and Wales, 1951. Life Tables.* H.M.S.O., 1957.

with a rate of return of 5% are only 50% of those needed with a 3% rate of return; and from 35 the contributions necessary with a rate of return of 5% are 62% of those needed with a rate of return of 3%. The greater

TABLE I

Percentage Contributions for a 50% Pension from 65

Age on entry.	Rate of return.					
	3%.		4%.		5%.	
	Men.	Women.	Men.	Women.	Men.	Women.
18	3·33	4·55	2·33	3·15	1·62	2·18
20	3·62	4·94	2·57	3·47	1·81	2·40
23	4·12	5·61	2·98	4·02	2·16	2·89
26	4·72	6·40	3·49	4·69	2·58	3·45
29	5·43	7·35	4·10	5·49	3·09	4·13
32	6·33	8·49	4·84	6·57	3·73	4·97
35	7·37	9·90	5·79	7·73	4·55	6·04

difference for younger entrants is because any difference in the rate of return makes more difference to the size of a fund over a longer period. Tables II and III show the effects of age on entry and of the rate of return on men's contributions.

TABLE II

Necessary Contributions as Percentages of those Necessary on Entry at 20

Age on entry.	Rate of return.		
	3%.	4%.	5%.
18	92·0	90·7	89·5
20	100·0	100·0	100·0
26	130·1	135·8	142·0
35	203·5	225·4	250·9

TABLE III

Necessary Contributions as Percentages of those Needed with a 3% Rate of Return

Age on entry.	Rate of return.		
	3%.	4%.	5%.
18	100·0	69·8	48·6
20	100·0	70·9	50·1
26	100·0	73·9	54·6
35	100·0	78·5	61·7

12. Bearing in mind that necessary contributions for women are higher, and that the provision of other benefits, expressed for our purposes as their equivalent cost in lump-sum payments, also requires premiums, it is obvious

that after an age of entry of about 35, *i.e.*, for about two-thirds of the present adult population, the contributions necessary for entry into an actuarially sound scheme would become very burdensome with a 3% rate of return, though with a 5% rate of return a few more years would elapse before contributions reached a similarly burdensome level. The above discussion, however, has assumed retirement at 65; and it is possible to calculate the

TABLE IV

Percentage Contributions Needed for a 50% Pension from Various Ages

Age at retirement.	Rate of return.					
	3%.		4%.		5%.	
	Men.	Women.	Men.	Women.	Men.	Women.
60	6·15	7·82	4·49	5·62	3·25	4·05
63	4·52	5·98	3·24	4·24	2·32	3·01
65	3·62	4·94	2·57	3·47	1·81	2·44
67	2·86	4·05	2·00	2·80	1·40	1·95
70	1·94	2·90	1·33	1·98	0·92	1·35

effects on necessary contributions of varying the age of retirement. Table IV shows the percentage contributions needed for persons entering the scheme at 20, and retiring at various ages from 60 to 70. The outstanding thing about these figures is the rapid increase of contributions necessary to finance a lower retiring age, and the equally marked reduction made possible by a rise in the retiring age. This is more marked for men than for women, and more marked at high than at low rates of return, as is

TABLE V

Necessary Contributions for a 50% Pension from Various Ages, as Percentages of Contributions for Retirement at 65

Age at retirement.	Rate of return.					
	3%.		4%.		5%.	
	Men.	Women.	Men.	Women.	Men.	Women.
60	170	158	175	162	179	166
63	125	121	126	122	128	123
65	100	100	100	100	100	100
67	79	82	78	81	77	74
70	53	59	52	57	50	55

shown by Table V, which gives the contributions necessary for a 50% pension from various retiring ages as percentages of the contributions necessary for an entrant at age 20 retiring at 65. It is thus clear that any general reduction in the age of retirement would greatly increase, and the

adoption of a moderate postponement would similarly ease, the burden of paying for pensions. For retirement at ages over 65, one possible arrangement would be that contributions stopped at 65. This would make comparatively little difference to the levels of contributions needed, as most of the income of pension funds at ages around 65 comes from interest on accumulated funds, and not from current contributions. In the case of entrants at ages over 20, variations in the age of retirement cause even larger variations in the necessary premiums.

13. The other form of benefit whose cost will be considered here is the lump-sum payable at death. No attempt will be made to assess here the number of years' income which would be necessary, on the average, to cover payments such as orphans' allowances; for illustrative purposes the cost of lump-sum payments on death equal on average to the average annual income of contributors has been worked out. As in the case of pensions, this would not be actuarially equivalent to the cost of paying lump-sum benefits equal to the actual income of the individual, unless there was no correlation between income level and age at death; but in this case a positive correlation between income level and length of life would strengthen the scheme's actuarial position, since postponement of the larger payments reduces the actuarial liability at any one time. In view of the assumed

TABLE VI

Percentage Contributions Needed to Pay One Year's Income on Death

	Age on entry.	Rate of return.					
		3%.		4%.		5%.	
		Men.	Women.	Men.	Women.	Men.	Women.
Death before 60	20	0·38	0·25	0·34	0·24	0·32	0·21
	26	0·45	0·28	0·42	0·28	0·39	0·26
	35	0·61	0·36	0·59	0·39	0·57	0·36
Death after 60	20	0·69	0·67	0·48	0·45	0·34	0·31
	26	0·90	0·87	0·66	0·61	0·48	0·44
	35	1·40	1·34	1·09	1·01	0·85	0·78
Total	20	1·07	0·92	0·83	0·69	0·65	0·53
	26	1·35	1·15	1·08	0·90	0·87	0·71
	35	2·01	1·70	1·68	1·40	1·42	1·14

purpose of lump-sum benefits it is also desirable to subdivide deaths into those of persons with and without dependants; this cannot be done here in any detail, but as a first approximation the liability in respect of deaths below and above the age of 60 are considered separately. Table VI shows the necessary premiums to pay for these, from various ages of entry up to a retirement age of 65. It will be seen from Table VI that for lump-sum benefits in the case of death at over 60 there is little difference in the premi-

ums necessary for men and women; this is because their later average age at death balances the fact that more women survive to over 60. In the case of death at over 60 the rate of return has a marked effect on the necessary premiums. For lump-sum benefits payable in the event of death before 60, on the other hand, premiums for men are substantially higher than those for women, whereas the rate of return on accumulated funds makes very little difference to the premiums necessary; this is because, as the liabilities of such a fund are spread throughout its life, its aggregate size is never very large. When the contributions necessary to cover lump-sum benefits at death at all ages are added the total is found to vary both with sex, men's contributions being heavier, and with the rate of return, low rates of return making for high premiums. In all cases the premiums rise with the age of entry into the scheme, but more so in the case of benefits payable on death at over 60.

14. Finally, we shall consider the total premiums necessary for an actuarially sound scheme providing both 50% pensions on retirement at 65 and lump-sum benefits equal to one year's average income, payable at death at any age. The premiums needed for such a combination, which is

TABLE VII

Percentage Contributions Necessary for 50% *Pensions from* 65 *plus Lump-sum Benefits*

Age on entry.	Rate of return.					
	3%.		4%.		5%.	
	Men.	Women.	Men.	Women.	Men.	Women.
18	4·32	5·40	3·09	3·78	2·22	2·66
20	4·69	5·86	3·40	4·16	2·47	2·96
23	5·32	6·64	3·93	4·81	2·91	3·53
26	6·06	7·55	4·56	5·59	3·45	4·19
29	6·96	8·65	5·33	6·52	4·11	4·95
32	8·08	9·98	6·28	7·76	4·93	5·94
35	9·39	11·61	7·47	9·12	5·97	7·18

chosen for illustrative purposes only, are shown in Table VII. It will be seen that the necessary contributions form a higher proportion of income for women than for men, though to a lesser extent than in payments for pensions alone. Contributions rise rapidly with age of entry, to an extent which makes it clear that there can be no question of an actuarially solvent scheme for the older age-groups, though, of course, a scheme providing for less than 50% pensions for older entrants could raise the maximum age for entry into an actuarially solvent scheme. Necessary contributions also vary greatly with the rate of return on accumulated funds.

15. One conclusion which emerges very strongly from the calculations whose results are presented here is that in any attempt at evolving a national

superannuation scheme on an actuarially solvent basis, one of the worst problems would be estimating what level of premiums would suffice to make a scheme actuarially solvent. He would be a bold planner who would attempt to forecast the " rate of return " as defined above, over the next 50 years, or what would be the trend of mortality over a similar period; all the calculations above are based on the 1951 life tables, and the reductions in mortality which are expected over the next fifty years are bound to increase the cost of pensions, through longer survival, by far more than they reduce the lump-sum benefit components of any possible scheme, by postponement. Thus all the premiums worked out above may be expected to be inadequate to an extent which cannot be accurately forecast.

16. A further difficulty with an actuarially solvent scheme is the enormous size of the funds which would be accumulated. Table VIII shows the size of the accumulated fund which would exist at the age of 65, to provide 50% pensions on retirement at 65, in units of average income, per entrant at 20 and per survivor at 65.

TABLE VIII

Years' Income per Member in a 50% *Pension Fund, at* 65

	Rate of return.					
	3%.		4%.		5%.	
	Men.	Women.	Men.	Women.	Men.	Women.
Per entrant .	3·24	4·48	3·03	4·16	2·85	3·88
Per survivor .	4·70	5·58	4·40	5·18	4·14	4·83

Even granted that this is the maximum size attained by such a fund, and that during the periods of building up and running down the sizes of the funds of other age-groups would be smaller, funds of this size would form a large proportion of the nation's total capital, and the investment of resources on this scale would present major administrative and financial problems.

II. THE ASSESSMENT APPROACH

17. The second section of this article considers the economics of schemes for pensions and for lump-sum benefits payable at death working on the opposite extreme principle; the assessment principle, under which all current benefits are paid for from current contributions, and no funds are built up. In this type of scheme the rate of return does not matter. Also, as there is no need to provide in advance for the liabilities of the scheme, the problem of forecasting trends in mortality does not affect the solvency of the scheme; but it would be prudent, before any such scheme was adopted, to examine the size of the burden it would place on the other members of the community. For this purpose, use is made of the population forecasts given

by the Government Actuary's Department and Registrar General,[1] carried forward to 2025 by the author by extrapolating the mortality trends assumed in the estimates up to 1995. Table IX shows the resulting forecasts of the population in the age-groups over 20, divided into contributors and pensioners at three possible retiring ages, 60, 65 and 70. From this table can be calculated the percentage contributions from current personal incomes which would be necessary to provide pensioners with incomes equal on average to 50% of the average incomes of those still of working age.

TABLE IX

Estimated Future Population of Great Britain in Stated Age-groups

(000,000)

Year.	Age-groups.					
	20–59.	60 +.	20–64.	65 +.	20–69.	70 +.
1960	27·14	8·78	30·43	6·07	32·64	3·86
1965	27·43	9·55	30·48	6·50	32·89	4·09
1970	27·73	10·35	30·94	7·14	33·65	4·43
1975	27·62	11·01	30·83	7·80	33·70	4·93
1980	27·74	11·16	30·60	8·30	33·49	5·41
1985	27·41	11·51	30·62	8·30	33·20	5·72
1990	27·46	11·41	30·36	8·51	33·25	5·61
1995	27·74	11·10	30·49	8·35	33·10	5·74
2000	27·98	10·81	30·72	8·07	33·20	5·59
2005	27·90	10·76	30·83	7·83	33·30	5·36
2010	27·12	11·41	30·65	7·88	33·29	5·23
2015	26·73	11·59	29·87	8·45	33·05	5·27
2020	26·41	11·62	29·41	8·63	32·23	5·80
2025	26·20	11·50	29·10	8·60	31·80	5·90

The necessary contributions have also been calculated for a scheme under which pensions start at 30% of the average incomes of those of working age, rising to 50% after 50 years, *i.e.*, by 2010, assuming that the scheme comes into operation in 1960. This appears to approximate to the effects of the gradual introduction of the differential elements of the pensions proposed in the Labour Party's draft scheme. Table X shows the percentage contributions needed on both these assumptions, assuming entry at 20.

18. It is clear from these figures that, whatever the age of retirement, the burden of paying for pensions is due to increase rapidly for the first twenty-five to thirty years of the scheme, but then to level out or decline except in the case of pensions at 60 with a gradual increase to 50%. It is also clear that, just as in the case of an actuarial pension scheme, the burden increases rapidly as the age of retirement is lowered. On the basis of the figures given above, it is obvious that there can be no serious prospect of the retiring age falling below 65 with pensions at or approaching the 50% target. A rise in the retiring age as far as 70 is unlikely, the figure being taken because it can be derived easily from the published forecasts, but a rise of

[1] See *Annual Abstract of Statistics*, 1956, Section II, Table 9.

one year in the retiring age would result in the reduction of necessary contributions by about 1% of average incomes initially, this saving rising to about 1¼% by 2025. Some rise in the retiring age appears to be essential if the burden of contributions under a current scheme is to be kept within reason. In the case of women a retiring age of 65 would itself represent a substantially raised age of retirement.

TABLE X

Percentage Contributions Necessary for 50% Pensions, and for Pensions Increasing to 50% by 2010

Year.	Retiring age 60.		Retiring age 65.		Retiring age 70.	
	50%.	30–50%.	50%.	30–50%.	50%.	30–50%.
1960	15·84	9·51	9·97	5·91	5·91	3·55
1965	17·38	11·13	10·66	6·82	6·08	3·98
1970	18·67	12·68	11·54	7·85	6·58	4·48
1975	19·94	14·35	12·64	9·10	7·31	5·26
1980	20·11	15·28	13·53	10·30	8·08	6·14
1985	21·01	16·81	13·55	10·84	8·62	6·90
1990	20·77	17·44	14·01	11·77	8·44	7·09
1995	20·00	17·60	13·69	12·04	8·67	7·63
2000	19·31	17·77	13·14	12·09	8·43	7·75
2005	19·28	18·51	12·69	12·18	8·05	7·73
2010	21·03		12·85		7·86	
2015	21·68		14·14		7·97	
2020	22·00		14·67		9·00	
2025	21·94		14·77		9·27	

19. The contributions required under a current scheme are, of course, much larger than the premiums required from the younger age-groups in an actuarial scheme; but even so, contributors in the near future under a current scheme would be paying in contributions a lower fraction of their incomes than would have to be paid by their successors in, say, 1995, when a person aged 30 in 1960 would retire if the retiring age remained at 65. The excess of contributions on a current, over those needed for younger entrants on an actuarial basis, is of course simply a result of the lack under a current scheme of the large fraction of the income of an actuarially based pensions scheme which comes from the return on its accumulated funds. This difference gives rise to certain problems if a national scheme is not to be compulsory for all—anybody aged 20–30 who was allowed to contract out from a public current scheme into a private actuarially based scheme would have a strong incentive to do so. The Labour Party's draft plan avoids this difficulty by making the "basic" part of its pensions scheme compulsory, and arranging the differential element so that it is fairly similar to an actuarially based scheme.

20. The cost of lump-sum benefits on a current basis can also be calculated, at least approximately, by deduction from the population forecasts,

adjusted for migration.[1] Table XI shows the contributions needed, as a percentage of the incomes of persons aged 20–65, to provide lump-sum benefits payable at death equal on average to one year's income of contributors. With 1951 mortality figures, 20% of the male and 13% of the

TABLE XI

Percentage Contributions Needed for Lump-sum Benefits on Death Equal to 1 Year's Income

Year.	Estimated deaths (000).	Percentage contribution.
1960	580	1·91
1965	595	1·95
1970	614	1·98
1975	632	2·05
1980	660	2·16
1985	686	2·24
1990	704	2·32
1995	704	2·31
2000	701	2·28
2005	686	2·23
2010	686	2·24
2015	688	2·30
2020	692	2·35
2025	702	2·41

TABLE XII

Percentage Contributions Needed for Pensions at 65 Increasing from 30% in 1960 to 50% in 2010, plus Lump-sum Benefits on Death

Year.	Pension.	Lump-sum.	Total.
1960	5·91	1·91	7·82
1965	6·82	1·95	8·77
1970	7·85	1·98	9·83
1975	9·10	2·05	11·15
1980	10·30	2·16	12·46
1985	10·84	2·24	13·08
1990	11·77	2·32	14·09
1995	12·04	2·31	14·35
2000	12·09	2·28	14·37
2005	12·18	2·23	14·41
2010	12·85	2·24	15·09
2015	14·14	2·30	16·44
2020	14·67	2·35	17·02
2025	14·77	2·41	17·18

emale deaths take place before 60, and these proportions will fall as mortality ecreases. Provision for lump-sum payments on death before the age of 60 osts very little more on a current than on an actuarial basis, but in the case f death at over 60 the current basis requires contributions far above those r entrants at 20 to an actuarial scheme.

[1] The adjustment is very crude in the absence of detailed forecasts of the age-distribution of igrants; the question of the status of migrants under a national superannuation scheme will elf present some problems.

21. Finally, for illustrative purposes Table XII shows the total premiums necessary for a combined scheme providing for contributions from 20 to 65, and pensions for those over 65 rising from 30% in 1960 to 50% in 2010, plus lump-sum benefits on death at all ages equal to one year's average income of contributors. The total cost of such a combined scheme would rise sharply, increasing by 80% in the first thirty years of the scheme, and continuing to rise, though more gradually, afterwards. A desire to avoid a rising rate of contributions, and to take advantage of some of the benefits from investment income of an actuarial scheme, has obviously prompted the third alternative method of financing pensions, that of the non-actuarial fund, as proposed in the Labour Party's draft scheme.

III. A Non-actuarial Fund

22. It remains to investigate the implications of paying national superannuation benefits out of a fund which, although not actuarially solvent, would serve both to even out the level of contributions over time and to lower their ultimate level by providing at least some income from accumulated funds. The growth of such a fund is strongly dependent on the level of contributions, since the fund can be considered as the difference between a fund built up by the stream of contributions flowing in and growing at compound interest and a fund built up from the stream of benefits flowing out and growing in a like manner. A small variation in the level of contributions relative to the level of benefit payments can thus make a very large proportional difference to the rate of growth of the residual fund. This can be seen by comparing Tables XIII and XIV. Table XIII shows the size at five-yearly intervals of a fund financed by contributions equal to 10% of the average income of persons aged 20–64, and paying out pensions to persons over 65 rising from 30% of the average income of persons of contributing age in 1960, to 50% of the average income of persons of contributing age after 2010. The rate of return here is that defined above. Table XIV shows the size at equal intervals of a fund financed by a 1% contribution from the incomes of persons aged 20–64 with no expenditure. It is apparent on comparing these tables that the size of a non-actuarial pension fund at any date depends strongly on the rate of return assumed on invested funds. Also, it is clear that a quite small variation in the level of contributions could alter the size of the resulting fund to almost any desired extent. Thus with a rate of return of 3%, a cut of ¼% in the rate of contributions could reduce the fund to zero in 2025, or an increase of ¼% could double it. With a 4% rate of return, a cut of 0·62% in the rate of contributions would be needed to reduce the fund to zero by 2025, and with a 5% rate of return, a cut of almost 1% could be made. Thus the necessary level of contributions depends only slightly on the rate of return on invested funds. The exact size of the contributions levied would depend on the views of the governments administering the scheme as to how large it was desirable that the accrued funds of a national superannuation scheme should be at any time.

Table XIII

Size of Pension Fund Financed by Contributions of 10% *of Incomes and Paying Pensions Rising to* 50% *in* 2010

(In units of 1 million average incomes)

Year.	Rate of return.		
	3%.	4%.	5%.
1960	1·12	1·12	1·12
1965	7·12	7·31	7·51
1970	12·46	13·19	13·97
1975	16·77	18·43	20·27
1980	19·77	22·77	26·22
1985	21·91	26·67	32·42
1990	23·16	30·18	39·06
1995	23·72	33·52	46·60
2000	24·09	37·24	55·97
2005	24·42	41·73	67·78
2010	24·11	46·53	82·14
2015	22·18	50·73	98·85
2020	18·72	54·60	118·89
2025	14·36	58·94	144·10

Table XIV

Size of a Fund Financed by 1% *Contributions, with no Expenditure*

(In units of 1 million average incomes)

Year.	Rate of return.		
	3%.	4%.	5%.
1960	0·30	0·30	0·30
1965	1·97	2·02	2·07
1970	3·92	4·12	4·34
1975	6·18	6·69	7·25
1980	8·79	9·80	10·95
1985	11·82	13·58	15·66
1990	15·32	18·18	21·67
1995	19·37	23·76	29·34
2000	24·08	30·57	39·14
2005	29·55	38·86	51·66
2010	35·89	48·94	67·63
2015	43·21	61·18	87·98
2020	51·66	76·03	113·93
2025	61·44	94·07	147·02

23. If it was desired to finance lump-sum benefits on a non-actuarial fund basis, funds reducing to approximately zero in 2025 could be provided by contributions of 2·2% of average incomes with a 3% rate of return, or of 2·1% or 2·05% if the rate of return was 4% or 5% respectively. One advantage of a non-actuarial fund is that if the original forecasts concerning

either mortality or the rate of return prove to be wrong the results can be corrected by a comparatively small change in the level of contributions, though the later such a correction is left, the larger it will have to be. On the other hand, a non-actuarial fund must levy contributions in the early years which are larger than those which would be required on a current basis; for it is only by this means that the funds are built up, the income from which enables the contributions in later years to be reduced below those which would be required on a current basis.

24. The desirable level of the funds connected with any national superannuation scheme cannot be discussed in detail here; it must depend partly on the view which is taken of the optimum size of such a fund from the point of view of finding investment opportunities, and on opinions concerning the merits or otherwise of institutional investment; and partly on an assessment of how far the savings embodied in such a fund are additional to, and how far they are substitutes for, savings which would have been made in other ways either by individuals or by institutions, including the State.

25. This article has thus presented at least provisional figures concerning the orders of magnitude involved in the three alternative approaches to national superannuation: the actuarial approach, the assessment, or current, approach and the non-actuarial fund. It is emphasised that these depend on very hazardous forecasts concerning mortality, which may well not be realised; it is also emphasised that the modification of the above figures to cover a scheme in which the pensions and other benefits are related to the average income during working life of the individual contributor, relative to the national average, would require detailed knowledge of the correlation between income level and longevity, which is not available for the present, let alone the future. Thus it is possible to do little more than indicate orders of magnitude based on alternative hypotheses. It is hoped, however, that even this will help in an intelligent assessment of the economic consequences of any proposed national superannuation scheme.

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REVIEWS

Lord Norman. By SIR HENRY CLAY. (London: Macmillan, 1957. Pp. ix + 495. 36*s*.)

SIR HENRY CLAY was killed in a road accident when he had been working for four years on this book and had almost completed his first draft. The sponsors—the Court of the Bank of England and Lord Norman's family—were then presented with the difficult question of how the work should be prepared for publication. They decided to go forward with the help of Norman's friends and former colleagues at the Bank of England. Two of these contributed postscripts to take the place of Clay's intended final chapters, and his draft of the rest, though submitted to minor editorial revision, remains " intrinsically Clay's work in his own words."

Let it be said at once that the editorial decision was eminently right. Clay, an economist of high academic standing, had a long personal knowledge of his subject; he had enjoyed full access to the Bank's records, Norman's private papers and the papers of Norman's opposite number across the Atlantic, Benjamin Strong; and this book was to Clay a labour of love. To leave the draft unpublished was therefore unthinkable. Of the two additional chapters, it was not unreasonable to confine one (" The Second World War ") to a brief factual survey. The second, " The Man," though drawing again and again on Clay's own chapters, is certainly not the appraisal Clay himself would have written, but it can stand by itself as a fascinating portrait, as fine a piece of biographical writing as has appeared for a long time. In Clay's own chapters " every effort has been made to avoid re-writing and to preserve the balance of emphasis and judgment." I doubt whether Clay would have revised more drastically; he was not a writer of high polish, though like any other author he would no doubt have gone back to sharpen his paragraphs after he had seen the whole emerge under his hand. There are in fact very few blemishes to remind the reader of the book's sad hiatus; only in the second section of Chapter VI had I any sense that Clay had intended to go back and insert further sentences.

Unlike political history, economic history has little room for biography. To the shaping of economic events few men make such highly personal contributions as warrant detailed attention to their lives, but Montagu Norman, with some inborn luck and some abilities, but mainly by sheer force of character, made himself one of these few. The puzzles inherent in his singular claim to attention enhance the interest in the more personal side of his story; how was it that, lacking in intellectual training and indeed in trainability, lacking in health and often lacking in patience, he yet won unique command in a field where perception and persuasion and a certain toughness all count tremendously? Clay's early chapters will be

eagerly studied for the light they throw on these problems: I confess—and I say this not in any critical spirit—that for me the problems remain a long way from solution. Perhaps the most significant episodes are Norman's travels in the United States and his service in the South African War. His early American visits had chance origins (I count this in his luck of family circumstances), but it is apparent not merely that Norman worked hard to understand his hosts but that he drove himself to make the most of these unusual opportunities. At the height of his career this experience was to be immensely valuable. The United States was just becoming critically important in international economic relations, and Norman was among the first to appreciate it and the most able to cope with it. In his middle twenties he had sat through debates in Congress and, in days before the aeroplane offered its soft option, he had travelled West and South to learn the dreary width of Texas and the continental range of America's economic activities. All this was to bear fruit in the close link between Governor Strong of the New York Reserve Bank and Governor Norman of the Bank of England.

The second illuminating episode—the South African War—interrupted one of these American tours, though not in quite the spectacular way told by pre-Clay tradition. This episode is important in quite a different way: it gave Norman no peculiar advantage for his personal mission in later years. Yet somehow it must hold a clue for us: for looking over the whole of Norman's life, it seems almost certain that this was his happiest time. What was it about his active service as a subaltern in the Veld that gave him such satisfaction? What is there in this satisfaction to link with the missionary zeal of Norman's Governorship of the Bank?

My guess is that the link is with an aspect of the Governor's activity that hardly appears in this book. Not that that work receives too little attention here; on the contrary, three-quarters of the book is (very properly) devoted to the Governorship. Clay's account is of the most authoritative kind: besides drawing on his own direct knowledge (extending over more than half the period) Clay was allowed to see and to quote at length from the Minutes of the Court, and other Bank records. It is something new for these records to be quoted within twenty years of their origin, and it is to be hoped that Clay's effective use of them in the advancement of knowledge will encourage the Bank to follow the precedent. In this book they have been used as the foundation of three major aspects of Norman's work: the restoration of the gold standard, subsequent international banking relations and the re-organisation of British industry. On these three subjects Clay's account is likely to remain a standard authority.

The first and second—the restoration of the international standard and subsequent international relations—are closely linked, in that the return to gold was viewed by Norman as a major contribution to the establishment of sanity in international economic relations, and all that followed was,

until 1931, an attempt to hold and improve upon that position and after 1931 to make the best of what was left. The account of Norman's part in the return to gold holds no surprises. Norman appears as one who assumed all through that the return must be at the old parity, but he was ready to postpone and postpone until conditions were reasonably propitious—though he appears (pp. 147–8) to have rejected the 1923 proposal that the Gold Export Control Act should, to give elbow-room, be extended to 1930. Once the deed was done, Norman was willing to experiment surprisingly freely in his determination to make things work. Chapter VI shows that the term "gold standard" at once became a travesty: a mechanism we should now describe as "E.E.A." was in fact working smoothly in 1927–29 (see especially p. 255), and little invention was required when the situation of 1932 had to be faced. (The account, on pp. 402–3, of this last is not altogether satisfactory, and it is difficult to believe that Snowden's famous phrase about "embarrassment to our trade" did not mean what Englishmen as well as foreigners took it to mean.)

All the time, Norman was trying to lessen England's difficulties—and the world's difficulties—by discussions and correspondence not only with Benjamin Strong in New York but with other central bankers throughout the world. Clay's account of these occupies much of the middle part of the book, but I missed reference to Norman's own formulation of his reasons. In a letter, not quoted here, to another central banker Norman explained that the central bankers must be the economic statesmen of the world: politicians, always being subject to electoral favour, could not be expected to take the long view that was required in facing the world's economic problems, and the central bankers, more firmly in the saddle, must do the job for them. This philosophy of central banking explains Norman's readiness to stray from what might be claimed as the proper sphere of the banker; it may also be part of the reason for his eventual (surprisingly late) acceptance of his position as a permanent Governor.

This philosophy can scarcely explain the other part of Norman's work that bulks large in this book: his concern in the reorganisation ("rationalisation" was the contemporary word) of the old staple industries of Britain. It might be supposed that this pre-occupation had a rational connection with Norman's gold standard policy: he thought no tinkering with exchange policy could avert the need for major reshuffling of Britain's industrial capacity. That adjustment, he considered, had to be made in any event, and he might have argued that, having done the best he could to restore international trade, industrial reorganisation was the logical complement, to take care of the remaining disequilibrium in the British economy. There is, however, no evidence in this book that Norman rationalised his actions in this way. His industrial interest was, it is clear, altogether more accidental. In the course of private banking business he would not have regarded as ordinarily proper to a central bank,

the Bank became involved in the future of a mammoth firm in one of the depressed industries. Norman, ready to run wherever the public interest (and a certain gluttony for work) would lead him, plunged deeply into this, and having become doctor to one of the patients, was led on to other industries that were also in the sick ward. The profits the Bank had made in the conduct of its other business gave Norman a purse from which he could draw in aid of these schemes, and his interest eventually became minute. The story is told at length by Clay, whose particular sphere of interest it was while he was employed by the Bank. Perhaps for this reason—though also no doubt out of tenderness for living persons—the story is told impersonally, perhaps too impersonally considering Norman's highly personal way of arranging things. It is also told uncritically: there are alternative views about how Britain's industries should have been put in order, and future industrial historians must not content themselves with Clay's version. But they will find it extraordinarily valuable. They should also, when they are assessing Norman, notice (in Postscript I) that during the Second War the future of British industry was a major preoccupation of Norman's.

But what of Bank Rate, open-market operations, relations with the commercial banks, the " hint from headquarters " and all the rest of the business that is the heart of central banking? The reader will indeed find innumerable points referring to these matters, but they add up to surprisingly little of the book. I suspect that this justly reflects the proportion they occupied of Norman's time. They were regarded as his own institution's technical business, and Norman took them in his stride without stopping to reason about them. Perhaps his attitude to Bank Rate was unduly moulded by the event in his first month as a Director: Campbell came in, he saw the figures, he put Bank Rate up without waiting for anyone, " and he was dead right." (I have told the story as Clay told it to me, not quite as it is told on p. 56.) This was to Norman's taste; he was not tempted into intellectual explanations, and when other people offered them (the Cunliffe Committee in 1918, and even Keynes in 1930), the story remained relatively simple. And what is true of Norman on Bank Rate is also true of his attitude towards other facets of the Bank's central business. He was always aware of the dangers of a big floating debt, never appears to have argued it out convincingly, but most often he probably pushed policy in the right direction.

All these things play quite a minor part in the book. On some there was perhaps rather more to be said. For example, there is very little (it is on pp. 130–1) on Norman's influence on the amalgamations among the commercial banks; future historians must look elsewhere for reference to his quite considerable interest. Similarly, the reader will gain little idea of the intense and active interest Norman took in the personnel not only of the City itself but of a much wider circle of British industrial and

trading concerns. (This highly personal activity is perhaps the link with Norman's satisfaction in South Africa.)

If I have in these paragraphs stressed some of the omissions of this book, this is not ingratitude: it is rather that the book is so important, and should be so widely studied, that its shortcomings thereby themselves become important enough to call for attention. This is, I will venture to say, the best as well the most important book Sir Henry Clay wrote: it must have the attention of all serious students of banking, of international economic relations and of the economic history of the first half of this century.

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Lloyds Bank in the History of English Banking. By R. S. SAYERS. (London: Oxford University Press, 1957. Pp. xii + 381. 35*s.*)

THIS work " is essentially a picture of English Banking development, mainly during the nineteenth century, as it appears in the records of Lloyds Bank and the host of other banks from which Lloyds Bank has grown " (Preface, p. 5). It was not to be expected that the records would be anything like complete. " There are, alas, serious gaps." But when the material from the branches was collected, " what at first glance seemed a desert was soon a garden almost choked with fruit and flowers—and weeds."

The past records of business concerns, when by good fortune they have been preserved, nearly always yield results of value to economists. And Professor Sayers has made good use of his material in telling the story of the 166 separate banks which have gone to the making of the Lloyds Bank of the present day.

He has not given us a continuous chronologically arranged narrative, but the successive chapters deal each with its own aspect or topic.

A preliminary chapter is given to " The Roots of Lloyds Bank." It started in Birmingham in 1765 as a private partnership, Taylors and Lloyds. The last Taylor dropped out in 1852, and as Lloyd and Co. the bank was converted into a joint-stock company in 1865. The chapter surveys in summary fashion the principal groups that were destined later on to amalgamate with it. It tells us something of the Lloyd family, whose connection, first as partners and then as directors, has been continuous to the present time.

In 1770 two of the partners in Taylors and Lloyds started a bank in Lombard Street, in which successive generations of Lloyds held partnerships till (after amalgamation with Barnetts Hoares in 1864) it was merged in Lloyds Bank in 1884. A genealogical tree shows in concise form the various branches of the Lloyd family and the partnerships and directorships they held.

Chapter 2, " The Bankers," is devoted to personalities, especially those who became Chairmen of Lloyds, and some who achieved distinction in

groups subsequently merged in it, for example, E. B. Merriman, who was responsible for the amalgamation policy of the Capital and Counties Bank. The Lloyd family contributed Howard Lloyd, who was General Manager for more than thirty years (1871–1902), and just lived to see the crowning amalgamation of Lloyds with the Capital and Counties in 1918.

Chapters 3, "Staff," and 4, "Customers," have gleaned much material of social interest. The next four chapters are concerned with matters of financial and business organisation. Chapter 5, "Country Bankers and London Agents," is full of interesting information as to the manner of carrying on business in the banking world of the nineteenth century, when the development of branch banking was still inconsiderable. Chapter 6, "Relations with the Bank of England," is occupied chiefly with questions of note issues and of the Bank of England branches. Broader questions of policy come into view with Lidderdale and the Baring crisis (pp. 155–6 and 208). It is interesting to find Lloyds resorting in an emergency to the telegraph as early as 1856, to make payment to the Bank of England in London and procure a transfer of gold from the Bank's branch in Birmingham (p. 205).

Chapter 8, "Employment of Funds," tells us something of the standards of liquidity of the private banks and early joint-stock banks, also of the nature of their investments. Before limited liability, the entire fortunes of partners or shareholders formed the backing of a bank's obligations, and it was natural to regard a miscellaneous collection of investments as eligible. Consols were by no means the perfect investment. The heavy depreciation after 1900 found out the weakness of more than one small bank (p. 256). And the idea that Consols were always saleable was rudely shaken by Lloyds' experience at the time of the Baring crisis of 1890, when jobbers refused to make a price (p. 213). The War of 1914 solved the problem of investments by furnishing an inexhaustible supply of short- and medium-dated Government securities (p. 189).

The book winds up very suitably with a chapter on "Amalgamation and Expansion." Occasional mergers and absorptions occurred in the early part of the nineteenth century, but, from the standpoint of Lloyds, the story may be said to begin with the amalgamation in 1884 of Lloyds, still a Birmingham bank, with Bosanquet, Salt and Co., and with Barnetts Hoares. These were Lombard Street banks, with seats at the London Clearing House, and Barnetts Hoares still maintained its family connection with Lloyds. Lloyds acquired the much-desired clearing facilities, but the transfer of the Head Office from Birmingham to London was a gradual process completed only in 1910.

The Capital and Counties Bank had absorbed a London bank and gained a seat at the Clearing House a few years earlier than Lloyds, and it was the vigorous and country-wide policy of absorptions and mergers thenceforth pursued by both that prepared the way for their union in 1918, when

Lloyds had 888 offices, and the Capital and Counties 473 (p. 265). A pair of maps shows conveniently the local distribution of the branches of the two banks.

An Appendix supplies a complete list of banks merged in Lloyds Bank, with dates of foundation, change of partnership and ultimate absorption. Other appendices give a list of the present branches, and biographical notes of the many personalities referred to.

Professor Sayers has made a fine response to the opportunity given him. He has made a subject which might easily have been dry very interesting and readable, and has made an important contribution to the history of banking in England.

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London.

Business Cycles and Economic Policy. By E. LUNDBERG. Translated from the Swedish by J. Potter. (London: Allen & Unwin, 1957. Pp. xx + 346. 32*s.*)

PROFESSOR LUNDBERG is well placed to review post-war Swedish experience of the management by the Government of the economy. As head of the (official but independent) Konjunktur Institutet for most of the post-war years, no one had a better chance to study what went on. This book started as a study of the functioning of economic controls; but as Professor Lundberg explains,

> "it soon became clear that the methods of physical regulation employed in Sweden during and after the war could only be satisfactorily analysed if comparisons were made with more general methods of economic policy and, in particular, with monetary and fiscal measures. In order to make such comparisons, I extended the scope of my investigations to include the discussions and experiences of the latter types of policy in the inter-war period. This obviously entailed a study of Swedish economic fluctuations and general development over the whole period from 1918 to the present."

The Swedish edition was published in 1953. In the English version some parts have been omitted, and the discussion revised to take account of events since 1953.

Professor Lundberg's real interest is with economic policy, not with economics as a behavioural science; and the book gives a clear indication of his own predilections. But these are supported by arguments of a general and often elementary nature, and do not logically depend on empirical evidence. Much of the time he is tilting at what one imagines was a prevailing interventionist orthodoxy: he has (as he disarmingly says) "a rather idealized picture of how a private economy with a well-functioning price-system might behave under favourable conditions" and "a distrust of power-loving and ambitious government administration."

In his historical analysis of economic developments in Sweden, Professor Lundberg makes a case for supposing that the fluctuations both in the level of activity and in the price level in Sweden in the inter-war period were imported from abroad, and that without outside influences conditions in Sweden would have been fairly stable. The balance of payments remained fairly well in balance despite large swings in both exports and imports, which is to be explained in part by the fact that output was allowed to fluctuate in sympathy with fluctuations in exports. The analysis is, however, comparatively unanalytical, and at times seems to pay too little regard to alternative interpretations of the data. To take one rather important instance, the large deficit on the balance of payments in 1947 is ascribed to an increase in the pressure of demand (p. 65); but one would have imagined that the previous over-issue of import licences (criticised on p. 272) had something to do with it.

Professor Lundberg's account of the " economic policy debate of the inter-war period " is of interest, among other things, for showing that the application of modern economic ideas was at that time very limited, so that they can be given little of the credit for the recovery of prosperity in the late thirties. There are references at various points to an occasional but rather terrifying extremism in the attitude of economists: Wicksell in 1918 demanding in the interest of " honesty " that the price level be restored to its pre-war level; Lindahl suggesting (in 1935) that the Riksbank should direct the Minister of Finance on the preparation of budgetary policy so that the latter might be integrated with monetary policy; or Cassel (also in 1935) inveighing against the " crippling " effect of public works.

The logic of Professor Lundberg's own philosophy is roughly as follows. His acquaintance with national-income forecasting leads him to the conclusion that it is an inexact art. It follows that budgetary policy is not so precise a means of influencing the economy as might be supposed. The same holds for controls (particularly controls over imports or investment): moreover, if long retained, controls (particularly price control) obstruct the working of the price system. For these reasons Professor Lundberg favours " general " methods of influence rather than detailed, specific interferences; and (for reasons made less explicit) he tends in fact to emphasise monetary rather than budgetary policy, though without inquiring how effective it is or whether effective for the same purposes.

One of the most interesting passages is the description of monetary policy since 1945, and some fun is had with the lack of monetary policy in the early part of the period. This is an easier task than it would be here, since monetary policy appears to have been highly explicit. Some *Communications to King* by the Board of Directors of the Riksbank were indeed nothing if not technical (see p. 141). Professor Lundberg, however, puts in a most unfashionable plea for " an atmosphere of uncertainty and perhaps even mysticism " in the conduct of monetary policy: one can only wonder how he would have liked it in fact. Also interesting is the discussion of the working of controls in Sweden. Professor Lundberg touches on the difficulty of retaining staff to administer controls when the war period was over; and suggests that some of the delays operating import controls were unnecessary. He discusses the case for using import restrictions in a balance-of-payments crisis as an alternative to deflation; but would seem from various remarks to be surprisingly happy to incur the latter to avoid the former (pp. 277–8). He seems to overstate the case against building controls. Towards price control he is surprisingly kind, admitting that it can and did at various times stabilise prices or moderate the speed of price rise; and by checking speculation also restrain the pressure of demand. This, however, does not remove its general disadvantages, at least as a permanent policy. A long discussion of wages under full employment seems to lead to little conclusion except that the degree of full employment must be an important factor in determining the rate of wage increase (p. 258); and at one point (p. 335) though not always (see p. 246) he calls for " some renunciation " of full employment.

Professor Lundberg's injections of scepticisms are doubtless valuable. But at times the reader may think that he has been insufficiently sceptical about his own position. Thus his exposure of the difficulties of forecasting affects *all* kinds of economic policy not merely budgetary policy (since all kinds of economic policy take time to have effect); and the only moral which follows is that Ministers of Finance must do the best they can. At times Professor Lundberg seems to go so far in scepticism as to doubt the possibility of knowledge of economic relationships (p. 295). But this can hardly be the real belief of one who has written what is an assertive book about economic policy and economic developments.

J. C. R. Dow

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The Image. By K. E. Boulding. (Ann Arbor, Michigan: University of Michigan Press, 1956 (London: Oxford University Press, 1957). Pp. 175. 30*s*.)

The content of this book is a single profoundly suggestive idea developed with brilliant virtuosity and the fertile play of wit over an impressive store of modern culture. The *image* is the entire configuration of concepts, assumptions conscious and unconscious, theories, beliefs, valuations, myths, " make-pretences " and mental elements of every kind, which exists in a man's mind, having evolved and grown up there by virtue of all his life's experience and always open to be further modified by fresh " messages " from nature, from other persons and from the " transcript " or written record of man's historical ordeal and all that it has taught him. The

image it is which gives particular shapes to his responses to challenges and stimuli and the general necessity to contend with the environment. When demands are made upon him, his " image " tells him how to react.

In a less all-pervasive and richly many-sided form, ideas of somewhat related tendency have been used by neuro-physiologists and psychologists under the name of the *schema*, and very recently indeed by Professor G. P. Meredith under the name of the *modulus* (in Chapter XIV of *Uncertainty and Business Decisions*, edited by C. F. Carter *et al.*, 1957). Professor Kenneth Boulding's conception in its universality of application and explanatory power seems entirely his own, and its creation will surely stand as one of the most striking products of the Center for Advanced Study in the Behavioral Sciences (known in some quarters as the Think Tank) at Palo Alto.

Eight chapters of the book, following an Introduction and followed by a vista of possible development and use, are eight branches of a single tree. Professor Boulding shows how " the image " works at the biological, the intellectual and the social levels, and in the epistemic, the economic and the political spheres and in the whole course of human development and history. Is the tale convincing? It is at any rate enthralling. The reader sits agape while the whole nature of man is unfolded before him, swiftly, seductively, with homely illustrations, vivid strokes of irony and an unfailing verve and coruscating wit. Perhaps the whole enterprise is too all-embracing. It is difficult, after one has laid the book down and taken time for sober reflection, to believe entirely that incisive and exact results will be secured, very directly, from a conception which claims applicability to genes and even to viruses as well as to firms, governments, societies, churches and civilisations. But this criticism will perhaps be welcomed by the author: it is, I suspect, just what he wanted someone to say, in order that he might pin it down as the central defect of the modern academic outlook: the belief in the necessity for ever-greater specialisation, the neglect of the search for a universal principle, a unique key to the whole cosmos of man's nature, conduct and history.

If I had to pick out one chapter as containing the author's deepest undercurrent of thought and feeling about the nature of things and the purpose of life, it would be the one called " How manifest is destiny?" Here he has pushed aside a little the curtain of iridescent verbal foam and let us glimpse his *own* image: it may be guessed to be as serious in its ultimate concerns as the vehicle of his thought is racy and high-spirited. There is in the book a great deal about biology, yet the connections between the brain and the mind are admitted to be still mysterious and perhaps impenetrable. It is no doubt an essential part of the author's design to carry the foundations of his idea down, as it were, to neural bedrock; yet the gulf to be bridged between the most successful of the human sciences, economics, and even the psychologist's universe of discourse is so great that any remoter

contacts seem unlikely to be profitable. The economists do not get high marks from Professor Boulding. They " have badly neglected the impact of information and knowledge structures on economic behaviour and processes." It is true; and the understanding of explicit decisions, where these are the key elements in swinging a firm or an economy into a new channel, must surely depend on just such a line of attack as he is proposing. Yet in a sense it is the very efficiency of the central economic mechanism, the market, that absolves us from studying it from the psychologist's viewpoint. The market is a communications system, a prime object, one might therefore think, for the cyberneticist. But not a bit of it. The market handles and uses its information with so little fuss that in its communication aspect there is little to study.

I cannot accept Professor Boulding's pious claim that Henry Ford invented the motor car; but there is no doubt that in the Behavioral Research Center, the heirs of his achievement, invented something of incalculable potentialities.

G. L. S. SHACKLE

University of Liverpool.

Location and Space-Economy. By W. ISARD. (New York: Technology Press of the Massachusetts Institute of Technology and John Wiley (London: Chapman & Hall), 1957. Pp. xiii + 350. 70*s*.)

To those who have struggled with Lösch, this book will be very welcome. It is clearly written and employs familiar techniques. That does not mean, alas, that Professor Isard has written an " easy " book. For instance, to anyone not acquainted with the literature, the chapter entitled " Some General Theories of Location " (and specially its appendix) will in large part be incomprehensible, as will certain extensive applications of Palander's diagrammatic techniques in the chapter entitled " Partial Graphic Synthesis and Summary." The non-specialist should probably skip these chapters on first reading, while everyone is advised to omit the first chapter, entitled " Posing the Location and Regional Problem," which is distressingly dull, full of rhetorical questions and of no consequence to what follows. The remainder, however, is very well worth reading.

Professor Isard maintains, and undoubtedly quite rightly, that the problem of location can be very adequately tackled with traditional tools. The individual unit of decision will act to maximise profits or utility. Maximisation implies that (given the possibility of continuous variations) no substitution between its decision variables can increase its advantage. Define a transport input as the movement of a unit weight over a unit distance. Then the location of, say, a producer can be determined from the condition that no substitution between transport inputs, or some transport input and anything else, should be capable of increasing his profit. All that has happened is that in the definition of profit, transport costs,

and in the formulation of the transformation function, location, are explicitly taken into account. This is not always easy to do mathematically, but the principle is clear and obvious. It is, for instance, evident that if the prices of all inputs, other than transport inputs, are independent of the location of these inputs, that the producer will locate where transport costs are minimised. This is called " transport oriented location." But if, for instance, labour is cheaper in one place than it is in another, substitution between transport and labour inputs affects costs, and the optimum might be found at the point of cheapest labour (labour oriented). Professor Isard examines all these cases with patience and skill and shows how " the substitution principle " makes light work of the sometimes extremely ponderous and rather special constructions of his predecessors. He does not treat of those cases where, because of the absence of continuous variability, the techniques of programming would be most appropriate, but we are promised an analysis of such cases in a further volume, which will also deal more extensively with the determination of transport rates and costs which are taken as given here.

Having established that the location of a unit of production can be determined by familiar methods, Professor Isard turns his attention to the general equilibrium aspects of Location Theory. Here the analysis of " market and supply area " is an important first step. Given the location of two producers of an identical good, what their market area will be can be easily determined given their cost function and transport costs. The reverse problem: given the market area (in the simplest case a straight line with uniform customer density) where will two producers locate, a problem made familiar by Hottelling and Chamberlin and others, is more difficult and admits of a number of answers. Professor Isard's guidance in all this is firm and sure. One puzzle remains. It is easily shown that given a uniform distribution of resources and people and free entry, that the only possible market areas are either triangles, squares or regular hexagons. It is also not excessively difficult to show that only hexagonal markets area lead to a " Pareto optimum." What is not so clear is how competition leads to the establishment of such areas. Lösch is not very clear on this, and Professor Isard (in the mathematical chapter) only shows that squares and triangles do not minimise society's transport costs. This is quite an interesting problem, since, as Lösch has shown, distance and transport costs inevitably imply that a negatively inclined demand curve faces individual producers, and it may well be, although I have no proof, that perfect competition as usually understood would never lead to an " efficient " net of market areas. Perhaps Professor Isard will return to this in his future work. His criticisms, by the way, of Lösch are all just and interesting.

We are next led to a discussion of forces making for agglomeration (external economies and the like) and to a theory of agricultural location. The latter is a pretty exercise in marginal analysis, much indebted to Dunn and Hoover. We are then shown that transport costs are not without relevance to the doctrine of comparative advantages and thus to International Trade Theory. The book finishes with a mathematical treatment (a little too elliptical) of the problems discussed and a geometrical chapter, which, as already mentioned, will be tough going for anyone who does not know this field pretty well already.

As Professor Isard (perhaps just a shade too frequently) remarks, the space dimension is much ignored in Anglo-Saxon literature, and there is little doubt that his book has much to teach us. In particular, it is a great relief to find that so much from our cosy little tool-kit will do quite nicely in this field. This pleasant fact may perhaps lead the reader to underestimate Professor Isard's contribution. A brief glance at the German literature or Professor Isard's summary of the theories of his predecessors, however, should quickly convince him that he has been lucky to find a guide who speaks his own language with such competence.

F. H. HAHN

University of Birmingham.

International Economics (Fourth Edition). By R. F. HARROD. (London: Nisbet and Cambridge University Press, 1957. Pp. xiv + 186. 8*s.* 6*d.*)

MR. HARROD has made some substantial changes in preparing the fourth edition of his justly famous text-book on international economics. The general framework of the book remains the same. The author first explains, on the basis of a classical comparative cost analysis, how international trade can enable gains to be made by the concentration of output in each country on the production of the products in which they have relative advantages. He then links up the comparative-cost theory with an analysis of the factors which determine the absolute level of money prices and costs in the trading countries. This leads to a description of the foreign-exchange markets and of the items in the balance of payments. Then the book is completed with a discussion of the " macro-economic " problems, that is to say, with the whole complex of interactions between wage-rates, exchange rates, levels of output and employment, and the balance of payments.

This progression from the " classical " to the " Keynesian " problems will commend itself to many teachers; and the new edition of Mr. Harrod's book provides one of the very few first-rate introductions to this last group of problems, to the solution of which he has in the past himself made important original contributions. His description of the possible conflict between policies for domestic equilibrium (for the preservation of full employment and the avoidance of inflation) and policies for external equilibrium (for a balance between international payments and receipts) is based upon an analysis of four possible situations in which a country may find itself: inflation or deflation at home with a deficit or surplus on the

balance of payments. From the distinctions which must be drawn between these four cases in the choice of policies the student can learn the basic elements of all the issues involved.

In reviewing the first edition of this book in this JOURNAL in 1934 Mr. A. W. Flux wrote: " Into a couple of hundred octavo pages [Mr. Harrod] crowds an astonishing amount of instruction in economic principles and of discussion regarding their application to practical problems." On reading the fourth and slightly shorter edition, this exactly expresses the feelings of the present reviewer—who, incidentally, has just completed a work covering the same ground in over 1,200 pages, of which Mr. Harrod, not unnaturally, wrote in this JOURNAL in June 1957 that " for the sophisticated reader it is undoubtedly laborious." But is it possible that there is somewhere a happy mean? There are a number of important topics (in particular, of commercial policy) which Mr. Harrod hardly, if at all, touches. What determines the height of the " optimum " tariff? Does the Most-Favoured-Nation clause stand in the way of tariff bargaining? What effect do tariffs have on the domestic distribution of income? Is there a special argument (such as the infant-industry argument) for the protection of industry in unindustrialised underdeveloped countries? Have subsidies to home production any advantages over tariffs or import restrictions for such purposes? Is a customs union a good thing (because it creates trade among the members) or a bad thing (because it diverts trade from outsiders)? Are there special circumstances in which it is desirable to use import restrictions on balance-of-payments grounds and, if so, should they be non-discriminatory? In view of Mr. Harrod's genius for succinct and lucid exposition of basic principles, the present reviewer greatly hopes that the fifth edition will run to 250 pages in order to include a fuller discussion of commercial policy.

J. E. MEADE

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Cambridge.

Industry and Technical Progress. By C. F. CARTER and B. R. WILLIAMS. (London: Oxford University Press, 1957. Pp. 244. 25*s.*)

THE task of writing this book has been deputed to Professors Carter and Williams by the Science and Industry Committee, set up by the joint sponsors of the research project, the British Association, the Royal Society of Arts and the Nuffield Foundation. The committee has itself taken an active part in the research, the aim of which is to identify the hindrances to the speedy application of science in British industry. One of the two full-time research units was housed in Belfast under Professor Carter and was responsible for all inquiries not involving visits to firms. The other unit, under Professor Williams, was housed at Keele and carried out case studies of over 250 firms. About 150 of these were " specific innovation "

studies; the remaining firms were visited in the course of " industry " studies. Four of these—those on pottery, cutlery, jute and paper—are summarised in an appendix. The authors are at pains to point out that this is only a first report, whose aim is to summarise their main conclusions.

The book deals first (Chapters 3–8) with the several stages in the application of knowledge, from basic research and the dissemination of its results to the decision to undertake full-scale production. With the brilliant exception of the short Chapter 4, which analyses the problem of communicating the results of basic research to those who can apply them in industry, this part of the book is somewhat lifeless. Too much of the discussion is taken up with the listing of relevant factors, mainly on the basis of common sense. Especially in Chapters 5, 6 and 7, on the readiness to use research and the results of research, there has been too little attempt to illustrate the points made by reference to the case studies, though this is not true of Chapter 8 on the decision to commit resources to full-scale production.

The second part of the book deals with the question whether Britain possesses the conditions necessary for the rapid adoption of new ideas—whether the supply of trained men or of money is adequate; whether the degree of competition in British industry encourages or hampers scientific advance. The discussion here is much better. Greater use is made of the case material, and there is less theorising and also less repetition. Few will quarrel with the conclusion that the degree of competition or monopoly in industry has had little influence on the application of science, and that this has not been markedly held back by a shortage of finance since the War. Nor would many deny the view that high tax rates have had little effect on the application of science, with the important exception that death duties often make it difficult for small firms to finance development from within. Indeed, the cynical may suggest that such obvious truths do not need proving in so great cost in time and money. The answer to this, of course, is that in economics it is often essential to give explicit proof to what, to many, seems merely the obvious. As the authors make clear (p. 7), many business-men who regard themselves as well informed (even, it seems, members of the Science and Industry Committee) sincerely believe that the " crushing weight of taxation," the " enervating influence of full employment " and the " excess of small firms " are the main obstacles to industrial advance. This authoritative analysis of such exaggerated claims —all too often the parrot cries of vested interest—can do nothing but good.

What does emerge from the report is that many of our failures in the use of science in industry are the direct result of inadequate training. In an outstandingly clear and able discussion supplemented by statistical evidence from the case studies (Chapter 9), the authors analyse the now familiar problem of how to obtain more qualified scientists. But there is a serious omission here in their failure to discuss methods of improving the quality of *management*, particularly since they conclude that, in their list of

the characteristics of the progressive firm, those " which relate to the quality of management . . . may be the most fundamental " (p. 188).

This is one of the crucial issues. It is surely wrong to argue as though good management is a gift of nature and that training is of no avail, even though at times the authors come near to implying just this. Training *does* help. But it is equally clear that training for management cannot be of the highest quality unless our universities are prepared to take a bigger share in it, as they already do in training for the law and for medicine. One can only hope that if Professors Carter and Williams agree that their report leads to this conclusion they will elaborate it in one of their further reports.

This is an exhaustive and authoritative study of one of the central problems of the British economy to-day, and it deserves a wide audience. Two minor criticisms seem worth making. First, while one cannot necessarily hold authors responsible for the dust-cover " blurb," this one contains the claim that the authors " cast doubts on a number of accepted points of economic theory." One wonders what these points are, since no obvious reference is made to them in the text. At a time when far too many economists are ready to attack it unjustifiably, such an imputation against " economic theory " needs substantiating in detail. The other point is this. On three occasions the authors deny that science and technology can be regarded as an " optional extra "; on another that they are an " optional gadget." One appreciates the authors' justifiable pride in such a telling phrase, but to use it four times in a mere 192 pages is surely overdoing it.

D. C. HAGUE

University of Sheffield.

British and American Manufacturing Productivity. By M. FRANKEL. (Urbana, Illinois: Bureau of Economic and Business Research, University of Illinois, 1957. Pp. 130. $1.50.)

WITH the voluminous literature which has appeared in the years since the War on various aspects of Anglo-American productivity, one is apt to forget that the subject is by no means new: well before 1939, various academic economists, notably Taussig and Flux, were trying to explain why output per head in the United States manufacturing industry was more than twice as great as that of the United Kingdom. At the same time it might be argued that the institution of recent inquiries has been dictated more by a sense of practical urgency than that of academic interest. Thus studies ranging from inter-plant to inter-industry in context have been initiated not only to assess the extent of the disparity between United States and United Kingdom manufacturing productivity but also to establish in what respects the United Kingdom can profitably assimilate American technical and managerial practices. Mr. Frankel's study is a contribution of the first kind, is consolidatory and chiefly descriptive in character. His approach is to examine a number of the main variables inflencing productivity and to correlate these with the differences in output per man year in individual industries. He is not concerned with explaining the causes of efficiency as such nor with assessing the extent to which the differences in Anglo-American productivity may be avoided; thus at the end of the book one is no wiser as to how Britain may reduce her productivity gap than at the beginning.

In Mr. Frankel's first chapters we are given a current assessment of Anglo-American productivity differences in thirty-four separate United Kingdom and United States manufacturing industries, the products of which are reasonably homogeneous. Using data derived from the United States Census of Manufactures for 1947 and the United Kingdom Census of Production for 1948, he derives a crude output per man year ratio of United States to United Kingdom productivity for those years of 2·44. This figure would appear to accord well with Rostas' earlier estimate of 2·2 for 1935–39, particularly when one recalls that during the interim period the average rate of productivity growth was 1·5% in the United States and 0·7% in the United Kingdom. In his examination of the causes of these differences Mr. Frankel adopts a two-fold approach: firstly, the *cross-sectional*, which " seeks to identify the chief factors responsible for observed productivity differences at a particular time and to evaluate their relative importance " (p. 11), and secondly, the *developmental*, the purpose of which is to assess the process of economic change as it affects productivity levels.

Concerning the former, four main variables—viz., resource conditions, plant and equipment differences, plant size and market size—are selected as important productivity determinants and a chapter devoted to an examination of each. In his choice, Mr. Frankel appears to have been guided by two criteria—first, the ability to reduce the variables to statistical terms, secondly, the relative importance of such variables as likely causes of Anglo-American productivity differences. There is, of course, something attractive about an approach which attempts to isolate and measure the significance of individual variables in the productivity function, but it is faced with two inherent difficulties neither of which Mr. Frankel completely surmounts, though he is obviously aware of their existence. One is the interdependence of the variables themselves; for example, plant size may influence productivity but is itself a function of market characteristics; the extent to which energy is used in industry reflects the resource endowments of the country and so on. The other is to establish which are the determinant elements in any causal relationship; for example, is productivity a function of the size of the market or is the converse true?

But perhaps a more serious weakness of Mr. Frankel's discussion—partly excusable by his first reason for selectivity, but not, I suspect, by his second—is the scant treatment he affords to management as a factor influencing productivity differences on the supply side. One rather feels

that whatever the relationship between the physical factors, it is important to probe behind these and take into account human considerations. It is true that the author does briefly refer to such questions in his final chapter, but his earlier analysis seems to be the poorer for an absence of their full discussion. As regards the variables which are analysed (three reflecting differences in the conditions of supply and one the conditions of demand), two are shown to have a definite—albeit a restricted—influence on productivity, whilst the significance of the other two is indeterminate. The market-size factor seems on first sight to be the most important single variable, but as the subsequent analysis is phrased in terms of the output of the industry and not that of the individual firm or plant, its practical significance is strictly limited.

In his concluding observations, which relate to economic expansion and productivity growth, Mr. Frankel attempts to project the future possible trends in United States and United Kingdom productivity. This provides an interesting theoretical exercise, as well as making quite clear, firstly, that the genesis of Anglo-American productivity differences dates back a very long way, and secondly, that save for some very unusual circumstances it is extremely unlikely that these differences in productivity will ever be reduced. Indeed, such evidence as is available would support the view that it will accumulate in favour of the United States with the possible United States/United Kingdom ratio in the year 2000 ranging from 3·04 to 3·75 according to assumed growth rates per annum. If there is a limiting factor likely to restrict the rate of United States productivity growth, it would seem to be that country's difficulty in maintaining an adequate rate of growth of raw-material imports.

The chief merits of this book lie in the factual presentation of the productivity statistics and a reasoned analytical account of the relative significance of certain variables. But its limited objective and selective coverage need to be constantly borne in mind. In fact, one is inclined to feel that the main value of Mr. Frankel's analysis is negative in character in that we do not know a great deal more than when we started except that we can better understand the reasons for our lack of knowledge. The implications for policy might also have been broached with profit. But the book reads well, and the author has a pleasant style and is lucid in expression: altogether its contents provide a very useful addition to the material available in this very complex subject.

J. H. DUNNING

Southampton.

The Conditions of Economic Progress. By COLIN CLARK. 3rd Edition. (London: Macmillan, 1957. Pp. xv + 720. 70*s*.)

THE first edition of this book was published in 1940 and ran to just over 500 pages. The second edition (completely rewritten and longer by nearly

100 pages) appeared in 1951. This third edition (largely rewritten) is more than 40% larger than the first edition in pages, but probably roughly twice its size in words and figures, because there are many larger tables and many pages of small-type notes.

Essentially it is still the same book. Erwin Rothbarth's review in the April 1941 edition of this JOURNAL would still be difficult to improve upon, although it would require a few minor changes of detail and a major change of emphasis to be equally applicable to the third edition. The minor changes would give the third edition an advantage over the first. This is because Mr. Clark has been able to take account of new research results. But the shift of emphasis required by a 1957 view-point is such that it cannot fail to be less favourable than the 1941 review, however friendly the reviewer.

In 1940 Mr. Clark was an innovator of great distinction, using his immense resources of energy and imagination in a neglected but important field. If the empirical study of economic growth is now the daily concern of an army of research workers he can claim no small part of the credit. But in this new context his pioneer work no longer appears as admirable and as stimulating. It is questionable whether his crude pioneering methods are justified at all to-day. The reckless statistical courage that was entirely appropriate to the first glorious sally hardly befits the massed advance on a broad front which is now in progress.

The fact is that Mr. Clark has not succeeded in digesting the enormous quantities of statistical material now available on the economic growth of nations. This is not surprising. It is amazing that he has been able even to take account of so much of it. But it is disappointing that anyone with as much accumulated knowledge and breadth of experience should have failed to limit himself to some part of the field in which he could make an effective analytical contribution.

What we have here, then, is the framework of the first edition expanded by the addition of the miscellaneous ideas, notes and tables acquired in more than fifteen years of keeping the original results up to date. It is a scrapbook of empirical research on economic growth, and like all diligently and intelligently compiled scrapbooks, it is a mine of interesting and suggestive items. Most active students in the field will be impelled to put it on their shelves in place of the second edition. But in spite of the addition of a list of tables, an index of people and a bibliography (which flouts all bibliographical conventions but is better than none at all), they will be maddened in this as in all previous editions by the unsystematic organisation and presentation of the material.

PHYLLIS DEANE

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Cambridge.

The Cotton Industry in Britain. By R. ROBSON. (London: Macmillan, 1957. Pp. xx + 364. 60*s*.)

ALTHOUGH the cotton industry over the past hundred years (and before) must be one of the best-documented industries, there has been no reasonably comprehensive account of its organisation and problems since Chapman's *Lancashire Cotton Industry* published in 1904. At that time, cotton was our biggest export trade, and the industry still had a further ten years of expansion to come. Mr. Robson now presents us with an account of an industry which has been declining for something like forty years, and with an uncertain future. After a brief account of the processes of the industry and of its historical development (in which the decline is shown to be the almost inevitable consequence of the growth of industrialisation in the rest of the world: in the years 1910–13 Britain produced 20% of the world's output of cotton goods and exported 70% of world exports, the proportions now being 5 and 12% respectively) there are chapters on the following matters: location; specialisation of firms by products and processes; vertical integration; the size of factories and firms and their growth; prices, production and investment policy; collective regulation and government policy; and the future of the industry. The main omissions are the raw-cotton market (though this receives a little attention in the chapter on collective regulation) and the organisation of labour (touched on incidentally in other contexts, such as re-equipment and double-shift working).

Mr. Robson is Director of Statistics to the Cotton Board, and his immense knowledge of the subject is everywhere apparent. Apart from the chapter on collective regulation, the treatment is primarily statistical. There are, in fact, some 140 statistical tables in the text, occupying in total some sixty pages out of 300; there are also twenty-nine pages of statistics in an appendix (and ten other appendices on particular points). In consequence, it is not a very easy book to read, especially as the tables are not numbered, are scattered through the text in a way in which it is not always obvious where they fit in, and on one occasion at least the text refers to the "following" table when it seems to mean the "preceding." There are occasional numerical statements in the text which do not accord with the figures in the tables, and now and again Mr. Robson appears to be using a different, perhaps more comprehensive, table for his exposition than that which is in fact reproduced. Occasionally, too, the style is rather obscure, and Mr. Robson fails adequately to explain matters which are obvious to him but not to the uninitiated.

The treatment of some matters is perhaps over-elaborate. This is particularly so in the chapter on Location, in which there are sixteen full pages of tables, as well as some smaller tables, in thirty-three pages of text. One wonders, for example, if it was really necessary to give detailed figures of employment for each of the main sections of the industry, or of the output of yarn by various counts, for every one of the cotton towns. For one reader at least, some interesting comments on the location of the industry tend to get lost in a mass of detail which is forgotten as soon as it is read. This is only an outstanding case in which it seems that the treatment has been influenced by the availability of statistical data rather than by the importance of the problem, and in which the statistician's enthusiasm could with advantage have been curbed (and possibly the price of the book made more moderate).

It is not, in fact, easy to get a clear general picture of the organisation of the industry. This is the more unfortunate in that Mr. Robson has many pertinent and illuminating things to say on specific topics. I should single out for special mention the discussion on the extent and rationale of specialisation; the analysis of the nature and advantages and disadvantages of vertical integration; the discussion of costs under different productive methods and the related problems of investment policy; the competitive position of cotton against man-made fibres; and the reflections on the future of the industry. Other readers will no doubt find other matters of equal interest.

The book must, however, be regarded as more of a work of reference for the reader who already knows something about the industry than a general survey for the student or general reader.

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American Industry and the European Immigrant, 1860–1885. By CHARLOTTE ERICKSON. (Cambridge, Mass.: Harvard University Press (London: Oxford University Press), 1957. Pp. x + 269. 38*s*.)

THE study of European migration to the United States has gone through at least three stages. The first generation, pre-occupied by the problems of assimilation, were concerned with the adjustment of the immigrant within the United States; the second, nostalgic and ethnically self-conscious, followed the fortunes and cultural lags of particular ethnic groups; only recently has a third generation at last, with a degree of detachment, come to examine the character and causes of migration from "migrant yielding country" to destination. The pioneer work of Hansen has now been supplemented by statistical studies such as that by Brinley Thomas and by monographs of a more qualitative kind such as that of R. T. Berthoff on British industrial immigrants and now that of Charlotte Erickson on the recruitment of European immigrants for American industry.

Miss Erickson's chief concerns are the methods whereby European labour was recruited during the first intense period of industrialisation from 1860 to 1885, and the adjustment of the labour force to the influx. Drawing upon a wealth of primary immigrant sources, government reports and

newspapers, American, British and Scandinavian, she has brought light into a topic which abounds in murky and obscure places. Her most important discovery is that the contract labour law of 1864 did not result in bringing large numbers of European immigrants to work in American industry under contract, but that misconceptions about the importance of contract labour clouded the thinking of the American Unions in dealing with the immigrant problem.

It seems clear that after the contract labour law was passed in 1864 the efforts of the Commissioners of Immigration to regulate, and the American Emigrant Company to recruit, immigrants quickly broke down. Instead, industrial firms recruited some skilled workers privately; but even these firms made little use of the labour contract, relying instead on connections in the trade and through previous immigrants. In any case, American employers quickly wearied of the obstreperous character of the British skilled workman, especially in cotton textiles, and yearned to replace him with an unskilled, but more docile immigrant, tending a machine.

Unskilled labour was recruited in Europe, not under contract and not even by industrial concerns, but by steamships and railway companies looking for fares and by banks anxious to handle immigrant remittances and funds. This left a great void at the receiving end which was filled by private labour exchanges in the big cities. These recruited labour for profit on behalf of industrial firms. At this stage, if at all, were labour contracts entered into; and the employers' use of these labour agencies to obtain strike-breakers instilled a deepening resentment against immigrants. Strike-breaking was common among unskilled trades such as mining and railways; but the trade which, through its Local of the Knights of Labor, brought immigrant competition into politics and eventually forced a repeal of the contract labour law, was the window-glass workers, a tiny skilled trade threatened by the import of glass blowers from Belgium and Sunderland. Neither the Foran Act of 1885, which prohibited contract labour, nor the establishment of public labour exchanges, put an end to the conditions against which labour protested; and, in its frustration, the American Federation of Labor turned from practical measures to that general advocacy, on racial grounds, of wholesale restriction by quota, which was to become official policy. Such is the important, if somewhat intricate, story which Miss Erickson traces with skill and knowledge.

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Recruitment to Skilled Trades. By GERTRUDE WILLIAMS. (London: Routledge & Kegan Paul, 1957. Pp. vii + 216. 23*s*.)

THIS book is based on an inquiry financed under the Conditional Aid Scheme for the use of Counterpart Funds. The object of the inquiry was to find the answer to a number of questions relating to recruitment for skilled trades and, in particular, to investigate the reasons for the continuing shortage of skilled workers.

The main source of recruiting and training workers for many skilled trades remains in this country, as it has been over the centuries, the institution of apprenticeship. Lady Williams, in this book, traces the historical development of that institution and describes its present nature. She examines its adequacy in the light of modern industrial and educational developments and finds it wasteful in its methods and inadequate to serve its purpose. She compares it with the arrangements in other industrial countries, and she makes various tentative suggestions as worthy of examination for its reform. She warns us that many of her inquiries were on too limited a scale for their results to have statistical accuracy, and she disclaims the practical experience of industry to enable her to make positive proposals. Nevertheless, she has made out a convincing case well worthy of serious examination by industrial interests and educational authorities. It appears that such examination is likely as a result of a report approved, since this book was published, by the Minister of Labour's National Joint Advisory Council and subsequently published.

Important conclusions deriving from the inquiry are that shortage of skilled workers in the industries examined is not, except in shipbuilding and printing, primarily the result of trade-union limitation of the number of apprentices, or of lack of boys willing to enter on apprenticeship, but rather of unwillingness of many firms—usually, but not always, the smaller firms —to undertake the burden of taking apprentices, and the lack of adequate training facilities offered by most of the firms which do take them. This leads the author to examine various possibilities for linking the responsibility for training less with the individual firm and more with the educational system and with the industry.

With regard to the length of training and the age at which it takes place, Lady Williams suggests reconsideration of the rigid requirements of an apprenticeship commencing at the age of fifteen or sixteen and lasting five or six years, which seem to have no basis but a long history and no relationship to the nature or degree of skill to be acquired. Relaxation of such requirements and revised methods of training would reduce the time occupied in training and widen the entry to include adult apprentices and youths who, before entering on apprenticeship, have had the advantage of grammar-school education.

So far as formal teaching of their craft is concerned, this is almost

entirely confined to such of the apprentices as attend, either voluntarily or as a condition of their apprenticeship, either during day release from their employment or after working hours, the courses provided at technical colleges. In this connection Lady Williams produces some rather startling figures as the result of her search of the registers of a number of technical colleges. From these it would appear that the big majority of the apprentices fail, even after repeated attempts, to pass even the Intermediate Examination, which is only a stepping-stone on the way to the Final Examination supposed to represent the level required of the skilled craftsman. This leads the author to inquire whether the fault lies in the quality of the instruction at technical colleges, the capacity of the students or the standard of the examinations. She finds a partial answer in each. Technical colleges, like other educational institutions, have their staffing problems, and some peculiarly of their own. The present general requirement that apprenticeship should start at fifteen or sixteen deprives industry, so far as craftsmen are concerned, of many of the increasing number of intelligent boys who now have the opportunity of grammar-school education. It might also have been added that the increasing demand for scientists, technologists and technicians, and the increasing opportunities to train as such, reduce the sources from which the intelligent skilled craftsmen can be drawn. The opinion of industry, however, to which Lady Williams draws attention, that many of those who fail dismally in the technical college examination make adequate and satisfactory craftsmen does suggest that these examinations, as a test of competency for a skilled craft, are of a totally wrong standard.

This, in turn, leads on to the further suggestion that a reasonable test of competence, rather than a rigid length of apprenticeship, might well be the certificate of craftsmanship and would provide a system more suited to the diverse degrees and types of skill required in modern industry.

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The Wages Councils System in Great Britain. By C. W. GUILLEBAUD. An Economic Monograph. (London: James Nisbet, 1958. Pp. 31. 2*s.* 6*d.*)

THIS small monograph is important for two reasons. First, because its author is one of our most experienced arbitrators. Second, because legal wage-fixing machinery, despite the immense growth of voluntary collective bargaining, now covers a remarkably large proportion of British wage-earners, estimated by Mr. Guillebaud at about one-fifth, some four million workers being under statutory wage-orders. But of our twenty-odd million employed people, nearly a third are salaried, so the proportion of wage-earners proper is probably higher.

It does not pretend to be the complete survey that the remarkable later development of the old Trade Board now perhaps calls for. It includes a useful and terse account of the history and legal position of the modern Wages Councils and their allied Wage-Boards, as well as a description of the procedure for their establishment, of their composition, powers and functions, and of the method by which their proposals are confirmed and enforced. But their nature does not fully appear from a formal description. Structurally, the Wages Councils appear to be a rather uncertain mixture of state wage-fixing, independent arbitration and collective bargaining. The greatest value of Mr. Guillebaud's account is thus the picture it gives of the role of the " independent members "—a picture that draws realism from his own distinguished service in that capacity. The device of the independent member, in fact, gives the Wages Council system a flexibility which is hidden by its surrounding legal formality. In practice, the independent members may play the part of arbitrators, mediators or mere ratifiers of agreements already made, as the circumstances of their particular Council dictate. By contrast, the power of the responsible Minister, which seems formidable in law, has been little exercised, and that only in minor matters.

Mr. Guillebaud's final assessment, however, is that " . . . the Wages Councils system has achieved the general purpose for which it was established." There is no doubt that it has largely eliminated " sweating." And that it has had the incidental effects of compelling less-efficient employers to improve their use of labour, and of reducing extreme inequalities in wages, can also be well argued—though Mr. Guillebaud does remark on the tendency of Wages Council rates to fall behind others in more recent years (a tendency which also suggests the indirect, if not the direct, effect of government policy on legal wage-decisions to be greater than he implies). But the motive for extending the legal wage-system so far *beyond* the old " sweated trades " was primarily to provide a form *transitional* to independent collective bargaining. And one can hardly judge this purpose fulfilled when—as has in fact occurred—the system has become so solid, extensive and apparently permanent.

Mr. Guillebaud states the orthodox union criticism of the system—that it deters trade-union recruitment and handicaps union claims for higher wages. But this criticism contrasts oddly with the unions' obvious reluctance to see the system's scope diminished—indeed, with their not infrequent pressure for extensions of it. One suspects, in fact, that the unions' criticism conceals (and excuses) their leaders' finding that it is easier to rely on legal support than to establish their bargaining position by organising campaigns. To a great degree, the Wages Councils system now provides an instrument for larger employers and minority unions to impose their own terms on the unorganised and unrepresented.

There may be a case, in some industries, for collective agreements to be legally enforced. But that does not require such elaborate indirect and

expensive machinery as the Wages Councils system: quite simple procedures, for instance, are already provided by the Industrial Disputes Order and the Cotton Manufacturing Act. Or if, to permit smaller employers to survive, a dual wage-rate system is desirable, a simple National Minimum Wage could be arranged to supplement collective agreements. But if unions (and employers' federations) insist in practice on maintaining the present legal-wage machine in all its elaboration, then there is nothing to justify the parallel maintenance of government non-intervention in the machine's wage policy. Official neutrality was originally designed to encourage independence; it arose from the supposition that the legal wage-boards were transitional. But if the State is to bear the permanent expense of maintaining wages in such detail and over so wide a field it cannot reasonably be argued that it should have no say in what those wages should be.

H. A. TURNER

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The Measurement and Behaviour of Unemployment. 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: Oxford University Press), 1957. Pp. 605. 60*s*.)

THE American recession of 1949 set off a controversy about the actual degree of unemployment in the United States that was stimulated when the 1940 and 1950 census returns made available new comparisons with then existing labour force data. This collection of papers is a major product of that discussion, and much of it will have an enduring value.

In Britain little recent attention has been paid to the measurement of employment and unemployment. With an unemployed registration usually below 2% of " employees," full employment has been assumed virtually continuous. Such things as the 1951 Census of Population's return of over twice the number " out-of-work " reported by the Ministry of Labour, or certain occasional but curious discrepancies in our labour-force statistics (and between them and other indices of activity) have passed without much comment—though a certain distrust of the unemployment index has become evident in some commentators' tendency to rely more upon such other data as returns of short-time working or of vacancies.

One reason for a re-examination of this question is the possibility of a new recession. And a study of our labour force data's recent behaviour suggests that British unemployment indices may very seriously under-state a decline of activity, especially at just that early stage of a stiff recession when counter-action should be launched if it is to be effective. Another reason, however, is the attempt implied in much recent discussion (and

policy) to re-define " full employment." And if new definitions are to be given, we had better know whether they have a measurable meaning.

Most of the papers in this Universities–National Bureau collection are, of course, much concerned with its national background. An apparently higher level of unemployment makes the latter's American character rather different from that recently experienced in the United Kingdom, and our sources and categories of unemployment information are not at all alike. Otherwise these papers leave two worthwhile impressions. First, of how fast the accuracy of a national statistic accepted by foreigners as authoritative (and American unemployment indices are technically rather superior to our own) disappears under close domestic scrutiny. And second, of how much short-term comparisons between countries must reflect their differing statistical methods rather than their respective economic situations.

Two papers, however, will be of very general value. Mr. Albert Rees' introductory to the Report's first section on the meaning and measurement of full employment is an outstanding critique of the standards that have been suggested—Beveridge's " verbal " and " numerical " definitions, price stability and so on, but his conclusion that no single rule (or technique of measurement) is adequate to the problem's complexities will not satisfy popular demand for a ready test both of paid work's availability and of the effectiveness of government policy. Between that demand, and the expert's desire for completeness and detail in measurement and discretion in judgement, some compromise must be found if public policy and statistics are to inspire any wider confidence.

In the collection's second part—on the behaviour of unemployment—there is a most impressive and useful examination of unemployment trends in nine Western Countries (which includes the United Kingdom, but excludes the United States) by Messrs. Walter Galenson and Arnold Zellner. Their analysis extends back to around this century's opening, and since several of the earlier series come from similar sources—trade-union returns particularly—they provide a very reasonable degree of comparability. Moreover, they do not seem particularly out of line with later series, derived from more official sources.

The results present a broad picture of the inter-war period as a startling but transitory relapse from normal high employment; but the paper also includes much valuable discussion and comparison of national sources and situations.

It is interesting that this collection should have so little to say on what, for the United Kingdom and quite a number of other countries, have become the most important phenomena of recent employment fluctuations. Both Mr. R. C. Wilcox (under the convenient title of " the secondary labour force ") and Miss Gertrude Bancroft remark on the problems created by the labour market's enlarged " fringe " of workers, like married women, pensioners and so on. But the effect does not seem as significant to them as

it would be to us. The problem of under-employment (which occupied the I.L.O.'s recent Ninth Conference of Labour Statisticians) is treated at length only in relation to rural areas. Here, the discussion of Mr. L. J. Ducoff and Miss Margaret Hagood may have a bearing on the labour issue in under-developed countries. But the whole question of " work-sharing," which has become in several industrial nations the major reaction to economic recession, is barely touched on. This form of unemployment is particularly responsible for the British index's current inadequacy. And only some variant of what Professor Rees calls the " maximum employment " concept seems capable of dealing with it.

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The Labour Movement in the Sudan, 1946–1955. By SAAD ED DIN FAWZI. (London: Oxford University Press for the Royal Institute of International Affairs, 1957. Pp. xiv + 175. 25*s*.)

IN newly developing countries such as the Sudan a major problem is the extent to which the economic and social experience, legislation and practices of advanced countries can be usefully applied. Among the issues raised in Dr. Fawzi's book are whether, except in a few industries, economic conditions in the Sudan are favourable for the establishment of a strong, responsible trade-union movement, and how in such conditions industrial relations should be regulated. Predominantly the population is engaged in peasant subsistence farming. Hired labour in agriculture, including cotton cultivation in the Gezira, is mainly seasonal. Only about 8% of the population live in towns. The Government is the biggest employer of wage-earning labour, and in private industry employers with considerable numbers of workers tend to follow the Government's lead in wages and working conditions. Also, until self-government was attained in January 1954 the Government was alien.

Dr. Fawzi's survey, published under the auspices of the Royal Institute of International Affairs as the first of a series of monographs on modern society in the Middle East, reviews objectively the political activities of the Sudan trade unions during the struggle for independence, as well as their industrial policies. In 1946 the Government proposed the formation of works councils or joint consultative advisory committees in government departments and private industry as " the basis on which trade unions could subsequently be set up on sound prepared lines " (p. 32). About the same time a Workers' Affairs Association was established, and it demanded recognition and the development of trade unionism. The Association, which was formed by artisans in the Mechanical Department of the Sudan Railways and became the spearhead of the trade-union movement, was hostile to the works council proposal, regarding it as a device by management to obstruct the growth of trade unions. The Association

became increasingly aggressive and anti-imperialist, and in 1947 succeeded in winning recognition by strike action. Impatient of delays, it did not recognise sufficiently the time involved in making governmental decisions on policy and in preparing legislation. On its side the Government did not take enough account of the inexperience of the workers' leaders, and of the urgency to them of remedies for low wages and other genuine grievances.

After the enactment of trade-union legislation in 1949 the Workers' Affairs Association was changed into the Sudan Railway Workers' Union, and unions were rapidly formed in other government departments and in private industry. The trade-union movement is still in its formative stage, with many signs of " mushroom " growth. Dr. Fawzi gives a list of about 130 unions, their total membership being only about 100,000, or little more than 1% of the population. Paramount is the Sudan Railway Workers' Union with about 25,000 members. Among the others a few have 1,000 to 1,500 members each, but the average membership is only about 600. Many are unions of workers in government departments, while in private industry they are often organisations of workers employed by individual companies. Trade unionism is insignificant outside the urban centres, and plays little part in Southern Sudan. Almost half of the unions are only spasmodically active.

Most of the unions became affiliated with the Sudan Workers' Trade Union Federation, which was formed in 1950 under the leadership of the railway workers. It started in a militant mood, brought the trade unions into the nationalist movement, claimed that the imperialist government was the main obstacle to the workers' efforts to improve their conditions, and the Federation organised a series of general strikes mainly to secure wage increases. It even opposed the Anglo-Egyptian Agreement of February 1953 by which the Sudan could achieve early self-determination. It showed communist sympathies and hostility to the International Confederation of Free Trade Unions, which its President described as an imperialist agency for weakening the will to struggle of the workers generally and colonial workers in particular. It remained militant after Sudan independence, its prestige declined from 1953 largely because its political policies were not supported by many workers, and it was greatly weakened when in 1956 the Sudan Railway Workers' Union and several other unions of workers in government service withdrew from it.

The coming of self-government has not changed the fundamentals of industrial relations. Wage standards are still limited, as everywhere, by productivity, and the Government is still the biggest employer. Many questions remain for solution. One is whether the trade unions will show increasing responsibility in collective bargaining and make less use of the strike weapon. A related question is whether compulsory arbitration should be adopted, as in India, Burma and Pakistan, for settling disputes in essential industries and government services, or whether, as the author prefers,

voluntary arbitration should be retained. Already before independence various wage anomalies had been removed, particularly the previous unduly wide differentials between clerical workers and skilled artisans and unskilled labourers. Also comprehensive legislation based in British experience was enacted to regulate trade unions, industrial relations, conciliation and arbitration. This legislation was misunderstood and opposed by the trade unions; yet after it had been in operation for several years the unions became so favourable to it that they regard it as essential for their freedoms and would strongly object to any tampering with it.

Dr. Fawzi's study is of value not only for the systematic account it gives of trade-union development in the Sudan, but also because, as Professor Phelps Brown indicates in a Foreword, the problems raised are common to many underdeveloped countries wherever there is impact of industrialisation and emergence of wage-earning labour in primitive economies.

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Cities in Flood. By PETER SELF. (London: Faber & Faber, 1957. Pp. 189. 21*s*.)

As the old depressed areas become " developed " and show (except for Northern Ireland) employment almost as full as the rest of the country, the other problem which the Barlow Commission considered pressing—urban congestion—comes to the fore. A book reviewing the present position of Britain's great cities is therefore very welcome. As the title and " blurb " of Mr. Self's book suggest, these cities are once again " at the flood "—striving to burst the dykes which have been dug to stop them spreading endlessly across the countryside. This theme is developed fairly systematically by Mr. Self. His first two chapters deal with the features that form the precise problem of the conurbations such as " lack of sunlight, privacy and opportunities for recreation " (p. 27) in the centre, and " nightmare " (p. 26) journeys to work from the sprawling suburbs. By thus affecting the health of workers and by the delays of traffic jams in the transport of goods, conurbations can certainly have high economic costs marked against them. The later chapters deal with policies hitherto pursued or proposed, to avoid—or at least to modify—these features. Here recent experience has often been discouraging. Attempts at redevelopment of the central areas have come up against " the very high cost of flat construction " which " is perhaps the greatest of the many mysteries of the British building trades " (p. 44). But even if the number of flats planned are actually built, not all the population can be rehoused in their original habitat. The policy next in line is therefore " overspill " of some of the central city inhabitants, and any additional population, into areas surrounding the city.

To avoid the continuous sprawl of subtopia, overspill is planned beyond

a green belt either into existing small towns or into New Towns. Mr. Self cites certain exceptions (pp. 68–74), but small town authorities have on the whole not been very keen to build the necessary houses, and attendant streets, sewage and other works on the terms offered by the large cities and the central government. The New Towns, where houses are allocated in the main only to those who are assured of a job in the town itself, have proved on the whole quite attractive to industries, and the towns already started appear likely to show a profit in the long run. But the Government's anti-inflation policy has for the present prevented more being started, and no sites have as yet been designated round Birmingham, though, as the author says (p. 25), the West Midlands was the only conurbation to grow substantially between 1931 and 1951.

Mr. Self is by no means a " long-haired " planner riding roughshod over economic considerations, and under the heading of " The Economic Equation " he asks (p. 30) how far it is economically wise or feasible to interfere with the natural growth of industry and commerce in and around the big centres of employment. If anything, he is a little too respectful to natural forces (and the entrepreneur's wisdom) in enlarging conurbations. It is true that a big conurbation can combine the economic advantages in efficiency and security of localising *several* industries. But it does not follow that all the industries actually found in a conurbation are necessary to its continued prosperity. Under the title (Chapter Six) of Jobs on the Move, Mr. Self discusses the success of the Government's development-area policy and rightly draws attention (p. 31) to the West Midland Group's list of industries (given in Chapter Eight of their *Conurbation*) which should operate equally well in places other than the Birmingham conurbation. Such self-denying lists should in fact be worked out in other conurbations and, if acted upon, might form the positive solution to the purely negative restriction of the Green Belt.

In conclusion, it should be said that Mr. Self's book will be found particularly useful in its summing up (pp. 149–64) of the principles, complications and implications involved in the legislation from 1945 to 1954, and of the clashes (p. 139) between development and decongestion policy (Merseyside and Glasgow are both congested as well as development areas) and between (p. 111) the agricultural and housing-plus-horticultural uses of land. Economists will find Mr. Self a most intelligent guide through the legal and political maze.

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Capital Formation in Residential Real Estate: Trends and Prospects. By L. GREBLER, D. M. BLANK and L. WINNICK. (Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research, 1956 (London: Oxford University Press, 1957). Pp. 519. 80*s.*)

THIS monograph is the first of a new series on long-term trends in capital formation in the United States, and it reviews the course of private residential construction there since 1889. The sources of the capital funds invested in residential construction are also examined, and in a final section the long-term prospects of the residential construction market are discussed. No study of house-building has ever been completed for so long a period in such detail before, and this contribution merits the highest praise, if only for its attempt to assemble the basic facts on residential building expenditures and on appropriate cost indices.

One of the main purposes of the book, as of others in the series yet to be published, is to discover what light past long-term trends in capital formation may shed on future prospects. The section in the present study appraising long-term prospects happens to be one of the least conclusive of the authors' contributions to this field of inquiry, but they give convincing reasons for their caution in extrapolating past trends into the future. They emphasise, for instance, that while a basic long-term relationship between increase in population and net additions to housing stock can be shown to have existed, it has been a relationship of great complexity (p. 267 and Chapter V *passim*). A potential maximum of 55 million non-farm households deducible from population analysis accommodated itself in 37 million *actual* households in 1950. Furthermore, population projections are in any case unreliable, for well-known reasons (the authors make an approving reference to Joseph S. Davis's somewhat sardonic commentaries on past population projections applied to the United States). The authors are cautious about the future role of government, in regard to credit aids or to public housing, and about the significance to be attached to the long cycles in residential construction, two of which have been shown in their descriptive work to have been associated with world wars (p. 303 and Chapter III). (There have been three such cycles with peaks in 1890, 1905–9, 1925 and 1950.) Allowing for all these uncertainties, their view is that, from about 1954 onwards, the pressure on housing is to be expected to diminish for at least ten years, during which period some types of non-residential construction may increase (p. 305), and that the federal government is likely to be somewhat liberal in its credit policies if this period of easier demand shows signs of causing a severe fluctuation (p. 306). After this period, renewed housing "need" may be expected to reassert its influence.

The limited character of these conclusions is imposed upon the authors by the character of their investigation, which, as Professor Kuznets emphasises in a Foreword, was directed to examining long-term trends rather than fluctuations and their causes. It is, perhaps, the greatest merit of this volume that it sets out those trends with such clarity. For example, the authors bring out the point that in 1929 prices the average private non-farm dwelling built in 1890 cost about $6,000, while in 1953 the average was only about $4,000 (for the period 1946–53 an average of $3,800). They examine possible changes in the physical characteristics, equipment, facilities and size of dwelling units which may help to account for this fall, and they pursue this problem into a discussion, to which a whole chapter is devoted, of a possible weakening in consumers' preference for dwellings as against other goods. "The doubling of real family income that has occurred since about 1890 suggests, therefore, that the real value of a new dwelling unit should have increased, rather than decreased, by 40 per cent" (p. 126). Relative prices have undoubtedly moved against residential expenditure. Borrowing an estimated price elasticity of demand from Duesenberry and Kistin, the authors allow that relative price movements may account for about one-tenth of the change in expenditure per unit, but argue that there is still a residual shift to be accounted for by preference changes.

These, and other fascinating topics, are touched on, rather than definitively settled, in this interesting and comprehensive monograph. The definitive contribution of the book largely consists of well-presented basic statistical tables, some of them in the lengthy appendices which occupy two-fifths of the volume. Most of these tables have been derived or adjusted from earlier published material (the cost indices from the *Engineering News-Record* series and from Colean and Newcomb's book on *Stabilizing Construction*, and the finance estimates from Raymond Goldsmith's publications, for example); nevertheless, it is of great convenience to have this information assembled and arranged for the specific purpose of studying the residential construction market. The book is bound to become a work of reference for the special facilities that it provides, including regional analyses both of residential activity and of types of finance employed, and at the same time a work of introduction to the economics of residential construction in the United States.

IAN BOWEN

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Estate Capital. By D. R. DENMAN. (London: Allen & Unwin, 1957. Pp. 218. 22*s.* 6*d.*)

THIS work is a write-up of four surveys of agricultural estates carried out by the Department of Estate Management of Cambridge University. The amount of investment in fixed equipment and land improvements is the centre of interest and the surveys obtained figures of the amount spent in recent years. For each farm on each estate requirements of further invest-

ment " were recorded item by item, as both the landowner and tenant described them. Details were obtained of external funds supporting the estates. Enquiries were made concerning the restraints that check the investment of these resources in fixed equipment and land improvement. . . . Details of mortgages, loans and other charges were noted " and other information was obtained. Furthermore, what the author calls the " character traits " of the estates were recorded. These include size, whether compact or scattered, type of farming, whether tenant or owner-occupied, whether the owner's title was recent, whether estate duty had been suffered or not, whether the owners were subject to surtax and several other factors.

The author is primarily interested in ascertaining three main groups of facts and discovering how they are associated with the various " character traits " of the estates. The first of the three relates to the extent to which estate income has sufficed to cover expenditure on improvements over a period of years. This is rather curiously described as " competence," although, as the author indicates, complete competence may reflect either a high income or low expenditure. It appears that of 133 tenanted estates, 45% were wholly incompetent to form estate capital from estate income, which presumably means that estate income was zero! The relationship between competence and various character traits is examined: it appears, for example, to be the same for scattered as for compact estates and lower for estates whose owners are subject to surtax than for those whose owners are not.

The second group of facts examined is the extent and composition of other wealth owned by estate owners. Such capital could be used to finance improvements to the estate. Figures giving the ratio of other capital to the value of estates are given by size class of estate, and the relation between this ratio and various character traits is also examined.

Thirdly, figures are presented showing the deficiency in physical terms of equipment and land improvements as compared with what the landowners deem to be desirable. There are also some figures of the cost (at current prices) of improvements undertaken over the ten years preceding the survey in comparison with the cost of meeting present wants. Unfortunately the meaning, and hence the significance, of all these figures is extremely obscure. " Deficiencies," we are told, " are matters of opinion." But even if all the respondents had the same standards, so that the figures for different estates represented a uniform opinion of " need," the author's explanation of the figures is too inadequate for their meaning to be apparent. If a farm with three barns " needs " a fourth, the percentage deficiency is 25%, while if a farm with no barn needs one the deficiency is 100%. This seems simple. But only one other explanatory example of " percentage deficiency " is given, and this shows how arbitrary the procedure is; we are told that perfection in water supply means a mains supply and that " a cottage or farmhouse with well water piped to the premises is looked upon

as 50% deficient." The author computes figures " for general percentage deficiency " by weighting deficiency percentage in items of first consequence for efficient production more heavily than those of less consequence. But there is no explanation of which items are of what consequence, and nor are the weights stated. All these inadequacies make the statement (in Table IX) that the percentage deficiency in general for estates of, *e.g.*, 100–249 acres was 7·06% utterly meaningless. One can only hope that few scarce resources were used in obtaining these figures.

Unfortunately statistical amateurishness, including totally inadequate exposition of the procedures followed, is not confined to the section just discussed but pervades the whole book. We are solemnly told that in " 6½% of the opinion " (p. 118) of thirty-seven (p. 114) landowners the estate-duty concessions on agricultural property constituted an inducement to improvement. And a diagram showing the relative frequency of various factors restraining rent increases includes one factor, " Rates Relief," which was apparently operative only in Scotland, yet the diagram relates to Britain, and the proportion of Scottish estates is not stated!

These two examples are minor matters. A major matter is the question of whether the Main Sample of 224 estates (a quota sample derived from the 11% effective response from a field of 12,400 estates selected in some unspecified manner) provides results which reflect the population of estates as a whole. Mr. Denman does not discuss this point, and one wonders whether, at any stage during the research, he took the obvious step of consulting a statistician.

These drawbacks are not outweighed by the presence of any economic analysis. Various interesting problems are raised, such as the effects of taxation on investment in improvements and the obstacles to increases in farm rents, but they are not set out and discussed properly. There are an occasional stimulus to thought and some useful pieces of information, but the book has little to offer so far as economists are concerned.

RALPH TURVEY

London School of Economics.

The Gold Coast Cocoa Farmer. By POLLY HILL. (London: Oxford University Press, 1957. Pp. 140. 16*s*.)

IT is difficult for those who have never carried out any field-work economic research in under-developed areas to understand the innumerable special difficulties that have to be faced. Limitations on time and money are accentuated by problems of suitable accommodation in remote areas, transport over long distances and bad roads and the low educational standards of available assistants. The research worker even finds frequently that he has to abandon his original intentions of scientific random sampling, as this leads him to suspicious villages and hostile informants. More fundamental is that he finds no one who really knows much about the

constituents of the aggregates which he is hoping to determine. He then turns, like the anthropologist before him, to case studies of places and persons, where he can be introduced by some sympathetic intermediary. Though well aware of the possible biases, he hopes that he may gain a clearer idea of the problem and perhaps the order of magnitude of the quantitative data he is seeking.

Miss Hill's recent work has been exploratory, and though, as she says, the figures collected may be useful in themselves, they are intended to be more of a peg on which to hang further inquiries. *The Gold Coast Cocoa Farmer* is largely concerned with two topics—the systems of employing labour on cocoa farms in Ghana and the pledging of the farms. In this study Miss Hill obtained the assistance of the Ghana co-operative movement, which handles one-fifth of all Ghana cocoa, and restricted her inquiries to its members, who are reasonably representative of all Ghana cocoa farmers.

The two most common systems of employing labour are the *abusa* system, under which the labourer receives one-third of the crop for his work, and the *nkototuano* system, under which he receives a fixed sum for each load of 60 lb. that he harvests. Under both systems the labourer does virtually all the work on the farm. This is inevitable where one man commonly possesses several cocoa plots, sometimes many miles apart, so that he is largely an absentee landlord. We need to know very much more about the precise relationships between the owners and the labourers and the variations from area to area. It is known that black-pod disease and capsids destroy much Ghana cocoa, but it is not clear whether the owner or the labourer takes the initiative in disease control. More important still, it would seem that the effective cocoa price from the incentive point of view may be the portion received by the labourer. In the case of the *abusa* system it is only one-third of the official buying price and not the full amount. Price incentives need to be examined afresh in this context.

If little is known about systems of employing labour, still less is known about the extent or even the nature of pledging or mortgaging of cocoa farms. A variety of legal fictions have sprung up in an attempt to reconcile the traditional principles with modern economic needs. One of these principles, still for the most part observed, was that land needed for the present and future maintenance of the family group must not be alienated; the modern pressure of economic necessity and advantage suggests to many individuals and groups that land should be converted into money. Uncertainty in this transition period is shown in many farms being mortgaged in circumstances which in European countries would have resulted in a sale of all or part of the farm. If outright selling had been the practice the condition of apparent heavy indebtedness would not have existed.

Interest rates appear to Europeans to be very high—50 or 100% usually being quoted—but as the time of payment of the interest is very elastic, it seems that the actual charges are often much exaggerated. Indeed, the terms on which money is lent are often so vague that even the two parties to the transaction are sometimes uncertain of them. Miss Hill found, as others found amongst the cocoa farmers in Western Nigeria, that most of the creditors were farmers living in the same area as their debtors, many being close relatives or friends. Middlemen in the cocoa trade formed an important though small group of creditors, but very few professional money-lenders lent direct to farmers. The reasons for pledging farms are concerned almost entirely with non-agricultural purposes, such as building, transport, litigation, education and medical expenses. The provision of credit for agricultural purposes has very little to do with the redemption of pledged farms.

In throwing light on the meaning of such terms as " farmer " or " indebtedness " in the Ghana context, this book illustrates how misleading it can be to apply Western terms and concepts to the less-developed countries without a clear idea of their local social and institutional backgrounds. It opens up a number of lines for future research, and it is perturbing to find how little is really known about matters so often accepted without discussion.

K. D. S. BALDWIN

Kaduna,
Nigeria.

English Overseas Trade during the Centuries of Emergence. By G. D. RAMSAY. (London: Macmillan, 1957. Pp. x + 279. 30*s*.)

IT is fifteen years since the publication of Mr. Ramsay's scholarly study of the Wiltshire woollen industry in the sixteenth and seventeenth centuries. Now the same author gives us that rare kind of book, a general review of an extensive topic, covering a fairly long period of time, written by an expert in one part of the field. The result is a book of quite unusual clarity and readability, and of sustained excellence.

The " centuries of emergence " are the sixteenth and the seventeenth, although what Mr. Ramsay has to say is not confined to these two. The book consists of seven chapters or essays which can be read independently of one another but which unite to form a well-balanced and complete picture of English foreign trade in the period. Perhaps the most interesting to the economist are the first, dealing with the rise of London and Antwerp; the third, dealing with the struggle of English merchants to establish themselves in the Indian Ocean; and the fifth, describing the interdependence of England's Atlantic and European trades in the seventeenth century. It is disappointing that here and there important economic questions remain unanswered—for example, how was enterprise so quickly effective in fifteenth-century Antwerp despite its natural disadvantages? and just what lay behind " the overexpansion of the cloth industry " in England in the fifteen-forties?—but it may be that the obscurity of a remote past now

makes these questions unanswerable in terms which a present-day economist would accept.

The outstanding merits of the book are two. In the first place, there is its lucidity. The sequence of events, the character of different trades, the policies of governments and of commercial organisations—all are complex and are shown in their complexity, and yet without confusion. And this achievement is all the greater, and the more important, because the second merit of the book is the way in which there are brought together both the political and the economic causes of change. Thus Mr. Ramsay shows how the impulse to find new markets in the Baltic, the Mediterranean and across the Atlantic became effective only after the trade difficulties of the fifteen-fifties had undermined confidence in the future of the Antwerp market, and reluctance to give offence to the Hapsburg family had evaporated with the accession of Elizabeth I in 1558. A combination of political and economic causes seems likewise to account for the triumph of the Dutch in the East Indies in the seventeenth century, " probably the greatest commercial setback suffered [by England] between the making of the Utrecht agreement with the Hanseatic League in 1474 and the revolt of the American colonies three centuries later " (p. 70).

This combining of economic and political motives naturally makes the trade wars of the seventeenth and eighteenth centuries far more intelligible than they usually seem. And in this connection it is striking to notice the significance of another factor upon which Mr. Ramsay does not dwell, namely, the armaments trade. There was an important armaments market in Antwerp before 1500. English tin—" a much-prized commodity in the war-ridden Mediterranean "—was wanted chiefly for casting bronze cannon, and the Barbary and Guinea trade was in part an exchange of timber and other English shipbuilding materials for saltpetre, the chief ingredient of gunpowder. In more ways than one war and trade were never far separated in those centuries, and economic progress, which was always going on at a pace which is perhaps often underestimated, can be seen as at once the counterpart and the result of the gradual imposition of order upon chaos.

Mr. Ramsay modestly disclaims originality for almost all that he has written; he has " relied wherever possible upon authoritative secondary sources." He gives, however, " A Commentary on the Authorities," which is itself almost in the nature of an original contribution to knowledge. And his seven chapters, even if properly described as a work of synthesis, are at once a greater achievement and a more valuable contribution than many a monograph.

A. J. YOUNGSON

Emmanuel College,
Cambridge.

Ruskin and the Economists. By J. T. FAIN. (Nashville: Vanderbilt University Press, 1956. Pp. 164. $4.00.)

THIS slim volume by the Professor of English at the University of Florida gives a useful critical introduction to Ruskin's views of economics. The subject has been neglected since J. A. Hobson took over many of Ruskin's views; it is not an unimportant one, however, for Ruskin's attack on classical economics had considerable influence in Victorian England, and some of his more positive ideas are worth examining even to-day.

Ruskin never read any books on economics, except Adam Smith (" did they suppose I got my knowledge of art by reading books? "), but he had gleaned enough ideas from browsing and from conversation to form the opinion that the " science of orthodox political economy " was " a lie—wholly and to the very root." It was scornful of religion; it professed to be a science of human relations, and yet it abstracted from Man all his truly human characteristics; it was concerned only with one phase in human history, " the phase of modern commercial operations "; it provided the wrong recipes for national economic policy. In none of these charges was Ruskin original, and in none of them did he try to be fair to his opponents. As Professor Fain suggests, he made no attempt to distinguish between different kinds of " orthodox " political economists, he gave the same treatment to academic treatises and to popular pamphlets, and he muddled the views of political economists and politicians. Nor did he fully develop most of the lines of his attack. If this had been the sum total of his writings on economics he would be no more interesting as an economist than Carlyle and far less interesting than Morris (whom Professor Fain for some reason does not mention).

The three most interesting elements in Ruskin's constructive economics are his emphasis on consumption (" the final object of political economy is to get a good method of consumption "), his analysis of social costs (particularly human costs) and his sharp distrust of the economic division of labour. The tools of industry, he maintained, shape two products—the men who work and the articles they make. On the quality of the articles he had less to say than Morris: on the men he had much to say which is still relevant in modern industrial relations. The " great and civilized invention of the division of labour " has been much studied, he wrote, but it is falsely named: " it is not, truly speaking, the labour that is divided; but the men: Divided into mere segments of men—broken into small fragments and crumbs of life." Interestingly enough this passage comes from *The Stones of Venice* (1853) before his economic doctrines were fully formulated: if he had made the comment the first chapter of a full treatise on political economy, as Adam Smith did his, he might still be read by twentieth-century economists.

Professor Fain's book sticks a little too close to the verbal arguments of

Ruskin, his adversaries, his critics and his disciples to breathe the life which Ruskin himself talked so much about. A fuller treatment of the mid-Victorian ideas of money, commerce and art would have placed Ruskin in a fuller context. The relevance of his ideas to twentieth-century conditions in a very different kind of economy—with, for the most part, a different kind of economist—deserves more attention. Professor Fain mentions Veblen and Professor Tawney. It would have been interesting to explore the differences as well as the similarities between Veblen's and Ruskin's work and to follow the links between *Unto This Last* and *The Acquisitive Society*. Like Veblen, Tawney and Hobson, Ruskin distrusted the curtailment of scope in theoretical economics even though it permitted greater precision. Like them, he refused to divorce problems of the economy and problems of the society. For all his misunderstanding—some of it seems deliberate—he had insights, and Professor Fain has been wise to point them out.

ASA BRIGGS

University of Leeds.

NOTES AND MEMORANDA

IMPORT DUTIES AND THE GROSS DOMESTIC PRODUCT AT MARKET PRICES

IN the December 1957 issue of the ECONOMIC JOURNAL Mr. H. Burton of Exeter University claims that the method of valuing imports at market prices which was first used in the 1954 National Income Blue Book: (i) constitutes a departure from internationally accepted conventions; (ii) produces internal inconsistencies; (iii) lacks theoretical justification; and (iv) leaves a gap in the statistics for years other than 1948. His article[1] relies largely on assertions the reasons for which are not always evident; nevertheless, some reply is called for.

The estimates of the gross domestic product at constant market prices, given in recent Blue Books, make use of the equation:

Gross domestic product
= Consumption + Gross domestic investment + Exports − Imports.

The estimates of expenditure on imports at 1948 market prices include import duties, at the rates current in 1948. Corresponding estimates at current market prices have not hitherto been given in the Blue Books. The only additional figures needed to obtain such estimates are the amounts of customs duties on imports. We do not know the total duties on imports paid for in the year—and it is the balance-of-payments figures which are used in the national-income estimates—but the total amounts of customs duties collected each year are available,[2] and anyone who wishes to do so can use these figures *faute de mieux*.

The correct treatment of duties on imports was considered for the first time in the course of preparing estimates of the gross domestic product at constant market prices for the 1954 Blue Book. The problem had not previously been discussed, either in the United Kingdom or internationally. It is true that in the United Nations and O.E.E.C. systems of national accounts the national (or domestic) income (or product) at market prices is taken to be the value at factor cost *plus* total net indirect taxes collected within the country, including import duties. But, at the time when these systems were drawn up, no one had put forward any alternative. It is unfair to suggest that these international organisations disagree with a method which they have not yet discussed.

[1] "Expenditure Taxes, Imports and Gross Domestic Product at Market Prices," ECONOMIC JOURNAL, Vol. LXVII, December 1957, p. 644.

[2] In the *Annual Statement of the Trade of the United Kingdom* (Supplement to Volume II) and, on a slightly different basis, in the *Monthly Digest of Statistics* (cf. March 1958 issue, Table 134).

Consistency demands that the same method be applied to the estimates at constant market prices and the estimates at current market prices of both the national and the domestic product. But since the Blue Books do not contain any estimates of the gross national product at current or constant market prices, or of the gross domestic product at current market prices —indeed, this is one of Mr. Burton's complaints—there cannot be said to be any internal inconsistency.[1] Nor is there any conflict between the Blue Book estimates and the proposition that net income from abroad is equal to the difference between the gross national product at market prices (no estimates of which are given) and the gross domestic product at market prices. Since Mr. Burton combines the Blue Book estimates of the gross domestic product at constant market prices with current-price estimates which he himself has compiled in accordance with a different system, it is not surprising that he manages to obtain some odd results.[2]

The reasons for the present treatment of duties on imports have been set out elsewhere,[3] and no more than a brief summary need be given here. In the equation quoted above every term should be valued in the same kind of prices, whether factor costs or market prices. It is just as wrong to combine market-price valuation of one item with factor-cost valuation of another as it is to add metres to yards. The market prices of imports, being the prices actually paid by the purchaser, include import duties. Since all imports enter into consumption, domestic investment or exports, any duties on imports will be included in the market-price valuation of one of these three categories. Thus when we add together

Consumption + Gross domestic investment + Exports − Imports,

valuing each at market prices, import duties will be included in one or other of the positive terms and also in the negative term (imports) and will not, therefore, affect the (algebraic) sum, which is equal to the gross domestic product at market prices.

The latter is also equal to the sum of the net outputs (including depreciation) of all domestic industries, valued in each case at market prices. Any commodity which is not part of the output of a domestic industry is not part of the gross domestic product. Hence any tax on such a commodity should not be included in the value of the gross domestic product. Since imported tobacco is not part of the net output of the cigarette-manufacturing industry,

[1] Estimates of the gross national product of the United Kingdom at current market prices, in accordance with the U.N. and O.E.E.C. systems, were included in some of the earlier White Papers on National Income, but have not been given since 1951.

[2] The statement in *National Income Statistics—Sources and Methods* that those who want estimates at market prices can easily get them by adding taxes on expenditure to, and deducting subsidies from, the aggregates shown at factor cost, although not implying any preference for one definition rather than another, was perhaps misleading in not referring at the same time to the recent change in the treatment of import duties.

[3] J. L. Nicholson "National Income at Factor Cost or Market Prices?" ECONOMIC JOURNAL, Vol. LXV, June 1955, p. 216.

how can a customs tax on tobacco form part of the gross domestic product of the United Kingdom?

Estimates at market prices derive their importance from the underlying assumption that, in equilibrium, the marginal productivity or marginal utility of each commodity is proportional to its market price. Thus, if the duty on an imported commodity is reduced or removed, the amount imported will increase, causing its marginal productivity and marginal utility to fall, until equilibrium in relation to the new (lower) price is re-established. If duties were not included in the prices of imports, the relative quantities purchased would not have this precise relationship to relative prices.

Mr. Burton comes close to endorsing an important part of my argument when he writes (p. 648), "Furthermore, a value which includes taxes levied on imports, and which can vary with changes in the volume of imports or the rates of taxes levied on them, can hardly be a useful or reasonable measure of income accruing to a nation but not due to current activity within the domestic territory." The argument which is here applied to net income from abroad is equally applicable to the domestic product. Can changes in import duties, or in the volume of imports, really be regarded as part of domestic economic activity? "One can agree," he also writes (p. 651), "that the valuation of imports at market prices should include taxes levied on them." He immediately adds "but . . . *Tm* (import duties) have already been included . . . in $C + I + X$, and . . . to include *Tm* again with negative sign appears to produce the opposite result to that intended." It is difficult to know what to make of this remark. Either Mr. Burton has not said what he intended to say, or he agrees that our intention is correct in which case most of his criticisms fall to the ground. That our intention is in fact carried out has been shown above.

Later (p. 652) he expresses the view that, if taxes on imports rise and everything else including the volume of imports and the output of every domestic industry remains unchanged, the gross domestic product at market prices should rise by the same amount, whereas in the official treatment—as he says himself—it would be unchanged. Taxes on imports should not have the same effect on the gross domestic product at market prices as taxes on the products of home industry, simply because the latter form part of the gross domestic product while imports do not. Mr. Burton is able to agree that "imports at market prices should include the taxes levied on them," but fights shy of the consequences.

One consequence is that the difference between the gross domestic (or national) product at market prices and the gross domestic (or national) product at factor cost is not equal to the total of net indirect taxes *collected* within the country; but it is equal to the sum of net indirect taxes on all constituents of the gross domestic (or national) product. Unless the very collection of customs duties is regarded as a productive economic activity the value of which is correctly measured by the total amount paid in duties—and no one

has suggested that the work done by tax collectors is quite as important as all that!—the latter identity is more important than the former.[1]

Mr. Burton never comes to grips with the arguments set out in my article. His frequent use of the phrase " this seems reasonable (or unreasonable) " does not add up to an effective answer. Further comment seems unnecessary except on one point. Mr. Burton chides us for using the word " welfare " in explaining the national income estimates. He thinks that, as a result, national-income accounting is in danger of becoming a controversial subject. It is difficult to recall any time when the national income was not a controversial subject; it also seems doubtful whether it can be freed of all welfare and productivity connotation and still remain a useful tool in economic analysis.

J. L. NICHOLSON

Central Statistical Office.

CURRENT TOPICS

THE Annual Meeting of the Royal Economic Society will be held at the London School of Economics at 5 p.m. on Thursday, July 17. After formal business, Sir Alexander Carr-Saunders will address the Society on " The Place of Economics and Allied Subjects in the Curriculum."

MR. S. R. DENNISON, Fellow of Gonville and Caius College, Cambridge, and University Lecturer in Economics has been elected to the Chair of Economics in the Queen's University, Belfast. Mr. A. J. Youngson, Fellow of Emmanuel College, Cambridge, and University Lecturer in Economic History has been elected to the Chair of Economic History in Edinburgh University.

NUFFIELD COLLEGE, Oxford, has recently elected to Honorary Fellowships of the College Mr. R. F. Harrod, Nuffield Reader in International Economics, Professor J. R. Hicks, Drummond Professor of Political Economy, and Mr. K. C. Wheare, Rector of Exeter College and formerly Gladstone Professor of Government and Public Administration.

[1] The only way of partially salvaging the previous method is to treat import duties as part of the gross domestic products at market prices of foreign countries which is appropriated from them by the home country. Any countries which impose customs duties on imports from this country would likewise be regarded as appropriating part of our gross domestic product. Customs duties on imports would then form part of the domestic and national income. But they could not be regarded as part of the domestic product which would, however, include any customs duties levied by foreign countries on imports from this country.

PROFESSOR E. DEVONS of the University of Manchester has been elected to the university Chair of Commerce (with special reference to international trade) at the London School of Economics and Political Science. Mr. A. W. Phillips, Reader in Economics, has been elected to the Tooke Chair of Economics and Statistics, also at the London School of Economics.

PROFESSOR W. A. LEWIS, Stanley Jevons Professor of Political Economy in the University of Manchester, has accepted appointment to the Chair of Economics in the University of the West Indies.

MR. R. R. NEILD, Fellow of Trinity College, is leaving Cambridge to join the staff of the National Institute of Economic and Social Research and to take part in the new work of the Institute in the analysis of current economic trends.

THE following have been admitted to Life Fellowship of the Society:

Ara, Prof. K.	Chauhan, M.	Pandit, R.
Bell, Prof. P. W.	Geirsch, Prof. Dr. H	Shoup, Prof. C. S.
Breton, A.	Guerra, Dr. J. A.	Thornton, P. H. N.
Carpenter, G.	Lowell Harriss, Prof. C.	Wang, Dr. N. T.

THE following have been admitted to Fellowship of the Society:

Abu-Hamdan, H.	Caldwell-Jones, J.	Feiyisetan, G. O.
Adeusi, A.	Calvert, H.	Folk, H.
Adjei, A. E. T.	Chadha, N. S.	Fox, G. E. P.
Adler-Karlsson, G.	Chan, Fook Chuan	Ghandi, G. K.
Ala-Ud-Din, S.	Chapman, A.	Ghose, A. B.
Alderson, J. A.	Chaudhuri, N. N.	Girolami, P.
Amzart, M. A.	Choi, Prof. H.	Goenka, M. L. K.
Anandappa, A. P.	Chougale, K. B.	Goldblatt, L. D.
Anyane, S. L.	Chow Tin-Sik	Gottheil, F.
Ayoade, G. O. A.	Church, Miss R. M.	Green, D.
Bailey, D. T.	Cutolo, Prof. I.	Griffiths, A. E. T.
Bamford, A.	Davies, J. B.	Guy, G.
Bartlett, D. E.	De Cindio, Dr. F.	Han Kang Hong
Bell, W. H.	De Decker, H.	Haran, M. P.
Bhandarkar, M. S.	Dent, I. J. K.	Harewood, R. J.
Blanks, P. J.	Ejione, U. A.	Harvey, D. R.
Browne, C. C.	Essig, S. B.	Hughes, F. H.
Burgess, R. F.	Fan, M. H.	Hyett, G. P.

Iwegbu, G. N.
James, D. G.
Kahan, A.
Keller, R. H.
Krotki, K. J.
Kumar, K. R.
Littler, K. T.
Livingstone, J. M.
Lu Yaw
MacDowell, G. F.
MacPherson, W. J.
Maduekwe, M. A.
Marrash, W. B.
Moul, R. P.
Munshi, D. M.
Murray, M. J.
Naish, D. E. G.
Neisser, H.
Norie, R. H.
Ogunleye, M. A. C.
Olaniyan, C. F. I.
Oliver, J. M.
Palshikar, M. B.
Pickering, M. A.
Pitman, S. L. E.
Prior, E. A.
Ralph, J. H.
Reynolds, L. G.
Rhee, K. J.
Robinson, G. B.
Romanis, Miss A. W.
Rosen, D.
Rosenberg, Prof. N.
Rossell, C.
Saito, T.
Sapsford, A.
Sethi, K. C. K.
Sharp, D. P.
Shepherd, W. A.
Simpson, A. H.
Siong Seouw Lin
Skinner, F. E.
Small, J. R.
Smith, W. P.
Snowdon, J. M.
Sparrow, J.
Spraos, J.
Sreenivasa-Iyer, Y. S.
Stout, D. K.
Swendell, E. B.
Taplin, E. L.
Tawari, B. R.
Thompson, J.
Turner, P. H.
Valentine, E.
Virani, H. H.
Walker, C. S.
Whinston, A.
Wijesinghe, O.
Yeager, L. B.

THE following have been admitted to Library Membership of the Society:

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Banco Espanol en Londres, London.
Banco di Sicilia, Palermo, Italy.
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Bureau for Economic Research, University of Stellenbosch, S. Africa.
Ecole Polytechnique, Paris.
Flint College, Michigan.
Japan Productivity Center, Tokyo.
Junta de Comercio Externo, Luanda, Angola.
Knox College, Galesburg, Illinois.
Mercer University, Macon, Georgia.
Midland College, Fremont, Nebraska.
Odessa College, Odessa, Texas.
Organisation for European Economic Co-operation, Paris.
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Pennsylvania State Library, Harrisburg, Pennsylvania.
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Volkswirtschaftliches Institut, Freien Universitat, Berlin-Dahlem.

RECENT PERIODICALS AND NEW BOOKS

Applied Statistics

VOL. VII, No. 1, MARCH 1958. *Studies in the Variability of Two Blood-clotting Tests:* P. ARMITAGE and G. I. C. INGRAM. *Official Statistics of Economic Trends:* R. J. MAURICE. *Probits: an Application to Observational Data:* J. K. FRIEND. *Statistics of an Auction Sale:* D. C. DUNCAN. *A Regression Control Chart for Costs:* E. MANSFIELD and H. H. WEIN. *Initial Letters of Surnames:* P. G. GRAY.

Economica

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No. 6, 1957. *The Triumph of the Co-operative System in Agriculture. Ten Years of Socialist Industry. On Some Problems of Teaching Economics within the New Curriculum:* J. NATHAN. *On the New Statistical Abstracts:* Z. STEFANOV. *The Economic and Social Nature of Capitalist Industry During the First Stage of Popular Democracy in Bulgaria:* BACHVAROV. *The Location of Industry in Bulgaria:* M. ENEV. *On the Transport of Oil in Bulgaria:* B. PETROVSKY. *Changes in Finance Methods in Bulgaria:* S. VASILIEV. *The Pan-American Economic Conference:* J. MADRIGAL.

Izvestia na Vishia Finansovo-Stopanski Institut Svishchov (*Bulgarian text, German and Russian summaries*)

VOL. X, No. 1. *Overheads in an Industrial Enterprise:* V. NANKOV. *Overheads in a State Farm:* G. TOSHEV. *Some Legal Problems in the Disposal of Co-operative-farm Income:* D. BUROV. *The Establishment of Cost-accounting in Kilns within Industrial Combines:* V. RANKOV. *Quality Control and Rejects Analysis in an Industrial Enterprise:* T. TOTEV.

VOL. X, No. 2. *Consumption and Price-formation of Farm Produce in the Capitalist World Since the War:* CH. BEYAZOV. *Scope for Improving Accountancy in the State Savings Banks:* V. PAVLOV. *Technological Progress and the Technical Training and Education of the Worker:* H. BLEY. *The Computation of Production under Conditions of Changing Labour Productivity on Co-operative Farms:* N. MUTAFOV. *Overheads in Construction and Scope for Substantial Reductions:* YU. DONCHEV. *Specialisation and Co-operation Within Socialist Industry:* I. DOCHEV. *The Economic Efficiency of the Property Insurance Fund:* M. PETROV.

Statistikai Szemle (*Hungarian text, English and Russian summaries*)

OCTOBER 1957. *The 40th Anniversary of the Great October Socialist Revolution. Progressive Russian Statistics in the Revolutionary Movements and in the October Period:* F. GYULAY. *Forty Years of Soviet Statistics:* Z. KENESSEY. *Production Costs, Prices and Profitability in Mining:* L. OHRENSTEIN and L. OROSZ. *Viniculture and Wine Production in Hungary:* F. LESZÁK.

NOVEMBER 1957. *The Development of the Economy in the First Nine Months of 1957:* A. NYILAS. *On Industrial Activity in 1956:* S. CSIKESZ-TÜÜ. *The "Average Man" of Quetelet:* D. NAGY.

DECEMBER 1957. *The Financial Situation of Workers' and Employees' Families as Reflected in Household Statistics:* I. BARANYAI and S. FERGE. *Some Problems of Investment Planning:* M. TURÁNSKY. *The Improvement of Transport Planning by the Application of Time-series Analysis:* G. FARKAS.

Közgazdasági Szemle (*Hungarian text, English and Russian summaries*)

No. 12, 1957. *Trends in the Structure of Production and Consumption under Contemporary Capitalism:* A. HAÁSZ. *Recommendations of the Economic Expert Committee (II):* I. VARGA. *The Main Problems of Managing Domestic Trade under State Control:* I. FENYÖ. *Capacity and Efficiency of Economic Factors in Hungarian Viniculture:* P. TOMCSÁNYI. *The United Nations' System of National Accounts:* Z. KENESSEY.

No. 1, 1958. *Economics and Politics in Lenin's Theory of Imperialism:* GY. GÖNCÖL. *Implementation of Lenin's Theory of Democratic Centralism in the Management of Farming in the Soviet Union:* D. KOLPAKOV. *Problems of the International Division of Labour Between Socialist Countries:* J. BOGNÁR and I. VAJDA. *Similar and Differing Aspects in the "Prussian" Development of Hungarian and Russian Farming in the Latter Half of the Nineteenth Century:* Z. PACH. *On Certain Questions Relating to the Work and Tasks of* Közgazdasági Szemle.

No. 2, 1958. *Intensity in Farm Production:* F. ERDEI. *Planning Methods and Spontaneity:* G. RIPP. *On the Improvement of Planning Methods:* I. VARGA. *Features of the Hungarian Wage-system Before and After the Introduction of the Control of Average Wages:* T. MEITNER. *Trends in the Economic Development of Capitalism in the Last Two Years:* I. VAJDA. *Franco German Heavy Industrial Antagonism as Mirrored in the Moselle Canal:* I. GROÓ. *Agricultural Price Policies in Certain Capitalist Countries:* K. IHRIG.

Probleme Economice (*Rumanian text, French and Russian summaries*)

No. 11, 1957. *The Production Council—an Important and Efficient Form of Mass Participation in the Direction and Administration of Socialist Enterprises:* C. BĂRBULESCU and D. TOIȚA. *The Development of Metallurgy in the Years of Popular Power:* H. SERIAN. *A Contribution to the Study of the Infiltration of and Domination by Foreign Capital in Rumanian Forestry in the Period of the Relative Stability of Capitalism:* V. AXENCIUC. *The Way of the October Revolution and National Peculiarities in Building Socialism:* C. MURGESCU. *For the Improvement of the Finance and Planning System in Investment:* R. SĂVEANU. *Some Problems of Stockbreeding:* N. CORNĂTEANU. *Some Aspects of Jugoslav Progress Along the Road to Socialism:* V. RAUSSER. *Recent Trends in Economic Theory in Britain and the U.S.A.:* M. DOBB. *Some Aspects of the Action of the Law of Value under Socialism:* I. RACHMUTH. *On the Economic Development of Tunisia:* F. TUDOR.

No. 12, 1957. *The Economic Potential of the Rumanian People's Republic. Rumanian Collaboration with Other Socialist States in Engineering and in the Supply of its Raw Material Requirements:* G. POPA. *The Development of Rumanian Foreign Trade:* G. RĂDULESCU. *Needs and Scope for Developing Industrial Techniques in Building:* S. BALAN. *Finance at the Service of Building Socialism in Rumania:* M. DIAMANDOPOL and I. VĂCĂREL. *The Creation and Development of Socialist Property in Rumanian Agriculture:* N. BELLI. *Local Specialisation Among Socialist Farms:* V. PAȘCOVSCHI. *The Servitude and Pillage of the Rumanian Economy by German Monopolies on the Eve of and During the Second World War:* T. SAVIN. *A Contribution to the Study of the Economic Works of George Barițiu:* G. MLADENATZ. *The Economic Efficiency of Investment:* A. WITTENBERGER *et al.* *On the Calculation of Investment Efficiency in the Oil Industry:* T. HANCIULESCU. *The Development of the Craiova Oilfield:* C. CAROS and M. NETE. *The Economy of Ghana:* N. DANOS.

NEW BOOKS

British

ALLEN (E.), ODBER (A. J.) and BOWDEN (P. J.). Development Area Policy in the North East of England. Newcastle upon Tyne: North East Industrial and Development Association (9 Eldon Square, Newcastle upon Tyne, 1), 1957. 8½". Pp. 95. 5*s*.

[This report was commissioned by the North East Industrial and Development Association, but the views expressed are those of the authors, not necessarily those of the Association. It contains a general survey of Development Area policy in the North East since the War and a more detailed account of the experience of new establishments there, based on the answers to a questionnaire. Many of the findings will be of interest not only to those concerned with the problems of the North East, but also to students of location policy generally. This applies particularly to the chapter on the scope and limitations of Development Area policy. It appears that in general few of the firms that are new to the North East have suffered significant cost disadvantages from their location. There are, however, differences between industries and also between districts. The authors are critical of the Board of Trade's policy of taking relative unemployment levels as the overriding criterion in deciding which particular places within a Development Area to encourage firms to set up in.]

ALLEN (G. C.). Japan's Economic Recovery. London: Oxford University Press for the Royal Institute of International Affairs, 1958. 9". Pp. xi + 215. 25*s*.

[To be reviewed.]

BAILEY (F. G.). Caste and the Economic Frontier. A village in highland Orissa. Manchester: Manchester University Press, 1957. 9". Pp. xvi + 292. 35*s*.

[This is a book by a social anthropologist about a remote hill-village in the Kondmals area of western Orissa, in India. The aboriginal Kond population of this area had already in pre-British

times been subject to the intrusion of more sophisticated Oriya plainsmen, but till the coming of British administration its villages had been influenced very little by the State or by commerce. Mr. Bailey is particularly concerned with the effects of the inclusion of his previously self-sufficient village within the " economic frontier," that is, within a commercial economic system; these effects include the break-up of the joint-family system, the buying and selling of land, and the rise of previously lowly castes who had newly acquired wealth.]

CARTER (C. F.), MEREDITH (G. P.) and SHACKLE (G. L. S.) (Eds.). Uncertainty and Business Decisions. A symposium. Second, revised and enlarged edition. Liverpool: Liverpool University Press, 1957. 9″. Pp. x + 158. 22*s.* 6*d.*

[The first edition of this book was reviewed by M. J. Farrell in the ECONOMIC JOURNAL of March 1956, p. 129. This second edition contains four additional contributions: " Decisions and Uncertainty," by J. W. N. Watkins; " Shackle's Φ-function and Gambler Indifference Map," by B. R. Williams; " The Modular Theory of Expectation," by G. P. Meredith; and " The Present State of the Theory of Decisions under Uncertainty," by C. F. Carter. The last two of these have not previously been published.]

CLEMENTS (R. V.). Managers. A study of their careers in industry. London: Allen & Unwin, 1958. Pp. 200. 20*s.*

[To be reviewed.]

COULDERY (F. A. J.) and SHEPPARD (A. J. G.). Your Business Matters. London: John Murray, 1958. 7½″. Pp. vii + 236. 12*s.* 6*d.*

[This is intended as a guide to certain more general aspects of business management for the small trader who is familiar with the technicalities of his own particular line. It deals with legal questions, accounting procedures, taxation, credit, etc.]

DAVIES (R. W.). The Development of the Soviet Budgetary System. London: Cambridge University Press, 1958. 9½″. Pp. xxi + 373. 45*s.*

[To be reviewed.]

DENMAN (D. R.). Origins of Ownership. A brief history of land ownership and tenure from earliest times to the modern era. London: Allen & Unwin, 1958. 9″. Pp. 190. 22*s.* 6*d.*

[To be reviewed.]

ERHARD (L.). Prosperity through Competition. The economics of the German miracle. Translated from the German by E. T. Roberts and J. B. Wood. London: Thames & Hudson, 1958. 9″. Pp. xii + 260. 25*s.*

[To be reviewed.]

GILLMAN (J. M.). The Falling Rate of Profit. Marx's law and its significance to twentieth-century capitalism. London: Dobson, 1958. 9″. Pp. xi + 172. 25*s.*

[To be reviewed.]

GUILLEBAUD (C. W.). The Wages Councils System in Great Britain. An Economic Monograph. London: Nisbet, 1958. 8½″. Pp. 31. 2*s.* 6*d.*

[Reviewed in this issue.]

HABER (L. F.). The Chemical Industry during the Nineteenth Century. A study of the economic aspect of applied chemistry in Europe and North America. London: Oxford University Press, 1958. 9½″. Pp. x + 292. 45*s.*

[To be reviewed.]

HAGUE (D. C.) (Ed.). Stability and Progress in the World Economy. The first Congress of the International Economic Association. London: Macmillan, 1958. Pp. xv + 267. 25*s.*

[To be reviewed.]

HARROD (R. F.). International Economics. Fourth Edition. Cambridge Economic Handbooks. London: Nisbet and Cambridge University Press. 1957. 7½″. Pp. xiii + 186. 8*s.* 6*d.*

[Reviewed in this issue.]

JACKSON (R. M.). The Machinery of Local Government. London: Macmillan, 1958. 9″. Pp. xii + 360. 30*s.*

[To be reviewed.]

JONES (F. C.). Hokkaido. Its present state of development and future prospects. London: Oxford University Press for the Royal Institute of International Affairs, 1958. 9″. Pp. 146. 21*s.*

[To be reviewed.]

KENDALL (M. G.). A Course in Multivariate Analysis. Griffin's Statistical Monographs and Courses, No. 2. London: Charles Griffin (42 Drury Lane, W.C.2), 1957. 8½″. Pp. 185. 22*s.*

[The second volume in this new series of monographs provides a very valuable outline course in Multivariate Analysis, being based on lectures originally delivered by Professor Kendall in 1954. Economic statisticians are likely to be particularly interested in the chapters dealing with component analysis, the problem of estimating a functional relationship and canonical analysis. An historical chapter and a very extensive bibliography are also valuable features of this work.]

KENNAN (G. F.). Russia, the Atom and the West. London: Oxford University Press, 1958. 7½″. Pp. 120. 10*s.* 6*d.*

[This contains the author's celebrated 1957 Reith Lectures. A seventh lecture is added on Anglo-American relations. This was originally intended to be the last lecture in the series, but it was omitted from the broadcasts to make room for discussion of other more urgent topics.]

LYLE (P.). Regression Analysis of Production Costs and Factory Operations. Third Edition, revised by L. H. C. TIPPETT. Edinburgh and London: Oliver & Boyd, 1957. 9″. Pp. 204. 16*s.*

[This is a posthumous re-issue of a book originally published in 1944, which in turn was derived from a privately published booklet circulated in the sugar-refining industry. The editor has interpolated some comments and contributed a cautious preface indicating that " the statistical techniques of regression analysis are expounded in somewhat fuller detail than . . . is necessary for the purpose in hand."]

MACKIE (J.) and WALSTON (H.). Land Nationalisation, For and Against. Fabian Tract No. 312. London: The Fabian Society (11 Dartmouth Street, S.W.1.), 1958. 8½″. Pp. 19. 1*s.* 6*d.*

[Mr. Mackie is for, on account of various deficiencies in the present structure of land tenure in Britain; Mr. Walston is against, on the grounds that the main social and economic weaknesses in British agriculture are not of the sort that land nationalisation would cure and on the grounds also of shortage of administrators. Mr. Walston, however, favours limited acquisition by the State of agricultural land where it is thought to be in the interests of increased production. Both authors raise a number of interesting points, but it cannot be said that either the merits or the defects of the present system of land tenure emerge from their discussion quite as clearly as might be wished.]

MARTIN (A.). Restrictive Trade Practices and Monopolies. London: Routledge & Kegan Paul, 1957. 9″. Pp. xii + 264. 30*s.*

[This is a legal guide to the provisions of the Restrictive Trade Practices Act of 1956, intended for the use of those who may be affected by it and their professional advisers. A brief account is also included of the legislation of 1948, as it stands after the changes introduced in 1956.]

MOSER (C. A.). Survey Methods in Social Investigation. London: Heinemann, 1958. 9″. Pp. xiii + 352. 35*s.*

[To be reviewed.]

MYRDAL (G.). Value in Social Theory. A selection of essays on methodology edited by P. P. STREETEN. In the International Library of Sociology and Social Reconstruction. London: Routledge & Kegan Paul, 1958. 9″. Pp. xlvi + 269. 32*s.*

[To be reviewed.]

NATIONAL INSTITUTE OF ECONOMIC AND SOCIAL RESEARCH. 15th Annual Report, 1957. London: National Institute of Economic and Social Research (2 Dean Trench Street, Smith Square, S.W.1), 1958. 10″. Pp. 36.

[This report contains an outline account of the National Institute's new plans for continuous research work on current trends in the economy, as well as a survey of the various projects currently in hand and recently completed.]

NEF (J. U.). Cultural Foundations of Industrial Civilization. London: Cambridge University Press, 1958. 9″. Pp. xv + 164. 20*s*.

[To be reviewed.]

POPPER (K. R.). The Poverty of Historicism. London: Routledge & Kegan Paul, 1957. 9″. Pp. xi + 166. 16*s*.

[To be reviewed.]

QUENOUILLE (M. H.). The Analysis of Multiple Time-Series. Griffin's Statistical Monographs and Courses, No. 1, under the general editorship of M. G. KENDALL. London: Griffin (42 Drury Lane, W.C.2), 1957. 8½″. Pp. 105. 24*s*.

[This is an original research study on a topic of great importance to economic statisticians. It is concerned with the problem of estimating the auto-correlation structure of systems of time series. While Mr. Quenouille provides no easy way out of our present small sample difficulties, he does help to illuminate their causes and suggests improved ways of dealing with them. In the early part of the monograph elegant methods of determining the theoretical auto-correlation structure of a broad class of multiple time series are developed. The combination of theoretical and empirical treatment is reminiscent of Professor Kendall's *Contributions to the Study of Oscillatory Time-Series*.]

ROBBINS (L.). Robert Torrens and the Evolution of Classical Economics. London: Macmillan, 1958. 9″. Pp. xiii + 367. 36*s*.

[To be reviewed.]

ROBERTSON (SIR DENNIS). Lectures on Economics Principle, Volume II. London: Staples, 1958. 8″. Pp. 162. 16*s*.

[To be reviewed.]

SARGENT (J. R.). British Transport Policy. London: Oxford University Press, 1958. 7½″. Pp. ix + 164. 15*s*.

[To be reviewed.]

STRAUSS (E.). Common Sense about the Common Market. Germany and Britain in post-war Europe. London: Allen & Unwin, 1958. 9″. Pp. 168. 15*s*.

[To be reviewed.]

STURMEY (S. G.). The Economic Development of Radio. Industrial Innovation Series. London: Gerald Duckworth, 1958. 8½″. Pp. 284. 30*s*.

[To be reviewed.]

THOMAS (B.) (Ed.). Economics of International Migration. Proceedings of a conference held by the International Economic Association. London: Macmillan, 1958. 9″. Pp. xiii + 502. 45*s*.

[To be reviewed.]

TOWNSEND (P.). The Family Life of Old People. Institute of Community Studies, Report No. 2. London: Routledge & Kegan Paul, 1957. 9″. Pp. xvi + 284. 30*s*.

[To be reviewed.]

VAIZEY (J.). The Costs of Education. London: Allen & Unwin, 1958. 9″. Pp. 256. 30*s*.

[To be reviewed.]

WICKSELL (K.). Selected Papers on Economic Theory. Edited with an Introduction by ERIK LINDAHL. London: Allen & Unwin, 1958. 9″. Pp. 292. 30*s*.

[To be reviewed.]

WRAY (MARGARET). The Women's Outerwear Industry. Industrial Innovation Series. London: Duckworth, 1958. 8½″. Pp. 318. 30*s*.

[To be reviewed.]

Australian

DAVIDSON (F. G.). The Industrialization of Australia. Melbourne: Melbourne University Press (London: Cambridge University Press), 1957. 8½″. Pp. 26. 3*s*. 6*d*.

[Mr. Davidson is a Lecturer in Economics at the University of Melbourne. A large part of this pamphlet is devoted to a useful and quite detailed survey of the structure of manufacturing industry in Australia, with special attention to problems of monopoly and competition and to the degree of overseas ownership and control. In his more general concluding discussion Mr. Davidson considers the various motives that have underlain Australia's drive to industrialise and states the arguments that have been brought against it, mainly on grounds of cost. His own view is not emphatically expressed, but it is apparent that he does not feel great misgivings about the way things have developed. While by no means denying that attention must be paid to agricultural improvements, he doubts whether a great increase in Australian agricultural production is desirable and whether, if it were, it would absorb a great amount of labour. Industrialisation is therefore the natural course.]

WILLIAMS (D. B.). Economic and Technical Problems of Australia's Rural Industries. Melbourne: Melbourne University Press (London: Cambridge University Press), 1957. 9″. Pp. 146. 27*s*. 6*d*.

[This book has grown out of a review of Australian agricultural production and price policies which the author was asked to prepare for the International Conference of Agricultural Economists. He describes the structure of Australian agriculture and its prospects in the context of the present-day world economy and in the context also of general Australian economic policy. A large part of the book is devoted to more technical questions about means of improving the efficiency of Australian agriculture.]

WOODRUFF (W.) and MCGREGOR (L.). The Suez Canal and the Australian Economy. Melbourne: Melbourne University Press (London: Cambridge University Press), 1957. 8½″. Pp. 20. 2*s*. 6*d*.

[This pamphlet was stimulated by the Suez crisis and appears to have been written while the canal was still closed. The authors give a well-documented survey of the history of the canal and the movement over time of the volume of traffic through it, with special reference to traffic to and from Australia. Data are given of the proportions of different classes of Australian merchandise trade passing through the canal. The concluding section deals with the effects which the closing of the canal had on the Australian economy.]

Indian

JATHAR (G. B.) and (K. J.). Indian Economics. Bombay and London: Oxford University Press, 1957. 10″. Pp. xv + 479. 21*s*.

[This is a shorter and more up-to-date version of the two-volume *Indian Economics*, by G. B. Jathar and S. G. Beri. It includes a chapter on the two Five Year Plans, and will be useful as an elementary introduction to the subject. The treatment of most topics is too cursory for the serious student.]

KHAN (M. S.). Schumpeter's Theory of Capitalist Development. Aligarh: Muslim University, 1957. 10″. Pp. viii + 175.

[The author's purpose is to relate Schumpeter's theory to the writings of other economists, especially Wieser, Boehm Bawerk, Walras and Marx, and to post-Keynesian theories of growth and fluctuations. He writes clearly and shows a good knowledge of the literature he discusses. His own criticism of Schumpeter, from the standpoint of one interested in the problems of under-developed countries, is that in stressing the role of enterprise Schumpeter did not sufficiently analyse the social and other conditions in which the spirit of enterprise is most likely to flourish.]

MEHTA (M. M.). Structure of Indian Industries. Bombay: Popular Book Depot, 1955. 10″. Pp. 340. Rs. 22/8.

[This is a statistical study of the size, location and integration of industrial units of seven Indian industries: cotton, jute, sugar, iron and steel, coal, paper and cement. A great deal of quantitative information is given on changes in the size of industries, on size–cost relationships and on regional variations in costs and profits. The section on integration is especially useful for the light it throws on the managing-agency system. The domination of Indian industry by a small number of British and Indian managing agents is clearly shown.]

RAMA SASTRI (J. V. S.). Nationalization and the Managerial Role. A theoretical study. Bombay: The Popular Book Depot, 1957. 9″. Pp. 119. Rs. 6.

[The author's central thesis is that under nationalisation, as it has been practised in Britain and elsewhere, the function of management undergoes a significant dilution or "truncation," because of the presence of a higher political control above the immediate management. This truncation of the function of management he holds to be potentially dangerous in a country such as India, where industrial development is heavily dependent on managerial initiative.]

RANGA (N. G.). Credo of World Peasantry. Nidubrolu, Andhra: Indian Peasants' Institute, 1957. 8½″. Pp. xvi + 504. Rs. 7/50.

[This is an exposition of the author's views on the exploitation of peasants by capitalists and imperialists, and a plea for better organisation of the peasant class on the lines of the International Peasant Union. The theme of the book is, in the author's words, "Peasants of the World, Unite!"]

Ceylonese

SURIYAKUMARAN (C.). The Economics of Full Employment in Agricultural Countries. With special reference to India and Ceylon. Colombo: K. V. G. De Silva, 1957. 9″. Pp. 307. Rs. 12/50.

[This book is in four parts. The first includes an assessment of the relevance of existing employment theory for underdeveloped agricultural countries. In the second part the case for planned economic development, especially industrialisation, is argued. Part three considers the particular employment and planning problems of India and Ceylon, and in the fourth part international aspects are discussed. The author's policy for full employment contains many of the features of the Indian five-year plans which appeared after most of this book was written. It is unfortunate that their experience was not available to him. There is no index.]

American

BAUER (P. T.). Economic Analysis and Policy in Underdeveloped Countries. Durham, North Carolina: Duke University Press for the Duke University Commonwealth-Studies Center, 1957 (London: Cambridge University Press, 1958). 8″. Pp. xiii + 145. 22*s*. 6*d*.

[To be reviewed.]

BEACH (E. F.). Economic Models. An exposition. New York: John Wiley (London: Chapman & Hall), 1957. 9½″. Pp. xi + 227. 60*s*.

[To be reviewed.]

BECKER (G. S.). The Economics of Discrimination. Chicago: University of Chicago Press (London: Cambridge University Press), 1957. 9″. Pp. x + 137. 26*s*.

[To be reviewed.]

BELLMAN (R.). Dynamic Programming. A Rand Corporation Research Study. Princeton, New Jersey: Princeton University Press, 1957 (London: Oxford University Press, 1958). 9½″. Pp. xxv + 342. 42*s*.

[To be reviewed.]

BRIGHT (J. R.). Automation and Management. Boston, Mass.: Harvard University Graduate School of Business Administration (London: Bailey & Swinfen), 1958. 11½″. Pp. xv + 270. 80*s*.

[To be reviewed.]

BROWN (J. D.) and HARBISON (F.). High-Talent Manpower for Science and Industry. An appraisal of policy at home and abroad. Princeton, New Jersey: Industrial Relations Section, Princeton University, 1957. 9″. Pp. 97. $3.00.

[Mr. Brown writes on problems of recruiting and developing talent in industry in the United States. He deals in turn with the roles of corporations, educational establishments and the Government. Mr. Harbison writes on the development of human resources in the newly industrialising countries. He emphasises that the training of skilled manpower is a form of investment and ...

expensive; it is in competition with investment in physical capital for the limited investable resources available. Some readers may feel that in stressing the cost obstacle to educational improvement Mr. Harbison does not quite sufficiently underline the social obstacles that are also present in backward countries.]

CHAMBERLIN (E. H.). Towards a More General Theory of Value. New York and London: Oxford University Press, 1958. 8½″. Pp. xii + 318. 40*s*.

[To be reviewed.]

CROSSER (P. K.). Economic Fictions. A critique of subjectivistic economic theory. New York: Philosophical Library (15 East 40th Street), 1957. 8½″. Pp. xxiii + 322. $4.75.

[This consists of an extended attack on a series of economists who in the author's view are guilty of the sin of economic subjectivism. The economists in question are Thuenen, Menger, Wieser, Boehm Bawerk, J. B. Clark, Jevons, Schumpeter, Keynes and Othmar Spann. The author's attack on these economists is very all-embracing, and his style, involving as it does great numbers of epigrammatic one-sentence paragraphs, is extremely obscure; but his main point seems to be that post-classical economists abandoned the empirically based generalisations which he considers to have been typical of Smith and Ricardo and substituted a system of deductive model-building based on psychological introspection, thus leading ultimately to the reign of complete irrationalism.]

DALES (J. H.). Hydroelectricity and Industrial Development, Quebec 1898–1940. Cambridge, Mass.: Harvard University Press (London: Oxford University Press), 1957. 9½″. Pp. xii + 269. 45*s*.

[The greater part of this book is occupied with an elaborately detailed historical narrative of the main Quebec power companies, with special reference to their role in fostering industrial development. Many of the distinctive features of the hydro-electricity industry, especially in its earlier days, arose from the large minimum scale of operations. This made the raising of capital a major problem, and in the event a large proportion of the capital was raised in the United States. It also meant that the companies had a great incentive to seek new outlets for their power so as to make possible full capacity working. The author's conclusion substantiates the commonly held view that hydro-electric power has played a decisive part in the industrial development of Quebec.]

DIAMOND (W.). Development Banks. Baltimore, Maryland: Johns Hopkins Press for the Economic Development Institute (London: Oxford University Press), 1957. 9″. Pp. xiii + 128. 24*s*.

[The term Development Bank as used by the author includes both the nineteenth-century continental type of industrial bank and the various state-sponsored banks that have been set up in under-developed countries in recent years to foster private industry. The distinguishing feature of a Development Bank is that it not merely provides industry with finance, but also contributes to a significant degree to the supply of entrepreneurship. The author reviews the experience of such banks in advanced countries and then goes on to consider in more detail the problems of formation and operation in under-developed countries at the present time.]

Federal Lending: Its Growth and Impact. A summary prepared by the editorial staff of the National Bureau of Economic Research of a research report in the Financial Research Program. Occasional Paper 58. New York: National Bureau of Economic Research, 1957. 9″. Pp. viii + 48. $1.00.

[The report which is here summarised is the result of a major research project carried out by the National Bureau on federal government activities from 1917 to 1953 in extension of credit, guarantee and insurance of loans. The authors give particulars on the volume of this activity and its effects on economic fluctuations and on the allocation of resources. Four sectors are distinguished as beneficiaries: housing, agriculture, business and financial institutions.]

FUCHS (V. R.). The Economics of the Fur Industry. New York: Columbia University Press (London: Oxford University Press), 1957. 9″. Pp. 168. 40*s*.

[The author of this monograph is an academic economist with extensive personal experience in the fur industry. His great knowledge of the industry is in evidence throughout. He gives an analytical description of the main branches of the fur business, including estimates of the shape of cost curves in the manufacturing branch. This factual material serves as the background for his discussion of the causes and possible remedies for the two ills that have afflicted the industry in recent times: extreme short-run instability, and long-run stagnation and decline.]

GLAESER (M. G.). Public Utilities in American Capitalism. New York and London: The Macmillan Company (10 South Audley Street, London, W.1), 1957. 9½″. Pp. 634. 52*s*. 6*d*.

[To be reviewed.]

HAMMOND (B.). Banks and Politics in America, from the Revolution to the Civil War. Princeton, New Jersey: Princeton University Press, 1957 (London: Oxford University Press, 1958). 9½″. Pp. xi + 771. 100*s*.

[To be reviewed.]

HANDLER (M.). Antitrust in Perspective. The complementary roles of rule and discretion. New York: Columbia University Press, 1957 (London: Oxford University Press, 1958). 8″. Pp. vi + 151. 24*s*.

[The central question discussed in these lectures is the extent to which it is the function of the judiciary to apply the discretionary canon of " reasonability " in deciding whether a given practice is or is not contrary to the anti-trust acts. The approach which Professor Handler himself believes to be most appropriate and most in keeping with the ultimate objectives of anti-trust legislation is that the judiciary should exercise discretion in deciding whether or not a given practice does or does not militate against competition, but should *not* regard it as within its competence to decide that lessening of competition, if proved, is reasonable; this latter is excluded, since the aim of the legislation is expressly to maintain competition. The principles which Professor Handler favours are in fact actually adopted by the Supreme Court at the present time in the interpretation of the Sherman Act, but a different rule, and in his view a worse one, governs the interpretation of the Clayton Act. Professor Handler suggests the same general principles should apply to the treatment of mergers, which is at present in a very confused state.]

HEATH (S.). Citadel, Market and Altar. Outline of socionomy, the new natural science of society. Baltimore, Maryland: The Science of Society Foundation (Roadsend Gardens, 1502 Montgomery Road, Elkridge 27), 1957. 9½″. Pp. xxiv + 259. $6.00.

[The author, who was born in 1876, has had a successful and varied career as an engineer and as a lawyer. He sets forth in this book a general theory of the organisation of society. The most concrete feature of the system he envisages is that many if not all of the functions of the State would be taken over by property owners as a class.]

HICKMAN (W. B.). Corporate Bonds: Quality and Investment Performance. National Bureau of Economic Research, Occasional Paper No. 59. New York: National Bureau of Economic Research 1957. 9″. Pp. x + 33. 75c.

[This is a summary of the author's forthcoming book, *Corporate Bond Quality and Investor Experience*, to be published shortly by the National Bureau. The findings include particulars on yields and losses on corporate bonds of different grades in the United States between 1900 and 1943.]

JAMIESON (S.). Industrial Relations in Canada. Ithaca, New York: Cornell University Press, 1957 (London: Oxford University Press, 1958). 8½″. Pp. viii + 144. 14*s*.

[This is the first of a projected series of studies on industrial relations in countries outside the United States. It sets a high standard of lucidity and interest. The author deals in successive chapters with the economic and social setting, the origin and growth of the Canadian labour movement, the structure and policies of Canadian unionism, and government policy—this latter chapter containing also a survey of the main issues in Canadian industrial relations since the war. Most Canadian unions are branches of " international " unions dominated by the United States membership, and the history of industrial relations in Canada reflects a mingling of influences from the United States and of such specifically Canadian factors as the predominance of agriculture, the importance of recent immigration and also of emigration to the United States, and the strength of the Catholic Church in French Canada.]

LEE (D. H. K.). Climate and Economic Development in the Tropics. New York: Harper & Brothers for the Council on Foreign Relations (London: Oxford University Press), 1957. 8½″. Pp. xviii + 182. 28*s*.

[This provides a useful brief survey of the results of much recent work by geographers and others. The author begins with a discussion of the classification of climates, with special reference to the nature of tropical climates. He then proceeds to consider the effects of climate on crop production, animal husbandry (which much of his own research has been devoted to), human health and efficiency, and industry. A concluding chapter discusses future prospects. Professor Lee suggests that the ill-effects of tropical climate as such on Man are probably less than was formerly supposed. In the case of indigenous populations in tropical countries, poverty and disease rather than climate are the main causes of poor health and poor performance; and Europeans, even when " acclimatised," often fail to modify their way of life and social habits sufficiently radically to meet the requirements of a tropical environment.]

LIESNER (H. H.). The Import Dependence of Britain and Western Germany: A Comparative Study. Princeton Studies in International Finance, No. 7. Princeton, New Jersey: International Finance Section, Princeton University, 1957. Pp. 84.

[The author sets out to consider, mainly with reference to the period 1950–55, why it is that Western Germany's imports are so much smaller than those of Great Britain, notwithstanding that the two countries have roughly the same population and area and are at broadly similar stages of general development. He analyses in detail the two categories, food and raw materials, which between them account for by far the greater part of imports in both countries. This analysis includes much interesting and valuable information about the comparative structure of the two economies. Higher domestic production of food and raw materials and lower total consumption of them both contributed to Germany's lower import level. The author suggests that ultimately much of the explanation of the difference arises from the bias imparted to the structure of the German economy by the protectionist character of its commercial policy in the past.]

NEWMAN (J. W.). Motivation Research and Marketing Management. Boston, Mass.: Graduate School of Business Administration, Harvard University, 1957 (London: Bailey & Swinfen, 1958). 8½″. Pp. xiv + 525. 60*s*.

[The aim of this book is to show how " behavioural science," *i.e.*, analysis of why people behave as they do, can assist in the planning of advertisements and in selling generally. As usual with Harvard Business School publications, numerous entertaining examples are drawn from the results of field work.]

NEYMAN (J.) (Ed.). Proceedings of the Third Berkeley Symposium on Mathematical Statistics and Probability. Vol. V: Econometrics, Industrial Research and Psychometry. Berkeley and Los Angeles: University of California Press, 1956 (London: Cambridge University Press, 1957). 10½″. Pp. 184. 43*s*. 6*d*.

[The papers contained int his volume were delivered at Berkeley in December 1954, and July and August 1955. The four papers on Econometrics are of an extremely specialised character. The first by K. J. Arrow and L. Hurwicz is entitled Reduction of Constrained Maxima to Saddle-Point Problems, while the other three, by E. W. Barankin, C. W. Churchman and P. Suppes, are all concerned with the foundations of probability, utility and decision theory.]

NUSSBAUM (A.). A History of the Dollar. New York: Columbia University Press, 1957 (London: Oxford University Press, 1958). 8″. Pp. 308. 36*s*.

[To be reviewed.]

OLIVER (H. M.). Economic Opinion and Policy in Ceylon. Durham, North Carolina: Duke University Press for the Duke University Commonwealth Studies Center (London: Cambridge University Press), 1957. 9½″. Pp. xiii + 145. $3.50.

[This book provides a brief but perfectly adequate account of Government economic policies in Ceylon from 1916 onwards. But, in spite of assiduous study of the available printed sources, its author strikes a number of false notes in trying to account for the opinions and motives behind those policies. There may be several reasons for this: an insufficiently critical approach, the unfamiliarity of an Oriental society, the interpretation of survivals of colonial methods as " interventionism," and an apparent failure to meet politicians and senior Government servants.]

PERLMAN (M.). Labor Union Theories in America. Background and development. Evanston, Illinois: Row, Peterson, 1958. 8½″. Pp. xv + 313. $6.00.

[To be reviewed.]

SAULNIER (R. J.), HALCROW (H. G.) and JACOBY (N. H.). Federal Lending and Loan Insurance. Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Oxford University Press), 1958. 9½″. Pp. xxx + 566. 96*s*.

[To be reviewed.]

SHIOMI (S.). Japan's Finance and Taxation, 1940–1956. Translated by S. HASEGAWA. New York: Columbia University Press, 1957 (London: Oxford University Press, 1958). 10″. Pp. xi + 190. 48*s*.

[To be reviewed.]

SHISKIN (J.). Electronic Computers and Business Indicators. National Bureau of Economic Research, Occasional Paper 57. New York: National Bureau of Economic Research, 1957. 9″. Pp. 48. $1.00.

[The author is chief economic statistician in the United States Bureau of the Census. He describes the ways in which the use of electronic computers makes possible the use on a large scale of techniques of eliminating seasonal and other such disturbances from statistical series and so serves to assist government and business to make well-informed and up-to-date appraisals of trends in activity. The cost of processing statistical series in this way, and so making them more intelligible, is negligible compared with the cost of collecting the raw data.]

SPULBER (N.). The Economics of Communist Eastern Europe. New York: Technology Press of the Massachusetts Institute of Technology and John Wiley (London: Chapman & Hall), 1957. 9″. Pp. xxviii + 525. 100*s*.

[To be reviewed.]

WEINTRAUB (S.). An Approach to the Theory of Income Distribution. Philadelphia, Pennsylvania: Chilton Company (London: Bailey & Swinfen), 1958. 8½″. Pp. x + 214. 52*s*.

[To be reviewed.]

WHITIN (T. M.). The Theory of Inventory Management. Second edition. Princeton, New Jersey: Princeton University Press (London: Oxford University Press), 1957. 9″. Pp. ix + 347. 52*s*.

[The first edition of this book was noticed in the ECONOMIC JOURNAL of March 1954, p. 227. The second edition includes as appendices six further articles on the subject published by the author since the first edition appeared.]

WINNICK (L.). American Housing and its Use. The demand for shelter space. In the Census Monograph Series sponsored by the Social Science Research Council in co-operation with the Bureau of the Census of the United States Department of Commerce. New York: John Wiley (London: Chapman & Hall), 1957. 9″. Pp. xiv + 143. 44*s*.

[This study is based mainly on the Census of 1950. The analysis is conducted in terms of the number of persons per room. This ratio is related to a number of variables that might be held to affect it: income, household size, rent, location and race. Trends over time are also discussed. The result is a valuable work of reference, and the many interesting findings cannot be briefly summarised. Some of the more noteworthy may be mentioned. Improvement in the housing-space standard in the United States during the last half-century has been modest: the non-farm person-per-room ratio has apparently not been reduced by more than 15–20% since 1900. The extent of under-utilisation of space caused by rent restriction appears to have been small, though not negligible. There is no evidence of any marked trend towards increased use of separate living-quarters by the elderly, though the proportion of dwellings occupied by the elderly has, of course, increased with the rise in the ratio of elderly to total population.]

Womanpower. A Statement by the National Manpower Council with chapters by the Council Staff. New York: Columbia University Press (London: Oxford University Press), 1957. 9″. Pp. xxxi + 371. 40*s*.

[To be reviewed.]

German

OERTEL (R. R.). Das System der Sowjetwirtschaft. Institutionelle Faktoren, Marginalprinzip und Gleichgewicht in der Sowjetwirtschaft der stalinistischen Periode. Berlin: Duncker & Humbolt, 1957. 9″. Pp. 209. DM. 18.60.

[To be reviewed.]

RITTERSHAUSEN (H.). Bankpolitik. Frankfurt: Knapp, 1956. 8″. Pp. 222.

[The main distinction of this book on money, credit and banking is that it pursues its subject down to the level of individual firms and individual transactions. The author contends that there are credit elements in all transactions, whether by the banking system or not; secondly, he holds that the influence of the effective money supply on prices should be analysed by considering the pricing process on actual markets. In this last respect he is, by his own admission, not entirely successful. Policy is mainly represented by a preoccupation with inflation as it occurred in Germany in the early twenties, and the need to prevent similar inflationary increases in the money supply; there is, however, surprisingly little discussion of the means of credit policy and the details of central banking.]

WEBER (A.). Kurzgefasste Volkswirtschaftslehre. 7th edition. Berlin: Duncker & Humblot, 1956. 9½″. Pp. xvi + 304. DM. 14.

WEBER (A.). Kurzgefasste Volkswirtschaftspolitik. 7th edition. Berlin: Duncker & Humblot, 1957. 9½″. Pp. xii + 395. DM. 16.

[These are revised editions of two out of three companion volumes which together constitute a first course in economics, the third volume being devoted mainly to German conditions. The first book is an introduction to economic principles rather than a text-book, with more emphasis on points of view and modes of approach than on the mechanics of particular processes. The second book is more descriptive and mainly concerned with the structure of the economy and the role of various institutional arrangements rather than with short-term economic policy. Both books are classical in outlook, pre-Keynesian, orthodox and not free from dogmatism. They have been brought up to date in the sense that the theoretical developments of the last few decades are all mentioned; but in general the author does not approve of them, and on these occasions is given to polemics rather than to exposition.]

Swiss

BOEHLER (E.). Nationaloekonomie—Grundlagen und Grundlehren. Zurich and St Gallen: Polygraphischer, 1957. 9½″. Pp. 289.

[But for its insistence on the metaphysics of the subject, this would be an elementary text-book of the principles of economics. As it is, the author attaches much more importance to methodological matters than is usual, and parts of the book read like a monograph on the nature, object and method of economics. In addition to this, however, it contains a straightforward exposition of some of the elements of economics. There is first a chapter on the institutional framework, followed by a discussion of economic flows, including the generation of national income, and by a chapter on money and banking. Only then is the analysis of prices and cost introduced. The book concludes with briefer notes on the distribution of income and on the trade cycle.]

BOLLIER (R. D.). Die These einer chronischen Dollarknapheit. Zurich and St Gallen: Polygraphischer, 1956. 8″. Pp. 239. Sfr. 14.50.

[This doctoral thesis reviews various arguments which have been put forward to support the view that the persistent dollar shortage may be a permanent phenomenon. It concludes that, on balance, the case against the return to equilibrium by unaided economic forces must be accepted.]

FREI (R.) (Ed.). Economic Systems of the West. Vol. 1. Basle: Kyklos; Tübingen: Mohr, 1957. 9½″. Pp. 247. DM. 22.

[This symposium had its origins in an article in *Kyklos* in which Calvin B. Hoover suggested that there was a need for a survey of the extent to which the economies of each of the countries of the West could legitimately be described in terms of a competitive model. The list of questions which he drew up in that article has been before the contributors to the present volume and has served to give their contributions the same focus. Most of the questions related to aspects of competition, monopoly and state control of industry, but more general questions about the economic activities of the State were also included, and the various authors differ somewhat in the relative amount of emphasis placed on the two aspects. The countries covered in the present volume are Belgium (by V. Janssens), Denmark (by B. Fog), Great Britain (by G. C. Allen), Japan (by Gen-ichi Abe), Holland (by C. Goedhart, J. F. Haccou, P. Hennipman and J. H. van Stuyvenberg), Austria (by W. Weber), Spain (by H. P. Eguilaz) and Sweden (by H. Hegeland). Some of the articles are in German, some in English and some in French, and summaries are provided in each language. A second volume dealing with other countries is promised.]

HAERRY (H.). Die Intensitaet des Wettbewerbs. Winterthur: Keller, 1954. 8″. Pp. 108.

[A doctoral thesis which deals with the different definitions and measures of the degree of competition (or its absence) which are current. The author's own contribution is to suggest a subjective approach in which the entrepreneur's consciousness of various threats to his profits is the decisive characteristic of the market situation.]

STOHLER (J.). Der Basler Arbeitsrappen. Zurich and St Gallen: Polygraphischer, 1957. 8½″. Pp. 180. Sfr. 14.50.

[The title of this book refers to a programme of public expenditure adopted by the City of Basle during the pre-war depression in order to relieve local unemployment. The first half is taken up by a description of this programme, which consisted mainly in increased expenditure on building and construction, financed by a loan, which in turn was serviced by a special tax on employment

income. There follows a survey of the theory of employment and income and an outline of a corresponding model for local economic policy. The latter is, of course, similar to the usual model but for a much higher propensity to import. The presentation is noteworthy in that the author makes some attempts to arrive at specific numerical values of the coefficients for the particular case with which he is dealing.]

STUTZ (F. N.). Der Konjunkturtest. Zurich and St Gallen: Polygraphischer, 1957. 8″. Pp. 291. Sfr. 18.65.

[The greater part of this book consists of an exhaustive description of the surveys of business opinion which in recent years have been adopted by the IFO-Konjunkturinstitut in Munich and the I.N.S.E.E. in Paris. The main characteristic of these surveys is that those taking part are asked to indicate the tendency of a wide range of economic variables without, however, having to give any exact numerical information. This ensures high response rates and a rapid collection of information; more important, surveys of this type successfully probe the intentions and expectations of the business world. It is the latter property to which the author attaches most importance, and after the description of the methods used in these surveys he reviews various economic theories which have some bearing on anticipations and uncertainty. The survey data are then fitted in various ways into the slight theoretical framework which the literature yields. Finally, an attempt is made to judge the reliability of the survey results by internal evidence. The important question how this unconventional type of statistics is to be interpreted, and how it fits in with the customary aggregate characteristics, is mentioned, but it appears that the solution to it has not yet been found.]

Belgian

VANDENBORRE (H. J.). De Geldkringloop in de Keynesiaanse theorie. Leuven: Ceuterick, 1956. 8″. Pp. 171.

[This doctoral thesis, entitled " Money Flows in Keynesian Theory " is a detailed critical analysis of various aspects of Keynes' " General Theory " and some of the reformulations of the central theoretical parts which have been suggested later. The author makes much of the algebra of the savings-equals-investment equation, for example, but rejects it finally mainly because paid-out income lags behind and is not necessarily equal to the value of production. The other points which he raises seem to be of the same order of importance, but the book is difficult to read, and this may conceal its real contribution. On the face of it, however, it appears to correct Keynes and later expositors of his theory on a number of minor points without adding much to economic analysis.]

Dutch

CHILD (F. C.). The Theory and Practice of Exchange Control in Germany. A study of monopolistic competition in international markets. In the International Scholars Forum series. The Hague: Martinus Nijhoff (London: Batsford), 1958. 9½″. Pp. 241. 38*s*.

[To be reviewed.]

COBNENHAGEN (M. J. H.). Economische geschriften. Amsterdam: Elsevier, 1957. 10″. Pp. 605.

[A memorial volume of selected papers, posthumously collected, which are mainly concerned with philosophical and ethical considerations bearing on the nature of economics.]

HACCOÛ (J. F.). Some Fundamental Problems of Policy Formation and Organisation in the Commercial Field. Leiden: Stenfert Kroese, 1957. 9″. Pp. 53.

[The first of these two lectures deals with certain general questions of organisation in a distributive undertaking. The second lecture deals with the particular problem of what he calls the " assortment " or choice of product-mix. The author's addiction to an abstract and unspecific style of writing similar to that of some sociologists does not make for easy reading.]

HUGH-JONES (E. M.) (Ed.). Human Relations and Modern Management. Amsterdam: North-Holland Publishing Company, 1958. 9″. Pp. x + 256. Guilders 20.

[To be reviewed.]

SCHLOSS (H. H.). The Bank for International Settlements. An experiment in central bank co-operation. Amsterdam: North-Holland Publishing Company, 1958. 9″. Pp. xi + 184. Guilders 15.

[This is based on the author's doctoral thesis at Columbia University. It provides a straightforward account of the origins of the Bank, of its part in the reparations negotiations, of its functioning during the 1930s and of its revival after the War. The author has a high regard for the work of the Bank and is sympathetic to the point of view that it has represented.]

SHACKLE (G. L. S.). Time in Economics. Professor de Vries Lectures, No. 2. Amsterdam: North-Holland Publishing Company, 1958. 7½″. Pp. 111. Guilders 6.50.

[To be reviewed.]

Japanese

OHKAWA (K.). The Growth Rate of the Japanese Economy since 1878. Tokyo: Kinokuniya Bookstore, 1957. 8½″. Pp. v + 250.

[This is an important and pioneering collection of newly estimated statistical series relevant to the study of Japanese economic development. The data given include: national income in total and in primary, secondary and tertiary industries respectively; output of leading commodities; prices; total and gainfully occupied population; and a long section on capital. The latter provides estimates of the capital stock at different dates, of the rate of capital formation and of capital-output ratios in particular sectors of the economy. The national-income data are taken back to 1878; the data on capital formation mostly start in the early years of the twentieth century. Full explanation of sources and methods of estimation are provided.]

Nepali

PANT (Y. P.). Planning for Prosperity in Nepal. Kathmandu: Nepal Cultural Association, 1957. 7″. Pp. 152. Nepali Rs. 2/-.

[This small book analyses the main features of Nepal's draft first five-year plan and discusses some of the problems of its future implementation. The author rightly stresses that with " scarcely any statistical data, scant financial resources and inadequate administrative personnel " the Plan will not bring miracles.]

Official

CANADIAN

RESTRICTIVE TRADE PRACTICES COMMISSION, DEPARTMENT OF JUSTICE, OTTAWA. Report Concerning the Manufacture, Distribution and Sale of Metal Culverts and Related Products. Ottawa: Department of Justice, 1957. 10″. Pp. 157.

[This inquiry relates to the system of uniform pricing practised by manufacturers of metal culverts in Canada. This system is found to result from deliberate agreements between manufacturers and not from price leadership or other such cause.]

INTERNATIONAL

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT and INTERNATIONAL MONETARY FUND. Current Problems of Credit and Fiscal Policy. An informal discussion at the twelfth annual meeting of the Boards of Governors. Washington, D.C.: International Bank for Reconstruction and Development and International Monetary Fund, 1957. 11″. Pp. 24.

[This contains a series of short addresses, mainly on problems of inflation, by W. M. Martin, Chairman of the Board of Governors of the Federal Reserve System, H. V. R. Iengar, Governor of the Reserve Bank of India, J. Pardo, Governor of the Bank for Peru, Sir Dennis Robertson and Per Jacobsson, Managing Director of the IMF.]

ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION. Eighth Annual Report. Europe To-day and in 1960. In two volumes. Paris: O.E.E.C., 1957. 9½″. Vol. I: Pp. 120; Vol. II: Pp. 152. 7*s*. each volume.

[The first volume contains a review of economic conditions and problems in Europe up to the end of 1956, including a chapter on the economic effects of the Suez crisis. The second volume gives projections of production and consumption of various classes of product in Europe in 1960. Given the maintenance of full employment and the expected growth in productivity, a rise in GNP in real terms of about 17% is forecast for the period 1956–60.]

ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION. Liberalisation of Europe's Dollar Trade. Second Report, June 1957. Paris: O.E.E.C., 1957. 9½". Pp. 164. 9s.

[This contains an account of the measures taken to relax quantitative restrictions in the OEEC countries on trade and invisible transactions with the dollar area. Discussion is also included of the effects of liberalisation and its relation to the state of the balance of payments.]

UNITED NATIONS. Economic Survey of Europe in 1957, including studies of the international trade of European countries and manpower and employment in Eastern Europe and the Soviet Union. Prepared by the Research and Planning Division of the Economic Commission for Europe. Geneva: United Nations, 1958. 11". Pp. 390. 28s.

[To be reviewed.]

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THE ECONOMIC JOURNAL

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THE PLACE OF ECONOMICS AND ALLIED SUBJECTS IN THE CURRICULUM[1]

MY predecessor in the office of President of the Society took as the subject of his address " The Teaching of Economics in Schools and Universities." If his successor in office had been another teacher of economics, no apology would have been needed if he had chosen to follow in Professor Robbins' footsteps and had resumed the discussion of the same subject; for it may be said to be among the unsettled questions of political economy. Did not Professor Robbins, when concluding his address, say that these matters are " very controversial "?[2] But I have never taught economics to anyone. My subject is the place in the curriculum of economics and allied subjects, and by the latter I mean in particular the other special social sciences. I shall say more about schools than about universities; in the latter these subjects are firmly established, whereas in the former the teaching of them is at an experimental stage.

I

Beginning with schools, I propose first to take note of such evidence as throws light on the extent of the formal study of the social sciences. The most illuminating evidence is derived from the number of entries for the General Certificate of Education, though, as will presently appear, not all entries are made by candidates from schools. The subjects for which candidates may enter are grouped under broad headings, of which three fall within the social sciences: Economics (including Economic and Public Affairs); English Economic History (including Economic Structure of England and Industrial History); and British Constitution. It is also possible to offer Commercial Subjects, but only at Ordinary level; since under this heading come book-keeping, shorthand and typewriting, the subjects there classed do not call for attention in the present context. The number of entries from 1952 to 1956 for each of these three subjects, at

[1] Presidential address delivered to the annual meeting of the Royal Economic Society on July 17, 1958.

[2] Lionel Robbins, " The Teaching of Economics in Schools and Universities," ECONOMIC JOURNAL, Vol. LXV, 1955, p. 593.

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Ordinary and Advanced levels, is set out in Table I; the figures for 1951, when the new system began, are omitted because they were not presented in a manner which makes it possible to compare them with those for 1952 and later years. From 1952 to 1954 there were eight examining authorities, and in 1955 and 1956 there were nine. The number of authorities which included papers in these subjects is given in brackets after the figures for entry. The number of entries, it may be added, exceeds the number of candidates, because most candidates make more than one entry; in 1956 there were in all 1,219,634 entries and 281,728 candidates.

TABLE I

Entries for the General Certificate of Education

Year.	Ordinary level.			Advanced level.		
	Economics.	English Economic History.	British Constitution.	Economics.	English Economic History.	British Constitution.
Summer 1952	1,838 (6)	933 (3)	311 (2)	1,394 (8)	597 (3)	465 (1)
,, 1953	2,100 (6)	1,354 (1)	384 (2)	1,563 (8)	745 (2)	593 (1)
,, 1954	2,338 (6)	1,509 (2)	444 (2)	1,874 (8)	799 (2)	670 (2)
,, 1955	2,842 (6)	2,104 (4)	665 (2)	2,129 (9)	996 (2)	848 (3)
,, 1956	2,825 (7)	2,352 (5)	640 (4)	2,653 (9)	1,195 (4)	1,117 (3)

How are we to interpret these figures? There are well over half a million young people in each of the annual age groups whence candidates are drawn; hence it follows that these subjects are studied only by a tiny fraction of these young people. But this is merely a reflection of the fact that among them full-time study of any subject is confined to a very small section. It might seem illuminating to relate the entries for these subjects to all entries at the corresponding level; thus in 1956 entries for Economics formed 0·26% of all entries at Ordinary level and 1·7% at Advanced level. But this is misleading unless account is taken of the fact that entries at Ordinary level for English Language, the most popular subject at that level, formed only 15% of all Ordinary level entries, and that entries at Advanced level for Physics, the most popular subject at that level, formed only 14% of all Advanced level entries. Perhaps the most informative way of assessing the place held by these subjects in relation to others is to set out the entries for them alongside those for some of the other fifty-one subjects which can be offered at Ordinary level and some of the other thirty-one subjects which can be offered at Advanced level. This has been done in Table II.

It appears that at Ordinary level, relatively to other subjects, the three social science subjects take a very low place; at Advanced level they take a considerably higher place. But it must not be assumed that these figures represent the relative place of these subjects in schools, because some candidates for the Certificate do not come from schools. This fact would

have no bearing on the interpretation of the figures if entries by non-school candidates were distributed over all subjects in the same proportion as by school candidates. But there is evidence that this is not so. The authorities of London University have been good enough to supply me with figures showing that in 1957 there were 10,617 school candidates,

TABLE II

General Certificate of Education, Summer 1956

Subject.	Number of entries.	
	Ordinary level.	Advanced level.
English Language	162,763	—
English Literature	112,435	15,550
French	100,975	11,394
Mathematics	117,653	18,508
Geography	88,745	8,509
History	86,549	11,997
Latin	39,986	6,483
General Science	25,747	—
Physics	39,457	21,253
Chemistry	36,390	18,160
German	14,951	3,038
Economics	2,825	2,653
Greek	2,380	1,518
Economic History	2,352	1,195
Geology	857	477
British Constitution	640	1,117

of whom 442 entered for Economics at the Advanced level, and 9,690 non-school candidates, of whom 1,220 entered for that subject at that level. In London, Economics at Ordinary level is also more popular among non-school than among school candidates, but to a lesser extent than at Advanced level. Though there are reasons for thinking that the London experience is not precisely repeated under other authorities, it is clear that Economics in schools, especially at Advanced level, does not occupy as high a place in relation to other subjects as the figures in Table II suggest.

The number of schools submitting candidates for these subjects at the G.C.E. provides further evidence of the extent to which they are taught. Concerning this there are no published figures; once again I am indebted to the University of London for the following information. In London, in 1957, 93 out of 687 schools, or less than one in eight, submitted candidates for Economics at Ordinary level, and 91 schools out of 525, or less than one in six, submitted candidates at Advanced level. Thus only a small proportion of schools in the London sample teach Economics—the most popular of the three social science subjects. There is no corresponding information for technical institutes, whence come over half of all non-school candidates for the G.C.E.; but the great majority of them are known to be equipped to teach the social sciences, and in this respect they stand in contrast to the

schools. This is perhaps the place to say a word about the work of the technical institutes and the other Further Educational Establishments as they are called in official terminology. They play a very large and important role in the teaching of the social sciences; they offer courses for those who have in view professional examinations, National Certificates in Commerce or other objectives. Their work is so varied that no description of it can be attempted here. Moreover, it falls largely outside the field to which I wish to direct attention; I am thinking of the study of the social sciences by those who are below the normal age of entry to a university, and over half the students in all Grant-aided Establishments for Further Education (that is over 1 million out of 2 million) were aged twenty-one or over in 1956. Arising out of this situation, it is not surprising to find that 40% of the candidates for the G.C.E. who come from these sources were aged nineteen and over, as against 3% in the case of maintained grammar schools.

I pass now from the extent of the study of these subjects, as measured by entries for the G.C.E., to the nature of the syllabuses as laid down by the various authorities. On this point I can be very brief. A study of the syllabuses for those papers, classed under the heading of Economics at Ordinary level, is a bewildering experience. The Cambridge authority calls the subject Economic and Public Affairs; there are various options, among them Structure and Working of British Government and World Affairs since 1919. The other authorities all call the subject Economics, but the divergences between the syllabuses are very large. The Oxford authority sets a paper in two sections, one called The National Income and the Balance of Payments and the other Economic Development in Britain since 1919. The Durham authority and the Joint Matriculation Board, the former setting two papers, give a considerable place to economic theory; the London and Welsh authorities provide syllabuses which are largely descriptive. At Advanced level the syllabuses are not quite as divergent, though the amount of attention given to economic theory and to descriptive economics differs greatly in depth and breadth. Of the other two social-science subjects it is enough to say that differences between the authorities are found, not only in the content of their syllabuses, but also in their attitude to these subjects; some authorities omit them altogether; some find a place for them under another heading, and others again give them a place of their own.

This is a very brief and compressed summary of the place now occupied by social science subjects in the curriculum of the grammar schools. But out of what has been said the following picture emerges. So far as the number of entries is evidence of the extent of study, the amount of attention given to these subjects is small in relation to that given to other subjects. So far as the number of schools submitting candidates is evidence of the extent of facilities for teaching these subjects, the proportion of schools

which possess these facilities is inconsiderable. The facts relating to the number of examining authorities setting papers in these subjects show that they are in doubt whether these subjects should occupy a place in their schemes of examinations. The extraordinary diversity between the syllabuses in all subjects indicates that among those who compose them there is no consensus of opinion concerning their proper content.

It is clear that the place of the social sciences in the school curriculum is an unsolved problem. These subjects have been introduced into the curriculum only in recent years, and when a new subject is introduced, time is needed before it assumes a satisfactory place and shape. But as yet, in regard to the social sciences, things show no signs of moving in that direction; indeed, there are some who hold that these studies are not suited for schools. This is not a satisfactory state of affairs, and there will be no improvement unless all those concerned take an active interest in the problem. Those concerned are the teachers of the subjects in schools, the Institutes of Education, the Ministry of Education and especially those who teach the subject in universities. The latter, in the present case, are the economists; most of the teaching of the social sciences in schools now passes under the head of Economics; moreover, Economics is the oldest and most firmly established among the social sciences, and therefore economists are in a position to exercise powerful influence over the whole field which is under discussion. It is hardly necessary to say that, of those concerned, the teachers in schools give much thought to the problem, but they are left isolated and without help from the others who should be concerned.

In this respect the position of social science teachers in schools stands in sharp contrast to the position of teachers of other school subjects. Let me illustrate what I mean. In 1956 the Ministry of Education organised eighty-five short courses (so-called refresher courses) for serving teachers, but among them no course for teachers in Economics though the teachers have asked for this assistance.[1] The Economics Association, a body which these teachers have formed, has had to organise refresher courses for its members, who must pay their expenses if they attend, whereas teachers in other subjects attending officially organised refresher courses can claim their expenses from the local authorities. Institutes of Education organise courses for teachers in many subjects, but never, so far as I have been able to ascertain, in Economics. Again Institutes of Education include on their staffs members who take a special interest in the teaching problems of particular subjects, but never, so far as I know, in the teaching of the social sciences. Through bodies such as the Geographical Association, the Mathematical Association, the Historical Association, the Classical Association

[1] Courses for teachers of Commerce are sometimes provided and include general topics, such as wage policy, which are of interest to teachers of Economics; but they do not touch the problem of teaching Economics in schools.

and others, membership of which is open to all teachers of the subjects wherever they serve, close and continuous association is maintained between the schools and the universities. These bodies publish periodicals, such as *The Mathematical Gazette*, *Geography* and *The School Science Review*, which are largely devoted to teaching problems in schools; they also publish special reports on particular problems; the Mathematical Association published the thirty-eighth report of this kind in 1955. Conferences are held open to all teachers, two a year by the Geographical Association.[1] There is no similar contact through such means between teachers of Economics in schools and universities. Membership of the Economics Association "is open to all who are interested in the teaching of social studies in schools and in further education," but apart from the holding of honorary offices, university teachers do not join.[2]

II

As I have indicated, I propose to devote most of what I have to say to the place of the social sciences in the school curriculum, and I shall do so in the hope of enlisting the help of economists in finding a way to a better state of affairs. The first question is whether the social sciences should find any place in the school curriculum. I am addressing an audience of which the members are or have been connected with universities, and there is matter arising out of the attitude of the universities to the school curriculum as a whole about which I may first say a word. The situation under which the schools go about their business is as follows. At about the age of fifteen four out of five pupils leave and cease full-time education; at the age of seventeen only one in eleven, and at the age of eighteen only one in thirty, is still at school. The schools must keep these facts about age of leaving in the forefront and must do what is possible to provide the leavers with a rounded education at whatever age they depart. The universities are directly interested only in those pupils who will become candidates for university entrance, and are troubled because candidates often exhibit inadequate capacity for clear thought and expression. This creates sympathy with the proposal that more school time should be devoted to basic drill and that, in order to find time, such subjects as social studies should be excluded from the curriculum. But if social studies ought to find a place in the curriculum of those who will not seek to enter a university, a matter still to be discussed, there is a conflict between what the schools must do and what those who favour this proposal would like them to do; this is so because it is not possible to identify university candidates in

[1] An inspection of the syllabuses for other subjects reveals no such diversity as that which characterises the syllabuses for social science subjects. Thus there is evidence of a consensus of opinion concerning the most suitable way of teaching other subjects which may be attributed to the attention devoted to teaching problems in schools by the bodies mentioned above.

[2] Membership of the Association of Teachers in Economics is open only to university teachers.

advance, and therefore to isolate and treat them separately. Does this mean that the interests of the best equipped of the school population, the potential university candidates, may have to be sacrificed to those of the less well equipped—in fact, to those of the great majority? I do not think so, because I believe that proposals of this nature are fundamentally misconceived. The subjects attractive to pupils, and one of the reasons advanced for the exclusion of social studies is their attraction, are those likely to stimulate thought and expression. More generally, barrack-square drill and field manœuvres should go hand in hand; otherwise the barrack-square product is likely to be of very limited use when the engagement begins. Dropping metaphors, is not the aim unobtainable in this way? I recall an odd case which came to my notice many years ago. A man was a candidate for a number of subjects in an examination; he passed in proficiency as a teacher, but failed in all the subjects which he proposed to teach. This strange and, it would be thought, impossible product of the educational system bears some resemblance to the type of candidate for university entrance whom certain university teachers would apparently welcome, the candidate who has somehow acquired proficiency in thinking and communicating, but has had little of interest to think about or express.

From this it follows that social studies need not be excluded from the school curriculum because their inclusion conflicts with the broad educational needs of any section of the school population. It even gives some support for their inclusion if it is true that social studies attract pupils, since, unless there are reasons to the contrary, subjects that interest pupils should have preference. But this is to anticipate. If we step back from the present scene and think of earlier ages when there were no schools and the young picked up such knowledge as they acquired, it was about the social world in which they lived that they picked up most. Men must always learn something about the social world, because in order to get on at all, they must be able to comport themselves in it. When in very recent times school education began, it was obvious that, if the history of the social world is important, the young must be taught about it; it is not knowledge of the kind which is picked up. But to the young at least history has little bearing on the social world which they experience; nevertheless, so deep-seated is the belief that enough knowledge of social institutions can be picked up, even to-day when their complexity is bewildering, that it does not occur to us to ask if there may not be a gap in the curriculum.

If we turn to the secondary modern schools for a moment we find something of interest in the present context. In these schools there is social study on a wide scale, though of the most simple kind. It takes the shape of selecting topics as the inclination of the pupils and the local surroundings may suggest; among the topics may be transport, food supply, housing, local government and so on. Some knowledge is gained; that there are problems becomes clear, and thought about them is encouraged.

That the ends of general education are promoted by such studies there seems to be no doubt at all. Evidence relating to leavers from secondary modern schools who continue their studies and have opportunities to take social subjects in such institutions as the Bournville Day Continuation College and the Ipswich School of Commerce and Social Studies points in the same direction. If such pupils are in employment the relevance of their studies is especially obvious; they are avid to know more about, and to understand better, the world into which they have been launched. They acquire some understanding of their place in the world and of their rélation to their fellows; their faculties are sharpened; they are being educated in the wide sense of the word. If compulsory part-time attendance came about, social study should have a prominent place in the curriculum; if study were continued long enough and it were thought suitable for pupils to sit for the G.C.E. at Ordinary level there might well be an increasing stream of candidates for social science subjects. This goes to suggest that there is an important place in the curriculum of grammar schools for social studies.[1]

All this is coming about because the needs of four-fifths of the school population are being examined afresh and, as it were, on the spot, untrammelled by conventional and traditional ideas as to subjects which it is proper to include in the curriculum. When that happens, the value of social study becomes very evident. It is time that we loosened our minds and considered afresh the needs of the remaining fifth of the school population, those who have been selected to enter grammar schools, the élite in other words. Social study in these schools is now largely confined to history, with some help from geography; no one questions their great value, but they can do little to help towards an understanding of the immediate social world which presses upon young people and with greater insistence as they grow up. About this world they pick up some knowledge and a few notions of how it works. Surely there is reason to say that it would be advantageous if at Ordinary level there were as many entries for social science studies as for history; at present there are over thirty times more entries for the former than for the latter. It is studies at Ordinary level about which I am now speaking, and they deserve most attention, because there are in all seven times as many entries for Ordinary as for

[1] For the Bournville Day Continuation College, where 90% of the pupils had attended secondary modern schools, see R. S. Miles, "Social Studies and the Young Worker," *Journal of Education*, November 1951, p. 593. For the Ipswich School of Commerce and Social Studies see H. G. Benner, "A Successful Educational Experiment," *Education and Commerce*, October 1953, p. 12. In the latter there were some 200 full-time and some 250 part-time day-release students who had previously attended secondary modern schools. Some of those who continued their education full-time for two years sat for G.C.E. papers with success.

In 1955–56 there were in England and Wales nearly 400,000 day-release students attending vocational courses. It would undoubtedly be of great benefit to them if they could combine social study with their vocational work. On this subject see M. Strachan Cousins, "Social Science and Technology," *Journal of Education*, November 1951, p. 594.

Advanced level. That there is even this number of entries for social science subjects is surprising and affords evidence of the interest which they arouse when it is remembered that not all examining authorities include them and that only a small minority of schools prepare for them, to which may be added the fact there is little support for them from the schools which teach them.

It is in general education that I am interested and not primarily in what is called education for citizenship, by which I understand an attempt to produce a better-informed electorate. But let me hasten so say that I am old-fashioned; although we watch experiments in parliamentary government deriving its authority from an electorate which is mostly illiterate and note that they have not yet come to grief, I still believe, to use Mills' words, that it is " highly desirable " that voters should be well informed about public affairs. Thus education in the social sciences has a subsidiary function to perform. Let me also say that I am thinking of the study of the social sciences as laid out in a syllabus having all those attributes which are necessary when a subject is included in a scheme of formal study. Talks about citizenship, and classes devoted to current affairs, are excellent features in some schools. The master opens the newspaper and says that the Zambesi is in flood and threatens the Kariba dam; he asks where the Zambesi is and what the dam is for; all this, admirable in itself, does not begin to be a substitute for the formal studies which I am discussing.[1]

III

I have suggested that social science subjects at Ordinary level could become a most valuable element in general education if the scheme of study were thought out afresh. Mere revision of existing syllabuses would not begin to meet the case. The present arrangements should be put out of mind, and an approach should be made, free from the attitude to school education which university teachers are apt to bring with them, especially when, as in the case of economists, they have not previously attended to education at this level. University teachers are inclined to think of education as a staircase leading to the university, forgetting that at each landing a large body of the climbers walk off and climb no farther. Syllabuses are thought of as first steps in the study of a subject, though, for most pupils who use them, this is the only step they will take. The existing syllabuses in Economics seem designed as introductions to the subject, though it is common knowledge that very few pupils indeed will pursue

[1] An interesting innovation has been made by the Joint Matriculation Board. A General Paper, intended for sixth-form pupils, is set at ordinary level. It consists of three sections: current affairs general science and literature; the first section includes papers on economics and politics. The intention is to test general knowledge in much the same manner as in a college entrance examination; but this valuable development in no way forms a substitute for, or an alternative to, the papers in social science subjects which I am discussing.

it—surely a very absurd situation. Again the approach must not be down from the university situation, but up from the situation of those aged fifteen and sixteen. An example of the result of approach from above is the automatic transfer to the school curriculum of the divisions between subjects which are appropriate in universities, but may not provide the most suitable frames into which to put the social sciences for fifth formers. I am not saying that the social sciences should not be taught under the headings of Economics, Economic History and British Constitution; but I do say that it should not be taken for granted that this is the most suitable arrangement.

No scheme worth serious attention could emerge except as the result of the combined labours of those with the necessary knowledge and experience; therefore you would not welcome definite proposals if I had any to put before you. But I will venture on one or two observations. While under any rearrangement subjects must not become too general and therefore amorphous, because they would not then possess those characteristics which are essential for serious study, it might be possible to pay considerable attention to the broad aspects of the contemporary social world, beginning with population, its geographical, industrial and occupational distribution, which are fundamental to the whole social scene.[1] Again it should be a moving and not a static picture; economic history could be linked closely with the position to-day, and so provide this dynamic element. Lastly, economic organisations and their functions must form the core of these studies; they are close to the experience and observation of pupils of this age. Most of them are soon to enter employment, and the nature of the employment of their parents is a matter which governs their lives. It follows that the teachers should be graduates in economics whose university course of study has included, as in my opinion all such courses should do, subjects allied to economics.

This brings me to the teaching problem which any proposal such as I am making creates for the schools. It is one of the less-admirable features of the activities of the organisations mentioned earlier that they function as pressure groups—pressing for more time to be given to the fields of study in which they are interested. The difficulties of arranging the school timetable are well known; there are grammar schools which find a working week of five days not long enough to incorporate all that must be taught, and therefore arrange their programme on a six-day basis, beginning on Monday in the first week, on Tuesday in the second and so on. But my proposal differs from those usually advanced in that it is a plea for more time for general education, whereas pressure is usually for extra time to be

[1] On this subject see V. K. Wright, "Social Studies in the Class-Room," *Journal of Education*, November 1950, p. 600; W. A. C. Stewart, "Social Studies," *Journal of Education*, December 1950, p. 657; and Shirley C. Gordon, "Social Studies in Education," *Educational Review*, November 1954, p. 43.

given to subjects of less wide and general importance. I can illustrate how I see the situation. When I ask those who have left grammar schools without attempting to acquire qualifications for university entrance what subjects they have studied, I come usually to the conclusion that, if for one of these subjects they had substituted social study, assuming that the thorough revision of the treatment of this field, which I believe necessary, had taken place, they would have lost nothing of special value to them in relation to their present employment and would have gained in general education.[1] Thus what I should like to see would not make the time-table more heavy. Admittedly there remains the problem of teachers, and since the teaching strength of a school is in proportion to the number of pupils, my proposal implies the allotment of more of the teaching complement to the social sciences.

I come now to the teaching of the social sciences at Advanced level. There is no doubt that the division into subjects which is customary in universities is appropriate here. About British Constitution and Economic History I do not propose to say anything; in regard to them there may be certain problems of syllabus revision, but there is not any question of their suitability as subjects for the sixth form. Doubts have, however, been expressed about the suitability of Economics as a subject at Advanced level. Some reasons for doubt, such as that Economics is unsuitable because it is controversial, do not deserve serious attention; others are raised by real difficulties. Nine years ago I signed a report which emphasised that economic analysis involves a large degree of abstraction from everyday affairs and that there is no time to carry it forward to a point where it becomes a useful tool.[2] Others have framed somewhat similar doubts in different terms. Professor Robbins has said that "no simple proposition in economics is likely to be true, unless it is understood as being subject to a whole complex of assumption not likely to be read in to it, save by those who have a sufficient knowledge both of the system of propositions as a whole and of the world of reality to which they have reference."[3] These real difficulties may be summed up under two heads, those arising from the need to simplify and those inherent in the fact that school pupils have an incomplete grasp of the world of reality. But these difficulties are encountered in the teaching of other subjects in schools. When my old subject, Biology, is taught, simple statements about the nature of living matter must be made, but they are subject to a whole series of qualifications. History is taught in primary schools to pupils whose outlook is childish. In these and other subjects difficulties of this nature have been faced and

[1] If, as might well be the case, pupils, aiming at qualifications for university entrance, found substitution difficult, this would imply that general education and university requirements are not easily combined.

[2] *Report of a Special Committee on Education for Commerce*, 1949, p. 29.

[3] Lionel Robbins, *loc. cit.*, p. 580.

overcome. Economics is a relatively new subject in schools; we are at a stage when the difficulties have become apparent, and concern is caused because the subject is now sometimes taught at Advanced level without due regard to them. But the difficulties have not yet been faced; that will happen only when university teachers of Economics have made contact with school-teachers and have become familiar with problems of school-teaching and with the manner in which difficulties are overcome in other subjects.

It may be added that the syllabus in Economics at Advanced levels should be designed not only for the benefit of those who will study the subject at a university but also with regard for the needs of those who will not go to a university, and of those who will do so but will not take economics when they get there. University teachers of some subjects, Economics among them, may prefer that their students should begin serious study of these subjects when they get to the university. If the reason for this preference is that their students should have a wide education at school, well and good, so long as other pupils are not deprived of the chance to take up these subjects at school.[1] Concerning the benefits of a wider dissemination, to use Professor Robbins' words, of an " understanding of the great elementary platitudes of the subject—supply and demand theory rather than what may be called the metaphysics of value—combined with descriptions of the real world which permit exercises in the applications of these platitudes," there can be no doubt;[2] this wider understanding would be promoted if sixth formers who are not going to pursue the subject were enabled and encouraged to study it at Advanced level.

Before passing from schools to universities I owe you some apology for dwelling so long on topics which are remote from the interests of economists. But these topics are not remote from their responsibilities. As I have said, the examining authorities are uncertain whether to find a place for social-science subjects, and the school authorities are uncertain whether to teach them. Added to this, the teachers in schools are frustrated and lack help, while graduates in Economics think twice before they take up teaching. Economists have not sought these responsibilities, and may not realise that they rest upon them; but that they have these responsibilities is one of the facts of life in this country at the present time and it is urgent that they should exercise them.[3]

[1] If the reason for this preference is the belief that school pupils do not benefit from studying these subjects, then, in regard to Economics, it is interesting to note that of the twelve graduates of the London School of Economics who specialised in Economics and gained first-class honours from 1952 to 1957, eight had taken an examination in Economics when at school, and that of the seventy-four who gained upper second-class honours fifty-three had also done so. These facts suggest that the belief may not be well founded.

[2] Lionel Robbins, *loc. cit.*, p. 586.

[3] As I have explained, it is not possible to deal in this address with the place of Economics in the work of the Establishments for Further Education. But I may call attention to this problem and of the need to examine it. See E. Davison, J. L. G. Ciano and N. Skene-Smith, " Economics in Professional Studies," *Education and Commerce*, January 1958, p. 8.

IV

The day has long passed when there was need to present a case for the study of Economics in universities. Degree courses in economics are firmly established, but there is some doubt about the nature of these courses.[1] There are degree courses of which the aim is the acquisition of professional competence; courses in medicine and dentistry are examples. The length of the course is determined by the time needed to acquire specialised practical capacity in a defined sphere of action; the degree is evidence that its holder possesses this capacity; thus the degree is in effect a certificate of competence. It is of interest to note that the great majority of those who enter upon professional courses succeed in getting a degree; this means that the average student leaves the university with a certificate of competence. He becomes a professional man, and a professional man is a person to whom a client or an employer, after deciding that something shall be done, say to buy a property, hands over the task of getting it done, in this case to a lawyer who prepares the legal documents. The task of getting it done lies wholly outside the competence of the employer or client, who would never dream of undertaking it himself. If this is a correct description of professional functions, an economist is not a professional man, and a degree in Economics is not a professional degree. It has been suggested that an employer can reasonably expect a man with a degree in Economics to possess ability to do certain things not expected of holders of other degrees—to handle economic statistics has been given as an instance—and that this places this degree among professional degrees. But this is not a sufficient reason for so classifying a degree in Economics. The reasonable expectation of an employer of a graduate in French that the employee can speak that language does not mean that a degree in French is a professional degree.

A degree in Economics therefore belongs to the class of non-professional degrees. And what is the object of non-professional degree courses, almost all of which are now honours courses? There is no doubt as to whom they are best suited; they are best suited for those who will be life-long students or exponents of a subject. Nowadays for most people the most hopeful way of becoming a life-long student of a subject is to get on to the staff of a university, and members of university staffs have as their ambition to attain the rank, or at least the status, of a professor. So professorial is not an unsuitable name for non-professional courses.

It is a fact that only a small minority of students are potential professors; this does not mean that most students have not got capacities which enable them to fill posts of an importance equal to, or greater than, that which

[1] In the session 1955–56, out of 10,731 honours degrees awarded in British universities, 549 were in Economics. In the same session, out of 12,668 full-time advanced students, 234 were working in the field of Economics.

attaches to a chair. But it does mean that most students following professorial courses are not getting instruction well designed to meet their needs; the system so works that most of such students leave the university classified as having fallen short of attaining professorial standard by a measured distance; it would not be a complete caricature of what goes on in the non-professional subjects in universities to say that the average student leaves labelled as failed professor, whereas from the professional departments the average student goes out with a certificate of competence, the possession of which seems justified by experience, since we are not aware of scandals on a large scale caused by lack of professional competence.

From this it follows that the teaching of non-professional subjects needs attention. Here we are concerned only with Economics. I incline to the view that two separate courses are needed, one a general course for the ordinary student, and one a special course for those who show promise as scholars, each designed with regard to aptitude, interests and probable future careers—especially to the latter—of the students concerned. The ordinary student will never return to the university after graduation and will maintain no more than social contact with it. So habituated are university teachers nowadays to thinking of degree courses in relation to the needs of the scholar that a true wrench of the mind is required in order to construct a course suitable for the student whose future will be in affairs. It is in fact far more difficult to design a general than a special course, and we know that to do the latter is not easy. But it is urgent that the attempt should be made. The length of a general course is determined by practical considerations, among which the chief is that, unless good cause is shown, public money will not be available to maintain students at universities for more than the conventional limit of three years; and since in the case of a student following a general course there is no argument derived from the need to attain a measurable standard of practical competence, there is no good cause for prolonging the course beyond this limit.

It is also true in regard to a special degree of the non-professional kind that there is no case for prolongation beyond the conventional limit on the grounds of the need to attain professional competence because that is not the aim. The aim is scholarship, and the question is the time needed to reach a stage in the approach to a subject which it is proper to recognise publicly as a first step towards this goal. Practical considerations limit the choice to three or four years. I have no doubt at all that the latter should be the length of a special course; manifestly the advance which can be made in three years is not enough to justify public recognition. But I am doubtful about the timing of the examination; examinations cast shadows before them within the outlines of which students confine their perambulations and thus live in an atmosphere lacking the warmth which encourages growth. I am interested in the arrangement for special degree courses in certain natural sciences, where the student takes the main

examination at the end of his third year and spends his fourth year on some special piece of work and on further general study not regulated by syllabus; for performance in the last year credit is given and taken into account when awarding the degree. Perhaps a similar arrangement might be considered for Economics.

V

It remains to say something about the place of allied subjects in a degree course in Economics. The case for their inclusion has been put so clearly by Professor Robbins that I need say no more than that I agree with all he has said about the need for a balanced approach to the study of society. But it is not easy to achieve what it is sought to accomplish. To attain a balanced view of society it is not enough that a student should make some study of allied disciplines; he must be able to relate them to his main subject. But the student seldom succeeds in this, and only too often regards the study of allied subjects as a tiresome imposition which diverts him from his chief interest. A similar difficulty is found when two or more social subjects are given equal prominence; the student does not see their bearings one upon the other.[1]

I was brought up in the field of the natural sciences, where similar difficulties are not found. The student of Biology who is required to study Chemistry and Physics does not think that he is being called away from his main task; he sees the relevance of these subjects to his own. To him the world of science is one world. In that world specialisation does not lead to separatism. Since the days when I studied Zoology specialisation has gone rapidly ahead, and we have Genetics, Ecology, Animal Behaviour and so on. But the contacts with other specialisms, Cell Morphology, Physiology, Biochemistry, Neurology and so forth, are closer than before. Therefore separatism need not follow specialisation, but in social studies it does so. In consequence, we hear of the need for inter-disciplinary studies and so-called cross fertilisation; in natural science these things happen of themselves. I have listened to many ingenious proposals for including different lines of social study within one curriculum, and have been left with the feeling, to use the terminology of chemistry, that the result would be a mixture and not a compound.

The reason for disappointment with the results of introducing allied subjects into an Economics degree is that the social world is not readily seen as one world—a world in which the facts are unlike those of the world of natural science and in consequence require appropriate methods of investigation. It is the world of natural science with which men are in a general way now most familiar. That world needs no introduction; the student is at home in it straight away. But there does seem to be need for

[1] See Max Beloff, *The Tasks of Government*, 1958, p. 7.

some introduction to the study of the social world; not an introduction which includes problems, such as prediction in the social sciences, which might do more to bewilder than enlighten the student at this stage; but an introduction which would explain and define the limits of the social world, present it as a unity, deal with the various ways of investigating it and show why any one mode of social study, pursued without attention to others, must be lopsided. If this sounds like the intrusion of sociology and causes alarm, I may perhaps calm your fears by saying that, if this is sociology, it is not that kind of sociology which aims at transcendence over the special social sciences; its aim would be the contrary, namely to examine whence they set out and not where they have got to. This might help students to see how the so-called subjects are in fact related.

In conclusion, may I add this. My predecessor was no doubt right when he said that the proper business of economists is to get on with Economics. But there are occasions when it is appropriate to turn aside; he found one such occasion, and I hope that I have found another. Perhaps it would not be inappropriate if economists, and those engaged in other special social studies, occasionally took time off to have a look at the problems of social study as a whole; for unless the exponents of the special social sciences exhibit more interest than they now manifest in these broad problems, it is not likely that young students, left to themselves, will discover the links binding together the subjects which are presented to them as allied.

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London.

INFLATION AND THE BRITISH ECONOMY[1]

WHEN I caused myself to be billed to talk on the subject of Inflation and the British Economy, I had not, as so often happens, given much thought to the precise interpretation which I should accord to so wide a theme. On reflection, it seems to me that I should not be wise to talk primarily of the forces which have produced inflation in this economy in the recent past, still less of the measures which might be taken to stop it. These, it seems to me, are industries in which, as in a number of others at present, there is a considerable danger of redundancy, and though I must confess to having been employed in them, it seems prudent for the present purpose to move over to a somewhat different, though related trade. I propose, therefore, to examine some leading aspects of the way in which the British economy has worked in the last ten years of peace-time inflation. This will involve some comparisons with the way in which it worked in the decidedly non-inflationary period of the 1930s. I must say, also, before going farther, that there are some very important aspects of the economy's working in these years which I propose to exclude from my survey. In particular, the whole of the external trading and payments position of the British Economy has been so much discussed of late that I see the shadow of redundancy there too, and I am very happy to leave it alone.

When we think of the last ten years, or of the whole period since the War, the most striking feature which marks it off from any previous period in the experience of this economy (apart from the continuous price-inflation which has gone on) is, of course, the astonishing absence of unemployment. We have enjoyed this absence long enough now for it to be perhaps worth reminding ourselves that it is, indeed, astonishing in the light of previous history, and of inter-war history in particular. We have had a decade (not to go back to the War and immediate post-war years) with an average unemployment rate of about 1½%, as against an average which, if measured on our present statistical basis, would probably have been about 11% (and never substantially less than 8) in the whole period between the two World Wars. We have surpassed in this respect the hopes which Lord Beveridge set out in 1944 in his book *Full Employment in a Free Society*—hopes which many other economists at the time regarded as over-sanguine. It is perhaps worth looking a little more closely at the relation between these aspirations, based upon inter-war experience, and what has happened since.

Lord Beveridge quoted Mr. Saunders' estimate that the average rate of unemployment due to seasonal variation in activity alone had, in the inter-war years, amounted to 2% of the insured population, but hoped that, under

[1] Presidential Address delivered to Section F of the British Association, at Glasgow on August 29, 1958.

pressure, this might be reduced to 1%. To this he added a further 1% for "structural" unemployment connected inevitably with qualitative changes in the demand for labour in the course of technological and economic progress. To this, again, he added another 1% as an allowance for those fluctuations in export demand for which it would not be practicable to compensate by manipulating the level of internal effective demand in the country. This gave him his target level of 3%—about twice the rate of unemployment which we have actually experienced in the last ten years.

It may be claimed that the Beveridge estimate, and its generally less optimistic rivals, were based upon the tacit assumption that the demand for and supply of labour were to be in equilibrium in the sense that the total number of extra workpeople whom unsatisfied employers would like to take on should be equal to the number of able and willing people in the economy who are out of work—that is to say, that the excess demand for labour in the trades where it exists should be equal to the excess supply elsewhere. It may be claimed, further, that since the War there has been, not equilibrium in this sense, but a net excess of demand—hence, some people would say, our inflation. I may say in passing that I do not subscribe to this last deduction; I see no reason to suppose that, with our particular mechanism for determining wages, the general level of wages should be stable (still less that it should rise at the same rate as labour productivity) when the excess demand for labour in some trades or districts equals the excess supply in others. Leaving this aside, however, we can note that a very careful estimate has been made by Messrs. Dow and Dicks-Mireaux[1] of the amount of net excess demand in the British labour market since the War, which sets the average excess over the years 1948–56 at only one-third of 1% of the insured population. If this is correct, it is clearly insufficient to explain the gap between the Beveridge target level and what has been realised.

My own suggestion is that the Beveridge target might well have been over-optimistic but for one factor which was imperfectly foreseen, and which may have played a very important part in realising the still lower level of unemployment which we have reached. That factor is a change in the attitude of employers, from regarding labour as a commodity always in perfectly elastic supply to treating it as something which, if once released, may not be easily replaced. In short, it is some degree of labour-hoarding. At what level of unemployment it became general we cannot say; that critical point no doubt occurred during the War. Nor is it easy to produce statistical evidence for its existence, but one can, I think, find one or two pointers.

Before the War employment fell off very promptly and sharply when production fell. Between 1929 and 1932, the index of industrial production fell by about 15% and total real output by perhaps half as much. At the

[1] *Oxford Economic Papers*, February 1958.

same time, the number of insured employed fell by 11%. The other recorded reduction in labour-power employed—the reduction in average hours of work—seems to have amounted to some 3 or 4%. Again, in the recession of 1937–38, the index of industrial production fell by about 5%, and total real output in the economy by about 3 or 3½%. Employment fell about 3½% and hours of work by about 2%. In short, before the War, a reduction in the demand for labour was met much more by reducing numbers in employment than by reducing hours of work.

Since the War we have had only one genuine recession in production so far, that of 1951–52. On that occasion the index of production fell by 3%, and total real output by about 1%. Employment seems to have fallen by about 1% as well, but hours of work by nearly the same amount. More generally, the year-to-year percentage in hours worked in the last decade have always, I think, been greater than the corresponding (opposite) changes in the unemployment percentage—this has been very clearly true in the last two years. Before the War, changes in hours worked were always small in comparison with the corresponding changes in the unemployment percentage.

The greater variation in hours than in numbers employed is, of course, natural when there is difficulty in getting more employees and when the marginal units of labour are being paid for largely at overtime rates. It may be argued that, in so far as it indicates unwillingness to lay employees off when they could, for the time being, be dispensed with, it not only amounts to a concealment rather than a genuine reduction of unemployment, but hinders progress and flexibility by keeping men out of the labour market who could be in it. It is hard to pass judgment on this argument. The records of the last decade in progressiveness and adaptability will have to be looked at later. Meanwhile, two things can be noted. In the first place, against the tendency of labour shortage to cause the withholding of labour from the market when there is a temporary or local surplus of it we have to set the powerful incentive which it provides to the efficient use of labour in all times and places of peak demand. Secondly, when one considers that the average period of continuous employment provided by some enterprises before the War to large parts of their labour was to be measured in weeks, one can hardly feel that an increase in continuity and security is to be deplored.

Let us turn now to what has been not only a main condition of the low post-war unemployment rate, but one of the most striking features of the period in its own right—namely, the absence of fluctuations of activity in the British economy. The most important cause of this has certainly been the absence of fluctuations in the world economy as a whole. We have usually imported a large part of our booms and depressions. Between 1929 and 1932, for instance, the fall in the value of our exports of goods and services was apparently three or four times as great as the fall in our internal

investment—though fortunately about half of this fall in export demand was offset by the fall in the price of our imports. But there has been nothing that could be called a fluctuation in international trade since the War. The quantum of world trade has increased every year (up to 1957) except for a minute fall from 1951 to 1952 which was mirrored by a slight dip in our real exports of goods and services. There have been disturbances from world prices, at which we shall have to look later, but real international trade, and our real exports, have followed a remarkably steady rising trend.

Have we, then, been left with no trace of a " trade cycle " in the post-war years? I do not think this is so. We have, certainly, nothing so far that looks like a cycle in fixed investment, which, contrary to what used to be regarded as the settled order of nature, has been the steadiest part of the national product—it has risen (in real terms) every year since the War. What we have had is a ghost—or perhaps something more than a ghost—of an inventory cycle. According to the work of Dow and Dicks-Mireaux, to which I have already referred, the peak years of pressure on our labour resources have been 1947, 1951 and 1955. These have all been peak years, also, of accumulation of stocks. The troughs of excess demand for labour according to the same estimates have been 1950 and 1952, which are trough years of stock accumulation also. It is true that 1957, which looks as if it may turn out to have been another peak of inventory investment, will have spoilt the run by being anything but a peak year of demand in general, though 1958 still has a chance to redeem the record by providing a coincidence of troughs. What is interesting, however, is that we have had here something much more like the inventory cycles in the United States than has been observed before. Admittedly, we know extremely little about inventory investment in this country for any earlier period; but such estimates as there are of its course in the 1930s suggest that it followed the main cycle in fixed investment.

Now, inventory cycles can be quite formidable fluctuations. In the United States the amplitude of changes in inventory investment seems to vary from 3 to 5% of the gross national product, and our cycle, too, has been up to that standard. How is it that it has not disturbed the economy, and employment, more than it has? Before trying to answer this question, we should perhaps note that it under-states rather than over-states the problem, because the fluctuations of inventories in industrial and commercial hands have been supplemented rather than offset by changes in the behaviour of consumers. If we try to draw up a simple Keynesian consumption-function connecting consumers' expenditure on goods and services with the income which consumers (after paying taxes) had available for spending, we see that expenditure is for some years above the line, and for some years below. Up to 1949, it was kept down by rationing and shortages; the first post-war re-stocking boom was not reinforced by anything that could be called

" abnormal " buying by consumers. In 1950, however, there was an enormous buying spree, compounded no doubt of making up for lost time and providing against a possible spreading of the Korean War. This explains, in part, why the great de-stocking of 1950 did not mean more than a slight slackening of the pressure on resources—it was a matter of increased final buying rather than reduced orders for production. But the next year—1951—brought a combination of continued high buying with very heavy accumulation of stocks; the two reinforced each other in putting pressure on productive capacity. Similarly, in the recession of 1952 not only did inventory accumulation fall to nearly nothing but consumers' spending was also well below its " normal " relation to available income. Wardrobes, in particular, were full, and clothing purchases fell. Similarly, 1955 was a year when abnormally heavy consumer buying supplemented stock accumulation, though the degree in which this buying was abnormal was less than it had been in the previous year. Although abnormally heavy or light final purchases sometimes offset (indeed, explain) changes in inventories, therefore, it seems that at least in the peak years of 1951 and 1955, and the recession year 1952, what we may call the inventory policy of consumers has supplemented the changes in trade inventories, leaving us with a heavier task in explaining why these fluctuations did not upset the economy more.

The main systematic reason is that there has been a very close connection between the changes in inventory investment and the changes in imports. On the average about half—and sometimes much more—of the change in inventory investment from one post-war year to the next has simply corresponded to a change in imports (if we measure both at 1948 prices). This was particularly marked in the peak years 1951 and 1955 and the trough year 1952. What it means in the present context is that only about half (sometimes less) of post-war changes in inventory investment have affected the pressure on our domestic resources; on the other hand, the remaining half or more has affected the pressure on our external-payments position. One might say, with only a moderate degree of over-generalisation, that our four-year inventory cycle accounts for alternate members of our series of biennial exchange crises (the rest being connected rather with events in the overseas sterling area). Inventory investment may be regarded as an exchange of monetary reserves for reserves of goods.

Apart from this reason why our fluctuations in inventory investments and consumers' buying habits have not borne more heavily on the economy, there are a number of important but less systematic factors to take into account. The first of these is the fact that the course of public expenditure on goods and services has been, on balance, such as to offset the inventory cycle. These purchases fell from 1946 to 1947 by an amount which was, in fact, much greater than the rise in inventory investment, and which allowed

for substantial real expansions of fixed investment and consumption. They rose again to 1953, and have since been remarkably steady (in real terms). The biggest real increase in a single year came between 1951 and 1952, so that it coincided with a fall in inventory investment and with slackening total pressure on our resources. It seems clear, however, that the timing of these changes in public spending in relation to the fluctuations of the economy has been much more a matter of good luck than of good management. The great fall in public spending up to 1947 was, of course, due to the clearing away of commitments left from the War; the increases of 1949 and 1952 were due to defence programmes occasioned by outside events. We cannot claim to have operated a deliberate stabilising policy through the size of government spending. Perhaps, in the absence of severe fluctuations in private fixed investment, it is hardly to be expected that we should.

But the way in which public expenditure is financed is another matter. For the present purpose, we may perhaps confine our attention to the total true surpluses or deficits of the public authorities. Here, the most striking features have been the large, disinflationary, surpluses of the years 1948–50, and the not quite so large, inflationary deficits of 1952–54. These have been far from perfectly anti-cyclical. The biggest change from a deflationary to an inflationary pressure came in 1950–51, when inventory investment was increasing. On the other hand, the further increase in the rate of net borrowing up to 1953, the change to a small surplus by 1950 and the resumption of borrowing in 1956 were certainly, on the whole, anti-cyclical influences. On balance, public finance can probably be claimed to have steadied the course of the economy rather than the reverse.

It remains to mention another influence which has affected the course of the economy—this time one which was outside the control of British Government policy—namely, changes in world prices. So far as the level of activity in this country is concerned, the influence has certainly been a stabilising one. In the booms of 1947–48 and 1950–51, and again in a much smaller degree in 1955, the greater rise of import prices than of export prices certainly tended to drain away purchasing power and to depress profits—this is always (so far as it goes) a stabilising influence so long as our booms coincide with those in the world commodity markets. In the same way, the great fall of import prices relatively to export prices in 1951–53 no doubt had an immediately stimulating effect. This is all subject, of course, to the maintenance of reasonable steadiness in the *volume* of our exports, which was, as we have seen, a feature of this period.

But the rise of world prices—particularly import prices—has, clearly, been in another sense inflationary. While it has had a depressing or moderating effect on the level of activity, or on the excess demand for labour, it has worked powerfully, though with some time-lag, to raise prices and wages. The largest annual increase in wage-rates since the War was in the recession year 1952. In discussing short-run changes, at least, it is necessary

to distinguish very carefully between those things which are inflationary in the sense of tending to expand activity and the pressure on our domestic resources, and those which are inflationary in the sense of tending to raise the prices of those resources and their products. It has been all too often assumed in the past that the two things are the same—or, at least, that they coincide.

So much, then, for the forces which have tended to keep the level of employment steady, in spite of a very considerable fluctuation in inventory investment and consumers' habits. As compared with, for instance, the United States economy, where inventory fluctuations of about the same amplitude (relatively to total product) have had more serious consequences, our greater steadiness seems to have been due partly to the greater " openness " of our economy. Inventory fluctuations have been largely offset by variations in borrowing from, or lending to, overseas primary producing economies and, nevertheless, our exports of goods and services (largely to those economies) have been maintained fairly near to a steady trend. In addition, our financing of public expenditure has been in the main " functional," and we have been lucky in that the variations in the public authorities' real demand for goods and services, though mainly imposed by outside events, happen to have helped stability rather than upsetting it. These and no doubt other factors have enabled us to keep astonishingly free from fluctuations in our fixed investment. The element of luck in these factors should warn us against expecting their continuance.

I propose now to turn to another point, to which I have already referred; namely, the extent to which the economy in this period of full employment and inflation has shown a high or low degree of adaptability. Now, adaptability is not easy to measure, and for this purpose I have been content merely to measure, in rather a crude way, the degree in which the distribution of the occupied population between the twenty-four Orders of the Standard Industrial Classification has changed, and to compare the result with one similarly calculated for the very different period from 1929 to 1937. The method is simply to calculate for each industrial group the percentages of the total occupied population engaged in it in the years 1948 and 1956 respectively, to take the difference between these two percentages for each group, and to add them up for all the groups. Oddly enough, the result of this calculation for 1948 and 1956 is very nearly the same as (in fact a trifle more than) for the years 1929 and 1937. By this measure, the amount of change in the structure of the economy was about the same in the recent period as in the pre-war one. There is not much else that these two periods have in common. Not only was the first a time when there was no shadow of labour-shortage in any industrial group, and the second a time through most of which every industrial group experienced some shortage, but the rates of growth of employment were different, too—the numbers in work expanded by about 11% in the earlier period against 7% in the later one.

The identities of the relatively expanding and contracting groups were largely different in the two periods, also—in a great measure, no doubt, because one was a period of contracting exports and the other a period of trade expansion. Some groups, it is true, were expanding their share of total manpower in both—distribution, banking and insurance, gas, water, and electricity supply, the vehicle industries and the food industries. Others were losing in both—agriculture, mining, textiles and clothing, for instance. But the chemical, engineering and metal industries were expanding their share after the War though not before it; so were paper and printing; and the professions were expanding very much faster after than before. On the other hand, we have the rapid fall in public administration and miscellaneous service since the War, in comparison with rapid increases before it. With all these differences, the total amount of change, measured in this simple way, turns out to be about the same in the two periods. But it is, perhaps, worth noting (though it is not surprising) that the similarly measured amount of net change in the rather longer, and greatly disturbed interval between them—that is to say, between 1937 and 1946—turns out to have more than twice as great as in either of them.

It seems, on the face of it, unlikely that the process of change in the distribution of the labour-force is the same under full employment as it is with plenty of labour to spare. Before the War there was a highly elastic supply of labour for almost any enterprise, anywhere. Now, the presumption is that an enterprise, or an industry, can expand its labour-force only by outbidding someone else. Is there any trace of this difference in the available statistics?

One way to look for this would be to see if there is any greater tendency now than there was before the War for the industries that pay the highest wages to be those which expand most. Perhaps there is, though I have not looked into this as thoroughly as I should like. Certainly there is extremely little correlation between average adult male earnings in an industry and its rate of expansion before the War; for the period 1948–56 there is some sign of one, though it is spoilt by such notable exceptions as the high earnings and decline of employment in coal-mining and the rapid growth of employment in the food, drink and tobacco trades or the gas, water and electricity industries in spite of earnings rather below the average. But one would not really expect the correlation to be very good; differences between industries in degree of skill required, ease of entry and inherent attractiveness all combine to prevent it—not to mention differences in the relative strength of organisation of employers and wage-earners.

Some of these disturbing factors ought to be reduced if we ask, not about the relation between growth of employment and level of earnings in an industry, but about that between growth of employment and growth of earnings. Is there a greater or smaller tendency now than before the War for industries to increase their share of the labour-force only be raising the

average earnings they provide for their employees relatively to those in other industries?

When we ask this, we come upon a paradox. For the years from 1929 to 1937 there was a definite tendency for the industrial groups which expanded relatively to the rest to be those with earnings which fell in relation to other earnings.[1] Such relatively shrinking industries as agriculture, coal-mining, precision instruments and jewellery, and metal manufacture did better than the average in weekly earnings; their relative gains in remuneration were, on the whole, more marked than were the relative losses of those other shrinking industries, such as textiles, leather and clothing, where earnings rose less than average. In the same way, the relatively expanding industrial groups—gas, water and electricity, national and local administration, building and contracting, banking and insurance—did not keep pace in earnings with the economy as a whole; distribution was the only important expanding group where earnings improved much more than the national average.

How can we explain this tendency? Before trying, one should perhaps point out that it is, in any case, only a vague one, just sufficiently marked to appear worth explaining at all. For what it is worth, one could, of course, explain it by saying that the changes in labour distribution in this period must have come mainly from the supply side rather than from relative changes in the demands for different kinds of product. The high general level of unemployment makes it unplausible to suppose that spontaneous movements of labour from one industry to another made big differences to the relative scarcities of labour in different branches of activity; it seems more reasonable to think of changes in relative wages, brought about by different bargaining institutions in the various industries, as being the source of changes in the labour-supply situation. If we follow this line of argument we can say that there was some tendency for labour in the industries where it secured the biggest wage-increases to price itself, or its products, out of the market.

But that is not the only possible line of explanation, or even perhaps the most likely. In so far as differences in wage-fixing institutions were dominant in determining the relative alternations in wage-rates in the 'thirties, it may be that the negative correlation between wage-changes and employment-changes arose from a general tendency for trade unions to be strongest in the static or declining industries. One can think of reasons for a tendency of this kind. Labour is perhaps less likely to be organised in an industry which is recruiting work-people fast than in one where the labour force has been long established. Industrial expansion between the wars was largely concentrated in parts of the country where trade unionism was, initially, relatively weak—an association which was only partly a matter of cause and

[1] The correlation coefficient is −0·41, which stands near the 5% level of significance.

effect. Strong labour organisation may well be, on the whole, an attribute of mature industries.

But whatever may have been the reason for the pre-war connection between relative growth of employment and relative decline of wages and earnings, it is clear that this connection has subsequently ceased to exist. Mr. Nicholson [1] showed that there was, in general, an association between high increase in employment and high increase in wages in the years 1938 to 1943, and it seems that the same kind of association has existed in the period from 1948 to 1956.

For this post-war period the correlation between changes in economy and changes in employment is certainly positive—if the inquiry is confined to adult male wage-earners it is quite high.[2] Leather, railways, clothing, agriculture and public administration are conspicuous for relatively low increases in earnings, and low (or negative) rates of growth; printing, chemicals, metal manufacture, and food, drink and tobacco for high growth both of earnings and of employment. The vehicle industries, with one of the highest rates of growth in employment, show a growth in hourly earnings which is less than the average, but there are no other large departures from the general tendency.

It seems, therefore, that while the economy has changed its structure about as fast under full employment as it did in the pre-war period of high unemployment, there is, indeed, some sign that the growing parts have had to outbid the rest for labour; it has not come to them (as it did before the War) in spite of a relative fall in the remuneration they offered it. This change has, no doubt, some significance in connection with the mechanism of inflation. When wage-rates rose generally before the War (as they did in the middle and later 'thirties), the rise was not distributed according to the changes in their demand for labour; rather it seems to have been a matter of trade-union organisation and enterprise. No doubt these qualities are still very important, but the different extents to which they have been helped by different strengths of demand for labour as between industries have emerged as a major feature of the scene. Perhaps one can say, too, that full employment has tended to make the bargaining-powers of labour in different industries more nearly equal than they were before the War—the proportional relative changes in earnings between the industrial groups have, in fact, been rather smaller in 1948–56 than it was in 1929–37.

So much for the flexibility of the economy under inflation. It is appropriate next to look at its record of progress. It seems to be very widely accepted that this has been good in relation to previous times, if not specially brilliant in comparison with other economies (also undergoing inflation) in recent years. The rate of growth of real domestic product has, since the

[1] *Oxford Institute of Statistics Bulletin* 1946.

[2] Mr. R. Wilkinson has calculated a correlation of +0·22 using total labour employed and its weekly earnings, but +0·61 using adult male labour and its hourly earnings.

War, been something like 3% a year, which is about the same as the rate achieved in late Victorian times, and a good deal faster than we have managed over any considerable period in between. But whereas fully half of the Victorian expansion was directly due to the growth of the labour force, our population in work has been growing at only half the Victorian rate, and output per person in work has grown by about 2¼% a year.

This is a respectable, but not, by modern standards, a sensational rate. It is misleading to compare it with the German expansion of recent years, which has contained a stronger temporary element of restoration, as contrasted with genuine growth. It is also misleading, for some purposes, to compare it with the contemporary growth of Russian real income (probably about twice as fast as ours), which is made possible in part by the application of techniques as modern as our newest in place of some which we have long outgrown. But it is more to the point to note that our real output per head since 1948 has still been rising less fast, though not so very much less fast, than that of the United States.

It is natural to connect our rate of progress with our rate of net investment. We have accumulated capital faster (on the average) than before the War—which can be associated with our higher rate of growth as compared with then—but also much more slowly, in relation to the size of our output, than the Russians or the Americans—hence, one might say, our lower rate of growth as compared with their economies. Capital accumulation and growth of output certainly go together, but the connection between them is very far from simple. How far it is from simplicity can be seen from two aspects of our recent experience. The first is that the temporal relation between investment and the growth of output per man-hour, in the short run, is not very clear. There seem to have been two periods of rapid increase in physical output per man-hour since the War; one which brought a sharp peak in 1949, and another perhaps rather more sustained but less rapid in 1953 and 1954. These spurts certainly do not follow bursts of rapid net investment, as one might expect. The first post-war burst of net investment, whether one considers all kinds of accumulation, or all excluding dwellings, or simply net investment in ships, vehicles, aircraft, plant and machinery, was only just getting into its stride in 1949, and increased in intensity for a year or two after the rate of growth of output per man-hour had started to fall. Then, again, the much bigger investment boom which we have recently been enjoying was very far from over when the rate of increase in labour productivity passed its latest peak in 1954. We shall certainly not make much sense of that fashionable entity the marginal capital–output ratio from data such as these.

There is more to be said for looking at the period as a whole, or rather, for taking the interval between 1948 and 1955, two years in which the degree of labour shortage seems to have reached peaks of about the same height.

It simplifies matters, too, if we confine our attention to manufacturing industry, which was responsible for about three-fifths of the real increase in our domestic product over those years. Manufacturing industry increased its labour force in employment by about 13½% in that time. How much did it increase its fixed capital? By a rather doubtful calculation based upon Mr. Barna's estimates of the replacement value of fixed capital, and the Central Statistical Office's figures of net investment, it seems that the proportionate increase may well have been about the same as that in the labour-force—about 13 or 14%. But the output of manufacturing industry increased by 42%. That means that it increased in relation to both the labour and the capital employed by some 25%—about 3% a year. This is increasing returns with a vengeance. What the experience suggests is that more of the increase in manufactured output comes from improvements in the quality of capital—from technical progress in the strict sense—and from improved supply of other factors, such as managerial skills, than from sheer capital accumulation. Or one may say that, since manufacturing capital seems to have increased no more than in proportion to the amount of labour working with it, the very substantial increase in output per man-hour is to be attributed not to increase in the quantity of capital (as it might be measured by its cost of production at constant factor-prices) but entirely to improvement in its quality and to such improvements as there have been in supplies of other factors. This no doubt helps to explain why the connection between net investment and improvement in output per man-hour in the economy as a whole has been so loose. Its looseness, however, in no way detracts from the importance of capital accumulation and capital replacement as the means by which improved techniques are brought into practice.

This brings us to a final subject, which has, perhaps, more direct connection with inflation as such (as opposed to full employment) than those which I have been considering. How has the economy reacted (especially in its spending and saving habits) to the increase of prices? Has the expectation of inflation become an accepted part of life? It has often been pointed out that there are certain difficulties in envisaging a long-lasting and general expectation of continued inflation. Where prices are flexible, and are formed in free markets, such an expectation will at once generate a price-increase of just such a size that the general expectation of further increase is itself extinguished. If in some way it is continuously regenerated, then the only possible outcome is hyperinflation. A lasting and generally held expectation of inflation, therefore, in an economy which has obviously not suffered hyperinflation, can exist only in those markets where prices are not formed as the more or less instantaneous outcome of expectations. Now, there are many markets where this is the case. Indeed, it is only in the primary commodity markets (if we exclude purely financial markets for the moment) that prices are completely sensitive to expectations about their

future. Even there, also, we have to make an important reservation. A general expectation of price-increase proceeding at an annual rate less than the percentage annual cost of holding stocks of the commodity will not cause the current price to rise. Since the War the course of primary commodity prices has fluctuated; there have been two major decreases to discourage expectations of anything like continuous increase; and the rate of ascent of the trend about which the fluctuation has taken place must in most, if not all, cases have been less than the percentage cost of holding the commodity concerned in stock. The existence of widespread expectations that prices will be higher in future in nearly all markets is therefore a very decided possibility.

What effect would such expectations have? The main effect, of course, should be to divert preferences away from money and assets of fixed money value towards assets of fixed real value and towards immediate consumption. It is worth looking to see whether there are any signs of these shifts.

I have already referred to some of the features of a simple Keynesian consumption function relating to the personal sector of the economy in post-war years. If such a schedule is drawn up with disposable incomes and consumers' expenditure measured at 1948 prices, and the data for a pre-war year are inserted, it becomes plain that the schedule may have shifted upwards a little since before the War, but not by very much—consumption may be £200 or £300 million higher at any level of total real disposable income than it was before the War. Does this indicate a reduced willingness to save, because of fears of inflation? Not necessarily. One has to remember that there has been a very substantial shift in the distribution of disposable personal incomes since the War; the million of the total population with the largest incomes now have little more than half the percentage of aggregate personal income which the richest million had before the War. Again, the evidence is that, in the long run, as average real income rises, the proportion of a given real income which is saved tends to decrease, perhaps for reasons which have been set out by Professor Duesenberry, perhaps for the simpler reason that economic progress seems to consist largely in the invention of ever more seductive kinds of consumers' good. One would expect some shift in the schedule after a decade or two. Some shift due to apprehension of inflation is not excluded, but I do not see any positive sign of it, and it cannot be very large.

One might expect to get more definite signs of any general change in expectations from the public's attitude towards different kinds of asset. But this is not a simple matter either. The relative supplies of the different kinds of asset have changed very greatly since before the War, and the drastic increase in taxation of yields must have had some effect on behaviour also. For the last decade as a whole, the yields of equities have been above those of bonds by about the same amount as in the 1930s; the gap has been greater than in the periods of recovery and prosperity before the War. Other

things being equal, this might be taken to mean that preference for fixed-interest assets is somewhat greater than in the rising phase of a pre-war trade-cycle. Among the other things that are not equal, one—the greatly increased supply of bonds in comparison with equities—may seem to support this suggestion. More bonds in relation to equities should, by itself, mean cheaper bonds in relation to equities, and thus a bigger gap between their respective yields, and this, as we have noted, is contrary to what we find. Perhaps the other big change in the situation works the other way; assets providing uncertain money incomes, as equities do, are notoriously rendered less attractive by high marginal rates of tax. The comparision of bond and equity yields, therefore, gives no certain indication of any change in the public's attitude; but, again, it seems to me to show that there has at any rate been no large shift of preference away from fixed-interest securities.

The other question which one is tempted to ask in this connection is whether the schedule of liquidity preference has shifted. A general expectation of a fall in the value of money—even a slow one—might be supposed to reduce the amount of money which the public would be willing to hold at any given level of interest-rates—presumably net interest-rates after the deduction of an allowance for taxation. To reach a firm conclusion about this, is, again, not easy. It is possible to make allowances not only for taxation and for the changing requirements of money for transactions purposes, but also for the supply of liquid interest-bearing assets in the hands of the public, and for the level of dividends on equities. When all this is done, there seems to me to be nothing about the present situation which is out of line with general experience in the last thirty years.

I have tried in this lecture to range over a number of aspects of the internal working of the economy in the period of inflation and full employment since the War. Perhaps the chief general conclusion that emerges is that the difference that price-increase and absence of unemployment have made to it are remarkably small. I see no sign that expectation of continued price-increase has become engrained in the system; there are spasmodic signs of it in the distinct separate booms of the post-war years, but for the period as a whole it seems to be notably absent. There is no sign that saving has been seriously affected by inflation, and by achieving fuller employment and higher real income than before the War, we have increased the proportion of the national product devoted to investment. We have also achieved an accelerated rate of growth, connected with improved technology even more than with the enlargement of the capital stock. The occupational and industrial structure of the economy has apparently been about as flexible under full employment as it was with a great deal of unemployment, though the price-mechanism has been more patently the servant of demand changes in bringing it about.

The key to the positive achievements of this period has been full employment. This discussion suggests that it may be very easy to assume too much

in taking the continuance of this happy state for granted. We ought perhaps to pay more attention to the peril to stability inherent in an inventory cycle; we have weathered very considerable fluctuations of this kind fairly smoothly with the help of an appreciable amount of good luck (in the form of fortunately timed changes in defence expenditure) to supplement our not altogether bad management. But the far greater danger, which we have so far escaped, is that from a depression in world demand. Our weapons for combating this are untried; it is not even certain that they exist. And, lest it should be thought that any considerable lapse from full employment would at least relieve us of the embarrassments of inflation, I feel obliged to say that this, too, is unproved. My own view, indeed, is that one of the less welcome marvels of modern times is the possibility, within limits, of enjoying inflation and depression at the same time. But to discuss that would take me beyond the task I have set myself for this occasion.

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WELFARE PROPOSITIONS IN TERMS OF CONSISTENCY AND EXPANDED CHOICE[1]

IT has been shown elsewhere[2] that, following to its end the path originally slashed by Samuelson[3] through the jungle of utility and all that, we can entirely dispense with any notion of utility, cardinal or ordinal, also with indifference curves and preference orderings, and derive all that can effectively be said concerning consumers' demand from a single, simple, axiom of consistency.

At the time, I was still inclined to the view that the whole apparatus of indifference curves and the like was necessary for the discussion of welfare aspects of consumer behaviour, although it was no longer needed for the positive[4] aspects of consumer behaviour. In taking this view, however, I was wrong, for indifference curves are no more necessary for treating of welfare than for the analysis of consumer demand. It is a simple enough matter to consider welfare in terms of expanded choice and prove the various welfare propositions in terms which do not involve any indifference or utility apparatus at all. To demonstrate this is the purpose of the present contribution.

It would be a bore, of course, to catalogue all welfare propositions that have been advanced from time to time, and cast these in a new form; so selection is required. To this end, it would seem better to concentrate attention on the oldest and most respectable welfare proposition involving consumer behaviour alone (uncomplicated by problems on the production side), the proposition that, in trading with a fixed total of goods, perfecting the market can always lead to an increase in group welfare of the Paretian kind,[5] and the equilibrium reached under perfect market conditions is optimal in the Paretian sense.[6]

This proposition occurs in a variety of forms in the history of economic thought, but, in its most usual contemporary guise, it is the "optimum condition for exchange" of modern welfare economics.[7] The usual formal proof of this proposition is the well-known text-book demonstration in terms of two commodities and two consumers, using the indifference-curve

[1] The author owes much to a general context of thought among certain members of the staff o the London School of Economics and, above all, to R. G. Lipsey.

[2] K. J. Lancaster, "Revising Demand Theory," *Economica*, November 1957.

[3] Commencing as early as 1938, but especially in his "Consumption Theorems in Terms o 'Overcompensation' rather than Indifference Comparisons," *Economica*, February 1953.

[4] In the Friedman sense.

[5] In which only a situation in which someone is better off, and none worse off, is regarded a an unambiguous increase in group welfare.

[6] *I.e.*, no further change can make one person better off without making another worse off.

[7] See, *e.g.*, I. M. D. Little, *A Critique of Welfare Economics*, Chapter viii, or A. P. Lerner, *Th Economics of Control*, Chapter 2.

apparatus and the Edgeworth–Bowley contract box. Of all the optimum conditions of modern welfare economics, it is the proof of this one which is most completely associated with the indifference-curve apparatus.

I. INDIVIDUAL WELFARE

The individuals composing the community whose welfare we wish to study are assumed to be consistent. By consistent, we mean that, if an individual is free to make choice X or choice Y in one set of circumstances, and makes choice X, then he will not make choice Y in any circumstances at all in which both X and Y are available.

By a choice we mean a decision with respect to the totality of relevant circumstances, not a mere part of that decision. For example, let us suppose three collections of goods

(*a*) a bottle of wine, a loaf of bread, and a piece of cheese;
(*b*) two bottles of wine and a loaf of bread;
(*c*) two bottles of wine, a loaf of bread, and a piece of cheese;

and suppose that only (*a*) and (*b*) are available in the first situation, while all three are available in the second situation. Then, if the consumer chooses (*b*) in the first situation and (*c*) in the second, his choices are consistent. It is irrelevant that he did not choose cheese in the first situation, but did so in the second, for cheese is only part of a collection. The consumer would be inconsistent only if he chose (*b*) in the first situation and (*a*) in the second.

Given the consistent individual, we can take an increase in his welfare to be indicated as follows:

> *An individual's welfare has unambiguously increased from situation I to situation II if his choice is expanded as a result of the change, that is, if, in situation II he can have—*
>
> (a) *what he chose in situation I, and*
> (b) *at least one choice not available to him in situation I.*

We define a contraction of choice as a change which gives the individual no new choices, and denies him what he chose originally, and take a contraction of choice to indicate an unambiguous decline in the individual's welfare.

There are, of course, two other possible relationships between situation I and situation II, in which the change: (i) removes some of the choices previously available, but not the one actually made, and adds no new choices, or (ii) removes the choice actually made in the first situation, but adds choices not formerly available. We shall not make any welfare judgments concerning changes of these kinds, although it would be possible to consider the first as leaving welfare unchanged if one wished.

The assumption of welfare changes being shown by expanded and

contracted choice can be illustrated in a simple diagram, as in Fig. 1. In this diagram, a consumer has complete freedom of choice subject to a budget constraint.

Suppose that his budget constraint is given by LM in the initial situation. That is, he has an income OL and is free to trade at the price ratio $\frac{OL}{OM}$. Suppose that he chooses the collection (*i.e.*, of the commodity and retained

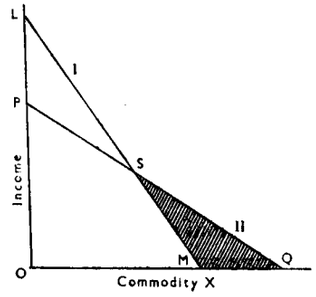


FIG. 1

income) given by the point S. Now let the second situation be such that his income is OP and the price is $\frac{OP}{OQ}$, so that he is free to trade along PQ and purchase, should he wish, his original collection S.

Then it follows that, in situation II, the consumer has available to him

(a) his original collection (the point S);
(b) choices not previously available (the shaded triangle MSQ);

so that his choice has expanded, and his welfare increased.

The reason for using the term " expanded choice " is explained by the above diagram. The new budget triangle OPQ is not necessarily larger, and may well be smaller, than the original budget triangle OLM: expanded choice does not imply any relationship between OPQ and OLM of this kind. What we do mean by expanded choice is that if the consumer were allowed any collection in, or on, the *whole area* $OLSQ$ he would not choose differently from the way he actually will choose in the triangle OPQ, *since he has already rejected points in the area* LPS *in favour of* S. Thus the change from situation I to situation II is effectively *equivalent* to offering the consumer the area of choice $OLSQ$ in place of the smaller area OLM, so that his choice is expanded by the addition of SMQ with no effective loss.

It is obvious from the diagram that, if the consumer's indifference map were drawn in, then what we have chosen to regard as an increase in his welfare would necessarily enable him to reach an indifference curve higher than before, so that the present approach to welfare does not conflict with older approaches.

II. Paretian Type Group Welfare

We shall simply assume an unambiguous increase in Paretian group welfare to be indicated as follows:

> *Paretian group welfare has unambiguously increased in moving from one situation to another if the change has resulted in expanded choice for at least one individual compatible with non-contraction of the choices of the remaining individuals.*

By " compatible " we mean that the individual with expanded choice could *actually* make at least one of the choices newly available, without contraction of others' choices, even if he chooses his original collection again.

An unambiguous decrease in group welfare would be defined, along the same lines, as a change which contracts the choice of at least one individual without expanding the choice of any other individual. A change which contracts the choice of some while expanding the choice of others will be left undefined as a welfare situation, as will changes such that individuals' choices are neither expanded nor contracted. The area of change for which no welfare judgment is made is greater on our approach than on the indifference-curve approach (although there is always such an area in Paretian welfare judgments, even using indifference curves), but we shall find this does not present any problems in relation to general welfare propositions.

A Paretian welfare optimum is a situation in which no policy can unambiguously increase group welfare in the Paretian sense, but there exists some policy that can unambiguously decrease group welfare. Not all changes from the optimum need decrease group welfare, but those that do not do so cannot increase it either, but can only expand the choices of some at the expense of contracting the choices of others.

III. The Optimum Conditions for Exchange

Having laid the foundations, we can now turn to our chief task, the demonstration of the optimum conditions for exchange of a fixed total collection of goods in terms of welfare as expanded choice. These well-known conditions are simply that the exchange of a fixed total collection of goods will be optimal when the market is perfect, that is, when all consumers are free to trade at a set of common prices, and no consumer acts so as knowingly to affect the prices.

The usual demonstration in terms of indifference curves consists in proving two propositions:

1. That, if different consumers are adjusting to different prices,[1] it is always possible to enable some consumer(s) to reach a higher indifference curve, with none moving to a lower, by allowing trade at some common set of prices.

[1] Or some are acting as monopolists (or monopsonists), which is the same, analytically, as having non-uniform prices.

2. If the market is in equilibrium with all consumers passively adjusting to the same prices, there is no change which can move any individual to a higher indifference curve without moving some other individual to a lower indifference curve.

It is these two propositions, expressed in our own terms, that we shall prove by our own methods. As in the traditional demonstrations, we shall concern ourselves with the exchange of two commodities among two individuals, leaving it to the intuition to perceive that this can be generalised for any number of individuals and commodities by a progression of two by two comparisons. We shall suppose the total quantities of the two commodities to be graphically represented as the sides of a rectangle or box-diagram, as in Figs. 2 (*a*) and 3 (*a*), so that any point inside or on the rectangle represents a particular division of the two goods among the two individuals. Each individual is receiving a quantity of each of the two goods measured along the sides of the box which pass through " his " corner.

Proposition 1. If there is equilibrium with the consumers passively adjusting to market prices, and these prices differ between consumers, there exists some set of common prices, freedom to trade at which unambiguously increases group welfare.

We take the two-commodity, two-person case depicted in Fig. 2 (*a*). *ACBD* is the rectangle representing the available totals of food and clothing, the quantities received by consumer A being measured with respect to *A* as origin, and quantities received by consumer B being measured with respect to the diagonally opposite corner, *B*. Let the point *M* represent the equilibrium reached when A faces prices corresponding to the slope of the line a_1a_2, and B faces prices corresponding to the slope of the line b_1b_2. Then *M* is A's choice for the budget line a_1a_2, while it is also B's choice for the budget line b_1b_2. A and B do not necessarily choose the same collection, of course, since A's collection is the distance of *M* from one set of axes, while B's is the distance of *M* from a different set of axes.

Then the proposition is proved by showing that, if both consumers are now allowed to trade freely from the point *M* along some single price line, such as x_1x_2 in the diagram, there is compatible expansion of both consumers' choices.

If this is not immediately obvious, it is clear from Fig. 2 (*b*) and (*c*), which are merely the two opposite corners of Fig. 2 (*a*) placed side by side, with corner *B* rotated so that it is in the same sense as corner *A*. Then, taking Fig. 2 (*b*), consumer A has the new choice area a_1Mx_1 plus his original choice *M*, so that his choice has expanded. Similarly, in Fig. 2 (*c*), B has the expanded choice area b_1Dx_1M, plus *M*. A's expanded choice is in the direction of giving up food for clothing, while B's is in the direction of giving up clothing for food, so that the two expanded choices are compatible. For some particular slope of x_1x_2 equilibrium (if it exists) will be reached, and the new equilibrium involves an unambiguous increase in group welfare.

Thus, if we commence from the equilibrium of an imperfect market, removal of the market imperfections necessarily increases group welfare.

Proposition 2. If there is already equilibrium under perfect market conditions there is no policy which can unambiguously increase group welfare.

There are only three types of policy possible in this simple system which will affect the equilibrium position. The first, causing price dispersion among consumers, cannot increase group welfare, as we have just seen.

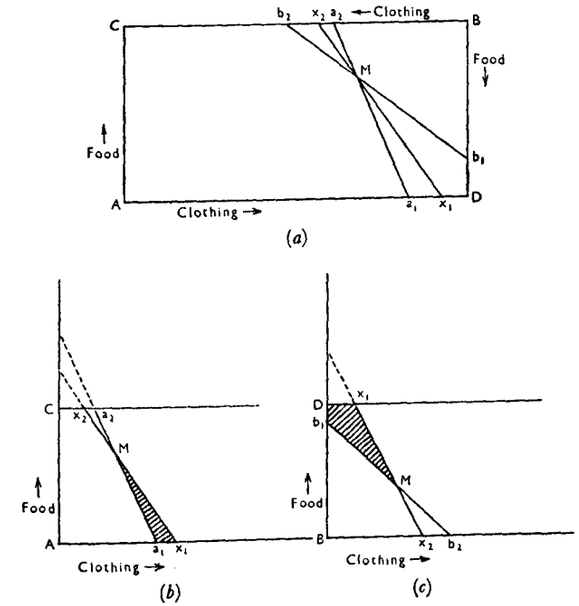


FIG. 2

The second, income redistribution, expands the choice of some at the expense of contracting the choice of others in the most obvious fashion, so this cannot lead to an unambiguous increase in Paretian welfare. The third, causing a change in the price ratio common to all consumers, requires investigation.

We use the same type of analysis as for Proposition 1. Let *N* in Fig. 3 represent the free-market equilibrium reached, with x_1x_2 the equilibrium price line. Consider a change to some other price ratio, represented by y_1y_2. Then, from Fig. 3 (*b*) and (*c*), each consumer is seen to have an expanded choice, but these expanded choices are incompatible, both involving the giving up of clothing for food. Thus no change in relative prices from the equilibrium position can give the consumers compatible expanded choices, so that no change can cause an unambiguous change in group welfare.

Without recourse, therefore, either to utility or to the indifference curve apparatus, we have demonstrated the optimum condition for pure exchange,

that the equilibrium reached under perfect market conditions is optimal in the Paretian sense.

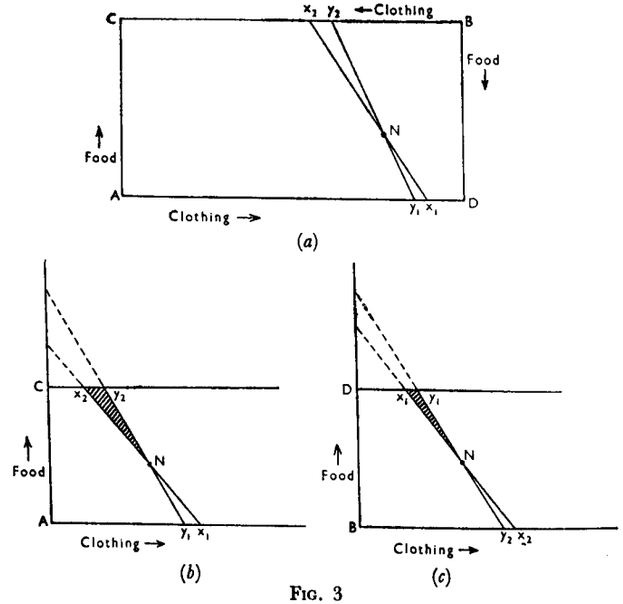


FIG. 3

IV. CONCLUSION

It has been shown in this paper that the optimum conditions for exchange can be demonstrated with no utility or indifference apparatus, employing a direct approach to welfare in terms of expanded choice which does not rest on a substructure that lies in the shadows between economics and psychology. This particular welfare proposition was chosen as a sample only: other such propositions can be treated in the same way, including the direct versus indirect taxes propositions.[1] Our approach to welfare relies entirely on objectively observable data, for, given a consumer's actual behaviour in any situation, whether his choice has expanded or contracted for some change is a simple matter of computation from his actual original purchases and the two sets of prices and incomes. It is not necessary to ask him whether he is on the same indifference level or not, a question which is inevitable in the usual analysis.

Since it has also been shown that propositions in demand theory can be derived from the consistency axiom, also without utility or indifference,[2] the writer feels that the utility concept and its child the indifference-curve analysis are reaching the end of their long and useful lives.

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[1] R. G. Lipsey has sketched such a proof, as yet unpublished.

[2] See Samuelson, *op. cit.*, and Lancaster, *op. cit.*

PROFESSOR HANSEN ON AMERICA'S ECONOMIC REVOLUTION

ON the eve of his retirement from Harvard University Professor Alvin H. Hansen took stock of his turbulent teaching career, what he had taught and advocated, the inter-war and post-war changes in economic thinking and policies, and above all the impact of " the Keynesian Revolution " on the American economy. The result is his latest book: *The American Economy*.[1] There Professor Hansen equates America's economic revolution with the Keynesian Revolution and, more specifically, with a new combination of a *mixed economy* and a *welfare state*, and then professes a new faith in the possibility of secular exhilaration, instead of repeating the famous " stagnation thesis." The purpose of this essay is not to review Professor Hansen's book in any conventional manner but to discuss in some detail fundamental questions of public policy and economic theory which it raises but which he does not himself discuss, namely: (1) limitations on a mixed economy, and (2) limitations on a welfare state—in sum, qualitative and quantitative limitations on the development of the American economy along the lines envisaged by Professor Hansen.

To indicate such limitations is not to imply any basic disagreement with the *principle* of a welfare-oriented, mixed public–private economy but to suggest a need for improving its *technique* by reference, not to stifling dicta, but to changing data. One may sympathise with Professor Hansen's propensity to give greater emphasis to the optimistic aspects of the American economic revolution, especially in this age of almost universal pessimism and cynicism, and still feel that qualifying observations, such as will be made in this essay, might be of use to the American economy trying to achieve and maintain stable growth and, by repercussion, to other mixed economies to which America's stable growth is a matter of common interest and concern.[2]

I. LIMITATIONS ON A MIXED ECONOMY

Professor Hansen thinks of a mixed economy as one " in which the powerful fiscal and monetary operations of an alert and informed government are playing a stabilizing and sustaining role." [3] He recalls the gradual acceptance in America of Keynesian criticisms of *laissez-faire*, the gold standard, sound finance and other familiar earmarks of individualistic

[1] McGraw-Hill, New York, 1957.

[2] For a great international concern in the stability and growth of the American economy see *The Business Cycle in the Post-War World*, E. Lundberg, ed. (London: Macmillan, 1955), especially contributions by E. A. G. Robinson, S. Tsuru, J. J. Polak and N. Kaldor.

[3] Hansen, *op. cit.*, p. 34.

capitalism, leading up to the 1946 Employment Act, the President's Council of Economic Advisers, the Congressional Joint Economic Committee and the more public-spirited Federal Reserve System as *faits accompli*. Thus the Keynesian foundations of the American mixed economy are made unmistakably clear, though the relation of Keynesian economics and the welfare state is left less clear.

The above developments in the American economy are viewed as the practical manifestations of the Keynesian Revolution, whereby it is theoretically demonstrated that the parametric role of market prices fails to equate aggregate demand and supply, to bring about automatic full employment or even to ensure the optimal allocation of resources—for the economy as a whole. The question naturally arises as to whether the American economy undergoing the Keynesian Revolution, as such, has become as depression-proof and stagnation-proof as Professor Hansen *now* seems to believe.[1] To ask such a question is to imply that there may be more difficulties in the way of the successful completion of the Keynesian Revolution than Professor Hansen is willing to admit. Before discussing some of those difficulties, however, let us look at the specific reasons why Professor Hansen supposes the American economy to be " on the march " toward stable growth and secular exhilaration.

Professor Hansen attributes his new faith and American people's new confidence in the possibility of stable growth to three structural changes in the American economy, which represent also three major characteristics of the American economic revolution: (1) the counter-cyclical and compensatory fiscal–monetary responsibilities of government as a permanent feature of public policy; (2) the commitment of the federal government to a policy of guiding the private sector to maintain " maximum production, employment and purchasing power " in accordance with the Employment Act; and (3) such " built-in stabilisers " as the democratic welfare state is capable of providing on an increasing scale (*e.g.*, progressive taxes, social security, farm-support programmes, public housing and mass education). Professor Hansen seems to consider these to be not only necessary conditions but also sufficient conditions for the stable growth of the American economy. The sufficiency of these conditions, however, may be questioned for a number of reasons.

We may discuss the first two conditions, leaving the third to the next section. Fiscal policies based on Keynesian theory are of the two broad types, one of which is designed to strengthen the propensity to consume and the other to stimulate the inducement to invest. These types of fiscal operations are not necessarily compatible with each other, however. Suppose that we follow the multiplier theory and let public-works expenditures act as a multiplicand. To be sure, consumption re-spending will increase effective demand, which will in turn induce some private investment, according to the familiar multiplier–acceleration interaction. But apart from the usual objections to the acceleration principle (the possible presence of excess capacity and the possible expectation of short-lived demand), there are two ways in which a permanent programme of public works may undermine the private propensity to invest. First, in so far as public-works expenditures are geared to productive projects, the productive capacity of the economy may increase relatively to its effective demand, only to depress the profitability of further investment, as Mr. Harrod and Professor Domar have shown.[1] Second, once public-works programmes have been accepted as a matter of principle, it will be difficult not to concede the theoretical possibility of the Government providing all the necessary employment opportunities and all the necessary goods and services on a non-profit basis. Such a concession amounts to a tacit rejection of the supposed necessity of private enterprise for maximum employment and production. Thus a permanent programme of public works, however countercyclical, carries with it an implied threat to private investment and private enterprise, at least in the minds of entrepreneurs.[2]

Such adverse reactions on private investment and private enterprise are not, of course, arguments against the principle of public-works programmes, for private investment and private enterprise can have the same capacity-increasing, investment-depressing effect, but cannot have the stability of the whole economy as their primary objective, anyway. These adverse reactions are pointed out here by way of qualifying the purely quantitative and one-sided analysis of public-works programmes as an income-employment generator. It would be a mistake, however, to draw the rash conclusion that public-works programmes are never compatible with private enterprise. Such a conclusion is as extreme as the opposite conclusion that public-works programmes are the quickest way to achieve state socialism. Professor Hansen, while he judiciously avoids such extreme conclusions, nevertheless overlooks the aforementioned antinomy of public expenditure programmes that discourages the private inducement to invest while at the same time encouraging greater induced consumption by the private sector receiving those public outlays as factor incomes.

Keynes was aware of the possibility that " the Government programme may, through its effect on ' confidence,' . . . retard other investment." [3] This awareness of the possible conflict between the aim of increasing induced consumption and the other aim of stimulating private investment led Keynes to mention " pyramid-building, earthquakes, even wars " [4] as being better

[1] Compare his *Full Recovery or Stagnation?* (1938).

[1] See R. F. Harrod, *Towards a Dynamic Economics* (1948) and E. D. Domar, *Essays in the Theory of Economic Growth* (1957). However, they call attention to the capacity-increasing effect of mainly *private* investment.

[2] Cf. S. S. Alexander, " Opposition to Deficit Spending for the Prevention of Unemployment," *Income, Employment and Public Policy* (In Honor of A. H. Hansen), 1948. Professor Hansen, however, lightly dismisses such opposition as " rapidly vanishing " (Hansen, *op. cit.*, p. 169).

[3] *General Theory*, p. 120. [4] *Ibid.*, p. 129.

than *laissez-faire*. He did not, of course, favour such obviously wasteful public-expenditure projects, but the fact remains that those projects of the non-stock-raising type, however wasteful, are in the nature of the case less competitive to private investment and private enterprise. Here lies the danger, despite Keynes' intentions to the contrary, that the desire not to impair business confidence may make policy-makers look upon " pyramid-building " and " wars " as the most practical form of compensatory expenditures. Thus perverted, Keynesian policies are naturally open to the criticism that they foster unproductive and undemocratic " make-work " ventures, such as are historically associated with the Nazi regime in pre-war Germany. Even though one can properly dismiss such a line of criticism as a gross misunderstanding of Keynes' intentions, one may not cavalierly disregard the above danger as an objective possibility. For this danger is a painful reminder of the antinomic character of Keynes' theory of effective demand, that is, a contradiction between the equally valid principles of inducing consumption and " pump-priming " private investment, and hence an implied contradiction between public-expenditure programmes to increase the former and those to stimulate the latter.

Similarly, tax programmes to encourage private consumption will be found to come in frequent conflict with tax programmes to stimulate private investment. Progressive taxation, which Professor Hansen favours on both compensatory and welfare grounds, could be carried to a point where the private motive to accumulation, the profit motive to production and the private inducement to invest are all so reduced as to offset its beneficial effect on consumption-demand.[1] Such a possibility is especially strong in a full-employment economy, since progressive tax rates, tax subsidies to low-income families, a reduction in retrogressive sales-taxes and other tax measures to sustain consumption-demand in conditions of full employment would bid away fully employed resources from the capital-goods industries—at least in a relatively short period during which technological advance and population growth could not be relied upon to make up for the diminished quantity of capital. A tax measure to stimulate investment could also prove self-defeating, as Professor Hansen has himself hinted. The accelerated-depreciation tax policy, for example, could be pushed to a point where private firms are encouraged to " scrap useful and comparatively new plant and equipment," which Professor Hansen criticises as " a highly wasteful use of resources," [2] but which one may criticise also as leading to such an over-accumulation of plant and equipment as to diminish the profitability of future investment. If investment-demand is thus reduced, income and induced consumption will fall via the reverse operation of the multiplier principle and in a self-defeating manner.

[1] Compare E. C. Brown, " Business-Income Taxation and Investment Incentives," *Income, Employment and Public Policy*.
[2] Hansen, *op. cit.*, pp. 134–5.

What of counter-cyclical monetary policy? If a cheap-money policy is taken as an integral part of Keynes' social philosophy as well as his economic theory, then far-reaching difficulties are bound to arise. On the one hand, Keynes' fundamental attitude toward the " functionless investor " (rentier) would logically lead to an " interest-free society," which Mr. Harrod recommends and defends on the ground that " it would enable us to dispense with the collectivist method of attacking capitalism." [1] But the trouble may arise when, not the collectivist, but the entrepreneur for whose benefit an interest-free regime is intended, starts asking whether the Keynesian denial of interest as a defensible property income will not eventually cast a serious doubt on the propriety of profit as a property income and the institution of private ownership itself. Professor H. C. Wallich, perhaps sensing such entrepreneurial apprehensions, has already raised questions of this kind.[2] Both the traditional criticism of monopoly profits as violating the rules of the competitive game (because it represents the exploitation of an inelastic demand curve) and the trade-union argument against profit-takers' tendency to make up for higher labour costs (due to higher-wage movements) by raising prices even when they can absorb them in reduced profits are indicative of profit being less functional than Keynes supposed on the tacit assumption of a competitive model. Thus viewed, the Keynesian cheap-money policy carries with it the far-reaching implication that the very entrepreneur whom it is intended to protect against the rentier's " oppressive power . . . to exploit the scarcity-value of capital " [3] may himself face that " euthanasia " which Keynes thought applicable only to " the rentier aspect of capitalism."

Professor Hansen does not discuss these fundamental questions of monetary policy, limiting himself to " the dangers of large changes in interest rates " [4] to capital markets. He objects to drastic changes in interest rates on the ground that such interest changes, even when designed to promote price stability, cannot be brought about except at the risk of provoking " general all-round instability of capital values " (presumably via the inverse relation of interest rates and capital values). Since this latter de-stabilising effect on capital markets ties the hands of the monetary authority, Professor Hansen makes that effect out to be a " basic " case against monetary policy for fiscal policy. He comes close to admitting that if the monetary authority did not have to worry about possible capital losses to banks and insurance companies, a consequentially feasible dear-money policy might be effective in checking inflation. Such an admission would, of course, weaken his case for fiscal policy. Professor Hansen might have made a more cogent case for fiscal measures to reduce inflationary pressures, had he argued that the interest-inelasticity of public and private investment would render any

[1] Harrod, *op. cit.*, p. 147.
[2] See his " The Changing Significance of the Interest Rate," *American Economic Review*, December 1946.
[3] *General Theory*, p. 376.
[4] Hansen, *op. cit.*, pp. 53 ff.

excessive reliance on the rate policy largely unfruitful, and if he had frankly recognised the fact that the large and growing public debt of the United States sets a practical limit to the upward movement of interest rates. Even the interest-elasticity of public-utility and housing enterprises (usually considered exceptions to the interest-inelasticity of investment in general) is likely to be reduced in the conditions in which the population is growing at a fairly rapid rate and the backlog of pent-up demand still lingering on—in sum, the post-war boom conditions tending to increase the marginal efficiency of capital relatively to any practicable maximum rate of interest.

Professor Hansen could have shown that a short-run dear-money policy to offset a reduction in the real value of interest income (though usually effected in the name of general anti-inflation policy) due to rising prices would run counter to the long-run objective of stimulating "growth investment" in fixed capital to that Keynesian extent of "the products of capital selling at a price proportioned to the labour, etc., embodied in them on just the same principles as govern the prices of consumption-goods into which capital-charges enter in an insignificant degree." [1] In Professor Hansen's hands all the objections to interest-rate policies become largely an argument in favour of fiscal policy, instead of becoming also a basis for showing how difficult it is for the monetary authority to reconcile the rentier aspect of capitalism with its entrepreneurial aspect, a difficulty which even Keynes apparently underestimated. For Keynes apparently considered it both desirable and feasible to do away with the rentier aspect of capitalism without thereby seriously contradicting his fond purpose of encouraging the entrepreneur *et hoc genus omne*. Such a contradiction does not arise as long as one deals with the rate of interest relative to the marginal efficiency of capital, abstracting from dynamic shift factors affecting the marginal efficiency of capital *schedule* itself. But as soon as it is realised that the phenomenon of interest considered as a functionless reward has ominous implications for the phenomenon of profit and for the whole institution of private ownership, investment incentives may be reduced so as to shift the marginal efficiency of capital schedule downward, thus offsetting any beneficial effect which a low interest rate may have on planned investment.

So much for the limitations on a mixed economy, limitations arising not only from the antinomic nature of Keynes' own underconsumption–underinvestment theory but from the dualistic nature of a mixed public–private economy itself. Let us now turn to the other major American development in the economic field.

II. Limitations on a Welfare State

Professor Hansen conceives a welfare state primarily as "a redistributor of income and a collosal purchaser of the products of private enterprise" [2]

[1] *General Theory*, p. 221. [2] Hansen, *op. cit.*, p. 149.

and justifies it as "a solid foundation upon which to build a full-employment program." [1] He makes allusion to Keynes as a *de facto* social-welfare reformer when he observes: "The *General Theory*, with its emphasis on the consumption function, taught us, however, that the social-security program was not only good social ethics but also good economics." [2] Thus Professor Hansen relates the American welfare state to Keynes through the latter's interest in an equitable distribution of income and wealth, the stabilisation of employment and the promotion of consumption-demand. In other words, Keynes is thought of as having provided an *economic* justification of what had been largely a humanitarian sentiment, even though the idea of a welfare state antedates Keynes. The welfare state based on Keynesian economics, together with the mixed economy discussed in the preceding section, is supposed to guarantee the stable growth of the American economy. There are a number of serious limitations on the welfare state as a stabilising and sustaining factor, ho ever.

There is a strong possibility that welfare expenditures will seriously conflict with military expenditures in a nation that is more defence-conscious than it is welfare-conscious. Professor Hansen himself alludes to such a possibility when he says that "the national-security budgets compete with the growing urgent need for much larger long-range social-welfare budgets" but that "we should all agree that national security comes first." [3] However, Professor Hansen gives us no satisfactory escape from the warfare–welfare dilemma, except to urge that America should "increase *now* by a substantial amount our long-range public-welfare budgets" presumably without reducing "our military program." [4] It is hard to see how the kind of long-range social welfare programme envisaged by Professor Hansen can be financed on an increasing and continuing basis without at the same time reducing defence expenditures even in so wealthy a country as the United States—unless the national income can be supposed to increase at a much faster rate than at present. Unlike an abstract welfare state that occupies a celestial space untroubled by so mundane a problem as the welfare *vs.* warfare controversy, a concrete welfare state must find shelter in a real world fraught with contending ideologies and conflicting scales of value. Until and unless the practical men of affairs become demonstrably willing and able to vote for larger welfare budgets than for defence budgets, they will, it is to be feared, continue to think of national welfare primarily in terms of military preparedness and so to frustrate such a genuinely welfare programme as Professor Hansen recommends on both economic and humanitarian grounds. The resulting welfare programme may fall far short of providing effective built-in stabilisers. This limitation is a limitation not so much on a welfare state *per se* as on a mixed welfare–warfare economy. In so far, moreover, as the welfare state has anything to do with Keynesian

[1] Hansen, *op. cit.*, p. 38. [2] *Ibid.*, p. 159 n.
[3] *Ibid.*, p. 148. [4] *Ibid.*, pp. 148–9.

thinking, the above limitation is that of Keynes' and Professor Hansen's over-idealised notion of the state both as a superb balancing agent and as a supreme judge of social priorities.

Next, let us consider Professor Hansen's argument in favour of "redistributive processes of the welfare state designed to broaden and deepen the consumption base." [1] Once a fiscal redistribution of income and wealth has been accepted as conducive to economic stability and welfare, the next logical step will be to question not only the traditional theory of distribution but also the existing system of distribution based on private property and factor pricing. For it is natural for egalitarians to dispense with redistribution, fiscal or otherwise, if they feel that they can permanently solve the problem of income disparities by modifying property relations that predetermine those disparities. Thus, on the one side, the welfare state tends to encourage egalitarians of the "underconsumption" type to move from a redistribution policy based on given property relations to a distribution system based on entirely different property relations and so to discourage private enterprise in general and private investment in particular. Keynes was himself somewhat responsible for this tendency, for he accepted J. A. Hobson's underconsumption doctrine tracing underemployment to inequality as being "undoubtedly in the right," [2] albeit in conditions of *laissez-faire* investment.

On the other side, Keynes' economic theory built around the strategic importance of private investment, coupled with his social philosophy granting "significant inequalities of incomes and wealth" as a useful concession to human motivation and as a helpful incentive to creative activities,[3] would serve to restrain any extreme egalitarian tendency which his other theory of underconsumption may foster. Realisation of Keynes' antinomic attitude toward the question of distribution would probably have the ultimate effect of stopping the redistribution function of the welfare state short of the point where it could, via the otherwise increased quantitative importance of comsumer incomes and expenditures, contribute substantially to the stabilisation programme. Thus it is by no means obvious that the redistribution feature of the welfare state can be counted upon as providing so solid a basis for the full-employment programme as Professor Hansen claims.

Lastly, no discussion of the welfare state is complete without some reference to the possible effects of monopoly on consumer welfare, investment stability and technical progress. In so far as a welfare state represents also a strong anti-monopoly atmosphere, as it does in the United States, the notion of built-in stability becomes extremely ambiguous and incongruous. Perhaps this is the reason why Professor Hansen leaves out anti-monopoly legislation from his list of built-in stabilisers which the welfare state is supposed to provide. However, his professed predilection for a "high-

[1] Hansen, *op. cit.*, p. 157. [2] *General Theory*, pp. 324–5. [3] *Ibid.*, p. 374.

wage, low-profit" regime [1] is strongly suggestive of anti-monopoly volition. Professor M. Bronfenbrenner in a Schumpeterian critique has challenged Professor Hansen's "high-wage, low-profit" scheme as of dubious compatibility with dynamic capitalism.[2] At any rate, it is important to consider the problem of monopoly in relation to the welfare state, both because monopoly has a vital bearing on the equitable distribution of income, and because monopoly is variously viewed as helping stable growth and as hindering it. Anti-monopoly legislation considered as an integral part of the welfare state will be found to present a serious dilemma for the American economy.

On the one hand, the reduction of monopoly may stimulate the private inducement to invest as well as the private propensity to consume via the sequence of lower consumer prices relative to money wages, higher real wage income, increased consumption expenditure, exhausted capacity in the consumer-goods industries, increased orders for capital goods and finally increased output of capital goods in the capital-goods industries. This beneficial effect of anti-monopoly legislation on consumer welfare and investment-demand is what Mrs. Joan Robinson's explanation of monopolisation implies.[3] Applied to the American economy, Mrs. Robinson's implicit case against monopoly acquires cogency and plausibility, for in that economy the growth of monopoly has tended to strengthen the propensity to save (out of corporate profits) more than it has stimulated the inducement to invest. *Apropos*, Keynes warned against excessive corporate saving such as monopoly would encourage when he observed: "It is possible . . . that the extreme financial conservatism of corporate finance in the United States, even during the slump, may account for it [the low marginal propensity to consume and hence a high leakage coefficient in the multiplier equation]." [4]

On the other hand, the same reduction of monopoly may militate against private investment if Schumpeter's theory of monopoly is correct. For according to Schumpeter, "trustified capitalism" tends to promote innovational investment through: (*a*) a favourable reaction on the cost-reducing type of research and know-how; (*b*) the stimulating effect on innovations of stable monopoly profits due to the downward rigidity of monopoly prices; and (*c*) the encouraging effect of monopolized finance on the industrial application of available inventions and innovations.[5] The logical implication is that anti-monopoly legislation does the private inducement to invest more harm than good. However, Schumpeter's explicit case for monopoly as the "creative destroyer" of dynamic capitalism and his implicit case against anti-monopoly legislation as a possible impinger on innovational

[1] See his *Economic Policy and Full Employment* (New York, 1947), pp. 48–9.
[2] See his "Some Neglected Implications of Secular Inflation," in *Post Keynesian Economics*.
[3] See her *The Accumulation of Capital* (London: Macmillan, 1956), p. 78.
[4] *General Theory*, p. 128.
[5] See his *Capitalism, Socialism and Democracy* (1947), Chapter 8.

investment are open to the following objections. First, monopoly may, via its decreasing effect on real wages (this via raising consumer prices relatively to money wages), depress consumption-demand and so offset any stimulating effect it may have on investment-demand. Second, monopoly may have the effect of making the adoption of capital-saving techniques (or labour-using ones) profitable via its decreasing effect on real wages, thus making for a weaker accelerator. Thirdly, monopoly may, via its tendency to restrict output, make the presence of excess capacity a normal phenomenon and so render the acceleration principle less operative than otherwise.

The main point to be stressed here is that the diametrically opposed views of monopoly as a force making for secular growth and as a force making for secular stagnation, in so far as they are taken to be both valid, would probably entail some compromise between extremely pro-monopolistic and extremely anti-monopolistic policies. The resulting half-hearted anti-monopoly programme of the welfare state can hardly be said to provide effective built-in stabilisers or to promote an equitable distribution of income and wealth. This last limitation is fundamentally a limitation on a mixed monopoly–competition economy. It is also a limitation of Keynes' theory (in contradistinction to post-Keynesian economics) lacking a macroeconomic treatment of monopoly.

Concluding Observations

Professor Hansen takes great pains to identify Keynesian policies with capitalism and to dissociate them from socialism. Thus after comparing Keynes' *General Theory* favourably with Marx's *Das Kapital*, Professor Hansen hastens to add: " The book is not an attack on private enterprise. Indeed Keynesian policies have . . . immeasurably strengthened the private-enterprise system." [1] By contrast, Keynes seemed willing to err on the side of socialism rather than on the side of capitalism. Thus the author of the *General Theory* proclaimed: " The purpose of the book as a whole may be described as the establishment of an anti-Marxian socialism." [2] True, it was a socialism of the anti-Marxian variety that Keynes intended to establish theoretically, but it is significant that he did not say " an anti-Marxian capitalism " instead. Perhaps this difference between Keynes and Professor Hansen is a reflection on their respective " anti-capitalist volition " and " pro-capitalist volition," as Schumpeter would say, but it may be a reflection also on two different political climates in which " socialism " is a more or less discussable subject. Be that as it may, the fact that Professor Hansen finds it necessary to stress Keynes as a saviour of capitalism and to defend Keynesian policies against those criticising them as " socialistic " is strongly indicative of the underlying antinomy of Keynesian

[1] Hansen, *The American Economy*, p. 167.

[2] *General Theory*, p. 355. See, in this regard, Mrs. Joan Robinson's rather independent appraisal of Marx in her " Marx and Keynes," *Collected Economic Papers* (1951).

analysis and policies. For we have seen that Keynes' theory of consumption tends to encourage radical policies, while his theory of investment tends to encourage conservative policies. Our analysis of those antinomic elements would suggest that the mixed-economy, welfare-state scheme of things is likely to prove less solid a basis for stable growth than Professor Hansen supposes and less automatic a transition to a full democratic socialism than some followers of Keynes seem to imagine.[1]

Professor Hansen might be right in stressing the fiscal, monetary and other Keynesian policies designed to stabilise aggregate demand as adequate for the American economy with abundant resources but without stable markets. But such policies may not be adequate for other economies with fairly stable demand but without sufficient domestic resources or sufficient foreign-exchange reserves. The chances of the American economic revolution succeeding along Keynesian lines are greater than critics of Keynesian policies are willing to admit, for, despite the limitations discussed above, parliamentary body politic, common suffrage, social security programmes, collective bargaining, mass education and other social-democratic practices in the United States are likely to give effect to more far-reaching social and economic reforms than anyone could have thought possible during the last century. The necessary reservation to have here is that the American economy may go beyond what Professor Hansen's mixed-economy, welfare-state approach would allow: (*a*) if moderate Keynesian policies prove inadequate to the task of maintaining stable growth, and (*b*) if other predominantly private-enterprise economies adopt, for economic or political reasons, more drastic programmes than Keynes intended for " the democracy of nations."

It may be true that the American economy has become less susceptible to instability, not in spite but because of Professor Hansen's " stagnation thesis " and his anti-stagnation policy recommendations, as his book seems to imply. But it would be amiss for any one to infer that therefore the essentially unstable nature of a predominantly market economy has disappeared. That cyclical growth is the essential way in which capitalism develops seems to remain as valid to-day as when Schumpeter held it in his day. The success of the American economic revolution based on Keynesian theory and policies will depend increasingly on future progress " toward a blurring of the distinction between capitalism and other systems,"

[1] See, *e.g.*, J. Strachey, *Contemporary Capitalism* (London: Victor Gollancz, 1956); H. Gaitskell, *Recent Developments in British Socialist Thinking* (London: Co-operative Union, 1956); C. A. R. Crosland, *The Future of Socialism* (London: Jonathan Cape, 1956). These writers may not consider themselves as followers of Keynes, but what they write seems to be in line with Keynesian thinking. In this regard, Professor P. T. Homan reports " a thoughtful British socialist " as saying: " The basis of present British Labour policy is not Marxian or Webbian, but Keynesian." (See his " Socialist Thought in Great Britain," *American Economic Review*, June 1957.) However, Professor Homan may be over-optimistic in his conclusion that " the day of the prophetic Utopian vision, equally with the day of the Marxist imperative, appears to be over [presumably in Great Britain as well as in the United States]."

toward that blurring process which is attributed to " the influence of the Keynesian school." [1] For both the romantic sympathy for " capitalism " and the doctrinaire support for " socialism " must give way to an elastic realism, if the mixed-economy, welfare-state approach is to be given full play, to experiment with social and economic reforms boldly and imaginatively. A modern mixed economy undergoing the Keynesian Revolution has the unique opportunity to demonstrate the wisdom of planning for stability and growth " whilst preserving efficiency and freedom " [2] and on the basis of clear and perceptive recognition of the limitations which that economy itself occasions.

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[1] See D. M. Wright, "The Prospects for Capitalism," *A Survey of Contemporary Economics* (H. S. Ellis, ed.), 1948.

[2] Keynes, *General Theory*, p. 381.

IMPORT RESTRICTION AS AN INSTRUMENT OF BALANCE-OF-PAYMENTS POLICY [1]

I. INTRODUCTION

WHAT contribution can import restrictions make to balance-of-payments policy? Three stages of thought on this question can be distinguished. The first may be called the partial equilibrium approach, the second the absorption approach and the third the real-income approach, which underlies the present paper.

(1) The *partial equilibrium approach* concentrates attention on the effect of import restrictions on the particular imports restricted and tends to take for granted that the resultant saving in imports constitutes a net gain to the balance of payments.

(2) The more recently developed *absorption approach* has cast doubt on the capacity of import restrictions to secure a given improvement in the balance of payments.[2] This approach emphasises that an improvement in a country's balance of payments implies an increase in savings, a decline in investment or some combination of the two.[3] Import restrictions may well lead to a temporary increase in saving, due

[1] This paper was written in the course of a study (financed by a grant from the Rockefeller Foundation) being undertaken at the National Institute of Economic and Social Research on the use of import control in the United Kingdom since the War. The authors are indebted for helpful comments from Professors G. Haberler, H. G. Johnson, J. E. Meade and R. Nurkse, Mr. W. A. B. Hopkin, Mr. L. Klein, Mr. A. Maizels and Mr. M. Fg. Scott.

[2] The term " absorption approach " was introduced by S. S. Alexander in his paper " Effects of a Devaluation on a Trade Balance " in *I.M.F. Staff Papers*, April 1952.

Cf. R. Nurkse, " The Relation between Home Investment and External Balance in the Light of British Experience, 1945–1955," *Review of Economics and Statistics*, May 1956, p. 138: " Balance of payments measures such as import restrictions . . . cannot be relied upon as automatic means of bringing about a country's absorption of goods and services within the limits of its total production. . . . Only in conjunction with some deliberate measure of restraint on total spending can the restriction of imports in this case bring about any lasting relief to the balance of payments."

Cf. also H. G. Johnson, " Sketch of a Generalization of Keynesian Balance-of-Payments Theory," *The Indian Journal of Economics*, July 1956, p. 55. ". . . though exponents of controls often argue as if an import prevented were a saving made, there is no reason for assuming in general that residents will consume less rather than more in total when imports are restricted."

[3] In the " absorption approach " the balance of payments B is generally defined in terms of $B = Y - E$, where Y is total income from home production and E is total domestic expenditure. This can be derived from the usual foreign trade definition as follows:

Let M be total imports (which, for simplicity, may be assumed to consist exclusively of finished goods) and

X the total production of exportables, of which X_h is consumed at home and X_f exported, so that

$$X = X_h + X_f$$

Y be total income derived from production of exportables, X, and of goods sold only on the home market, H, so that

$$Y = X + H$$

[*continued on page* 484

to the delay in re-arranging the pattern of expenditure or to postponement of expenditure in anticipation of the restrictions being removed; they may also lead to a *temporary* fall in investment, due to a running down of stocks; but there is no certainty that they will lead to the desired *long-term* rise in saving or fall in investment. Indeed, in conditions of full employment and with sticky prices (hence no marked shift to profits), the long-term effect of import restrictions on the balance of payments may even be adverse.[1] To ensure a given long-term improvement in the balance of payments, it has been emphasised that import restrictions need to be accompanied by disinflationary measures designed to produce the required " disabsorption " of resources.

(3) The question then arises: if it is the disinflation which produces the indispensable " disabsorption," and if import restrictions make no certain contribution to the required rise in saving or fall in investment, what is the object of using them at all in conjunction with disinflation? The answer is that the contribution of import restrictions in this connection must be looked for not in their effect on the balance of payments as such, but on the level of real income at which a given improvement in the balance of payments is attained. It is this third stage of thinking about import restrictions which we have called the *real income approach*, and which lies at the basis of the present paper.

II. A Simple Diagrammatic Representation

Two Basic Assumptions

The three approaches discussed above may be illustrated rather crudely in terms of a familiar indifference-curve diagram. In using this type of analysis we start with two simplifying assumptions:

(a) *Constant Distribution of Income.* In the first place we ignore the effects of the various balance-of-payments measures considered on the distribution of income; in other words we treat the community as though it were a single individual.

(b) *Constant Prices.* Secondly, we assume that all prices, domestic and foreign, remain constant.[1] This has two important implications. In the first place, it means that the effect of balance-of-payments policy on the terms of trade is being ignored. Second, it implies the possibility of disequilibrium between supply and demand—either excess demand, manifesting itself in lengthening order books, queues and rationing, or excess supply, resulting in unsold stocks or unemployment.[2]

It may be noted that the assumption of constant prices excludes also changes in the exchange rate. Attention here is focused primarily on the effects of import restrictions and deflation. Exchange adjustment can be an alternative or an additional instrument of balance-of-payments policy; its role is discussed briefly in Section XI below.[3]

The consequence of removing these two assumptions is discussed in Section X below.

Diagrammatic Representation of the three Approaches

In Fig. 1 imports are measured along the X-axis and home-produced goods (both home-market goods[4] and exportables) up the Y-axis; the quadrant XOY contains a map of community indifference curves. The fixed price ratio between imports and home-produced goods is shown by the slope of the expenditure line R_0S_0. The initial income is OS_0 in terms of imports, or OR_0 in terms of home-produced goods. R_0S_0 is tangent to an indifference curve at T_0 which shows the initial position at which OU of imports is bought and UT_0 of home-produced goods. T_0 is assumed to be a position of full employment,[5] but with a balance-of-payment deficit of ZU $(= KT_0)$ which it is desired to remove. We can now see how this problem appears under the three approaches distinguished above.

E be total domestic expenditure on finished goods, both for consumption C and investment I, so that

$$E = C + I = H + M + X_h$$

Then the balance of payments (surplus or deficit)

$$\begin{aligned} B &= X_f - M \\ &= X - X_h - M \\ &= (Y - H) - (E - H) \\ &= Y - E \end{aligned}$$

But, also, total income is distributed between saving S and consumption C, so that

$$Y = S + C$$

$$\text{and } E = I + C$$

$$\text{so also } B = S - I$$

[1] This would occur if the fall in real income due to the distorting effect of import restrictions on the allocation of expenditure led to a fall in saving. In conditions of full employment there would be no possibility of this " distortion effect " of import restrictions, which reduces real income, being compensated by a rise in real income due to employment creation.

[1] For present purposes it is necessary only to assume that prices are not responsive to the particular measures, import restrictions and disinflation, under consideration; we are not concerned with price changes arising for other reasons. While the assumption of constant prices is primarily an expository device, it has also a certain relevance to the United Kingdom economy, where prices are notoriously sticky, and particularly to the early post-war years, when prices were largely subject to control.

[2] The concept of excess foreign demand for exports is particularly important in the case of capital goods—Britain's major export—which are made to order, and where shortening or lengthening of delivery periods, rather than price fluctuations, is the rule.

[3] Post-war experience has suggested that the assumption of a fixed exchange rate, like that of sticky prices, may also be not so unrealistic; in practice there appears to be considerable reluctance to use exchange adjustment as a corrective to balance-of-payments disequilibrium.

[4] *I.e.*, goods produced at home only for the home market, as distinct from exportables, which are produced both for export and for the home market, and of imports, not produced at home. These home-market goods are sometimes described as *sheltered* or *non-foreign trade* goods.

[5] The concept of full employment is used here and subsequently in the absolute sense that no increase in output of goods and services can be squeezed out of the existing resources, *i.e.*, that the elasticity of supply of home-produced goods is zero.

(1) According to the *partial equilibrium approach* all that is required is an import cut of $\mathcal{Z}U$ $(= KT_0)$, which would produce the desired balance-of-payments improvement.

(2) The *absorption approach* takes account of what happens to KT_0, the money which can no longer be spent on the restricted imports. If there is no reason to expect import restrictions to lead to an increase in saving or a fall in investment the frustrated demand will be diverted on to home-produced goods. Given that T_0 was a position of full

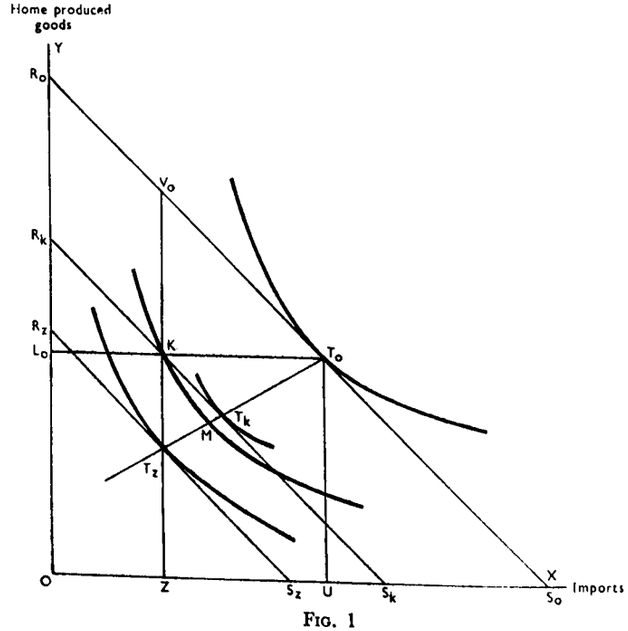


FIG. 1

employment, this increased demand for home-produced goods can be satisfied only at the expense of exports,[1] which will then fall by KV_0, equivalent in value at the fixed price ratio to KT_0. In these circumstances the import cut of KT_0 will produce no improvement in the balance of payments. The only way to improve the balance of payments is to reduce domestic absorption, and this means deflation. Deflation is represented in Fig. 1 by a parallel downward shifting of the expenditure line R_0S_0; it leads to reductions in expenditure on imports and on home-produced goods determined by points of tangency of successive expenditure lines with indifference curves, *i.e.*, a movement down the consumption line T_0T_z. To ensure the required improvement in the balance of payments T_0K, home expenditure

[1] If not all imports are subject to restriction, part of the frustrated demand may be diverted to unrestricted imports; the effect on the balance of payments is the same as if it flowed only to exportables.

must be deflated from the initial level R_0S_0 to R_zS_z. At this point imports will have fallen by the required amount T_0K. Moreover, not only will there be no additional home demand diverted to exportables, there will actually be a net reduction in domestic demand for home-produced goods of KT_z. This implies unemployment,[1] and though this is an unfortunate by-product of removing a balance-of-payments deficit by deflation, at least the balance-of-payments improvement has been secured.

(3) At this point the "*real income*" school comes in to show that with the help of import restrictions the unwanted unemployment KT_z can be avoided. Instead of deflating to R_zS_z, it is necessary to deflate only to R_kS_k, if that deflation (or "disinflation" as it might now be called [2]) is accompanied by an import cut. This amount of disinflation [3] serves to avoid the diversion of any new expenditure on to exportables (and hence ensures that the import cut yields a *net* improvement in the balance of payments of the required amount), but also avoids any actual *reduction* of expenditure on home-produced goods which would cause unemployment.

It is true that the import cut causes some distortion of demand; this is indicated on the diagram by the fact that though money expenditure is the same as it would be at T_k, the resultant real income is equivalent only to money expenditure at M. But M is still substantially better than T_z; so long as home-produced goods constitute any sort of substitute for imports (*i.e.*, the indifference curve at K is not vertical), the loss through distortion at K will be less than that through unemployment at T_z.

Two Implicit Simplifications

This, then, is broadly the "real income approach" rehabilitation of import restrictions.[4] But the picture presented here is an over-simplification, in two important respects:

(*a*) In the first place, if there is any *excess demand for exports*, the reduction in expenditure on home-produced goods due to deflation

[1] The unemployment may take the form of *under*employment, resulting in loss of output. Throughout this paper the expression "unemployment" may be taken as covering "underemployment" also.

[2] The term *deflation* has been used to cover any reduction in domestic expenditure, irrespective of whether it creates unemployment or only avoids excess demand for domestic resources. It is often more appropriate to describe a reduction in expenditure serving only to counterbalance the increased demand for domestic resources resulting from import restriction or some other such measure—so that the total demand for home output is unchanged—as *disinflation*.

[3] The necessary amount of disinflation, from R_0S_0 to R_kS_k, can include any automatic deflationary effects (increased saving or decreased investment) of the import restrictions with which it is combined. It represents a net change in expenditure resulting from expenditure policies plus import restrictions.

[4] A broadly similar argument can be used to "rehabilitate" devaluation against criticisms of its efficacy from the side of the absorption approach. The argument is relevant to a comparison of the effect of deflation alone with that of deflation accompanied *either* by import restriction *or* devaluation; but not to a comparison of the merits of these alternative accompanying measures. See Section XI below.

will not wholly cause unemployment: to some extent it will release more goods for export, and thereby contribute to the improvement in the balance of payments. In this case deflation would not need to proceed as far as R_zS_z in order to secure the desired improvement, nor would as much unemployment as T_zK result.

(*b*) In the second place, *if T_0 is not a position of absolute full employment*, the demand V_0K diverted on to home-produced goods by an import cut of KT_0 need not wholly flow to the detriment of exports: in part, it may serve to increase home output and employment.

The effects of these complications are dealt with in subsequent sections of this paper.

III. "Efficiency" of Deflation: the Export-promotion Ratio q

Definition of Deflation-efficiency

Our main purpose is to compare the effect on real income of securing a given improvement in the balance of payments, on the one hand, by means of deflation combined with import restrictions and, on the other hand, by means of deflation on its own. We consider first the effect on the balance of payments and real income of deflation on its own.

A change in total domestic expenditure, E, on both consumption and investment, is distributed between home-market goods, H, imports, M, and exportables, X, in accordance with the marginal propensities to consume these goods, modified by the effects of existing controls and supply limitations. The ratios in which marginal changes in expenditure are distributed between these types of goods may be denoted by h, m and x, such that $h + m + x = 1$.

A policy of deflation is one directly reducing E. A reduction in E of ΔE will reduce expenditure on H by $h\Delta E$, on M by $m\Delta E$ and on X by $x\Delta E$. To some extent these changes benefit the balance of payments; to the extent that they do not, they create unemployment. The ratio of the net "balance-of-payments-improving" effect to the whole (*i.e.*, "balance-of-payments improving" *plus* "unemployment-creating") effect we term the "efficiency" of deflation, regarded as an instrument of balance-of-payments policy.

The Export-promoting Ratio q: Role of Excess Demand for Exports

The "balance-of-payments-improving" effect of deflation comprises two elements. The first is the direct effect of reduced expenditure on M, $m\Delta E$, and depends only on the marginal propensity to import. The second, which we may call the "export-promoting" effect, is the indirect effect of the reduced expenditure on H and X goods, in so far as the resources released result in increased exports. On our assumption of constant prices, this export-promoting effect can occur only in a situation where there is excess foreign demand for exports, and will be equal to the amount of excess foreign demand for exports, X_e, or to X_r, the amount of additional exportables released, whichever is less.[1] X_r itself is dependent on two further factors: first, the marginal propensity to spend on exportables, and second, the mobility of resources released from the home-market-goods industry. If this mobility is indicated by f, defined as the proportion of resources released from producing H goods which move to the X goods industry, then $X_r = \Delta E(x + fh)$.

The unemployment-creating effect of deflation is the direct obverse of the export-promoting effect; it is that part of the reduction in expenditure on H and X which does *not* lead to increased exports that creates unemployment. This may be the result either of lack of excess foreign demand for exports—so that the exportables released cannot be sold—or of deficient export releases themselves, due to an excessive marginal propensity to consume home-market goods combined with immobility of resources released from their production. The ratio of export-promoting to unemployment-creating effects of deflation (which we may call q) can thus be defined as follows:

(1) Where $X_e > X_r$

$$q = \frac{x + fh}{(1 - f)h}$$

(2) Where $X_r > X_e$

$$q = \frac{X_e}{\Delta E(x + h) - X_e}$$

With ample foreign excess demand for exports (case (1)), the export-promotion ratio depends on: (*a*) the ratio between the marginal propensities to consume X and H, and (*b*) the mobility of resources released from H goods production.[2] Unemployment-creation will be less and export-promotion greater: (*a*) the higher the marginal propensity to consume exports in relation to the marginal propensity to consume home-market goods, and (*b*) the greater the mobility of resources producing H goods.

Where excess foreign demand for exportables is less than the amount

[1] We are assuming that the foreign demand for exports is not affected by the level of imports, either through the foreign-trade multiplier or otherwise.

[2] Formula (1) can be written

$$q = \frac{x}{h}\left(\frac{1}{1-f}\right) + \frac{f}{1-f}.$$

With a given ratio between the marginal propensities $\left(\frac{x}{h} = \text{constant}\right)$, q varies with mobility; and, with a given degree of mobility (f = constant), q varies with the ratio of the marginal propensities. Mobility is important only where $\frac{x}{h}$ is small, and the ratio $\frac{x}{h}$ is important only where mobility is small.

of additional exportables released (case (2)), it is the size of the excess foreign demand for exports which alone determines the increase in exports.

Determinants of Deflation-efficiency: m and q

We may sum up the two main determinants of deflation-efficiency as follows:

(1) m;

(2) q, dependent on X_e or X_r, whichever is less; X_r in turn being dependent on $\frac{x}{h}$ and f.

The two determinants operate on different sides of the balance of payments, the first determining the reduction in imports, the second the increase in exports; but their effects are not independent of one another. The more important the first determinant (*i.e.*, the nearer m is to unity), the less important the second. Deflation efficiency will be at a maximum (*i.e.*, the whole of the deflation will result in an improvement in the balance of payments) if *either* $m = 1$ *or* $q = \infty$; for it to be at a minimum (*i.e.*, for the whole of the deflation to create unemployment) it is necessary that *both* $m = 0$ and $q = 0$.

Diagrammatic Representation of Deflation-efficiency

The concept of deflation-efficiency and its relation to m and q is illustrated in Fig. 2. T_0 is the initial position corresponding to an expenditure level shown by R_0S_0. Deflation causes a movement down the consumption line, T_0T, inflation up the consumption line T_0T'.

The slope of the consumption line T_0T depends on the marginal propensity to import $\left(\text{it is in fact } \frac{1}{m} - 1\right)$, and determines the extent to which deflation reduces imports. The higher the marginal propensity to import (*i.e.*, the nearer is m to unity), the flatter is T_0T. If m were to equal unity, then T_0T would coincide with T_0L_0, and a balance-of-payments gain of T_0K would be secured by a mere deflation to R_kS_k. No question of unemployment would arise, since there would be no reduction in expenditure on home-produced goods. The lower is m, the steeper is T_0T; at the limit it coincides with T_0U, and deflation makes no contribution to the balance of payments via imports; its assistance to the balance of payments then depends only on the effect of reduced expenditure on home-produced goods in promoting exports.

This effect on exports is shown by the q-indicator, T_0Q_0, which divides the reduction in expenditure on home-produced goods in the ratio q as between export-promoting (upper sector) and unemployment-creating (lower sector) respectively. Thus deflation to R_nS_n reduces expenditure on

home-produced goods by T_nB_n, of which B_nA_n increases exports and T_nA_n causes unemployment.[1] The ratio $\frac{B_nA_n}{T_nA_n}$ is the export-promotion ratio q. The net gain to the balance of payments is shown by T_0C_n, made up of a reduction in imports of B_nT_0 plus an increase in exports of B_nA_n; at the given price ratio between imports and home-produced goods the latter is worth C_nB_n in terms of imports. Deflation-efficiency is indicated by the ratio of this gain T_0C_n to the whole reduction in expenditure T_0N.

Similarly, T_0Q_0' indicates the ratio q' between export-impeding and

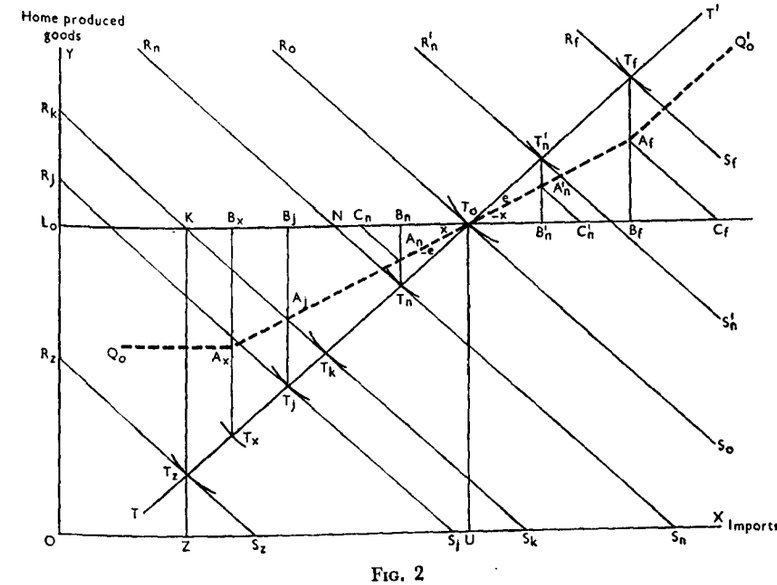


FIG. 2

employment-creating effects of inflation. An inflation to $R_n'S_n'$ causes an increase in expenditure on home-produced goods of $B_n'T_n'$, of which $A_n'B_n'$ will be at the expense of exports and $A_n'T_n'$ provides increased employment. The net worsening of the balance of payments will in this case be T_0C_n'.

The q-indicator T_0Q_0 shows how far deflation needs to proceed in order to produce a given balance-of-payments improvement. Thus in Fig. 2, to secure an improvement of T_0K, expenditure must be reduced to R_jS_j. This will reduce imports by T_0B_j and increase exports by A_jB_j (*i.e.*, by B_jK in terms of imports), together giving the desired improvement in the balance of payments T_0K. At the same time unemployment of A_jT_j will have been created.

[1] In Fig. 2 the angles subtended by B_nA_n and T_nA_n are marked x and $-e$ to indicate increases in exports and decreases in employment respectively.

The q-indicator Q_0T_0 need not be a straight line; the ratio of export-promoting to unemployment-creating effects may vary with the extent of deflation. In fact, once $X_r > X_e$, *i.e.*, once the excess demand for exports has disappeared (shown by the point T_x in the diagram) q becomes zero and the indicator T_0Q_0 horizontal.

Nor is there any reason why the slope of T_0Q_0, the q-indicator, need be the same as that of T_0Q_0'. In the case of q, the ratio of export-promoting to unemployment-creating effects of deflation, we saw that the *supply* of exports, X_r, might be increased almost indefinitely by deflation, but that there might be an effective limit on the *demand* side, if X_e, the excess foreign demand for exports, were less than X_r, the additional exports released. In the case of q', the export-impeding ratio of inflation, the limitation on the demand side, X_e, is no longer relevant, since we are concerned with a reduction, not an increase, in exports. But, contrary to the case of deflation, q' may be affected by limitations on the supply side, depending on the amount and distribution of initial unemployment and mobility of resources. Once full employment is reached in the X goods industry,[1] then any increased demand for exportables is likely to reduce exports; if there is full employment in the H goods industry as well, increased domestic demand of any kind will reduce exports. Thus, if inflation is carried to the point of full employment (shown by T_f in the diagram) the slope of the q'-indicator, T_0Q_0', becomes the same as that of the consumption line TT'.[2]

Effect of Deflation on Real Income

With a given marginal propensity to import (*i.e.*, given the position of the consumption line TT') it is clear that the real income at which a given balance-of-payments improvement can be achieved by deflation will be higher the higher is q. If $q = \infty$ (so that the whole benefit of reduced expenditure on home-produced goods accrues to exports) T_0Q_0 runs coincidentally with T_0T, and the balance-of-payments target is achieved, with no unemployment, at T_k. At the other extreme, if q is zero (as assumed in Fig. 1) deflation must proceed to R_eS_e, and the balance-of-payments improvement can be achieved only at the much lower real income of T_e, with T_eK of unemployment. As we have seen, the actual real income at which the target is achieved depends partly on the marginal propensity to import (shown by the slope of TT') and partly on q (the slope of T_0Q_0); the latter in turn depending on the excess demand for exports, or the relative

[1] After allowing for the maximum possible transfer of unemployed resources from the H goods industry.

[2] The slope of Q_0T_0 is $\frac{q(1-m)}{m(1+q)}$. When $q = 0$ (where excess demand for exports has disappeared), this becomes zero. Similarly, the slope of T_0Q_0' is $\frac{q'(1-m)}{m(1+q')}$, and when $q' = \infty$ (at full employment) this reduces to $\frac{1-m}{m}$, *i.e.*, the slope of T_0Q_0' becomes the same as that of the consumption line TT'.

propensity to consume home-market goods and exportables and the mobility of resources as between the production of home-market goods and exportables, whichever is less.

IV. Effect of Import Restrictions: the Export-impeding Ratio i

Import restrictions, like changes in the level of expenditure, affect both the balance of payments and the level of employment, though in this case the effect on the balance of payments is more complex. Whereas deflation tends to improve the balance of payments both by reducing imports and by increasing exports, in the case of import restrictions the effect on the balance of payments is favourable on the import side but unfavourable as regards exports. Moreover, while deflation tends to reduce the level of employment, import restrictions tend to increase it.

Determinants of the Export-impeding Ratio i

Expenditure diverted from imports by import restrictions, in so far as it is not saved, will be re-allocated between exportables and home-market goods in accordance with the marginal propensities to consume these two classes of goods, as modified by the import restrictions. The modified marginal propensities, which we may call x' and h' respectively, may not bear the same relation to one another as the basic marginal propensities x and h; for the ratio $x' : h'$ depends not only on the relative income elasticity of demand for X and H goods (as does the ratio $x : h$), but also on the relative substitutability of these goods for the restricted M goods. If, for instance, exportables are much closer substitutes for the restricted imports than are home-marketed goods, then $x' : h'$ will tend to be greater than $x : h$, and vice versa.

Import restrictions reduce imports and at the same time increase expenditure on home-produced goods; the effect of the latter, as in the case of inflation, is partly to reduce exports and partly to increase employment.[1] The ratio between these two effects (the export-impeding ratio) we call i. The value of i will depend to a large extent on the relative size of the modified marginal propensities x' and h', but, as in the case of the export-impeding ratio of inflation, q', in certain conditions may also be affected by supply factors such as the amount of unemployment in the H and X goods industries and the mobility of resources between them. As we have already

[1] In this paper we have implicitly assumed that the imports restricted are finished goods. If, on the contrary, they were raw materials, and hence complementary rather than competitive with domestic resources, then an import cut could also create unemployment. But there would still be a process of diversion of expenditure—in this case a rather larger diversion—from the goods which would have been manufactured with the raw materials no longer imported on to other home-produced goods. The employment-creating effect of this diversion will be greater to the full extent of the unemployment created. Thus on balance there will still be a net employment-creating effect, though some local unemployment may result.

seen, in the limit where $X_e < X_r$, q becomes zero, while in the case of i, at the limit when full employment is reached i becomes ∞. But, apart from these different limits, i will tend to differ from q to the extent that the ratio between the modified marginal propensities x' and h' differs from that between the unmodified propensities x and h.

Diagrammatic Representation of the Effects of Import Restriction

Fig. 3 illustrates the effect of import restrictions on the balance of payments and the level of employment and its dependence on the export-impeding ratio i.

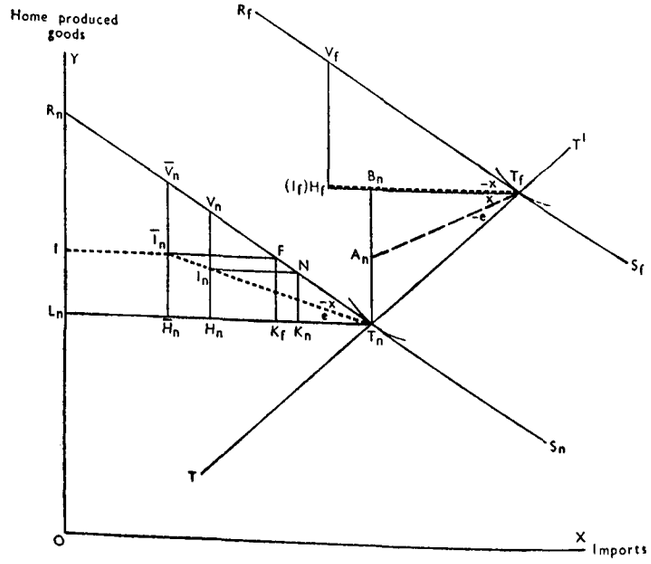


FIG. 3

The initial position T_n is one without import restrictions, and thus lies on the consumption line TT'. Import restrictions, assuming they lead to no change in saving or investment, cause a shift up the expenditure line T_nR_n. The dotted line T_nI divides the effects of the resultant increases in expenditure on home-produced goods (diverted from imports) as between employment-creating (lower sector) and export-impeding (upper sector) respectively; the ratio between these two effects of import restrictions we have called i.[1] An import cut of T_nH_n increases expenditure on home-produced goods by H_nV_n, of which I_nH_n increases employment and I_nV_n reduces exports. The net effect on the balance of payments is T_nK_n, made up of a saving in imports of T_nH_n *less* a loss in exports of V_nI_n (equivalent to I_nN in terms of imports). At the same time employment is increased by I_nH_n.

[1] If p is the slope of the expenditure line R_nS_n, the slope of T_nI_n is $\frac{p}{1+i}$.

If initial unemployment is $\bar{I}_n\bar{H}_n$ (in terms of production foregone), an import cut of $\bar{H}_nT_n$ will produce full employment together with an improvement in the balance of payments of T_nK_f. This is in fact the maximum improvement in the balance of payments which can be achieved by import restriction as from initial position T_n. Any further import cut causes an additional loss of exports which wholly wipes out the additional saving of imports.

The initial amount of unemployment thus sets a limit to the improvement in the balance of payments that can be achieved by import restrictions alone. If we start from a position of full employment T_f (similar to T_0 in Fig. 1), then T_fI_f coincides with T_fH_f from the outset, and no improvement in the balance of payments from import restriction is possible.

It is evident that the gain to the balance of payments from import restriction is greater, the smaller is i, *i.e.*, the nearer T_nI_n approaches to the expenditure line T_nR_n (in other words, the larger the effect of import restriction in increasing employment and the smaller its effect in impeding exports). Once full employment is reached i becomes infinite, the i-indicator T_nI becomes horizontal, and no further improvement in the balance of payments or the level of employment is possible.

V. Import Restriction Combined with Deflation (Assuming $q = i$)

Fig. 2 showed how deflation alone can produce a desired improvement in the balance of payments but at the cost of creating some unemployment. Fig. 3 showed how import restriction alone can increase employment, but cannot necessarily produce a desired balance-of-payments improvement. Fig. 4 shows how with a combination of import restriction and deflation (disinflation) both full employment and a given balance-of-payments improvement T_fK can be attained simultaneously.

Initial Full Employment

For simplicity Fig. 4 assumes: (*a*) that the initial position T_f is one of full employment, and (*b*) that $q = i$.[1] On these assumptions it is evident that a balance-of-payments improvement T_fK can be achieved without loss of employment by a combination of deflation to R_kS_k with an import cut of T_kH_k. The deflation to T_k results in a reduction of imports of T_fB_k plus an increase in exports of B_kA_k. The import cut of T_kH_k causes a further reduction of imports (making a reduction of T_fK in all), plus a fall in exports of KI_k. On our simplifying assumption that $q = i$, the loss of exports KI_k due to the import cut exactly balances the gain to exports B_kA_k due to deflation. Similarly, the loss of employment A_kT_k due to the deflation is exactly balanced by the gain to employment H_kI_k due to the import cut. On these

[1] The effect of starting with some unemployment is dealt with in Fig. 5 and that of varying the assumption that $q = i$ in Section VII below.

assumptions K is a position of full employment yielding the desired balance-of-payments improvement T_fK.[1]

Initial Unemployment

Fig. 5 shows how the same result (internal and external equilibrium) can be attained starting from an initial position with unemployed resources. T_0 is such an initial position, with a balance of payments deficit of T_0K and unemployed resources measured by T_fA_f (in terms of home-produced goods foregone). By inflating to R_fS_f this initial unemployment can be eliminated but at the cost of increasing the balance-of-payments deficit by T_0C_f. This

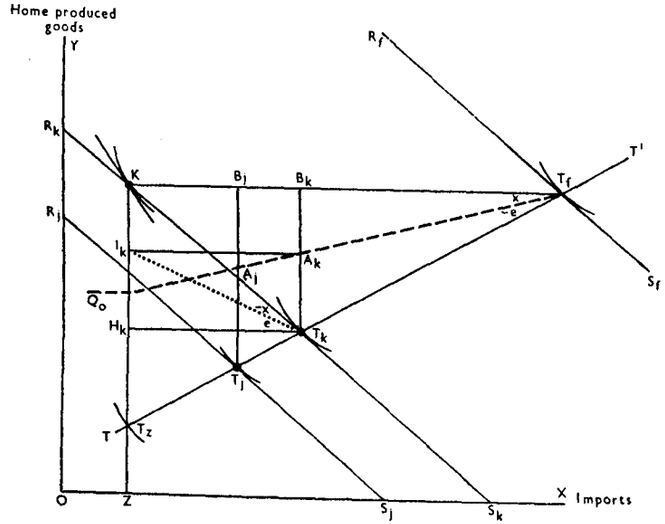


FIG. 4

brings us to a position of full employment T_f, but with an increased balance-of-payments deficit T_fK' $(= KC_f)$. As in Fig. 4, this deficit can be eliminated, while still maintaining full employment by a combination of deflation to $R_k'S_k'$ with an import cut of $T_k'H_k'$.[2]

[1] The above example illustrates the point emphasised by R. Nurkse (*loc. cit.*, pp. 142–3) that the simultaneous achievement of internal and external equilibrium by the use of deflation combined with import restriction is essentially *a joint operation*; it is not possible to attribute internal equilibrium to one instrument and external equilibrium to the other, since both instruments affect both ends.

[2] It may be noted that the disinflation from T_f to T_k' required to accompany the import cut may be greater or less than the inflation from T_0 to T_f required to produce full employment. In other words, the net expenditure policy needed in conjunction with the import restriction may be either an inflation or deflation (more strictly, *re*flation or *dis*inflation), depending on whether the initial unemployment A_fT_f $(= A_fD_f$ in terms of imports) is greater or less than the initial balance-of-payments deficit (KT_0); moreover, the net amount of inflation or deflation required is equal to the difference between the initial unemployment (in terms of value of output foregone) and the initial balance-of-payments deficit.

The Real Income Effect of Import Restriction: Distortion v. *Unemployment*

Figs. 4 and 5 have shown how import restriction can be used, in conjunction with expenditure policy, to achieve a given balance-of-payments improvement and full employment at the same time. But on the assumption that $q > 0$ (*i.e.*, that deflation has some effect in promoting exports as well as in reducing imports), it is no longer evident that the full-employment solution K offers the community a higher real income than the pure deflation solution T_j. In other words, the indifference curve through K (Fig. 4) may be a higher or lower one than that through T_j.

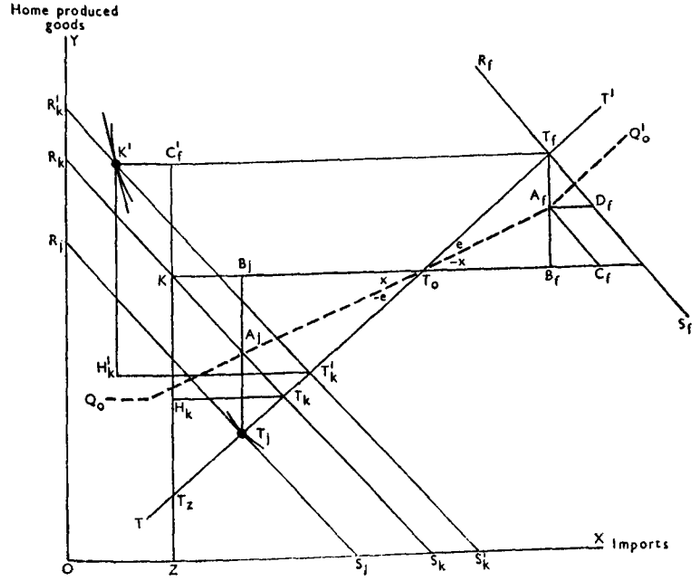


FIG. 5

Whether K or T_j represents a more desirable solution depends on the relative importance of two factors; the distorting effect of import restriction and the unemployment-creating effect of deflation.[1] At T_j there is no distortion but unemployment of T_fA_f; at K there is no unemployment but distortion measured by the difference between the slope of the indifference curve through K and the price ratio R_kS_k. The steeper the indifference curve through K, *i.e.*, the less substitutable home-produced goods are for imports, the greater the distortion, and the less the relative advantage from using import restrictions; on the other hand, the less steep the slope of

[1] Unemployment is measured by the direct loss in money income (and output) to which it gives rise. Distortion is measured by the fall in money income, which, in the absence of distortion, would lead to the same fall in *real* income. (See Fig. 1, where the distortion at K is measured by the difference in expenditure at T_k and M.)

T_0Q_0, *i.e.*, the lower is q, the export-promoting effect of deflation, the less the relative advantage of employing deflation alone.[1]

The same two opposing considerations apply in the case of Fig. 5, where the initial position is no longer one of full employment. The only difference is that in this case both the employment gain and the distortion loss at K' compared with T_j are greater than in the initial full employment case shown in Fig. 4. The position K' not only avoids the unemployment caused when the balance of payments is remedied by deflation alone but provides also for the elimination of the initial unemployment. On the other hand, to reach K', imports have to be reduced by more than the initial balance-of payments deficit, in order to make up for the loss of exports incidental to eliminating the initial unemployment; the distorting effect of the necessary import cut is consequently greater.

VI. The Optimum Combination of Import Restriction and Deflation (Assuming $q = i$)

The Balance-of-payments Improvement Locus

The points K and T_j (in Fig. 4) represent two extreme solutions to the problem of improving the balance of payments by T_fK: one with zero distortion and the other with zero unemployment. There exist also a whole gradation of intermediate solutions, constituting what may be called the *balance-of-payments improvement locus* KT_j; this is shown in Fig. 6.

This locus shows all the combinations of deflation and import restrictions which will achieve the desired balance-of-payments improvement T_fK. Any point V_n on it is reached by deflation to R_nS_n combined with an import cut of T_nH_n. Some unemployment remains at every point on the locus, except K and some distortion at every point except T_j. Still retaining the assumption that $q = i$,[2] the locus KT_j is so constructed that the vertical V_nE_n from any point V_n on it to the horizontal T_fI_f is divided by the expenditure line R_kS_k (through the balance-of-payments target K) in the ratio $q(= i)$.[3]

[1] No account is taken here of the administrative problems of import restriction and their possible effects on productivity. To the extent that import quotas involve internal allocation, with its tendency to rigidify the productive structure, this may constitute a cost, additional to the distortion effect on demand, to be weighed against the gains to employment.

[2] And also assuming again initial full employment. Since we have shown (Fig. 5) how the problem of removing a given balance-of-payments deficit from a position of initial unemployment can always be translated into that of removing a somewhat larger deficit from a situation of full employment, it is not necessary to deal further with the case of initial unemployment.

[3] If p is the slope of the expenditure line R_kS_k, the slope of the balance-of-payments improvement locus KT_j is $p(\frac{1}{q}+1)$ (or $p(\frac{1}{i}+1)$). Above K (where, because of full employment, $q = \infty$) the locus could be continued along the expenditure line KR_k (its slope becomes p). All positions on KR_k (arrived at by a given deflation to R_kS_k combined with increasingly severe import cuts) yield full employment and the desired balance-of-payments improvement, but K does this at the minimum cost in distortion.

At V_n imports have fallen by T_fE_n (T_fB_n as a result of deflation to R_nS_n, and B_nE_n as a result of the import cut T_nH_n) and expenditure on home-produced goods by V_nE_n ($= B_nT_n$ *less* V_nH_n). The effect of the reduction in expenditure on home-produced goods is divided in the ratio $q\ (= i)$ as between increased exports E_nF_n and unemployment V_nF_n. The balance-of-payments improvement is T_fE_n due to the fall in imports *plus* E_nF_n due to

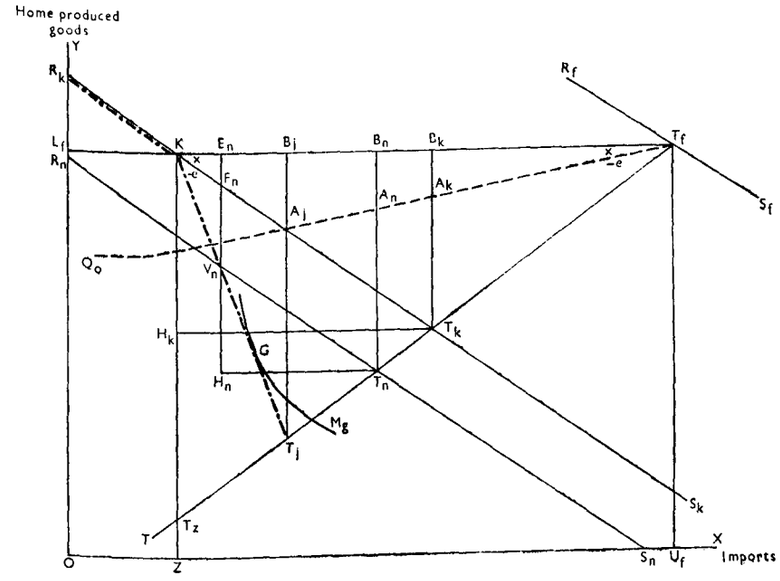


FIG. 6

increased exports ($= KE_n$ in terms of imports), together giving the desired improvement T_fK.

The Optimum Combination

The *optimum combination* of import restrictions and deflation which will yield the desired improvement is shown by the point G, at which the balance-of-payments locus is tangential to an indifference curve.[1] This point defines that combination of import restriction and deflation yielding the desired improvement in the balance of payments at which the marginal increase in distortion due to further import restriction exactly equals the marginal increase in unemployment due to further deflation. The point G is reached by deflating rather more and restricting imports rather less than is necessary

[1] It must be remembered that this is an optimum only on the assumption of a fixed exchange rate. It must thus be regarded as a *second-best* optimum. But, as so often, it may be the problem of the second-best optimum which is the more relevant.

to get to K.[1] As compared with the solution produced by deflation alone (T_f), it is reached by deflating rather less but restricting imports more.

The optimum position G will involve less unemployment than at T_f but more distortion (at T_f there is none). As compared with K, G involves more unemployment (at K there is none) but less distortion.

VII. The Effect of Variations in q and i on the Balance-of-payment Improvement Locus

So far we have made the simplifying assumption that q (the ratio of the export-promoting to the employment-reducing effect of deflation) and i (the ratio of the export-impeding to the employment-creating effect of import restriction) are equal. In practice, these ratios may well be unequal if the substitutability for imports of home-market goods and exportables are markedly different. We shall now consider the effect on the position of the balance-of-payments improvement locus KT_f of variations in q and i and in the relation between them.

The position of the balance-of-payments improvement locus may be defined by the position of its two ends, the lower end being the point where the balance-of-payments improvement is attained by deflation alone (T_f in Fig. 6) and the upper end where deflation is combined with the minimum amount of import restriction needed to maintain full employment (K in Fig. 6). The lower end represents the zero distortion solution and the upper end the solution with minimum distortion compatible with full employment.[2]

(a) *The Zero-distortion Solution: Dependent only on q*

The position of T_f, the lower end of the balance-of-payments improvement locus, since it involves no import restriction, is independent of the size of i. It depends only on q. As can easily be seen from Fig. 2, the amount of deflation needed to produce an improvement of T_0K in the balance of payments on its own increases as q falls, ranging from R_kS_k, resulting in position T_k, when $q = \infty$, to R_zS_z, resulting in position T_z, when $q = 0$. The level of real income corresponding to the zero distortion solution is lower, the lower is q.

(b) *The Full-employment Solution: Dependent on the Ratio q : i*

In the case of the full-employment solution the amount of deflation remains the same; it is only the extent of import restriction which varies. Starting from an initial position of full employment, T_f, the amount of deflation will always be equal to the desired improvement in the balance of payments, T_fK; in other words, the full-employment solution must lie somewhere on R_kT_k. Whereabouts on this expenditure line it will lie depends on the extent of import restriction; this can be shown to depend on the ratio $q : i$.

In Fig. 7 we assume the q-indicator, T_fA_k, remains constant, while the i-indicator, T_kI_k, varies, giving differing ratios $q : i$.

T_kI_k represents the position of the i-indicator hitherto assumed at which $q = i$. We have already shown (Fig. 4), that on this assumption an import cut of T_kH_k, leading to position K, produces both full employment and the

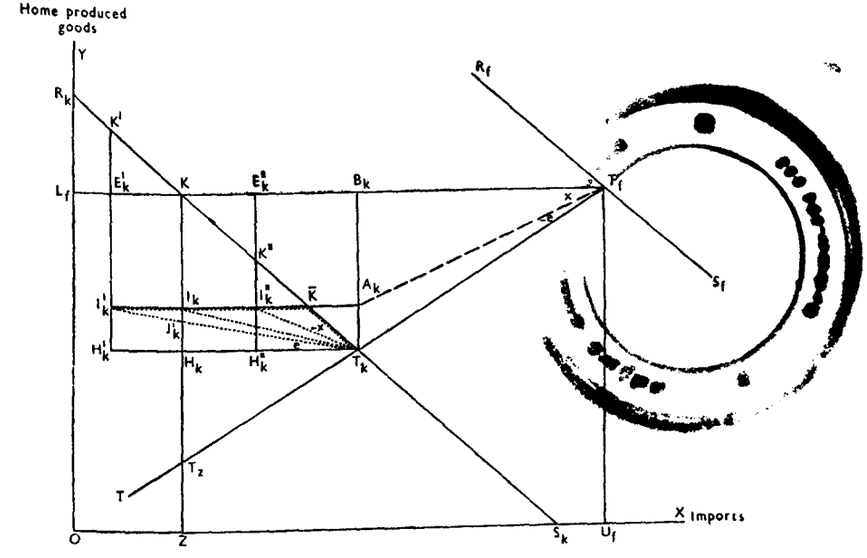


Fig. 7

desired improvement in the balance of payments T_fK. If $q \neq i$, K may be neither a position of full employment nor give the desired improvement in the balance of payments.

With the i-indicator at the position T_kI_k', where $i > q$, if imports are cut only by T_kH_k, leading to the old position K, there will be both unemployment and a balance-of-payments deficit of I_kJ_k'. To secure the desired balance-of-payments improvement at full employment, a larger import cut of T_kH_k' is needed, resulting in position K'.

In the opposite case shown by T_kI_k'', where $i < q$, K is indeed still a position of full employment and yielding the desired balance-of-payments improvement T_fK, but it is not the most favourable of such positions, *i.e.*, it satisfies the employment and balance-of-payments requirements but at the cost of an unnecessary amount of distortion. The i-indicator T_kI_k'' runs

[1] In certain circumstances (*i.e.*, for certain values of q and i) G may coincide with K (see Section VIII below).

[2] We can ignore the part of the locus representing full-employment solutions with more than minimum distortion, since this always runs up the expenditure line KR_k.

horizontally along $I_k''I_k$, once full employment is reached, so that any import out of T_kH_k'' or more yields the desired employment and balance-of-payments results. In these circumstances it is clearly preferable to select the smallest import cut T_kH_k'' which yields the desired gain at the minimum cost in distortion. This results in position K''.

The position of the highest point on the balance-of-payments improvement locus (*i.e.*, that representing the full-employment solution with minimum distortion) thus shifts up the expenditure line T_kR_k as the ratio of $i : q$ increases. The higher the ratio of $i : q$, the larger the import cut needed to achieve the full-employment solution and the lower the real income at which it is attained. Where $i = 0$, so that the import restriction has no effect on exports, the optimum full-employment solution is $\overline{K}$ (the point of intersection of R_kS_k with A_kI_k). Only where $i = q$ is K itself the optimum full-employment solution. If i becomes infinitely large (the whole effect of import restriction being to impede exports) the import cut needed to produce a full-employment solution of the balance-of-payments problem also becomes infinite; in other words, no full-employment solution is attainable.

VIII. The Optimum Combination Locus: Effect of Variations in q, i and m

We have seen in the previous section how variations in q and i affect the position of the balance-of-payments locus. In addition, we know (Section III, Fig. 2) that variations in m—the marginal propensity to import—affect the position of the consumption line T_0T_z (or TT'). Now these variations in q, i and m in turn affect the optimum combination of import restrictions and deflation, which is determined by the tangency of the balance-of-payments locus with an indifference curve.

We are interested in two distinct effects of changes in i, q and m. First, how do these changes affect the desirability of import restrictions relative to deflation, or in other words how do they affect the character of the optimum? Second, how do they affect the level of real income at which the optimum is attained?

Changes in q and i

Figs. 8, 9 and 10 illustrate the way in which the optimum combination varies when q and i change, first together and then separately.

(a) *q and i Equal but Varying Together.* In Fig. 8 we assume, as in earlier models (Figs. 4, 5 and 6), that q remains equal to i but now both vary together. As the q-indicator moves from position T_fK ($q = 0$) through T_fQ_0 to position T_fT_f ($q = \infty$), and the i-indicator moves from the position T_kK ($i = 0$) through T_kI_k to T_kH_k ($i = \infty$), the balance-of-payments improvements locus swings from position KT_k (where $q = i = 0$) through

KT_j to position KT_k (where $q = i = \infty$), and the point G traces out the *optimum combination locus* shown by the heavy line KGT_k.[1]

The highest real income—the *optimum optimorum*—is at T_k, where q and i are infinite; this is reached by deflation to R_kS_k with no import restriction. With $q = \infty$, the best of both worlds—full employment and zero distortion—can be obtained simultaneously.

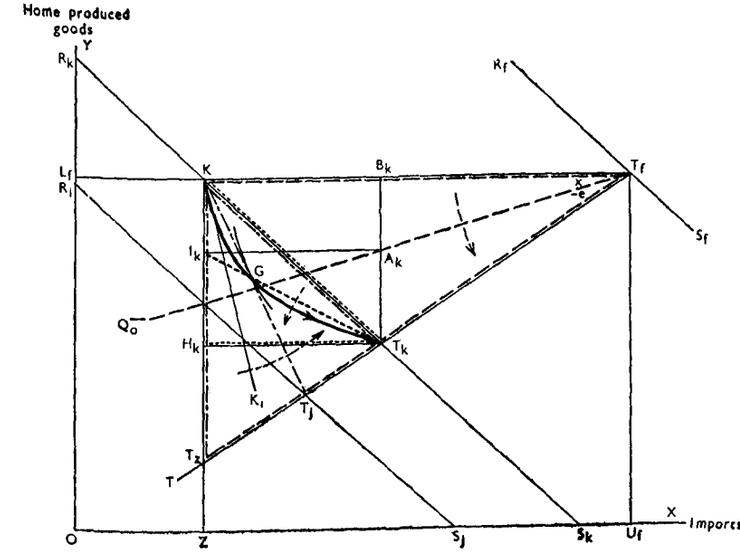


FIG. 8

As q and i fall,—*i.e.*, as the balance-of-payments improvement locus swings downwards, or, in other words, as both the favourable effect of deflation and the unfavourable effect of import restrictions on exports fall—it pays to use more import restriction, but the optimum amount of import restriction reaches its maximum (a cut of T_kH_k) when the balance-of-payments improvement locus coincides with KK_1 tangent to the indifference curve through K. For any lower values of q and i, K remains the optimum.[2]

The optimum amount of deflation at first increases with a fall in q and i and then decreases. This is because a fall in q and i has two separate effects on the desirable amount of deflation. First, it decreases the desirable ratio of deflation to import restriction. Second, it increases the amount of

[1] If we assumed that the ratio of $q : i$ were still constant but no longer equal to unity, the *optimum combination locus* would have much the same shape, but starting from a different upper position on R_kS_k—higher if $q < i$ and lower if $q > i$—and descending to the same lower point T_k, the optimum when $q = \infty$.

[2] The position of KK_1 depends on the substitutability of home-produced goods for imports; the higher this is, the more it pays to restrict imports instead of deflating, in other words the closer the locus KGT_k will lie to KT_k, and the less the difference between real income at K and T_k.

deflation needed to produce a given improvement in the balance of payments. As the ratio of import restriction to deflation increases, the former influence becomes preponderant.

Figs. 9 and 10 illustrate the effect on the optimum combination locus of independent changes in q and i.

(b) *q Varying, i Constant.* In Fig. 9, i is assumed constant while q varies. As the q-indicator, T_fQ_0, swivels between T_fL_f and T_fT, the balance-of-payments locus moves inward from K_zT_z,[1] through KT_j, ultimately converging on the point T_k. The optimum combination point G traces out a locus of the form $G_zGK_gT_k$.

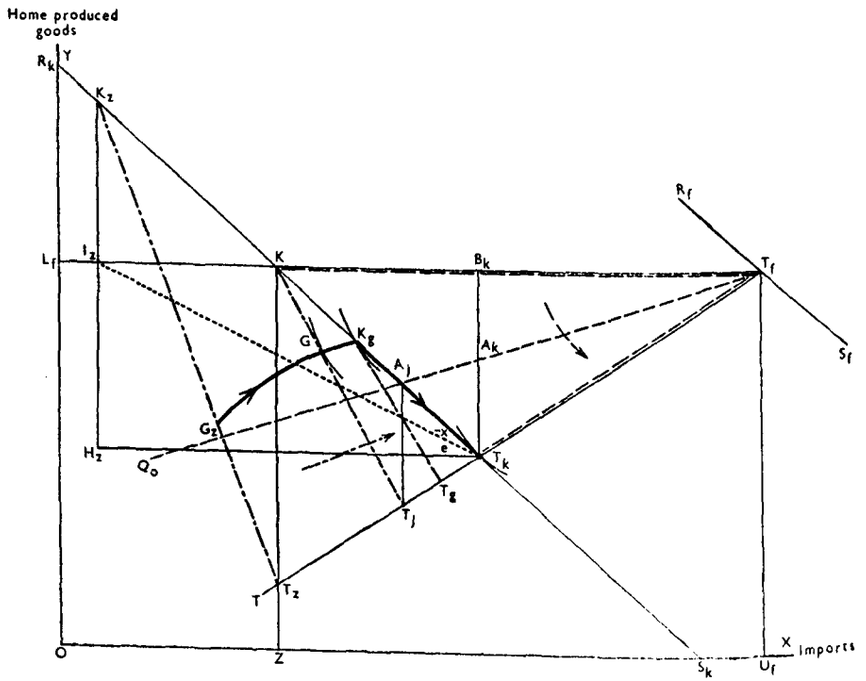


FIG. 9

The optimum points on sector T_kK_g of the locus all represent full-employment solutions but with increasing distortion for decreasing values of q;[2] they are all reached with minimum deflation (R_kS_k), but accompanied by increasing import restriction as q falls. As q decreases further, the optimum (moving down K_gG_z) calls for increasing deflation and involves

[1] The full-employment point K_z, corresponding to a zero value of q, is determined by the intersection of T_fL_f with T_kI_z and depends on the assumed size of i; the larger is i, the lower is real income at the full-employment point K_z, and the greater the import cut needed to reach it.

[2] The locus could lie lower so that K_g coincided with T_k; then the optimum would be a situation of full employment only when $q = \infty$.

increasing unemployment; whether the optimum level of import restriction increases further depends on the precise shapes of the indifference curves.

(c) *i Varying, q Constant.* In Fig. 10 q is assumed constant while i varies. As T_kI_k swivels between T_kH_k ($i = \infty$) and T_kK ($i = 0$) the balance-of-payments locus swivels between T_jR_j (parallel with R_kS_k) and T_jK_j, and the optimum combination point G traces out the locus T_jGG_k. G_k lies on

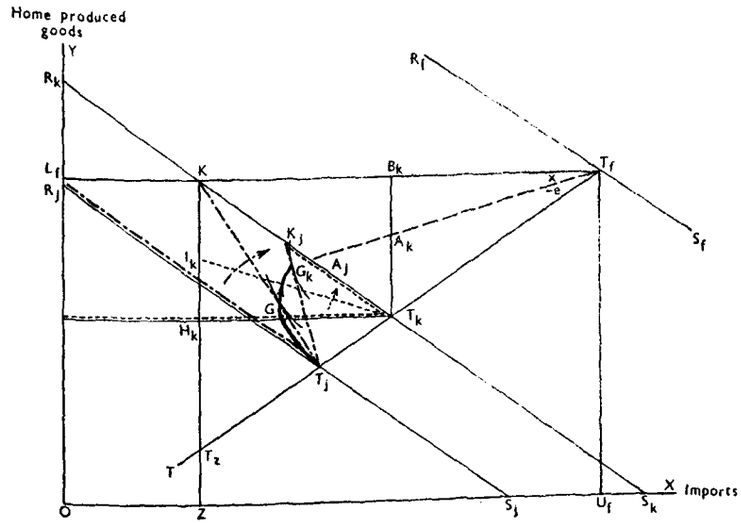


FIG. 10

K_jT_j, the balance-of-payments locus when $i = 0$. (G_k could coincide with K_j.)

In this case the highest real income is reached when $i = 0$, *i.e.*, when import restrictions have no export-impeding effect. It is only when $i = \infty$ that the optimum combination calls for no use of import restrictions. The amount of deflation at the optimum decreases as i approaches zero.

Changes in the Marginal Propensity to Import, m

The effects of changes in the marginal propensity to import cannot be clearly shown in terms of our diagram, since they imply changes in the shapes of the indifference curves. It is evident, however, that an increase in the marginal propensity to import reduces the loss in real income at which a given improvement in the balance of payments can be attained. It diminishes the disadvantage both of import restriction and of deflation; it means that a given import cut causes less distortion and a given deflation less unemployment; it thus reduces the difference between them. At the limit where $m = 1$ import restriction and deflation would have exactly the same effect; in this "ideal" situation deflation could produce a given

balance-of-payments improvement with no unemployment and import restriction would cause no distortion.

A change in m shifts the position of the optimum point G (Fig. 6), since the implied change in the shapes of the indifference curves alters the point at which the balance-of-payments locus KT_j is tangential to one of them. But it is not possible to say anything precise about the nature and method of reaching the optimum without making some definite assumption about the way in which the shapes of the indifference curves alter with changes in the marginal propensity to import.

It seems reasonable to assume, however, in Fig. 6, that as M_g, the point of intersection with the consumption line T_fT of an indifference curve tangential to KT_j, rises with an increase in m, G will also shift upwards along T_fK until it hits the "full-employment barrier" at K. For any further rise in m, K remains the optimum. Certain conclusions about the effects of an increase in m on the nature of the optimum follow from these assumptions: (1) Up to the point where G coincides with K, an increase in m calls for decreasing deflation at the optimum; thereafter the optimum amount of deflation remains that represented by R_kS_k. (2) For all values of m below unity, some import restriction is needed at the optimum; after G has coincided with K, the optimum amount of import restriction falls off with further increases in m, becoming zero when m reaches unity.[1]

IX. Measures which Influence q, i and m

The above examples show how q, i and m affect the usefulness of import restrictions. They also show that, *ceteris paribus*, a given balance-of-payments improvement can be attained at a higher level of real income the larger are m and q, and the smaller is i; or, if q and i move together, the larger is the ratio $q : i$. In addition to selecting the optimum combination of import restriction and deflation, it may be desirable, therefore, also to adopt measures which increase both m and q, so far as possible without also increasing i.[2] It follows from the analysis in Section III above that these measures would need to be of different kinds according to whether X_e, the excess foreign demand for exports, is $>$ or $<$ X_r, the additional exports released. If X_e is $< X_r$ the only way to increase q is to increase the foreign demand for exports by making exports more competitive. On the other hand, if X_r is $< X_e$, then the export-promotion effect can be increased only by measures which raise f, the mobility of resources released from H goods production, or which increase $\frac{x}{h}$, the ratio between the marginal propensities to consume exportables and home-market goods respectively.

In practical terms deflation efficiency can be raised by measures which increase the marginal propensity to import (*e.g.*, monetary policy designed to concentrate the effects of deflation on the holding of stocks of imported commodities[1]), or which shift the marginal propensity to consume home-produced goods towards exportables (*e.g.*, investment cuts designed to reduce home consumption of types of goods known to be in strong demand abroad[2]). However, it must be recognised that measures of this kind, designed to alter the marginal propensities, introduce distortions similar to those created by import restrictions; a higher level of employment is procured at the cost of interference with the pattern of demand, productive efficiency or the rate of growth. The choice between such indirect means of influencing marginal propensities and direct controls must ultimately rest on administrative considerations.

X. Effects of Removing Initial Assumptions

We consider briefly here the implications of removing the two initial assumptions of constant income distribution and constant prices.

(a) *Distribution of Income Effect*

The assumption of a constant distribution of income which underlies the use of a constant set of community indifference curves may seriously limit the practical conclusions which can be drawn from the analysis. The community has been treated as if it were a single individual. This meant, for example, regarding gains from increased output due to import restrictions as though they could be offset against losses due to the distortion of demand resulting from the same restrictions. But the distortion is borne by the consumers of the particular imports restricted, while a completely different section of the community may enjoy the gain in employment. Furthermore, with variable prices, import restrictions are likely to cause a shift towards profits of importers. Unless a practicable way can be found

[1] The particular level of m at which G coincides with K depends, among other things, on the slope of the balance-of-payments locus KT_j; in other words, on the ratios q and i. At one extreme if q and i are infinite, KT_j coincides with KS_k, G coincides with M_g at all values of m and does not reach K until $m = 1$; in this case there will never be any need for import restriction to reach the optimum, and an increase in m simply reduces the amount of deflation required. At the other extreme, if q and $i = 0$, KT_j coincides with KT_x; then G always coincides with K, which becomes the optimum for all levels of m; the optimum amount of deflation is then always K_kS_k, but an increase in m means that a decreasing amount of import restriction is needed to accompany it.

[2] The only way to reduce i in relation to q is by the selection of particular commodities for import restriction which are competitive with exportables as little as possible and with home-market goods as much as possible; but this in itself may increase distortion.

[1] Cf. J. R. Sargent, "Stocks and Quantitative Restrictions," *Bulletin of the Oxford Institute of Statistics*, February 1957.

The *temporary* automatic disinflationary effects of import restrictions (referred to in Section I above) are in fact likely to be biased in the desired direction, which is the main reason why import restriction is a relatively favourable policy for short-term use.

[2] Cf. R. Nurkse, *loc. cit.*

of compensating the losers from the profits of the gainers, it follows that practical policy must take into account the distribution of income effects.[1]

(b) *Variable Prices*

The removal of the assumption of constant prices may affect the operation both of import restriction and of deflation.

Import restrictions may affect prices in two ways which could influence our conclusions. First, they may reduce the buying price of imports;[2] secondly, they may raise the domestic selling price of imports, which in turn may indirectly raise export prices. This means that import restrictions are likely to *improve the terms of trade.* This is a factor strengthening the case for import restriction as compared with deflation as an instrument of balance-of-payments policy.[3] It is true that the gain to the terms of trade through import restriction may be lost if other countries retaliate in kind.[4] On the other hand, where import restrictions are imposed in accordance with some international agreement (*e.g.*, G.A.T.T.) under which their use is banned for other than balance-of-payments purposes, the risk of retaliation will be less.

Deflation tends to exert a downward pressure on all prices, but particularly on those of home-market goods and, if effective, this could help in various ways to *increase deflation efficiency.* It might cause a shift in home demand away from imports and exportables towards home-market goods, induce resources to move out of production for the home market towards the production of exportables[5] and stimulate foreign demand for exports. The resultant increase in m and q would strengthen the case for deflation as

[1] There are various ways of taxing the profits of the gainers from import restrictions: importers' profits can be collected *via* import-licence fees (*e.g.*, by auctioning of licences) or by special taxes, and part of the gains from higher production are collected through P.A.Y.E. and profits taxation. But it is much more difficult to compensate—even if one could identify—the losers from distortion.

[2] This assumes that the foreign supply of imports is not perfectly elastic, that import licences are issued to importers and that there is competition among exporters.

[3] This is true even if a country is already restricting imports to the point where the marginal increase in distortion equals the marginal improvement in the terms of trade (cf. S. S. Alexander, "Devaluation Versus Import Restriction as an Instrument for Improving Foreign Trade Balance," *I.M.F. Staff Papers*, April 1951). In the constant-price model we compared only the employment gain with the distortion loss. With variable prices the terms-of-trade effect comes in as well to reinforce the employment effect. It is true that the more imports are restricted already, the less will be the net gain from further restriction; but the point here is that without the terms-of-trade effect, the gain would be less still.

[4] This argument must not be confused with the point that if one country succeeds in improving its balance of payments by the use of import restrictions, this may put some other country into balance-of-payments difficulties and cause that other country in turn to impose import restrictions. This could, of course, equally well happen if the first country's improvement (and the consequent deterioration in the second) were brought about by deflation alone; it has nothing to do with the use of import restrictions as such.

[5] A similar incentive is provided for resources to move within the home-market industries to industries which replace imports. This import-replacing influence of deflation is analogous, and similar in its effects on the balance of payments, to its export-promoting effect.

compared with import restriction as a means of improving the balance of payments.

In practice, however, domestic prices tend to be relatively inflexible in a downward direction. Consequently, the above-mentioned gains to deflation-efficiency are unlikely to accrue as a result of variable *internal* prices; the same benefits may, however, be obtained from a change in the external value of the currency, which is discussed in the following section.

XI. The Role of Devaluation

The main subject of this paper has been the contribution of import restrictions to balance-of-payments policy. We have seen that, in conditions of full employment, import restrictions need to be accompanied by deflation to achieve a given improvement in the balance of payments and that the optimum combination of import restrictions and deflation involves a balancing at the margin of the distortion *less* the terms-of-trade effect of more import restriction, on the one hand, against the unemployment effect of more deflation, on the other. Discussion of the third main method of improving the balance of payments—devaluation—was initially ruled out by the assumption of constant prices. We may now consider briefly the role of devaluation, both as a substitute for and as an addition to, the use of deflation and import restrictions.

As indicated above, the essential function of devaluation, in association with deflation, is to replace or supplement downward flexibility of internal prices in producing both a rise in prices of internationally traded goods relative to those of home-market goods and a fall in the price of exportables in terms of foreign currency. The first effect reinforces the influence of deflation in increasing the *supply* of exportables; the second increases the *demand* for exports, though at the cost of some deterioration in the terms of trade. It may be noted that in a situation of excess demand for exports (*i.e.*, where $X_e > X_r$) the practical effect of the second influence would be confined to the worsening of the terms of trade, and the case for devaluation correspondingly weaker.

Similarly to import restrictions, in conditions of full employment devaluation cannot be relied upon to yield a given improvement in the balance of payments on its own.[1] It will not necessarily by itself produce the long-term rise in saving or fall in investment, and therefore normally needs some accompanying deflation to achieve the necessary "disabsorption" of domestic resources.

The main contribution of devaluation when used together with deflation is also similar to that of import restrictions: it allows a given improvement in the balance of payments to be achieved at a higher level of employment than if deflation is used alone. Whereas import restriction increases

[1] Cf. S. S. Alexander, "Effects of a Devaluation on a Trade Balance," *loc. cit.*

employment only by diverting expenditure from imports to home-produced goods (Fig. 3), devaluation does so both by discouraging imports and also by increasing q, the export-promoting effect of deflation (Fig. 2).

The actual choice at any time between import restrictions and devaluation as an accompaniment to deflation will depend largely on political and administrative considerations, and in particular on the speed of their respective effects on the balance of payments.[1] But in terms of the elements of the model used in this paper, it may be said that devaluation has the advantage over import restriction of avoiding distortion, while import restriction has the advantage of producing more favourable terms of trade; and both have the advantage over deflation of allowing a higher level of employment. The optimum combination of all three instruments involves a process of balancing at three margins. Not only must the marginal increase in unemployment from deflation be balanced against the marginal increase in distortion *less* improved terms of trade from import restrictions, as before; but each of the latter must also be balanced against the marginal deterioration in the terms of trade from devaluation.

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[1] An important practical feature of import restriction in which it differs from devaluation—as well as from deflation—is the fact that it can be used to discriminate by sources. This is relevant where cutting imports from one source reduces the demand for exports or the supply of credit less, or improves the terms of trade more, than if imports are cut from some other source. These differential aspects of import restrictions, particularly important in the case of the United Kingdom in relation to the sterling area, are not dealt with in the present paper.

CAPITAL THEORY AND ECONOMIC GROWTH[1]

I. INTRODUCTION

THE main purpose of traditional capital theory[2] has been to ground the whole theory of production and distribution in the theory of marginal productivity. The principal concerns of this theory, however, have been with the stationary state, and the rules for changes have been dealt with simply by comparing different stationary states. Although there have been many attempts to apply the capital theory to the problems of the trade-cycles,[3] the attempt to formulate an endogenous theory of economic growth has not been undertaken until recently.[4]

The object of this paper is to analyse the problems of economic growth from the standpoint of traditional capital theory, the problems which current growth economics is now attempting to solve. Modern growth economics[5] has accomplished much and helped us to understand the long-run growth process of the capitalist economy. However, no one will deny, I believe, that one of the most important problems which current growth economics has left open is the analysis of income distribution. How strange it is to imagine a growth theory of the capitalist economy which does not have analysis of income distribution as its central core. It would be *Hamlet* without the Prince of Denmark. In this paper I shall always pay due regard to the mechanism of income distribution, and try to elaborate the dynamic theory of capital accumulation.

II. ASSUMPTIONS AND DEFINITIONS

In what follows I shall exclude the changes in relative prices of commodities from my consideration, and assume the existence of only one price level, called the general price level, for commodities.[6] Further, the problem of land is disregarded in these investigations, and capitalists are assumed to be identified with entrepreneurs. As for labourers, I measure them in terms of number of workers and assume that they are all homogeneous.

[1] The author is indebted to Professor Fritz Machlup, of the Johns Hopkins University, and Assistant Professor Osamu Isono, of the Hitotsubashi University, for criticism which materially improved this paper, as well as for continuing encouragement. However, any deficiencies remaining in this paper are the sole responsibility of the author.

[2] *I.e.*, the Jevons–Böhm-Bawerk–Wicksell–Kaldor–Hayek lines of development in capital theory.

[3] For instance, F. Hayek, *Profit, Interest, and Investment* (1939).

[4] Joan Robinson: *The Accumulation of Capital* (1956).

[5] *I.e.*, the Harrod–Domar line of development in macro-analysis of economic growth. R. F. Harrod, *Toward a Dynamic Economics* (1948). E. Domar, *Essays in the Theory of Economic Growth* (1957).

[6] This is the basic assumption which underlies the macro-analysis of economic growth. For the justification for this assumption see E. Domar, *op. cit.*, p. 114.

Let us, then, begin with the definitions of concepts which constitute the basic framework of the following analysis.

Definition. *The labour productivity is the net output per labourer produced per period.*

As a unit period we may take, for instance, a year. Denote the net output produced by O and the number of workers employed during the same period by L; then the labour productivity can be shown simply as $\frac{O}{L}$.

Definition. *The capital intensity is the volume of capital per labourer advanced on the average per period.*

This definition may need further explanation. The traditional capital theory—especially the Austrian capital theory—has very often explained it in terms of the " length of period of production." But if there are many kinds of capital goods with various durabilities, how precisely can we define the length of period of production? [1] Remember further that capital implies not only fixed but also working and wage capital—it must include all the capital fund which is to be advanced in the production process. Modern growth economics is very obscure about this point. Moreover, " on the average " indicates that, if the durability of machine A is longer than that of machine B, the value of capital to be advanced on the average is, other things remaining constant, larger in the process using A than in the process using B. The turnover period of capital is substantially dependent upon the durability of capital goods, and we must compare the relative efficiency of methods of production by calculating their respective turnover periods of various capital goods.[2]

Definition. *The productivity function is the schedule of capital intensities with which the corresponding frontiers of labour productivity are connected.*

Imagine that there are two methods of production such that their capital intensities are the same (this does not mean both methods have the same " capital structure "). Our definition indicates that in this case only the possible highest labour productivity should be connected with the corresponding capital intensity. Without doubt, such " frontiers " are definitely dependent upon the relative prices, and some method of production which has not been on the frontier under some price system would appear on the

[1] On the measurability of " investment period " there has been a long controversy between Professor Knight and other economists. Cf. N. Kaldor, " Annual Survey of Economic Theory: The Recent Controversy on the Theory of Capital," *Econometrica*, Vol. 5, April 1937.

[2] Suppose that there is a machine of which the unit cost is \$1,000. If its durability-period is one year and the production process is " synchronised," the volume of capital to be advanced on the average per year is not \$1,000, but \$500. If its durability-period is two years it becomes \$750, and in the case of three years, it is \$833, etc., and finally in the case of infinitely long durability it becomes \$1,000. For the full discussion of this problem, see H. O. Goldschmit, *Financial Planning in Industry* (Leiden, 1955), pp. 54–5, and also F. Lutz and V. Lutz, *The Theory of the Firm* (1951).

frontier under another price system. But the assumption of constancy of relative prices makes it unnecessary to consider this complicated problem.

However, there still remains a problem. In so far as the volume of capital includes the payments to workers, in other words in so far as the wages are advanced to workers, every small change in the level of wages in terms of product will be followed by changes in the " real " content of capital intensity, because the " real " capital intensity involves, as such, the number of workers to be employed. In this case we are unable to draw any productivity function without knowing the level of wages in terms of product.[1] The most convenient way to avoid having the " real " capital intensity depending upon the level of wages is therefore to assume that the payments to workers are made at the end of the unit period. In what follows we shall maintain this assumption throughout.

What, then, are the properties of the productivity function? Following the traditional capital theory, we may sum up as follows:

In a series of production techniques which are wisely chosen the increase of the capital intensity leads, as a rule, to the increase of labour productivity, but at a decreasing rate.[2]

It should be remarked that this proposition is always true under any (reasonable) price system, and this is, as Mr. Kaldor has said, the foundation on which the whole theory of production and distribution, as we know and teach it, rests.[3]

Let K stand for the amount of capital to be advanced on the average per period, then the capital intensity may be expressed by $\frac{K}{L}$. By the definition of the productivity function, it follows

$$\frac{O}{L} = F\left(\frac{K}{L}\right)$$

As Mrs. Robinson has assumed recently, this function may be discontinuous in reality.[4] But for simplicity we postulate, following Wicksell, that this is

[1] This is a different problem from that of the shiftability of the productivity function due to the difference in the rate of profit, as shown by Mrs. Robinson. We omit this latter problem from our consideration by assuming a completely integrated firm, so that there is no division of the economy into a consumption-goods industry and a capital-goods industry.

[2] " That roundabout methods lead to greater results than direct methods is one of the most important and fundamental propositions in the whole theory of production. It must be emphatically stated that the only basis of this proposition is the experience of practical life. Economic theory does not and cannot show *a priori* that it must be so; but the unanimous experience of all the technique of production says that it is so " (Böhm-Bawerk, *The Positive Theory of Capital* (English trans., New York, 1930, p. 20).

[3] N. Kaldor, " On the Theory of Capital: A Rejoinder to Professor Knight," *Econometrica* Vol. 6, April 1938, p. 176.

[4] *Op. cit.*, Chapter 10.

continuous and differentiable.[1] The merit of such simplification will be found in the following analysis. Thus by the properties of the productivity function, the following relations will be proved to prevail:

$$F' \equiv \frac{d\left(\frac{O}{\bar{L}}\right)}{d\left(\frac{K}{\bar{L}}\right)} > 0 \qquad F'' \equiv \frac{d^2\left(\frac{O}{\bar{L}}\right)}{d\left(\frac{K}{\bar{L}}\right)^2} < 0\ ^{2}$$

III. Mechanism of Income Distribution

Let us start with the analysis of the mechanism of income distribution in a stationary state.

To simplify the problem, we assume that the general price level is constant. This assumption may be justified in macro-analysis of economic growth, because the only price problem is the relation between the money wages and the general price level of commodities, and this relation can be converted into the problem of the real wage-rate, namely the money wage-rate deflated by the general price level. If we further assume that the general price level is always unitary, the money wages are immediately nothing but the real wages themselves.

Next, we assume, for the time being, that the real wage-rate, w, is fixed at a certain level $\bar{w}$, namely

$$w = \bar{w}$$

Under what conditions such an assumption will be satisfied will be discussed later in this paper.

If capitalists (we regard capitalists as the same persons as entrepreneurs) behave rationally they will adopt the most profitable method of production, *i.e.*, the capital intensity that realises the maximum rate of profit.[3] Since the total profits per period are $(O - wL)$ and the average volume of capital to be advanced per period is K, the rate of profit is given by $\frac{O - wL}{K}$.[4]

[1] K. Wicksell sharply criticised the assumption of discontinuous productivity function which Böhm-Bawerk adopted. K. Wicksell (*Value, Capital and Rent* (English trans., 1954), pp. 135–6).

[2] There may exist such ranges of labour productivity that the second derivative F'' of the productivity function is positive. But we omit this possibility from our consideration and assume that F'' is always negative.

[3] The modern firm theory is based on the assumption that the firms behave so as to maximise the *total* profit itself, not the *rate* of profit. But this is incorrect, because this assumption does not take into consideration of capital requirements. On this problem, see André Babor and I. F. Pearce, "New Approach to the Theory of the Firm," *Oxford Economic Papers* (New Series), Vol. 4, October 1952, pp. 252–65.

[4] What is the rate of profit? Mrs. Robinson seems to avoid this question by assuming many simplifications (for example, *op. cit.*, footnote 1, pp. 106–7) and does not give the final answer, after all.

For simplicity, if we write y for the labour productivity and k for the capital intensity the rate of profit is given by

$$\frac{O - wL}{K} = \frac{\frac{O}{\bar{L}} - w}{\frac{K}{\bar{L}}} \equiv \frac{y - w}{k}\ ^{1}$$

The condition of a maximum rate of profit is obtained by differentiating the

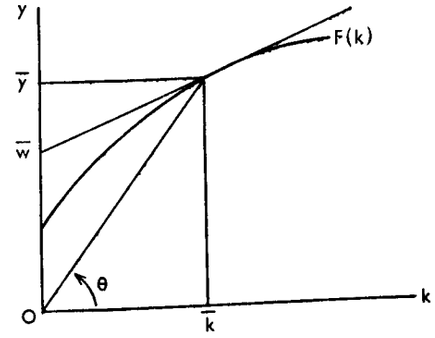


Fig. 1

profit rate with respect to the capital intensity and making it zero. Then it follows

$$\frac{d}{dk}\left(\frac{y - w}{k}\right) = \frac{F'k - y + w}{k^2} = 0$$

or

$$y = F'k + w$$

Summing up the above equations into one system, we have

(1.1) $y = F(k)$

(1.2) $y = F'k + w$

(1.3) $w = \bar{w}$

There are three equations to determine three variables—the labour productivity y, the real wage-rate w and the capital intensity k—so this economic system is complete.

In Fig. 1 the labour productivity y and the real wage-rate w are measured along the vertical axis and the capital intensity k on the horizontal axis. First, by the equation (1.1), draw the productivity function $F(k)$ on the diagram. The form of this function comes from our assumptions of the productivity function (Wicksell once utilised this diagram in 1893).[2] Next, by equation (1.3), measure the real wage-rate $w = \bar{w}$ along the vertical

[1] Therefore the productivity function is rewritten as $y = F(k)$.

[2] Mr. Hicks adopted this kind of figure for the analysis of equilibrium of the firm (*Value and Capital* (1939), p. 81). He assumes the negativity of the second derivative of the production function for the stability-condition of the firm.

axis. Finally, there remains equation (1.2). Now, dividing by k, we have

$$\frac{y-w}{k} = F' \equiv \frac{dy}{dk}$$

The left-hand side of this equation is, as mentioned before, the rate of profit, and the right-hand side F' is simply the derivative of the productivity function. Thus at the maximum rate of profit the rate of profit must be equal to the derivative of the productivity function. This is obtained by drawing a straight line from $\bar{w}$ tangential to the productivity function. That is $\bar{k}$. At the same time the labour productivity $\bar{y}$ which makes the rate of profit maximum is also determined.[1]

Some auxiliary explanations have to be added. From the equation (1.2) we have again

$$\frac{y-w}{y} = F'\frac{k}{y} = \frac{dy}{dk}\Big/\frac{y}{k}$$

The right-hand side of this equation is apparently the elasticity of productivity function with respect to the capital intensity. The left-hand side is, however, the relative share of profit in the national product, because

$$\frac{y-w}{y} = \frac{\frac{O}{L}-w}{\frac{O}{L}} = \frac{O-wL}{O}$$

Thus, under the maximum rate of profit, the relationship

The relative share of profit = The elasticity of productivity function

must prevail.[2]

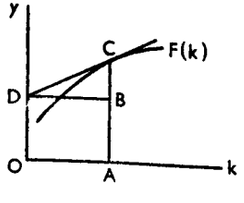
Next, as to the " capital–output ratio " or " capital coefficient," this is given, in terms of Fig. 1, by

$$\cot\theta = \frac{\bar{k}}{\bar{y}} = \frac{\frac{K}{L}}{\frac{O}{L}} = \frac{K}{O}$$

Then it is clear that the larger the capital intensity, the larger the cot θ, because the second derivative F'' of the productivity function is negative by

[1] From this figure it is immediately clear that the higher the real wage-rate, the larger the capital intensity. This is the well-known " Ricardo effect."

[2] The geometrical proof is as follows:



The elasticity of productivity function

$$= \frac{\frac{BC}{DB}}{\frac{AC}{OA}} = \frac{BC}{AC} = \frac{\frac{O}{L}-w}{\frac{O}{L}} = \frac{O-wL}{O}$$

= The relative share of profit

assumption. In other words, the capital–output ratio becomes larger according to the increase in the capital intensity. Since the capital intensity becomes larger according to the increase in the real wages, it follows that the higher the real wages, the larger the capital–output ratio.[1] In view of the current-growth economics, which deems this ratio as if it is a kind of invariable production coefficient, I think we must pay a great deal of attention to this fact.[2]

So far our main concern has been only with the determination of relations, namely the labour productivity and the capital intensity. Let us then introduce explicitly the static assumption of constant volume of capital into the system and try to construct the demand function for labour under the given volume of capital.

Suppose that the volume of capital K is given at $\bar{K}$. Then we have the following system:

$$\frac{O}{L} = F\left(\frac{K}{L}\right) \tag{2.1}$$

$$\frac{O}{L} = F'\frac{K}{L} + w \tag{2.2}$$

$$w = \bar{w} \tag{2.3}$$

$$K = \bar{K} \tag{2.4}$$

Since there are four equations to determine four variables O, L, K and w, our economic system is completely determinate. But the last equation (2.4) may need some explanation. When we say $K = \bar{K}$ we mean that capitalists have the amount of capital $\bar{K}$ at their disposal. According to the wage-fund theory, such a capital is supposed to consist of wage-goods to be advanced to workers. The problem for capitalists is to utilise such " free " capital in the most profitable way. In other words, capital goods exist first as free capital and are then transformed into some concrete durable form in such a way as to realise the maximum rate of profit. Of course, capital goods may be given from the outset in some concrete form—not only in the form of wage-goods but also of every kind of durable equipment—and such forms may happen not to correspond to the most profitable forms. However, if we grant enough time for capitalists to rearrange the capital structure in such a way as to realise the maximum rate of profit, we may treat them as if they were free capital. There may be, of course, some loss of its initial value. But we assume again, for simplification, that there is no loss of

[1] It should be remembered that the variability of capital–output ratio does not presuppose any technical improvements. Even under a state of given knowledge of technology, this conclusion is true.

[2] Even though authors who assume the invariant capital–output ratio happen to refer to the variability of this ratio in footnotes or fragmentally, it does not help us much, because the fundamental point is to explain such variability within the system. The endogenous theory of variable capital–output ratio must be presented if they admit its variability in relation to the changes in the real wages.

capital value during such a transformation by allowing enough time to capitalists.

In Fig. 2 we measure the labour productivity and the real wage-rate along the north-axis, the capital intensity on the east-axis, and the number of workers employed along the south-axis and on the west-axis. Now suppose that the real wage is given at the point A along the north-axis.

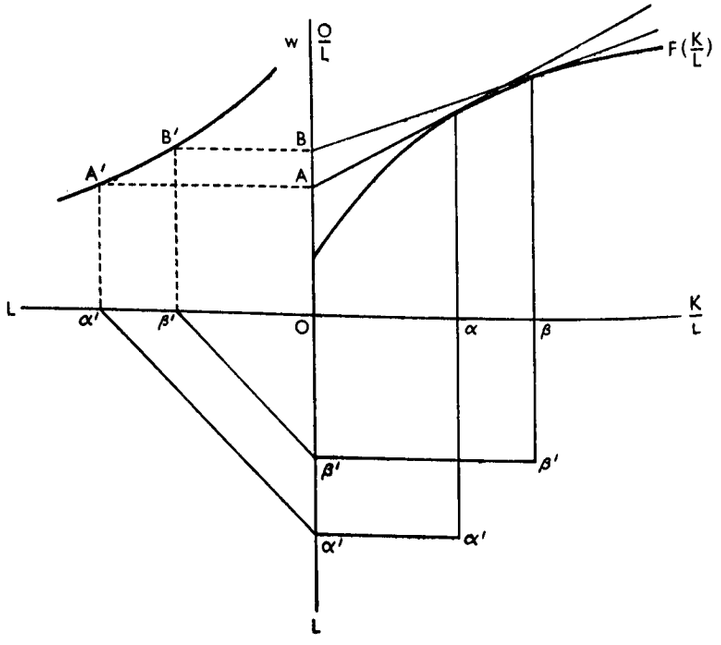


FIG. 2

Capitalists will choose the most profitable technique α. But K is given at $\bar{K}$. Then by the obvious equality

$$\frac{K}{L}L = K = \bar{K}$$

we can determine immediately the number of workers employed under the capital intensity α and the volume of capital $\bar{K}$. That is α'. This is dictated along the south-axis and the west-axis, and we copy the point A' on the second quadrant which connects the point A and the point α'. Next, imagine that the real wage is given at the point B; then capitalists will choose the capital intensity β which maximises the rate of profit. In the same way dot the point B' on the second quadrant which connects the point B and the point β'.

If we repeat these procedures in the same way under any level of the real wages we can get a curve indicated on the second quadrant. As will

be proved in the next section. this is nothing but the marginal productivity curve of labour or the demand function for labour with K kept at $\bar{K}$.

By a simple economic model we have shed light on the relationship between the labour productivity, the capital intensity, the rate of profit, the relative share of profit and the capital–output ratio under the state of given K and w. No one would deny that these phenomena constitute the most essential parts of the capitalist economy. Our next problem then is to proceed with the analysis of the dynamic aspect of the capitalist economy.[1]

IV. Theory of Capital Accumulation

In this section we are going to drop the assumption of constant volume of capital and present an endogenous theory of capital accumulation. In order to do this we must first make clear the structure of the national product for the determination of rate of capital accumulation.

In general, the real wage is said to be equal to the marginal productivity of labour if competition is perfect.[2] This theorem, however, has been so well explored that we need not here enquire into its details. Our problem is to enquire into the relationship between the marginal productivity of labour and the structure of the national product.

The marginal productivity of labour is, as is well known, the partial

[1] The above model is essentially an alternative formulation of Böhm-Bawerk's capital theory. In Böhm-Bawerk's capital theory capital is supposed to consist of wage-goods, and the capital intensity is related only to the length of period of production. Further, he assumes the full employment of labourers. If we take this latter assumption into our model it follows:

$$(2.1)^* \qquad \frac{O}{L} = F\left(\frac{K}{L}\right)$$

$$(2.2)^* \qquad \frac{O}{L} = F'\frac{K}{L} + w$$

$$(2.3)^* \qquad L = \bar{L}$$

$$(2.4)^* \qquad K = \bar{K}$$

From equations (2.3)* and (2.4)* the capital intensity under full employment is determined. From equation (1.1)* we can determine the labour productivity under full employment. Since the derivative F' is known, we can determine finally the level of real wages w from the equation (2.2)*, which maximises the rate of profit. Whether we should treat the real wage-rate w as an unknown or not (therefore whether we should treat the number of workers employed as a known or not) depends upon the problem which the economist is trying to solve. However, as long as the equation (2.4)* is maintained, we cannot deem both variables as known at the same time. If we could regard K as an unknown, and only in this case, we might designate L and w as known variables. This is the economic problem in under-developed countries, where w is the subsistence wage-rate or the planned consumption level of a worker and L is the number of fully-employed workers. In this case K would presumably be interpreted as a desired capital importation from other countries which assures the maximum capital accumulation or the maximum growth rate of the economy, because the non-consumption surpluses are merely the funds for economic development.

[2] Sometimes it is maintained that the marginal productivity of labour "determines" the real wage-rate. But this is not the correct statement of the marginal-productivity principle, because if the level of real wages is determined by such outside factors as the policy of trade unions, the marginal productivity of labour determines only the number of workers to be employed. The true statement of this principle is simply that the marginal productivity of labour is equal, or tends to be equal, to the real wage in an equilibrium condition.

derivative of the national output O with respect to L. Now, from the equation (2.1), we can derive

$$O = F\left(\frac{K}{L}\right).L \equiv f(K, L)$$

Differentiating O with respect to L, we have [1]

$$\frac{\partial O}{\partial L} = \frac{\partial}{\partial L}[F.L] = F + \frac{\partial F}{\partial L}L = F - F'\frac{K}{L}$$

We note that this derivation and result are always true, disregarding the maximum condition of profit rate. However, if capitalists adopt the most profitable method of production, it is immediately evident from equation (2.2) that the marginal productivity of labour is equal to the real wage, namely

$$\frac{\partial O}{\partial L} = F - F'\frac{K}{L} = w$$

This fact then tells us that the curve in the second quadrant in Fig. 2 is the marginal productivity curve of labour under the given volume of capital $\overline{K}$ (in our case, where the general price level is assumed to be unitary, the marginal productivity implies not only the physical but also value productivity).

Let us next prove that the function [2] $f(K, L)$ is a homogeneous function of the first degree. As universally known, the function $f(K, L)$ is said to be homogeneous of the first degree, if

$$f(gK, gL) = gf(K, L) = gO$$

is established, where g is a positive number. Then, multiplying both K and L by g, we have

$$f(gK, gL) = F\left(\frac{gK}{gL}\right).gL = F\left(\frac{K}{L}\right).gL = \frac{O}{L}.gL = gO$$

Thus the function $f(K, L)$ is proved to be homogeneous of the first degree.

Since $f(K, L)$ is homogeneous of the first degree, we have again

$$O = \frac{\partial O}{\partial K}K + \frac{\partial O}{\partial L}L$$ [3]

Remember again that this result is quite independent of the behaviour of capitalists. Thus we can confirm that the national product O is the sum of the marginal productivity of capital times the volume of capital and the marginal productivity of labour times the number of workers employed.

[1] $\frac{\partial F}{\partial L} = F'\frac{\partial\left(\frac{K}{L}\right)}{\partial L} = F'\frac{-K}{L^2} = -F'\frac{K}{L^2}$.

[2] In modern economics this is sometimes called simply *production function*.

[3] This is the well-known Euler theorem on homogeneous function. See R. G. D. Allen, *Mathematical Analysis for Economists* (1938), pp. 315–20.

We affirm then that this equation denotes the " production side of the national product " in the capitalist economy.

As proved above, the real wage is equal to the marginal productivity of labour if capitalists adopt the most profitable method of production. Therefore the total amount of wages is given by

$$\frac{\partial O}{\partial L}L = wL \equiv W$$

at the maximum condition of profit rate. Needless to say,

$$\frac{\partial O}{\partial K}K = F'K \equiv P$$

is the total profit of the capitalists.[1] The national product is thus distributed wholly among capitalists and workers without residuals according to their marginal productivities. We affirm then that the equation

$$O = P + W$$

indicates the " distribution side of the national product " in the capitalist economy.[2]

To make the problem as simple as possible, we shall assume that workers consume the whole of their wages and that capitalists save and invest their whole profits. Although, in reality, workers save and capitalists consume a part of their incomes, such assumptions are, at least as a first approach, surely admissible in the capitalist economy.

By this simplification, P is all expended to capital accumulation ΔK and W to consumption C. The " national product from the expenditure side " can be thus shown by

$$O = \Delta K + C$$

Summing up the above analysis, we have the following trinity of national product or income:

$$\begin{array}{lcccc} \text{Production side} & . \ . \ . & O = \frac{\partial O}{\partial K}K & + & \frac{\partial O}{\partial L}L \\ & & \| & & \| \\ \text{Distribution side} & . \ . \ . & O = P & + & W \\ & & \| & & \| \\ \text{Expenditure side} & . \ . \ . & O = \Delta K & + & C \end{array}$$

[1] The equality of $\frac{\partial O}{\partial K}$ to F' is proved as follows:

$$\frac{\partial O}{\partial K} = \frac{\partial}{\partial K}[F.L] = \frac{\partial F}{\partial K}L = F'\frac{\partial\left(\frac{K}{L}\right)}{\partial K}L = F'\frac{L}{L^2}L = F'$$

[2] This is an answer to the " imputation-problem " in the theory of production and distribution. It should be stated that our productivity function does not depend on the homogeneity of the first degree of f-function; on the contrary the homogeneity of the first degree of the f-function has been derived from the productivity function. It should be remembered that the validity of the marginal productivity principle for the imputation-problem is conditional upon the maximum rate of profit.

From this scheme, I believe, one can grasp the internal interdependence of production, distribution and expenditure in the capitalist economy.

Armed with these analyses, let us introduce the dynamic aspect of capital accumulation into the system. Then we get

$$\frac{O}{\bar{L}} = F\left(\frac{K}{\bar{L}}\right) \tag{3.1}$$

$$\frac{O}{\bar{L}} = F'\frac{K}{\bar{L}} + w \tag{3.2}$$

$$w = \bar{w} \tag{3.3}$$

$$F'K = \Delta K \tag{3.4}$$

There are apparently four equations to determine four variables O, L, K and w. So long as the initial value of K, say K_0, is given, we are able to determine these variables uniquely (the initial value of K must be given because this system is a difference equation of the first order).

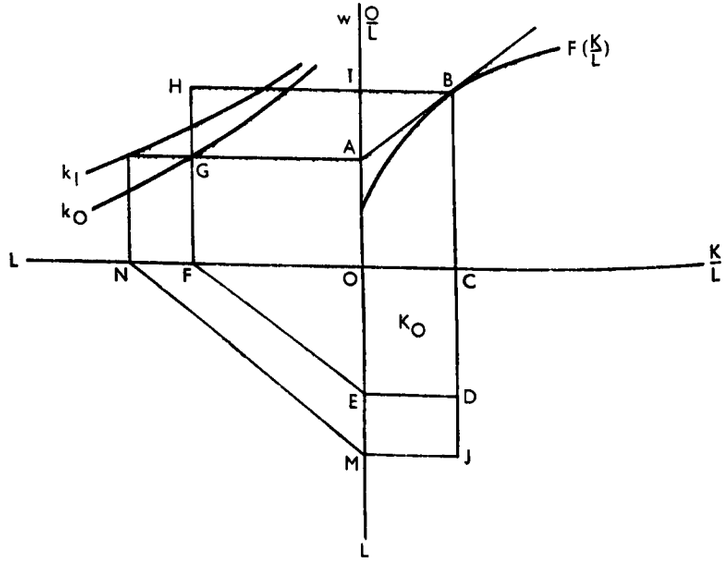


FIG. 3

What are the characteristics of this system? And what direction does the dynamic movement of the national product and the number of workers employed take? Here again, let us elucidate the above system by a diagram.

Let the real wage be given at the point A in Fig. 3. Capitalists will adopt the capital intensity C and employ the number of workers $OE = OF$ by utilising the volume of capital $K_0 = OCDE$ given as an initial condition. The curve k_0 in the second quadrant is the marginal productivity curve of

labour with the volume of capital given at K_0. Since $W \equiv wL$ is the total wages, $OFHI$ is the total volume of national product produced. Needless to say, $AGHI$ is the total profits.

By assumption, the whole of the profits are disbursed to capital accumulation, so that the volume of capital will be increased in the first period by the amount of $\Delta K_1 \equiv K_1 - K_0$. As the real wage is kept constant, the method of production to be employed does not undergo any change, so that $\Delta K_1 \equiv AGHI \equiv EDJM$ will be added to K_0. With the accumulation of capital, the number of workers to be employed will increase from $OE = OF$ to $OM = ON$, and at the same time the marginal productivity curve of labour will shift to the new position k_1 denoted in the second quadrant.

As Professor Hawtrey has defined it, the process of capital accumulation with the degree of capital intensity kept constant is expressed by the " capital widening " (the capital accumulation with the increasing degree of capital intensity is called the " capital deepening ").[1] If the case is capital widening the labour productivity remains at the same level regardless of capital accumulation, and the rate of profit, the relative share of profit and the capital–output ratio will never change. As will be seen in the next section, such a possibility will be found when the growth rate of capital is the same as that of labour supply.

V. Process of Economic Growth

So far, we have examined the conditions of capital accumulation while retaining the static assumption of a constant real wage. In this section we are going to drop this latter assumption and investigate the conditions of a variable real wage-rate.

In general, we may say that a definitive theory of labour supply does not exist yet even in the absence of growth in the labour supply. In the classical schools the supply curve of labour is supposed, according to J. M. Keynes, to be an increasing function of the real wages owing to the increasing marginal disutility of labour.[2] But Böhm-Bawerk, for example, deemed the labour supply to be definitely inelastic to the changes in real wages; in other words, workers were assumed to accept any level of wages until they are fully employed.[3] Generally speaking, I believe, the simplest and most straightforward formulation of the neo-classical assumption of the full employment of labour is to assume the infinitely inelastic supply function of labour with

[1] " The widening of the capital equipment means the extension of productive capacity by the flotation of new enterprises, or the expansion of existing enterprises, without any change in the amount of capital employed for each unit of output " (R. G. Hawtrey, *Capital and Employment* (1937), p. 36). The amount of capital employed for each unit of output is the same conception as the capital–output ratio in our model.

[2] J. M. Keynes, *The General Theory of Employment, Interest and Money* (1936), p. 5.

[3] Böhm-Bawerk, *op. cit.*, Book VI.

respect to the real wages. In terms of Fig. 4 this is denoted, for instance, by a straight line n_0.

In reality, however, there might exist in the society a customary level of real wages which workers do not allow to be reduced and even capitalists accept as normal. Such a level is, of course, dependent on the historical, social and economic circumstances of the society. Particularly in the society in which trade unions have strong power, the policy of the unions may have a dominant influence on the determination of such a level.[1] In order to focus our attention upon the role of capital accumulation, however,

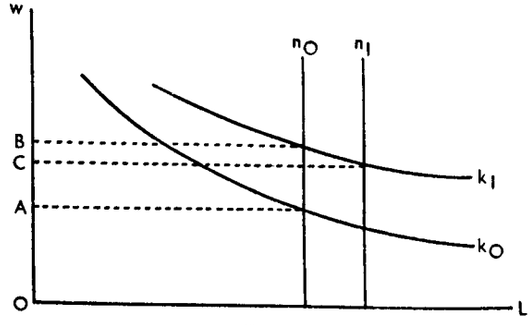


FIG. 4

it would be wisest to follow the neo-classical assumption of the full employment of labour, namely the assumption of a perfectly inelastic supply curve of labour. In what follows we shall proceed on this assumption.

In Fig. 4 let the marginal productivity curve of labour move from k_0 to k_1 as a consequence of capital accumulation. If the condition of labour supply does not undergo any change, in other words if there is no growth of labour supply, the real wage will be raised from A to B. But if there is any growth in labour supply such that the supply function of labour moves from n_0 to n_1, the real wage at full employment is attained at C instead of B. What are then the determinants of the growth in labour supply? Unfortunately, in this respect also, we have not yet a satisfactory theory of population. Therefore, it seems best to regard the growth in labour supply as autonomous.[2]

Let G_1 be the growth rate of labour supply which is constantly given,

[1] If the trade union has the power to determine the real wages at any level and decides to fix it so as to make the amount of total wages maximum, this is given by the following condition:

$$\frac{dW}{dw} = \frac{d}{dW}(wL) = L + \frac{dL}{dw}w = 0$$

Define the elasticity of labour demand with respect to the real wages as

$$\eta = \frac{dL}{dw}\Big/\frac{L}{w}$$

then we have $$L(1-\eta) = 0 \therefore \eta = 1$$

That is, the trade union must determine the real wage so as to make η equal to unity.

[2] J. Robinson, *op. cit.*, p. 68.

namely $G_1 = \dfrac{\Delta L}{L} = \text{constant}$. Thus, under the assumption of full employment, we may establish the following system of equations

$$\frac{O}{L} = F\left(\frac{K}{L}\right) \tag{4.1}$$

$$\frac{O}{L} = F'\frac{K}{L} + w \tag{4.2}$$

$$F' = \frac{\Delta K}{K} = G_k \tag{4.3}$$

$$\frac{\Delta L}{L} = G_1 = \text{constant} \tag{4.4}$$

There are four equations to determine the four variables O, L K and w; then our economic system is complete. Needless to say, K_0 and L_0 must be added to this system as initial conditions to find out solutions (w_0 is not an independent variable under the assumption of full employment).

Let us denote the growth rate of real wages by G_w, namely $G_w = \dfrac{\Delta w}{w}$. Then the question arises: What is the effect of difference between G_k and G_1 upon G_w? Common sense tells us that $G_w \gtrless 0$ according to $G_k \gtrless G_1$. This is true, as will be proved in what follows. But, for example, let $G_k = 20\%$ and $G_1 = 2\%$. What percentage may we expect for G_w?

To reply to this question, we can derive the following equation from the above system: [1]

$$G_w = h(G_k - G_1); \text{ where } h = -\frac{1}{w}\left(\frac{K}{L}\right)^2 F''$$

[1] The proof is as follows:

Rewrite the equations (4.1)-(4.4) as

(A) $O = F.L$

(B) $O = F'.K + w.L$

(C) $\Delta K/K = F' = G_k$

(D) $\Delta L/L = G_1 = \text{constant}.$

First, differentiate the equation (A), then it follows

$$\Delta O = \Delta F.L + \Delta L.F$$

The function F being a function of K and L, we have

$$\Delta F = \frac{\partial F}{\partial K}\Delta K + \frac{\partial F}{\partial L}\Delta L$$

Remembering $\dfrac{\partial F}{\partial L} = -F'\dfrac{K}{L^2}$ and $\dfrac{\partial F}{\partial K} = F'\dfrac{1}{L}$ (see the footnotes 1 on p. 520 and 1 on p. 521 in Section IV), we have again

$$\Delta F = F'\frac{1}{L}\Delta K - F'\frac{K}{L^2}\Delta L.$$

Thus finally we have

(A)* $$\Delta O = F'.\Delta K - F'\frac{K}{L}\Delta L + F\Delta L.$$

Next, differentiate the equation (B), then it follows

$$\Delta O = F'.\Delta K + K.\Delta F' + w.\Delta L + L.\Delta w.$$

In the same way as (A)*, we have

(B)* $$\Delta O = F''\frac{K}{L}\Delta K - F''\left(\frac{K}{L}\right)^2\Delta L + F'\Delta K + w\Delta L + L\Delta w$$

Putting (A)* = (B)* and remembering (B) and (D), we can finally obtain the equation desired.

For obvious reasons, h is positive in the normal situation, then we can establish the following relations:

$$\text{if } G_k > G_1, \text{ then } G_w > 0;$$
$$\text{if } G_k = G_1, \text{ then } G_w = 0;$$
$$\text{if } G_k < G_1, \text{ then } G_w < 0.$$

Remember that these are not the assumptions, but the necessary results obtained from the above system. Thus it becomes clear that the constancy of the real wage-rate is only a special case in these three cases.

It would be worth while noticing here that, other things remaining constant, the growth rate of wages is higher if:

(1) the level of real wages already attained is lower;
(2) the capital intensity is higher;
(3) the rate of decline of the profit, $|F''|$, is sharper.

Therefore, even though $G_k = 20\%$ and $G_1 = 2\%$, we cannot be sure that G_w is always the same.

Suppose that G_k is larger than G_1. Indeed, throughout the whole history of the capitalist economy so far, G_1 has seldom been known to exceed G_k for a long time.[1] As proved above, the real wage in period 1 becomes higher than that in the period 0, namely $w_1 > w_0$, and capitalists are obliged to adopt a higher degree of capital intensity. As long as the state of productivity function remains constant the rate of profit on capital will accordingly become lower. By the equation (4.3), $F'K$ will be added to the system as a new capital increment $\Delta K_1 = K_1 - K_0$, and at the same time the demand function for labour moves from k_0 to k_1.

So long as $G_k > G_1$, this process will be repeated. The real wages, the capital intensity and the labour productivity continue to increase and the rate of profit falls gradually. Some innovation is necessary to protect the system from a falling rate of profit, otherwise the capitalist economy will fall into a stationary state sooner or later.

One remark should be made in this connection. As long as the growth rate of labour supply is given as a constant, the profit rate cannot be lower than this value. To see the reason for this, suppose that $G_k = G_1$ has been reached owing to the decline in profit rate. The real wage will never rise any higher because of the equation $G_w = h(G_k - G_1)$, and the capital intensity becomes fixed. Even though the capital accumulation goes on, it is only the capital-widening process, and the capitalist economy falls into a stationary state before the profit rate reaches zero. The possibility of a zero profit rate can arise only in the case of a zero or negative growth rate of population.[2]

[1] W. Fellner, *Trends and Cycles in Economic Activity* (1956), p. 195.

[2] If capitalists consume a part of their incomes, the rate of profit will never be zero, even though the rate of population growth is zero.

VII. Final Remarks

So far we have been concerned with the analysis of growth process. In reality, however, there has been a ceaseless stream of technological and organisational improvements, and the capitalist economy has been exposed incessantly to changes in the productivity function. But that problem is beyond the scope of the present paper, still more the analysis of trade-cycles.

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DIFFERENTIAL PROFITS TAX[1]

THE main change brought about by the 1958/9 Budget was the unification of the Profits Tax, which hitherto discriminated in favour of profits retained in the business. This reform was recommended by both the majority and by the dissenting members of the Royal Commission on the Taxation of Income and Profits. The difference between the two sides was merely that the latter thought that such a reform should be accompanied by the introduction of a capital-gains tax. On the principle of non-discrimination between retained profits and distributed dividends the Commission was unanimous.[2]

The case for reform was also supported by the Economic Survey for Europe in 1955 of E.C.E. which benefited from the collaboration of Professor R. F. Kahn.[3] Thus there can be no question of the weight and disinterestedness of the massive opinion which supported the reform.

I nevertheless believe the recommendation, if it is at all effective—which is doubtful—to be inimical to economic progress, especially in conditions such as Britain finds herself at present, and I therefore look forward to its reversal. The fact that after the publication of the Budget the shares of the least dynamic sections of British industry, *e.g.*, beer, tobacco and real estate, benefited by the reform, of course, strengthens, but does not decisively influence, my view.

The argument in favour of non-discrimination has been succinctly put by the majority of the Royal Commission on the Taxation of Profits and Income (paragraphs 532–40). Taking it in a more logical order than that presented, the case can be summed up in four points.

1. A differential profits tax militates against the most efficient use of resources inasmuch as: (*a*) companies are not encouraged to distribute those profits which cannot be put to fruitful use, and this might lead to wasteful expenditure and to over-expansion in existing products, and (*b*) it depresses the market value of shares of enterprise, and thus places obstacles in the way of raising new capital,[4] especially discriminating

[1] I have much benefited by discussions with Mr. P. Streeten. Certain aspects of the problem have been discussed by us in "A Reconsideration of Monetary Policy," *Bulletin of the Oxford University Institute of Statistics*, November 1957, pp. 336–7 and by Mr. Streeten, "Report of the Royal Commission on the Taxation of Profits and Income," *ibid.*, November 1955, pp. 341–2.

[2] Mr. Kaldor, a dissenting member of the Commission, also supported the change in his book *An Expenditure Tax* (London, 1955, especially pp. 124–9 and 162–72). Mr. Kaldor bases his objection mainly on the increase, as a result of differential dividend taxes, of earnings-yields on equity shares and the discrimination this implies, in his view, against rapidly growing firms. He is, however, in favour of a dividend tax to be credited against income-tax.

[3] Especially Chapters 2, 3 and 4, pp. 33–113, in particular sections 2 and 3 of Chapter 4, pp. 91–100.

[4] Paragraph 536.

against rapidly growing firms who cannot finance the total investment they wish to undertake by their own ploughed-back profits.

2. This unfavourable effect is not mitigated by an increase in savings, as, in these conditions, "men are more disposed to try to retain for themselves and their families their accustomed standard of living . . . by living on capital,"[1] hence *net* saving is not increased by the increase in retained profits.

3. It does not encourage investment; indeed, it may depress it, as it tends to interfere with raising new capital, and distorts it by separating external and internal rates of return. The depression of share values through non-distribution raises the external terms on which capital can be raised, whilst those who have their own capital can undertake projects satisfying less stringent conditions and get higher returns. Thus of two firms, charging the same profit margins, faced with the same investment project, the firm with own capital can undertake it, but not the one that has to borrow.

4. The majority of the Commission found that the differential tax was not very effective in any case, as it did not prevent an increase in dividend distribution after 1953.[2]

I think that a weighing up of the two contrary arguments leads us to the conclusion that the tax has considerably influenced dividend distribution policy, and thus almost certainly increased net private savings, and considerably increased corporate savings. If we take into account the very sharp increase in personal savings after 1953, far exceeding the increase in dividends,[3] it is fair to argue that the majority's second point, claiming that the effect of the tax on dividend distribution is offset by a decrease in savings, has not been borne out. Other factors were much more important in determining the course of savings. At the same time the increase in real consumption of non-wage-earners which has occurred since 1953, and which absorbed a large part of the increase in the national product, and even the windfall produced by the improvement of the terms of trade, suggests that increases in dividends would not altogether be saved (as indeed anyone would expect *pace* the majority of the Royal Commission).

[1] Paragraphs 535 and, dealing with the relative equity of the tax on distribution as against diminished rentier income, 538. This part of the argument has been effectively demolished by paragraphs 101–2 of the dissenting opinion.

[2] Paragraph 537. This has been effectively contradicted by paragraphs 101–2 of the dissenting opinion, which showed conclusively that a very substantial change of dividend distribution has occurred since before the War, which cannot altogether be explained by the increased dynamism of British business. It is, to say the least, curious that the majority deprecate the effectiveness of monetary incentives, on which most of their recommendations really rest. There can hardly be a more powerful monetary incentive than the differential tax. If it were not effective this would be a good reason in favour of direct controls generally.

[3] From 431 million in 1952 to £700 million in 1956, while personal savings increased from £623 million to £1,351 million in the same period. National Income and Expenditure, 1957, Tables 28 and 47.

The case against the differential tax, therefore, rests on the argument that the consequential less efficient use of savings can be held to offset or more than offset the consequences of the decrease in total savings which is inevitable.[1]

Thus the decisive argument in favour of a unified, non-discriminatory profits tax rests on two assumptions. The first of these is that the non-distribution of dividends works in favour of existing (large) corporations by " placing an obstacle in the way of raising new capital " from the outside capital market, and thus encourages the tendency towards monopoly and inefficiency.

I do not wish to argue the point whether a tendency towards large-scale production and concentration of production in a few hands encourages or discourages efficiency. What is at issue is whether a non-distribution of profits would necessarily add further force to such a tendency at all. This hinges on the further unstated assumption that access to the capital market is easier for small firms relatively to large ones to a degree greater than their relative power to earn high profits and thus secure capital through ploughing them back. This in turn implies that the capital market is relatively less imperfect than the market for manufactures, or at any rate that smaller firms produce for less imperfect markets than larger ones, and that the difference in imperfection is larger than the difference in the relative ease of access to the capital market. Alternatively it has to be argued that though the larger firms are more efficient than the smaller, inefficient ones have a relatively better access to the capital market.

Anyone with any knowledge of the London Capital Market and of the very great difficulty in the way of small firms obtaining long-term finance could not possibly have put forward this view. There has been a continuous effort to obtain reasonable access on favourable terms to small firms. Despite the activities of various new organs, such as the I.C.F.C., no really substantial progress has been made in this respect.[2] The relative cost of small issues for lesser-known firms remains still far more burdensome than that of large ones, and the access to new capital still far more limited than any conceivable difference in their power to make profits.

Nor is this all. The total amount of capital available on the capital market will, as the dissenting members of the Royal Commission have conclusively demonstrated, substantially decrease if the abolition of the differential tax is indeed effective in increasing distributions. Their

[1] Other, subsidiary arguments concern its alleged detrimental effects on the financial structure of firms by favouring debenture finance. But, by strengthening the trend towards ploughing back of profits, this drawback—if it exists—seems counteracted. In any case the problem could be dealt with directly. Another charge concerns the inevitable complications arising out of the need to subject later distribution out of ploughed-back profits to the higher tax rate of profits tax. There is some force in this administrative argument, but it could not possibly determine general economic policy. It can be dealt with by a dividend tax.

[2] The E.C.E. Survey (op. cit., pp. 111–12) stresses this fact.

argument is conclusive—that a decrease in that part of current consumption, which is now financed by living on capital, can hardly offset the increase in current consumption due to the fact that less than 100% of the increased distribution of dividends will be saved.

Now measures which increase the rate of distribution of profits will necessarily make the larger firms more dependent on capital supplied by the capital market. If my contention is correct, *that their relative power to obtain capital from the capital market is greater even than their relative power of accumulating capital by being favoured in the treatment of retained profits*, there can be little doubt that smaller firms will be in a relatively weaker position to obtain capital even than they are now. Their access to the shrunken supply of savings will be made more difficult by the increased needs of larger firms.

If we reflect that the shares of the larger firms will have been made even more relatively attractive to the public by a fuller distribution of dividends than those of the smaller ones, the conclusion is inevitable that the position of smaller firms will deteriorate as a result of the unification of the profits tax. One could only escape this conclusion by making the further assumption that the unification of the profits tax as such will make the larger firms' markets less imperfect than they are, *i.e.*, that their profit margin will fall relatively to the profit margin of smaller firms because of the unification of the profits tax. This is patently absurd.

The further (and contradictory) argument that a differential tax on the distribution of dividends does not encourage investment, at any rate by larger firms, ignores the principle of increasing risk which has been elaborated by Dr. Kalecki [1] already before the War, and which has been proved by post-war experience. Thus the argument that somehow or other the savings will be put to a less than optimal use by existing firms would have to rest on the second set of assumptions. It would have to be claimed that all firms are of the one-product type [2] or, alternatively, that a Board of Directors, with access to the expert advice of professional technicians, is less capable of judging the prospects of a product or technical improvement than private citizens advised by stockbrokers and solicitors at second-hand through favouring certain shares. But by the nature of industry, larger firms are forced to branch out increasingly into ancillary fields. The danger of over-investment in existing products, coupled with a neglect of evolving new products through increasing research, is unlikely to be stimulated. Research has tended to become a large-scale industry with increasing returns. Unless we assume that investors are even more acute than Lord Keynes,[3] and that they will be able to make their preferences count with Boards of Directors, this seems absurd. I do not have to enlarge in

[1] *Essays in the Theory of Economic Fluctuations* (London, 1939), p. 95.

[2] Even the Majority of the Royal Commission does not go quite as far (cf. paragraph 539).

[3] Who was far more successful on the foreign-exchange and commodity markets than on the Stock Exchange.

detail on the lack of realism of these further assumptions. I conclude, therefore, that the non-distribution of dividends is bound to stimulate investment and that there is no reason to anticipate that the quality of this larger investment is likely to suffer.

There is one more thing to be said in this connection. Expanding firms are likely to work in markets in which demand is high. Thus it is likely that their capacity to accumulate retained profits is high and will rise in accordance with their need. Nor can it be claimed that such firms are handicapped in their access to new capital or need to restrict their activities to projects which yield more than the rate of earnings. It is no doubt true that the earnings–price ratio will be higher than it would be if dividend distribution would be higher. This should not influence Boards of Directors in their decisions over much. For a large part of the needs will be financed by retained profits, *i.e.*, very " cheaply." It certainly does not seem that the expense on that part of the capital needs which cannot be met by ploughing back profits is at all comparable to the expense on the increased total capital needs which would have to be raised from outside in the absence of ploughing-back. Most investment projects large enough to need outside capital are " lumpy." Thus *marginal* considerations do not apply. It is a question of all or nothing. And in that case ploughing back decreases the total cost. For the rest it is customary for firms to obtain capital from their own shareholders, and in an overwhelming proportion of cases they are able to do so. They can therefore be " generous " in their terms for borrowing without injuring the interest of their shareholders. Often shareholders will consider such new issues as part bonus distribution on which, for the moment, no capital-gains tax need be paid. This disposes effectively of the argument that the difference between " internal " and " external " returns is likely to thwart the mechanism. The Boards of Directors will be able to rely on external finance without having to pay so much attention to its " high cost." They can do so by knowing that all will remain, so to speak, " in the family." Only if the more rapid rate of expansion is not due to (or accompanied by) higher profit *rates* (*e.g.*, because of a firm cutting prices) does a discriminating tax burden rapidly growing firms (or firms wishing to increase their rate of growth). But even in that case it need be shown that the general increase in savings does not offset this specific handicap.

I conclude, therefore, that the recommendation of the Royal Commission, backed though it is by high expert opinion, is incorrect, and that unification of the profits tax, if it gives rise to a substantial increase in the distribution of earnings, will be disadvantageous to Britain, as it is bound to depress the rate of saving in the community. In addition, the increase in dividends and upper-class consumption is likely to increase the pressure for wage demands, and thus the difficulty of arriving at a solution of the problem of securing stability. This last argument effectively answers the

plea based on the quixotic argument that higher distributions would facilitate the control of the economic system by monetary means, *i.e.*, by banking policy and the Capital Issues Committee, because they would limit the liquid reserves of companies.[1] Control of investment could be handled more effectively by direct tax measures, while the effects of increased distribution—both direct and indirect—are bound to increase inflationary pressure.

The only argument which might reduce the force of these conclusions is that the dividends tax has not been effective and that its abolition will not very much influence corporate dividened policy. In that case the only unfavourable social and political effect is the reduced, uncalled-for fillip[2] given to shares in companies in the quasi-static sectors of the economy. It is doubtful, however, whether the change in the law will not put pressure on company boards to distribute more dividends. In these matters the general psychological atmosphere does matter. I hope therefore that differentiation in favour of ploughed-back profits will be reintroduced. I feel, however, that administrative convenience demands that it should be a dividends tax not ranking for income tax relief with a simultaneous reduction of the profits tax. This would avoid all complications of the old system which demanded a strict identification of ploughed-back profits so as to prevent this subsequent distribution.

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[1] This effectively contradicts the argument, often used simultaneously and discussed above, that the accumulation of liquid reserves does not stimulate investment (this is also contradicted by the suspicions voiced that increased reserves will lead to " wasteful " expenditure).

[2] It is doubtful whether this effect could be fully met by the recommendation of the Minority of the Commission, that the differential dividends tax should be abolished simultaneously with the introduction of a tax on capital gains.

EUROPE AND THE MONEY MUDDLE

A PLEA for international monetary co-operation from the distinguished pen of Professor Triffin [1] is to be welcomed. He asks for more regional co-operation in Europe, and also closer co-operation on a world-wide scale. He has the advantage of being both a theorist and a realist who understands practical limitations. As a principal founder of the European Payments Union, he writes with high authority about what can be managed and what is likely to succeed.

He opens with a general synopsis. He does not agree with those who hold that a dollar shortage is likely to be chronic—but his book was written before he had a chance of studying the elaborate survey of Sir Donald McDougall. He does justice to the great recovery that Europe has made in the post-war period. " The pace and amplitude of Europe's recovery has constantly belied the excessive caution and pessimism which has coloured, throughout the post-war years, most expert appraisals of Europe's future prospects and viability " (p. 40). He gives its proper place to the contribution that Europe can make to world prosperity. There has been too much tendency to assign responsibility for any lowering of world activity to the United States. " The course of economic activity throughout the world can thus be vitally affected by events and policies in other countries as well as in the United States " (p. 21). In my own view a very grave responsibility for the recent down-turn in world affairs rested upon the United Kingdom.

Professor Triffin has a passage on the theory of internal credit policy. This is difficult to follow; it is doubtful if new concepts in this historic field of subtle theorising and debate can be rendered intelligibly in so short an exposition. He uses the concept of excess liquidity; in the dynamic process this usually accompanies a depression, although it may be granted that it is a force, more or less strong, making for expansion, or even inflation. Some hold that it operates in an inflationary sense only through its influence upon the propensity to invest; Professor Triffin appears to assign to it a more direct influence, but the mechanism is not explained. It is odd that in a section on this topic there is no mention at all of the rate of interest—nor, I think, anywhere in the book.

Of the devaluation of 1949 he writes, " It is difficult to escape the impression that the Dutch, British, and Norwegian devaluations of September 1949 deteriorated these countries' terms of trade far more than was necessary to allow them to compete on the international markets for a level of exports adequate to restore equilibrium in their balance of payments " (p. 75). And again, more strongly, " The 1949 devaluations were excessive, or at least premature, so far as the restoration of competitiveness in international trade was concerned " (p. 80).

[1] *Europe and the Money Muddle.* By Robert Triffin (London: Oxford University Press, 1957, pp. xxviii + 351. 40*s*.).

He has a number of original things to say both about Keynes's Clearing Union, and about the International Monetary Fund. He lays stress on the absence of any provision for the multilateral clearing of credit and debit balances.

> " The only reference I have found to the problem in the record of pre-Bretton Woods negotiations was a question by Professor D. H. Robertson, asking how triangular settlements could be effected under the Fund's machinery. Robertson's question was curtly dismissed by Harry White: this was only a technical detail which he would gladly leave to the drafting committee! As we shall see later, it is precisely this very technical detail that, from the start, precluded any real Fund impact on the bilateral system of payments which strangled post-war international transactions. It was the refusal or inability of the Fund to concern itself with this ' technical detail ', that left a vacuum which Europe and the United States alike felt impelled to fill through the creation of a new institution, the European Payments Union " (p. 113).

There is a considerable section on the inception and later development of the European Payments Union, which, naturally, has high authority, and will be of the greatest use to all students seeking knowledge of that institution.

The text broadens out into a survey of the immediate prospect of general convertibility. On this Professor Triffin is an optimist, and he supports his optimism by sound argument. There is much of great value in this survey. I pick only on one particular slant that he gives to his narrative for criticism. Here he seems to lose that realism which is in other respects so marked and valuable a feature of his writing. My criticism does not touch the universal and long-run aspects of his argument, but only its implications for the here and now, with which he is also concerned.

" To be at all meaningful, the restoration of convertibility would therefore require the removal of trade restrictions as well as of exchange restrictions " (p. 237). " In the absence of external assistance, the deficit country will be forced by the depletion of its international reserves either to stop its inflation, or to devalue its currency, or to resort to trade or exchange restrictions. The first of these solutions will generally be deemed preferable to the second,"—about this there is no quarrel—" and the second to the third " (p. 254). About the latter there need be no quarrel either, in the long run, but the immediate prospect is somewhat different. Along with this point of view, I would take the passage in which he tends to deprecate controls of capital movements, while recognising that the liberalisation of current transactions is more important. " The maintenance of capital controls necessitates, however, a continued supervision over current transactions as well, and such supervision may be difficult to reconcile with market techniques of currency convertibility " (p. 236).

In the immediate future the question of the convertibility of sterling remains—despite the British muddles of the last two or three years—in the forefront of the question of the convertibility of currencies generally. From that, Professor Triffin would, I think, as a realist, admit that there is no escape. Since February 1955 sterling has been *de facto* convertible at a discount of about 1%. Before proceeding to the full *de jure* status, it would seem desirable to try out the *de facto* system with a low Bank Rate and with the elimination of the 1%. I believe, here agreeing with Professor Triffin's optimism, that we are not at all far from the feasibility of this, if only the British authorities would brace themselves to it (March 1958). But Professor Triffin's attitude in regard to trade restrictions and capital movements makes the matter much more difficult. He may be sacrificing the practicable and possible for the sake of a universal ideal. His view is held by others, and his lending it his authority could actually do harm by frightening the British off the form of sterling convertibility that alone is practicable. It may be the case that, in a general way, a trade discrimination has the same effect, clearly to the detriment of the economic optimum, as has an exchange restriction. It by no means follows that there would be no gain if sterling became convertible while sterling-area trade restrictions were maintained. Such a situation might be regarded, from an abstract point of view, as a half-way house. It would involve the achievement of an important stage of progress towards full multi-lateralism. For it would mean that third-party holders of sterling would be free to use it for the purchase of dollar goods. That would be a distinct gain, even if members of the sterling area were still restricted, in a greater or less degree, according as the situation developed, by trade restrictions. Such convertibility would impose a new strain on sterling, since, if the third-party world became subject again to a dollar shortage, sterling would bear the brunt. Yet the incidence of this possible dollar shortage on sterling would be relieved, to the extent that there was the possibility of maintaining, or even tightening, trade restrictions on dollar purchases within the sterling area. After all, the sterling area is a considerable part of the whole world; the restoration of *de jure* convertibility, in conjunction with the maintenance of trade-restriction machinery, surely stands out as the natural next step to take, now that the *de facto* convertibility step has already been taken and had success for three years, towards the complete ideal of full multi-lateral non-discriminatory freedom from exchange or trade restriction. That would take us one stage nearer the ideal.

But if the dogmatists of multi-lateralism, whom Professor Triffin appears unhappily to be joining, deny our right to advance to this next stage on the journey, and say that there can be no *de jure* convertibility without a general dismantling of trade restrictions, that may merely have the effect of frightening the British off making this further advance. If their only reward for their action is to be beset by representations and protests from international bodies

and by claims that they have no right to maintain trade restrictions, they may decide that it is better to continue with the present *status quo*. Professor Triffin regrets that the International Monetary Fund cannot take official cognisance of trade restrictions; that was no doubt deliberately intended; while not in accord with the universal idea, it might be of great help in the present situation, since it might enable Britain to take this important practical step forward, without being pestered by representations that she must simultaneously make another, and perhaps more difficult, advance. It is a curious thing that the proposal for what the non-British call "non-resident convertibility" appears to arouse a certain amount of illwill abroad. For by this very act, which entails displeasure, Britain would in fact give non-residents advantages, namely, the unimpeded right to buy dollar goods with sterling earned, while denying herself, through trade restrictions, those same advantages. And because it would be, in a certain sense, an act of self-denial, there is some doubt about how far Britain can go in asking other members of the sterling area to act with her. This is probably the most important obstacle to sterling convertibility at present. All depends on whether it was contemplated that there would have to be severe restrictions, on the general environment, on the hope that this important step forward would soon lead to a better pattern of trade and a subsequent further advance. It might be argued that the substitution of *de jure* for *de facto* convertibility, while still maintaining trade restrictions, would not be a clear gain. This is to ignore the all-important point that the *de jure* convertibility of sterling would be the signal for the re-establishment of the convertibility of a large number of other currencies. This could surely be a great gain.

Even more effective in frightening Britain off would be the idea that freedom for capital movement must follow hard on the heels of convertibility. Professor Triffin does not take this nearly seriously enough from the British point of view. The British position is probably unique, owing to her vast amount of portfolio capital. Her unbroken history of solvency means that she is still carrying National Debt representing expenditures in the wars of freedom against Louis XIV, Napoleon, Kaiser William II and Hitler, along with expenditures on secondary wars, some of which may have been less justifiable. And a large proportion of her industrial capital is represented by portfolio securities. Is it to be believed that their holders, whether insurance companies, private persons, trustees, etc., would not be tempted, nay, would not think it their positive duty, to sprinkle their portfolios with American holdings, after having been denied this right, except for the premium market, for nearly twenty years? Germany has been allowing the lawful export of capital, but there has been little drain in consequence. The reason is simply that there is comparatively little portfolio capital in Germany, owing to well-known events. Thus, the German precedent is irrelevant from the British point of view.

These criticisms of Professor Triffin's general attitude may seem some-

what insular. But we cannot get away from the fact that sterling is of key importance in this question of restoring convertibility. And Professor Triffin's concept of what convertibility should entail ignores the British difficulties, and could, by consequence, postpone the coming into effect of convertibility, which he rightly desires.

In a passage on the shortage of reserves, he treats the question of the raising of the dollar price of gold in a shockingly cavalier manner, dismissing it in a few lines. " The barrenness of this proposal makes it most repugnant to those who think that the international need for liquidity can be put to better use than financing and digging gold from the entrails of the earth and reburying it in the vaults of Fort Knox and other gold graves " (p. 298). This is unadulterated prejudice and obscurantism. The main benefit of raising the price of gold would lie in the revaluation of existing stocks, the second in reducing the " disappearance " of gold into private hoards; higher production comes third. If liquidity is important, why should the devotion of a minute proportion of human labour to providing it be " barren "? Is all the work of all the clerks who ply their pens in banks also barren?

It is not clear that Professor Triffin's own proposal, for enlarging the scope of the gold-exchange standard, avoids the objections to that standard. Its defect is that it does not increase *net* liquidity. He proposes that the nations should place deposits at the International Monetary Fund. Is this another way of proposing that the subscription should be enlarged, and brought up to Keynes's own figures (which Professor Triffin thought excessive)? Keynes hoped to increase liquidity, but it is doubtful if even his proposals, anyhow for the initial quotas, would have sufficed to offset the loss of liquidity due to the diminished value of monetary gold stocks in the world.

Professor Triffin admits that " one may shudder at the negotiating difficulties which the implementation of such proposals would raise " (p. 301). Professor Triffin's strongest point about gold is that a revaluation of gold " would appear totally unpalatable to public opinion in the United States " (p. 298). The " public " in question is only a small handful of people. They may learn sense in time.

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REVIEWS

Theoretical Welfare Economics. By J. DE V. GRAAFF. (London: Cambridge University Press, 1957. Pp. x + 178. 22*s.* 6*d.*)

OF the many books that are now available on welfare economics, I judge this to be one of the best. It was written as a thesis by a brilliant South African, who left his impress on the Cambridge environment but who subsequently revealed a preference to be a non-economist. We are indebted to those friends of Graaff who rescued the work from the obscurity of a library vault and got it published in book form. (Although dated 1957, the book gives internal evidence of having been largely completed around 1951. For example, only perfunctory notice is taken of Arrow's important book, and all references to Little are to the articles that preceded the appearance of Little's book.)

Modern welfare economics has suffered from pretentiousness. So in this rather advanced discussion, Graaff is careful to lean over backwards—meticulously pointing out the limitations of his findings. His discussion of each point is brief, almost too brief. Twelve chapters and four mathematical appendixes are packed into 170 small pages. The variety of subjects can be judged from a listing: technology (principally external effects); tastes (utility frontiers of the Pareto type, Bergson inter-personal social-welfare economics); indivisibility; uncertainty; foreign trade (optimal tariffs); marginal cost pricing; social income and index numbers.

While Graaff's discussion is not elementary, those just beginning their study of welfare economics will probably feel they are getting something from the book. For the most part the sexy symbols of mathematics are confined to Appendix ghettos or to footnotes. Even the theorist without much interest in welfare economics *per se* will benefit from the book—by seeing how Graaff grapples with problems of externality, indivisibility, uncertainty and other pathological phenomena.

Where does Graaff fit into the history of welfare economics? Since the days of Smith and before, economists have felt that perfect competition—when conditions for it are right—does accomplish something. By the time of Marshall and Walras, they had begun to realise that the initial " distribution of income " had to be ethically right if the competitive mechanism were to get you to the best state of the world. A little later, economists began to realise that they could not prove, from inside of technical economics and by the usual tools of science, that one ethical evaluation is " better " than another. Pareto at the turn of the century sensed (but perhaps never rigorously stated) the theorem that by means of lump-sum redistributions the device of perfect competition could in ideal circumstances be used by any ethical observer (who respected individual's tastes) to compute *his* best

state of the world. This is the nub of what it is that is valid in Smith's Invisible Hand doctrine.

An ethical observer who respects people's tastes could not call a situation an optimum if there exists a movement from it which will make everyone feel better off. So it is a necessary (but not sufficient) condition for his social optimum that it fall at a point on what we might call Edgeworth's " generalised contract locus " (both in a production and consumption sense)—or on the set of " Pareto-optimal utility frontier points." Pareto, for reasons that I have never found convincing, tried to elevate these *necessary* conditions for an optimum into a *wertfrei* system of " new welfare economics." By the mid-1930s, Lerner's writings had rediscovered the content of Pareto's necessary conditions. And around 1938, Bergson (and I following him) had straightened out the interrelations: first, between the old, hedonistic welfare economics and one involving general, interpersonal comparisons, and, second, between partial, necessary conditions for a normative optimum and complete necessary and sufficient conditions. In 1939 Kaldor and Hicks rediscovered the Pareto urge to elevate into a new welfare economics the subset of necessary optimality conditions which can be written independently of a social-welfare function. In addition to a technical criticism or correction by Scitovsky, there was considerable criticism in the war and post-war years of this attempt—with Little's book typifying the general disillusionment with the claims of welfare economists. Arrow's fundamental 1951 book breaks ground into the important realm of political philosophy and mathematical politics. It proves the non-existence of a reasonable " constitutional function " or " method-of-compromising-and-scoring-all-possible-ballots function." I believe such a constitutional function ought not to be confused with a Bergson social-welfare function, which makes interpersonal ordinal comparisons among a *given* set of individuals' tastes.

Graaff is in the mainstream of Bergson's kind of welfare analysis—which is no doubt why I found him so sage on point after point. He takes for granted, in rather a merciless way, the untenability of most *simpliste* versions of welfare economics and proceeds with the business at hand of analysing such realistic difficulties as externalities, indivisibilities, and the like. It is partly a matter of temperament that his findings are stated in a somewhat nihilistic manner: one who accepts the universe in a cheerful David Hume way might state the same conclusions and yet give a quite different impression.

Among arguments so numerous and detailed, the slips are remarkably scarce. Whereas a few of Graaff's arguments might have benefited from linear programming developments of recent years, it is astonishing how up to date the discussion reads. Personally, I should have been willing to sacrifice a few pages of the now overworked optimal tariff for a longer and more constructive attack on the problem of " the feasible optimum " along the lines of Ramsey and Boiteux. (I do not call this the economics of the " second best," because it is the economics of the feasible first-best.) But we must all be grateful for this able last testament of Graaff, and lament that economics has lost so able a mind.

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Towards a More General Theory of Value. By E. H. CHAMBERLIN. (New York and London: Oxford University Press, 1957. Pp. xii + 318. 40*s*.)

IN this book Professor Chamberlin has collected together sixteen separate papers, of which four are published for the first time. By far the greater part of the book is devoted to restatement, expansion and defence of his famous work on monopolistic competition. Throughout he has a complaint to make, namely, that his theory has been the subject of far-reaching misunderstanding, largely because it has been confused with what he argues to be the totally different analysis of imperfect competition published by Mrs. Robinson in the same year as his original *Theory of Monopolistic Competition*. The reader of the book under review should not be put off by what is perhaps an over-frequent recurrence to this complaint; for there is much substance in these Essays to enable him more fully to understand Professor Chamberlin's doctrines. In particular, Essay 1 (Towards a More General Theory of Value), Essay 3 (Monopolistic Competition Revisited) and Essay 7 (Some Aspects of Nonprice Competition) admirably provide an up-to-date restatement of the theory of monopolistic competition.

The book also contains some other Essays which are somewhat more loosely connected with this central theme; and three of these are of particular interest. Essay 9 (Proportionality, Divisibility and Economies of Scale) reproduces the author's well-known article on the question whether the existence of increasing returns to scale can always be traced to indivisibilities of one kind or another. Essay 11 (An Experimental Imperfect Market) describes the game played in Professor Chamberlin's seminar to reproduce an imperfect economic market, and gives some most interesting results from the experiment. Essay 12 (The Monopoly Power of Labour) provides a well-argued and provocative challenge to many arguments frequently used to justify the privileged monopoly powers conferred upon trade unions in modern societies.

But to return to the central issue of this book. How far does Professor Chamberlin justify his contention that his theory has been misunderstood by being confused with Mrs. Robinson's analysis of imperfect competition? Mrs. Robinson's *Economics of Imperfect Competition* gave an exhaustive account of the operation of the principle of profit maximisation (the equality between marginal cost and marginal revenue) in conditions in which the individual firm by altering its sales and purchases might affect the price of what it sold and what it bought. This is, after all, a large part of the subject matter of

Professor Chamberlin's book; and in so far as this is so, the two works are properly regarded by the general body of economists as covering the same ground.

In analysing the implications of profit maximisation when the firm can influence the price of what it buys and what it sells, Mrs. Robinson's work went into much greater detail than that of Professor Chamberlin. But, on the other hand, Professor Chamberlin claims that he covered in his theory three aspects of the problem which were inadequately or not at all covered by Mrs. Robinson; namely, selling costs; oligopoly; and real differentiation of the product.

In so far as selling costs are concerned, Mrs. Robinson worked on the assumption that the firm's demand curve could be taken to represent its selling price less the cost of selling the product. The diagram reproduced on p. 151 of the volume under review from an article by Mr. Henry Smith in fact shows that this procedure is quite legitimate. If in that diagram we take the curve $D'D'$ instead of the curve DD as the demand curve facing the firm, we can proceed with the rest of Mrs. Robinson's constructions. This difference between Mrs. Robinson's and Professor Chamberlin's treatment is not of essential importance.

Professor Chamberlin's contention that he covered, while Mrs. Robinson did not cover, oligopolistic repercussions is true and important; but while Professor Chamberlin stated and discussed the problem of oligopoly, he did not make his main contribution in helping to solve it.

Much the most important part of Professor Chamberlin's claim, in the view of the present reviewer, is that which relates broadly to the differentiation of the product. Here the restatement of his theory by analogy with the problem of location (see pp. 47 and 124–9 of the book under review) is particularly illuminating. In any spatial area of consumers to introduce a new shop in between existing shops is to introduce a real differentiation in products, since goods available at the new retail outlet are preferred to more distant goods by those who live near the new shop, though they are also in very close competition with goods from neighbouring retail outlets. Similarly, there may be an infinitely divisible span of potential real product differentiation between existing products. Mrs. Robinson confined herself to a discussion of imperfect competition between a group of producers producing what was really a homogeneous product.

Professor Chamberlin's type of product differentiation does give rise to two really important new issues. First, its implications for welfare economics are clearly quite different from those of Mrs. Robinson's assumptions; in his construction, variety has a real utility, whereas in Mrs. Robinson's it has not. Second, Professor Chamberlin's construction naturally allows room for freedom of entry, even though demand curves slope downwards for the individual firm. There is no contradiction in assuming that a new shop will enter a retail market if retailing is making abnormally high profits, even though existing shops would have to lower their prices in order to sell more; the new shop will enter the market in between the existing shops, and will automatically receive the real preferences of the customers in that locality. But there is some difficulty in assuming that a new firm will automatically enter an industry which is making a high profit if the consumer's preferences are irrational. For why, if there are no real differences in the product, should it be easy for a new firm to sell a new brand of a given product when existing firms find such difficulty in expanding their markets for their own brands? The well-known equilibrium position in which the demand curve and the average-cost curve are tangential is a natural part of Professor Chamberlin's world. It is more difficult to know what it was doing in Mrs. Robinson's.

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Time in Economics. By G. L. S. SHACKLE. (Amsterdam: North-Holland Publishing Company, 1957. Pp. 111.)

THIS little book contains three lectures delivered in Amsterdam under the Professor F. de Vries Foundation, together with one on "The Limitations of Economic Theory" delivered in the Hague. As one expects from Professor Shackle, the lectures are written in a style which is clear, forceful and imaginative. They develop ideas which he has already made familiar by his work on the theory of expectations, and he has added a useful list of books and articles containing substantial discussion of the Shackle theories.

Two moments of time can never be simultaneously present to an observer in their actuality; but the anticipation and the memory of other moments belong to the present, and can there be compared together and with the immediate experience of the present. The anticipation and the memory change as time rolls on; the headmaster, remembered with awe by the boy new from school, is remembered with affection forty years on; the holiday which rouses only the vaguest feelings a year in advance gives a lively pleasure by anticipation on the night before it begins. Decisions are made from time to time, and these involve a comparison of the anticipations of different possibilities at the moment when a decision is reached. Professor Shackle rightly points out that, since a decision is thus an inward comparison of mental states, there is no valid distinction between rational and irrational decisions.

The process of decision-making Professor Shackle regards as essentially creative or inspirational—not the formal solution to a formal problem, but as introducing a new element into the situation, which is fundamentally unpredictable. In consequence, economic dynamics cannot be the formal solution of a mechanical system, embracing "a sequence of

moments in their actuality"; its concern is "the internal structure of the individual's solitary moment-in-being," his memories, expectations and decisions. Uncertainty is of its very structure. At this point of his argument Professor Shackle does not, I think, deal adequately with the notion of a statistical dynamics, based on a concealed orderliness in the personal and varied anticipations and reactions of individuals.

In his second lecture Professor Shackle states the elements of his theory of potential surprise and of focus outcomes, starting from the idea of the essential uniqueness of a decision, because it belongs to the state of mind of an individual in a particular moment, and in particular of decisions which in themselves change the conditions for all future decisions. The broad lines of the argument are familiar from earlier writings, but disproportionate attention is given to a line of criticism which may be known as Carter's Error, and which was dealt with by Mr. W. M. Gorman in the ECONOMIC JOURNAL for September 1957 (p. 549). This arose from an incautiously worded statement which I made about the impossibility of compounding two pure rankings to produce a third. What I meant, and should have said, is not worth developing here, for Professor Shackle in chasing this matter is ignoring a much stronger line of criticism.

This relates to his continued unwillingness to recognise any distinction between outcomes which are "perfectly possible," or carry zero potential surprise. These outcomes are (on p. 47) both "equally" possible and "perfectly" possible. But surely these concepts are not the same; and I think that their difference explains some of the facts brought forward in disproof of Professor Shackle's theory. It is perfectly possible that the Conservative party will win the next election, and perfectly possible that the Labour party will win; both of these outcomes occasion zero potential surprise (whereas a victory for the Liberal party would occasion the maximum of surprise). But a Conservative victory and a Labour victory are not *equally* possible; if I am offered a choice between £1 for a Labour victory, and 25*s*. for a Conservative victory, then on present anticipations my focus-gain is not 25*s*., but £1. I suggest that for the sake of making more deadly his thrust at the statistical concept of probability, Professor Shackle has thrown away some of the reality of subjective probability.

The third lecture consists of some elegant examples of the results of bringing anticipations clearly and explicitly into economic theory. They relate to the mechanism of boom and collapse, as explained by the fact that investment schemes, once well begun, cannot be turned back, but may create the conditions which inhibit any further investment schemes; to "the multiplier as a complete and self-sufficient mechanism of output fluctuations"; and to the "inherent restlessness" of the rate of interest, a subject previously discussed in Professor Shackle's book *Expectations, Investment and Income*. These examples are not, of course, necessary as a justification for the study of expectations; that justification rests in the nature of reality. But they suggest that this still-neglected subject has more to yield of useful results.

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Activity Analysis and the Theory of Economic Equilibrium. By HELEN MAKOWER. (London: Macmillan, 1957. Pp. xiv + 192. 25*s*.)

THE development by Koopmans and others of activity analysis was probably the greatest advance in economic theory since Marshall. That the latter's method of partial analysis can throw light on so many problems is a measure of his greatness; but it has long been apparent that where a problem involves essentially more than a very few variables, partial analysis can be seriously misleading. Such problems are, unfortunately, very common in economics. We have all been aware of the unreality of the single-product firm, the two-commodity international trade and the elaborately stationary world of capital theory. Nor have former attempts at generality achieved more than vague or purely formal solutions.

Activity analysis provides a simple technique for producing precise and useful answers to such problems. Why, then, has such a powerful tool been so neglected by British economists? It is largely because, although the mathematical principles involved are in fact simpler than those of the marginal analysis, the leading expositors have used a rather overpowering mathematical apparatus. There has been, in other words, a crying need for a non-mathematical introduction to the subject, and Miss Makower has now given us just such a book.

The first part of the book gives a painstaking exposition of the fundamental concepts, while the remainder is devoted to applications of the method to taxation, international trade and capital theory. Even the most mathematically ignorant reader should be able, by working carefully through the book, to gain a useful knowledge of the method and some of its possible applications. The book confines itself to comparative statics, which is a pity, since activity analysis has perhaps its greatest potentialities in dynamic problems. However, even within its terms of reference, there are some respects in which the book is not entirely satisfactory.

Perhaps the most important of these concerns the implications of the assumptions of activity analysis. The basic assumption, that an economy can be represented by a finite number of "activities," each subject to constant returns to scale, seems on the face of it highly restrictive. A discussion of how such a theory can yet represent diminishing returns (and to some extent increasing returns) is obviously a vital part of any introduction to the subject. Unfortunately, this part of Miss Makower's exposition is, to say the least, obscure. If I have read her aright, she is arguing in Chapter VI that varying rates of substitution (curvature of isoquants) is

" not best regarded " as a technological characteristic. If so, I fear she will find few to agree with her—if only because in real life technologies *do* have curved isoquants. However this may be, the exposition of Chapter VI is hardly clear enough for a text-book. I suspect that the trouble stems from a failure to maintain a sharp distinction between diminishing returns to scale and diminishing returns to a factor; but a few illustrative diagrams would help, as would an explicit treatment of the simple and important concept of convexity.

Miss Makower brushes aside the question of increasing returns and skates rather lightly over the problems raised when prices cannot be assumed constant. These are both difficult points, but they are not unimportant. On the other hand, it is difficult to share her enthusiasm for formulating the theory of consumers' behaviour in terms of activity analysis. Certainly it can be done, but the important question is whether it is illuminating to do so. Of the applications, that to international trade is delightfully clear and suggestive. On the other hand, although the discussion of taxation problems is clear, one wonders whether activity analysis plays an essential part, while the application to capital theory gives the impression of being not fully worked out. One must note, too, that the writing is sometimes regrettably careless.

However, these are all minor blemishes in a book which (except for Chapter VI) is admirably written and which must rank as one of the most important expository works of recent years. I hope it will soon come to be compulsory reading for all students of economic theory.

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Exakte ekonomie. By D. B. J. SCHOUTEN. (Leiden: Stenfert Kroese, 1957. 9″. Pp. vii + 226.)

THE object of this book is to represent various economic theories by a series of simple mathematical models. Professor Schouten has selected ten doctrines that in his opinion sum up the accumulated wisdom of economic theorists, and stresses that they are all equally valid, although they may, of course, apply to different problems. The first five chapters of the book deal with the economic process as a whole, and are associated with the views of Quesnay, Ricardo, Marx, Walras and Keynes in succession. The second half is concerned with slightly more specific problems and covers the trade cycle, production and allocation, and international trade. There is a concluding chapter on economic policy.

The treatment of these diverse subjects follows a uniform pattern. It begins with a brief statement of the assumptions, which are then translated into a set of very simple algebraic equations. The main discussion of the model and its properties and implications comes next, and after this each chapter concludes with a numerical example; values of the system's data are provided and the equations are duly solved to yield the entries for a simple form of national accounting.

The uniform arrangement of alternative theories in standard mathematical form is an excellent and, I believe, novel idea. The didactic advantages of the method are obvious, and it can in particular bring out clearly what crucial assumptions give each model its distinctive properties. In doing so it would demonstrate the merits of explicit algebra in the discussion of abstract theories, and I think this is one of the objects the author had in mind. When measured by the high standards to which it aspires, however, the present execution of the scheme is somewhat disappointing. In the early chapters the successive theories represent variations on a common model, but later on the link between the various parts becomes tenuous. Moreover, within the individual chapters the opportunities of the chosen approach do not seem to have been fully exploited. The numerical examples tend to stand apart from the rest, and the discussion of the model is often only loosely related to the mathematical properties of the set of equations given earlier. In part this may be due to a self-imposed limitation of the mathematics, which excludes calculus and beyond. Strictly, this should make the book accessible to all, but it is doubtful whether it does so in fact. The author tells us this is part of a wager he was challenged to accept; but while he may presumably be congratulated on winning his bet, its conditions have not improved the efficiency of his expository method. Even where the ingenuity displayed in overcoming this handicap is to be admired, one feels that there are better principles to determine the level of mathematics employed.

If it is not entirely successful in the execution of its original design, the book unexpectedly has its best parts in the treatment of the sheer economics of the individual theories. The treatment is at an advanced level, but there is little or no argument of the specialist kind which inquires what Marx really meant. Professor Schouten is here original and imaginative, and he is not afraid to present Quesnay's system in the guise of an input–output table or to base his discussion of production and allocation on linear programming concepts. The clarity which is achieved in the unorthodox presentation of traditionally difficult classical doctrines constitutes the main contribution of this book.

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Economic Models. An exposition. By E. F. BEACH. (New York: John Wiley (London: Chapman & Hall), 1957. Pp. xi + 227. 60*s*.)

To the growing text-book literature on mathematical economics and econometrics, Professor Beach contributes an introductory volume designed

for use at a very elementary level. The first six chapters cover mathematical economics on the matter of description and analysis of supply–demand models and aggregative models of the economy as a whole. Static and dynamic, linear and non-linear systems are discussed. The models are presented directly as final products, and there is no attempt to develop the underlying mathematical theory of micro-economic behaviour. The mathematical properties of the models are described and analysed. Some elements of differential calculus and techniques of solving differential or difference equations are explained. The mathematical treatment is intuitive rather than rigorous, and will probably be easily assimilated by economics students. Numerous exercises are included.

The remaining four chapters deal with the econometric side of the mathematical models presented earlier. Basic concepts of statistics, regression analysis and econometric models of simultaneous equations are treated in this part of the book. As in the previous section, the presentation is given in an easy, understandable and smooth-flowing style. It makes itself available to a wide range of students.

On the whole, Professor Beach accomplishes his set task of bringing an understandable introduction to mathematical and econometric-model analysis before the beginning student. He has some good pedagogical devices in the statistical section on sampling and correlation. If words of general criticism were to be raised against his effort they would be that some of the treatment appears to be superficial and a bit old-fashioned. With so much important ground to be covered and so many new things to put before the student, why should he be saddled with bunch-map analysis? The problems of multi-collinearity deserve great emphasis and analysis, but probability methods and not laboriously computed bunch maps are surely the appropriate tools.

A mathematical technique as advanced as the differential calculus merits explanatory notes in such a volume as this, but Professor Beach introduces the more advanced idea of integral calculus without providing the additional notes that would be helpful. For balance, some purely mathematical treatment of the concept of integration in connection with the solution of differential equations would be helpful. The mechanical rules for solution hold more meaning if the basic ideas of what is being done are laid before the student.

In a pedagogical book, especially at the most elementary level, it is of the greatest importance to avoid mistakes, no matter how trivial. Endless hours of frustration and irritation fall upon the beginner who has the misfortune to be using a text with mistakes. Possibly, in pointing out some of Professor Beach's slips now, we may attract the attention of users of the book who can duly note them. On p. 12 the example for transforming units (U.S. cents into dollars) in a linear equation shifts the decimal point in the wrong direction. On p. 40, in explaining the concept of slope, the signs are all wrong. On p. 50 the solution for the value of supply in a quadratic supply–demand model is numerically wrong. On p. 57, in the last equation on the page, one of the coefficients is not squared, but should be. The same is true in the formula for S on p. 134. In discussing the concept of error about a regression line, Professor Beach suggests (p. 136) that parallel straight lines on either side of the regression should be expected to include 68% of observations *not in the sample on which the regression is based.* The appropriate interval and probability limits should be derived from a more complicated formula based on the type given on p. 146 for the variance of points on a regression line. In that formula he incorrectly adjusts twice for degrees of freedom, once in estimating the residual-error variance and again in the formula on p. 146, in which the adjusted-error variance is already used.

The discussion of modern developments in the estimation of systems of simultaneous equations contains a curious allocation of credit to Haavelmo and Koopmans, to the former for basing statistical method on the nature of the interrelated equations of the model and to the latter for the treatment of the question of identification. He goes on to remark (p. 193) that Koopmans' principle suggests the use of just-identified models. There is no *a priori* reason, other than simplicity of computation, to prefer these to over-identified models, and there is no remark in Koopmans' writings on the subject suggesting a preference for just-identified models.

There is a remark on p. 189 to the effect that the least-squares regression of quantity on price, in a particular supply–demand model, is correct if price is measured without error and the two-equation system is complete. If Professor Beach means "bias" by "incorrect," his statement will not hold. It is hard to see what he could mean otherwise.

The reviewer finds much to disagree with in Professor Beach's closing evaluation of recent work (including the reviewer's own) in the field of econometric model construction, but the disagreements here are in the realm of debatable questions or differences of opinion and are not demonstrably false, although the reviewer would give an entirely different interpretation of the findings.

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Œconomica Varia. Theoricæ notulæ. By E. FOSSATI. In two volumes. (Genoa: Istituto di Politica Economica dell'Università di Genova, 1957. Pp. 239 and 283.)

IN these two bulky volumes Professor Fossati has assembled his contributions to economic periodicals from 1923 to 1957. Most of the articles are written in either Italian or German, but there are also a few in French and one or two in English. In order to save cost, the subject matter has been mimeographed and not printed.

Professor Fossati is widely known for his contributions to the history of economic doctrines, especially on the monetary side; and a number of the articles reproduced here are concerned with this aspect. They show him to be a good scholar, seeking out his material from the original sources; and with the right sort of approach to the earlier generations of economic writers —more concerned to bring out the positive and constructive aspects of their work than to emphasise where they went wrong.

On the theoretical side he has mainly been influenced by Pareto and Walras; and two of the articles in this collection deal illuminatingly with the work of these two great economists.

Taken as a whole, these articles bear witness to the wide range of his interests in economics, both theoretical and applied, historical and contemporary.

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Utilizing World Abundance. By L. St. CLARE GRONDONA. (London: Allen & Unwin, 1958. Pp. 190. 21*s.*)

IN this book Mr. Grondona puts forward proposals for the automatic working of buffer-stock schemes on the following principles.

For any commodity which is to be brought under the scheme an initial " index " price would be fixed on a prescribed formula which would tend to set this " index " price rather below the ruling market price. An upper buying price and a lower selling price would then be fixed 10% above and below the " index " price. The authority would be empowered to borrow money without limit to purchase the commodity at the lower buying price, and would sell the commodity without limit at its upper selling price so long as it held any stock of the commodity. But the " index " price for the commodity (and so also the buying and selling prices set at 10% each side of the " index " price) would automatically be reduced, on a fixed sliding scale, as the buffer stock acquired more and more of the commodity; the " index " price would once more be automatically raised again on the same sliding scale as the authority reduced the size of its stock by subsequent resales to the market; and, if the authority possessed no stocks of the commodity, the " index " price would also be continuously raised on an automatic formula so long as the authority's buying price had been for more than a prescribed time and by more than a prescribed amount below the market price. To put the essence of the proposals into a nutshell, an automatic stabilising device would be introduced to set upper and lower prices at 10% each side of an " index " price, the absolute level of which would itself gradually follow the long-run development of the market, as the buffer stock found itself overloaded with, or running out of, the product.

The proposal has much to commend it; and it is indeed highly commended by two very distinguished economists, Mr. R. F. Harrod and Mr. Graham Hutton, in prefaces to the book itself. Mr. Grondona has for long been a consistent and persuasive advocate of the idea of stabilisation through buffer stocks; and the idea has in the past had other notable advocates, including Lord Keynes. Of late years less has been heard of it; and this recent relative neglect of the subject may be attributed to two considerations: first, the fact that buffer stocks should be initiated in periods of surplus supplies, since they must start operations by buying up stocks of the relevant commodities, whereas the post-war years have seen serious commodity shortages rather than surpluses; and, second, the increased realisation of the danger that the pressures of producers are liable to cause a buffer-stock authority to maintain so high a price for the product as to lead to the continued accumulation of excessive surplus stocks. The timing and nature of Mr. Grondona's proposals avoid these two difficulties. The present recession in the United States and recent movements in the markets for many primary products suggest that the time has come when purchases by buffer stocks might once more from time to time be desirable. Moreover, Mr. Grondona's proposals depend upon an automatic reduction in the prices set by the buffer-stock authorities so long as stocks are accumulating; and in so far as they are designed for independent national operation, an importing country such as the United Kingdom would not be subject to pressures of producers in the finance of its own national buffer stock.

It is indeed an essential, and in my view a very attractive, feature of Mr. Grondona's proposals that they could be introduced independently by one or more national governments. Suppose the United Kingdom and the United States had independent national schemes of this kind for the same product. The schemes would not become unworkable merely because the initial index prices, the buying- and selling-price margins or the sliding scales relating changes in prices to the level of stocks were not the same in the two countries. These things would determine whether the private market would at any one moment deal with the sterling national buffer stock or the dollar national buffer stock. But, as Mr. Grondona rightly argues, if the private market chose to deal with the one national buffer stock, the operation of that stock's automatic sliding scale would sooner or later bring its prices into line with those of the other national buffer stock. Close consultation and co-operation between the national governments in the devising of their buffer stocks would be most desirable. But in a world in which the national governments have the power of the purse, more can probably be expected of a confederation of national buffer stocks than from any supra-national buffer-stock authority.

But Mr. Grondona's proposals are open to criticism in some important respects.

In the first place, he seems to contemplate with equanimity the possibility that the United Kingdom, having set up a national scheme of this kind, should then freely receive into its buffer stock quantities of the product sold to it out of present surplus stocks of primary products held by the United States agricultural authorities. But this surely would be unacceptable. Otherwise it would be possible for the United States agricultural authorities to dispose of some of their surpluses to the United Kingdom buffer stock at special sacrifice prices equal to the latter's lower buying price, while the same authorities in the United States maintained the normal world market price well above this level by limiting the disposal of their supplies on the normal commercial markets. By such a means the United States agricultural authorities could use the United Kingdom buffer stock merely as a convenient repository for holding part of the United States surplus supplies. But this danger could be avoided by authorising the United Kingdom buffer stock to refuse to accept supplies which were offered to it substantially below the ruling world market price.

A second and more fundamental deficiency is Mr. Grondona's treatment of the balance-of-payments problem. It is true, as he suggests, that a United Kingdom buffer stock would only have to purchase imported primary products when their price was low and when, therefore, the United Kingdom's balance of payments would have been strengthened by a favourable movement in the terms of trade. It is true also, as Mr. Grondona also suggests, that money spent on stocking primary products is money spent on economising future and more expensive imports. This point could perhaps be emphasised by adopting the practice of always publishing the gold and dollar reserves side by side with the value of stocks held by the United Kingdom buffer stocks. But the problem is basically a quantitative one. In order that the United Kingdom's buffer stocks should exercise an important stabilising influence they must cover a wide range of commodities and their sliding scales must be such as to allow substantial increases in stocks without too large a fall in the "index" prices. But with such a large open commitment to buy imported primary products in times of world recession, it is difficult to believe that circumstances could not arise in which it would impose a heavy temporary strain on the United Kingdom's balance of payments. At this point the reviewer cannot refrain from lifting his own bonnet to allow his own bee out for a very short buzz. If the United Kingdom could by its general domestic monetary and fiscal policies successfully stabilise the price level in sterling of its own products and would then let the exchange rate between sterling and other currencies float, Mr. Grondona's scheme should be the more easily workable. A fall in the prices of world primary products might lead to heavily increased imports by the United Kingdom buffer stocks; but now this process, if it imposed a strain on the United Kingdom balance of payments, would be automatically eased not only by the sliding scale, which would cause the buying prices of

the sterling buffer stocks to fall as their stocks rose, but also by the temporary depreciation of sterling, which would tend to maintain the sterling equivalent of the supply prices of overseas primary products.

But there remains a third and basic point. Great as are the virtues of an automatic stabilisation system which cannot be subject to *ad hoc* political pressures, there are serious objections to the use of an automatic rule. Suppose that there were a secular downward movement, or at least a very prolonged fall, in the price of the commodity concerned. Mr. Grondona's automatic rule would oblige the buffer stock to build up its holding of the commodity until the formula had reduced its buying price to the lower ruling level. It would then have to hold more or less indefinitely what might be a large stock.

In this case the application of the automatic formula would involve the continuing cost of carrying a useless stock. In other cases it might so work as actually to accentuate fluctuations in market prices. Consider one example. Suppose that the demand for natural rubber were subject to a rather prolonged but marked cyclical fluctuation in demand due to a fairly protracted trade cycle in the demand for motor cars in the United States; suppose, further, that a fall in the price of natural rubber would lead to a fairly extensive use of it to replace synthetic rubber, but only after the lapse of a certain time lag in which plans and processes were suitably adjusted; and suppose that private dealers are not prepared to vary their stocks of natural rubber very much. In such conditions without a buffer stock there would be only small fluctuations in the stocks of natural rubber but considerable fluctuations in its price. Suppose now that a buffer stock is introduced, working on the automatic "Grondona" principle of buying and selling at a fixed range of prices which themselves are gradually lowered or raised as the amount of natural rubber held by the buffer stock rises or falls. There are likely now to be greater fluctuations in the total stocks of natural rubber; but, what is less obvious, there *may* now also be *greater* fluctuations in the price of natural rubber than before. For when the demand for cars, and so for rubber, starts to fall, the purchases made by the buffer stock will at first maintain the price; but this will delay the substitution of the natural rubber for synthetic rubber; as the prolonged depression in the market for cars deepens, a point may be reached when the buffer stock is so stocked up that on its automatic sliding scale it has to reduce its buying price very far below the initial level; this might coincide with the bottom of the recession in the market for rubber; and at this point at any given low price of natural rubber the users may buy less than they would otherwise have done because the price had been maintained by the buffer stock in the early phases of the depression so that they had not adjusted themselves to using natural rubber in place of synthetic rubber. As a consequence, the price of natural rubber at the bottom of the recession *might* be lower than it would have been in the absence of the automatically working buffer stock. (For a full

development of the dynamic properties of such automatic systems, see a forthcoming paper by Professor A. W. Phillips.)

Now it is always possible in theory to alter the formula for the automatic operation of a buffer stock in such a way as to ensure that it exercises a stabilising rather than a destabilising influence on prices in any given situation. For example, it might in some conditions be possible to do this merely by altering the sliding scale in such a way that, at the expense of a still larger fluctuation in stocks, the price would in fact be maintained throughout the most prolonged depression. Perhaps more importantly, it might be useful to relate the automatic reductions in price not only to the absolute size of the stock held, but also to the rate of increase in the stock held and to the length of time for which any stock had been held. But the basic point remains: an automatically working buffer stock will act as a stabilising device only if its automatic sliding scale is suitably devised. Should we run the risk of trying in each case to set these automatic rules in advance appropriately to the actual conditions of the real world about which we are so lamentably ignorant? Or should we reluctantly, in spite of all its attractions and advantages, abandon the principle of automaticity and allow a discretionary element of decision to the buffer-stock authority, so that it can attempt with experience to mould its policies to the requirements of the case? This is a most important issue which Mr. Grondona does not face in his book.

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The Sources of Invention. By J. JEWKES, D. SAWERS and R. STILLERMAN. (London: Macmillan, 1958. Pp. xii + 428. 31*s.* 6*d.*)

IT is curious that, in a society that owes much of its material well-being to a long series of industrial innovations, economists have until recently given little attention to the study of inventions, with the result that few assured general statements can be made about their causes and origins. To this neglected field of inquiry Professor Jewkes and his two colleagues have now addressed themselves. They have been primarily concerned with one facet of this large subject, for they have sought to answer the question of "where and under what conditions industrial inventions have arisen in modern times." It is an outstanding merit of their book that they have brought together a mass of information about inventions and inventors which is of great interest in itself and which will also be of utmost value to other investigators. Their discussion is mainly, though by no means entirely, directed towards a particular aspect of the broad question which they pose. What have been the distinctive spheres of the independent inventor and of teams of inventors, especially those working in the research organisations of the great industrial firms? Is it true, as is now popularly

supposed, that whereas in the nineteenth century invention proceeded chiefly from independent inventors, often untrained and scientifically unsophisticated, to-day it arises mainly from organised research conducted by trained scientists and technologists in large industrial establishments?

Their answers, fortified by ample illustrations, are clear and convincing. The popular antithesis is false. In both periods invention has come from a wide variety of sources. Inventors have at no time conformed to a common pattern. In the nineteenth century many inventors were men with a fine scientific training, though not necessarily an academic training, which, the authors point out, is not always of advantage to original genius. In the twentieth century, as in the nineteenth, a high proportion of the major inventions have proceeded from independent inventors or from men working outside the great firms. Even "development," which in most industries requires much larger resources than those needed for financing invention, has in many instances been undertaken in our own day by men or firms of small means. The authors insist strongly upon these conclusions, and in asserting the claims of the independent inventor, they point to the dangers of complete reliance upon institutional research. There is a brilliant discussion of the difficulty of reconciling the inventive temper with the conditions of research in great industrial establishments.

In the face of such evidence, few will dispute these general propositions. Perhaps, however, the authors have not fully made up their minds whether the dangers of which they speak are with us already or whether these dangers are likely to emerge only if present trends are carried a great deal farther. Since such a high proportion of even the most recent inventions have come from independent persons, the dangers do not yet seem to be imminent.

The authors, who rightly emphasise the importance of individual genius, speak with contempt of those who regard invention as a "social process" and particular inventions as in some sense "inevitable." Their contention is not, of course, that the progress of invention (and of innovation as a whole) is not closely affected by the kind of environment in which inventive persons find themselves. The disposition of society towards material progress—a disposition which inventors and innovators themselves help to shape—and the whole institutional framework must exercise a profound influence upon inventive activities. The authors frequently call attention to the importance of "communication" among scientists, technologists and business-men in producing inventions, and they show that the progress of invention has been attended by an improvement in and an enlargement of the methods of communication, through technical journals and societies, scientific and technical institutes, the patent office. May it not be claimed that in modern times the great research organisations of industrial firms can be considered, from this point of view, as an additional and valuable means of communication that did not exist in the past? The same can perhaps be said of technical collaboration among firms, which the authors view with some

suspicion. If so, then these developments are to be welcomed, provided that they do not seriously reduce the opportunities for the free and miscellaneous movement of inventive activity elsewhere.

In the latter part of the book the authors turn to an examination of " development " and innovation as a whole. Here their arguments, though always interesting and shrewd, are more general in character, and they have less that is new to contribute, especially, for instance, to the analysis of the relation between monopoly and innovation. Unfortunately the sensible discussion of these matters by economists has been prejudiced by the unrealistic character of the theories of competition and monopoly propounded in recent decades, and particularly by unhelpful definitions. From all this it is not easy to escape. Economists, like scientists, are sometimes blinded by traditional learning. Professor Jewkes and his colleagues have at any rate shown, when considering the importance of inter-firm or inter-commodity rivalries in stimulating invention, that many so-called monopolists or oligopolists are in fact exposed to types of competition that are highly conducive to progress in this field. Nevertheless, in voicing the suspicions with which they view the claims sometimes made for monopolists as progressive forces in modern industry, they do not (it seems to the reviewer) emphasise strongly enough the insecurity in practice of monopolistic structures in an age of rapid technical progress when established positions are liable to be variously assailed—not least by the intrusion by the leaders of one " industry " into the provinces of others. Great firms maintain themselves in prosperity only by constantly shifting their ground. These are among the questions which others will now be better equipped to examine—in gratitude to the authors for their path-breaking work.

G. C. ALLEN

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United States Imports and World Trade. By H. G. AUBREY. (London: Oxford University Press, 1957. Pp. 169. 21*s*.)

ONE of the main determinants of the extent to which world payments relationships will continue to be burdened by a dollar shortage is obviously the future size of American merchandise imports. For a wide range of industrial materials—which comprise more than one-half of the total American import bill—import requirements in 1975 (representing the 1970s) were estimated by the President's Materials Policy Commission, whose findings, published in 1952, are generally referred to as the Paley Report.

This report forms the basis of Mr. Aubrey's book, the chief purpose of which lies in the formation of an estimate of *total* United States imports in " 1975." In order to make such a projection, the author has had to add to the results established by the Paley Commission in two main ways. First of all, he has had to make some estimate of future prices of the commodities covered by the Paley Report—which latter dealt only in physical quantities—and secondly, he has had to project the volume and value of future American imports of food and of finished manufactures, both of these categories having been outside the Paley Commission's terms of reference.

These estimates, and the various underlying assumptions, are laid out in great detail and with much clarity in the second part of the book. Following the example of the Paley Report, Mr. Aubrey proceeded mainly by way of individual studies of each of some thirty commodities. He made ample use of the advice of experts in each of the separate fields, both for the purpose of verifying the Paley projections and in order to obtain some estimates of the likely trend of prices. This piecemeal approach is, perhaps, a rather cumbersome method, but nevertheless it strikes one as very much more appropriate for the particular purpose in hand than the alternative procedure of projecting econometric relationships calculated on the basis of past experience, though in the cases of imports of finished manufactures and of some other items Mr. Aubrey had no choice but to follow this second approach.

The first part of the book attempts to summarise these findings and to sketch their implications for the future of world trade and payments. Here, the author strikes a distinctly optimistic note, for even on the basis of a " conservative estimation " a markedly accelerated growth of American merchandise imports is indicated. The calculations suggest that by " 1975 " the American import bill (assuming that the overall price level remains constant) may amount to roughly $20,000 million, which is nearly twice the value of present United States imports, and which would almost certainly mean a reversal of the long-term decline in the ratio of imports to national income. The main reason for this development is the probable failure of American domestic production of raw materials to keep pace with American consumption.

The author naturally realises that a quickening of the rate of growth of American imports does not of itself assure that the dollar problem will become easier; in particular, he points out that the lion's share of this increase in American imports will probably go to Canada and to Latin America, and that other countries, especially the industrialised countries of Western Europe, will be able to benefit from these developments only if they can increase their exports to these chief recipients of the additional dollars, thereby at least partially displacing the sales of American manufactures. Mr. Aubrey realises that such a re-alignment of trade patterns may not be an easy matter, but even then one is bound to wonder whether he is not perhaps understating the difficulties involved. Stressing the effects of the post-war dislocation of production in many of the other major manufacturing countries on American sales of manufactures, he suggests that the pre-eminence of the United States as an exporter of manufactures, one of the

outstanding features of world trade since 1945, may not withstand the test of time. There is no doubt that the factors mentioned did tend to increase sales of American manufactures in the post-war era, but there are a number of perhaps equally strong influences to be reckoned against these. Two points in particular deserve to be mentioned. First, it must not be forgotten that restrictions on the import of American-produced durable-use consumers' goods (which, as Mr. Aubrey himself points out, are the commodities which the United States can produce relatively cheaply) have been imposed in many countries during the post-war period, and that such quotas continue to be of considerable importance in many of the most prosperous markets. Secondly, the procurement of the additional imports for American consumption on which the whole argument is based will inevitably lead to increasing American investment in the countries concerned, and such investment is likely, on balance, to encourage the use of capital goods produced in the United States. One might also add that the fast rate of technological advance which is one of the characteristics of the American economy will always tend to boost her exports of manufactures.

These considerations, however, only concern what the author admits to be a mainly speculative part of the book, and they do not detract materially from the great merits of Mr. Aubrey's work. There is no doubt that this is an eminently sound and often stimulating study, and that the author has done much to raise the discussion of the dollar problem—which for so long has proceeded on the basis of largely qualitative and therefore ultimately frustrating arguments—to a more productive and fruitful plane.

H. H. LIESNER

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The Conflict of Expansion and Stability. Documents relating to Australian economic policy, 1945–1952, edited by D. B. COPLAND and R. H. BARBACK. (Melbourne: Cheshire (London: Angus & Robertson), 1957. Pp. xvii + 795. 67*s.* 6*d.*)

VOLUMES of historical documents are common enough, but one of contemporary or near-contemporary documents is something of a rarity, at least since Sir Douglas Copland's own previous volumes of documents on Australian policy during the depression of the early thirties.

The documents here printed relate to Austalian economic policy from the end of the War until the "crisis" of 1952–53. The editors see this period as one in which a clear dilemma of policy emerged. On the one hand, a high rate of development and immigration was being encouraged; on the other, credit restrictions and import controls had to be imposed in order to counteract the resultant inflationary pressures and balance-of-payments difficulties. The danger was (and maybe still is) that these incidental controls might become ends in themselves and so militate against

further vigorous development which the editors in common with many Australians regard as highly desirable. This is the theme which the documents are selected to illustrate. They extend to nearly 800 pages of text, but by a judicious selection of paper and binding the volume has been kept to a reasonable weight.

Apart from the importance of its theme, the present volume is justified by the inadequate state of official publication and information services in Australia. Some important departmental statements are simply mimeographed, so that those who do not move regularly in official and parliamentary circles may never even hear of their existence. Others are printed but are difficult to obtain, there being no government bookshops in the major cities, as in the United Kingdom; whilst private booksellers are reluctant to stock them, partly because they are too often printed in clumsy folio form. Finally, in Australia, with its federal constitution, many key economic documents take the peculiarly inaccessible form of evidence before and judgments handed down by courts of law.

This volume therefore performs a very useful service in bringing together many documents not readily available to the student or the general public. Some of the sources are those to which one would naturally turn, such as Budget Speeches, National Income White Papers, and Commonwealth Bank and Tariff Board Reports. Others are not now as familiar as they once were, such as the reports of the Rural Reconstruction Commission and of the Joint Committee on Social Security, as well as the famous White Papers on Full Employment, Bretton Woods and G.A.T.T. All these are here, and many more, including ministerial statements unearthed from Hansard, and Arbitration Court judgments on cases relating to the basic wage, margins for skill and hours of work. The volume concludes, fittingly enough, with extracts from the various post-war Banking Acts and from the Privy Council decision in the Bank Nationalisation case.

In addition to these "official" documents, the editors have included a good deal of less definitive material, such as political speeches and broadcasts, newspaper editorials and the reported proceedings of assemblies of returned soldiers, primary producers and economists. It is, of course, valuable to have these records of contemporary opinion, but just how representative they are, or can be, is another matter. For example, this volume includes extracts from the Sydney and Adelaide Press, but none from the influential Melbourne papers. In these circumstances it might have been preferable to have omitted most of this material and to have extended the coverage of the "official" documents to some fields which are at present excluded, such as the establishment of the federally operated Trans-Australia Airlines; federal social-service legislation; and federal–state relations, particularly in respect of taxation, housing and land settlement.

The editors have taken considerable pains to arrange their documents according to topics illustrative of their main theme. For this purpose the

documents are grouped in ten chapters and thirty-four sections, each related to a particular topic. The disadvantage of this method is that a document may have to be quoted under several different headings, so that the student has no opportunity of appreciating it as a whole. The leading example is Sir Douglas Copland's own paper on "Some Problems of Economic Policy," written when he was Economic Adviser to the Prime Minister in 1944, and from which six extracts are given, the first on p. 4 and the last on p. 607. On the other hand, any other arrangement would probably have necessitated extensive editorial commentary and an elaborate system of cross references. Apart from an excellent brief introduction, the editors prefer to let their documents speak for themselves.

The editors of any anthology have an invidious task. Whatever decisions they make regarding coverage and arrangement, it is easy enough for readers to think of different ways in which the task might have been done. After all, the main point about the present volume is that it prints, either for the first time or in a handier form than was previously the case, documents that will be indispensable to all teachers and students of Australian affairs.

WILFRED PREST

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Regional Income. By the Conference on Research in Income and Wealth of the National Bureau of Economic Research, New York. (Editor, FRANK A. HANNA.) Studies in Income and Wealth, Volume 21. (Princeton: Princeton University Press (London: Oxford University Press), 1957. Pp. x + 408. Price 63*s*.)

THE National Bureau of Economic Research has brought the art of conference promotion to a highly effective level. We now know exactly what to expect of its conference volumes—a clearly limited subject matter, a solid core of research papers presented by experts in the field and artfully distributed between the theoretical and the empirical, and a series of carefully prepared comments provided by equally expert discussants. It is true that some of the conference papers have been more diligent than distinguished and that some of the published discussion was too tedious to justify the immortality of print, but it is difficult not to be impressed by the scholarship as well as the bulk of the Bureau's long shelf of conference volumes.

In view of the considerable work which has been done in the United States on regional income estimates and analyses, it is surprising that the topic was not disposed of in an earlier conference. In some ways this volume has benefited by the delay. The theoretical papers are more definitive and better balanced than they could have been a few years ago. One has the feeling, however, when reading these smooth statements of the conceptual issues, that it has all been said before, that there are no new ideas here to stimulate new approaches to the perennial problems of regional analysis.

But if the conceptual sections reflect a wide measure of agreement (or, at any rate, a lack of active controversy), the papers and discussion dealing with empirical research and data interpretation present a more ragged and a livelier front. These empirical studies fall into two groups—one concerned with the problems of explaining differences in regional earnings rates and the other with methods of estimating incomes and populations for very small regions. The methods described in the last group of papers will be of interest mainly to those actively engaged in regional income estimation. They are crude, but they are ingenious, and where data are scarce this kind of ingenuity repays study.

It is the analytical section of the volume that contains its most interesting contributions, though the results are far from conclusive. Amongst these, Frank Hanna's analysis of inter-state differentials and the lengthy discussion papers by Dennison, Williams and Borts, together constitute a useful commentary on the problems of using standardisation techniques to analyse regional income differentials. The alternative measures proposed by Hanna and his discussants in this connection suggest some widely different "explanations" of his data and define, without solving, some complicated problems of statistical interpretation. Probably these explanation problems are fundamentally insoluble. This does not mean, however, that they cannot be reduced sufficiently to provide bases for prediction.

The papers by Hurwitz and Stallings on the effect of using regional instead of national price deflators and by Mansfeld on the relationship between city size and income are also of considerable general interest. Here again, neither the data nor the analyses are full enough to validate the authors' hypotheses. The need to extend and strengthen the statistical series and to explore alternative formulations of the interpretation problems has been explicitly recognised by authors and discussants.

In sum, this volume is a useful and varied compendium of regional income studies. It contains several thoughtful essays on the conceptual issues involved, a critical discussion of some of the current analytical work in progress and a description of some experimental work with scanty material. As in all National Bureau volumes, the empirical work is amply illustrated with statistical data and with suggestions for further research.

PHYLLIS DEANE

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British Transport Policy. By J. R. SARGENT. (London: Oxford University Press, 1958. Pp. ix + 163. 15*s*.)

THE case for "co-ordinating" road and rail services by ensuring that prices reflect relative costs is, in outline at least, familiar. Mr. Sargent presents it fluently and with economy. The justification of free consumers'

choice occupies his first chapter; the second deals with the problems of identifying costs in transport; the third reviews the recent history of costing and charging practice. These introduce proposals for co-ordination, set out in the last three chapters. The main interest of the book lies here.

As the intention is to reach a wide audience, it is perhaps inevitable that some thorny problems are avoided. Whether the short cuts are justified in the end is doubtful, however. We are told, for example, that road and rail rates should diverge (in the same direction) from their respective costs by " equal amounts " (p. 20). The examples given indicate that the reader should interpret this as " by absolute equal amounts." One would, of course, have expected the rule to be " by amounts proportionately equal." Admittedly, no one knows how serious in practice the difference between these would be, and either would probably lead to a better allocation of traffic than exists now; but the difference *could* be considerable. Again Mr. Sargent makes the assumption that there is " no divergence between the ' direct costs ' of a service, when the term is used by the Transport Commission or by private operators . . . and the economist's concept of resources used by not providing it " (p. 37). This is a large pill to swallow, not least because Mr. Sargent—as he himself implies—thus forswears speculation about how the railways' costing system *could* be developed to conform more closely to economists' ideas.

Mr. Sargent's main concern is with " two major obstacles " to co-ordination by competition—the difference in the way in which road and rail may be expected to distribute " indirect " costs over their services, and the public's demand that some unremunerative services should be continued. On the latter, in arriving at the not unexpected conclusion that they should be subsidised, rather than handicapping competition, the author makes a most unusually thorough examination of possible ways of licensing or taxing operators who do not have such obligations. Granted his premise that the services should be provided, he argues convincingly that their costs should not fall on the tax-payer but on transport as a whole, and be imposed by a single authority for road and rail, which would replace the Transport Tribunal and the Licensing Authorities.

The proposals for recouping " indirect " costs seem less satisfactory. The problem is posed as follows: road operators perforce pay for their " indirect " costs—and much more—through indirect taxation. As the fuel tax is predominant (Mr. Sargent calls it " petrol tax," but clearly he intends to cover diesel also) road operators cannot avoid allowing for these payments in all their charges irrespective of the various degrees of monopoly power they enjoy. But the railways have a choice of services from which to recoup their indirect costs. How, then, may one ensure that the rule that rates should reflect relative costs will not seriously be infringed?

Several ways are canvassed, such as requiring road operators as well as railways to discriminate in charging, or requiring railways to charge an

amount at least equal to the " indirect " costs of road services. These are rejected, for reasons of economy or administration, in favour of requiring road and rail each to cover its own indirect costs separately, imposed by each as a uniform charge per ton- or passenger-mile on each service offered. This is to be done on the railways by issuing instructions and on the roads by imposing the nearest equivalent, a fuel tax. (Deviations from the rule are allowed to cope with short-run excess capacity.)

In part, judgment of these proposals depends on the weight one gives to " indirect " costs, and to the degree of monopoly power actually enjoyed by the railways. Unfortunately, when the reader has swallowed the pill in Chapter II he is still unsure in Chapter IV exactly what is the nature of " indirect " costs. If, strictly, the proposals relate to the cost of the tracks only—and this seems a reasonable interpretation—then it is difficult to believe that these are now a very important part of total railway costs; for road operators it is unlikely that they would exceed, say, 5%. And the monopoly power of the railways and their willingness to use the freedom allowed by the present framework of public control seem over-estimated.

Mr. Sargent also proposes that the road taxation not needed for road " track " costs should be raised over the whole of transport. Since total indirect taxation on road users has recently been running about four times the total expenditure on roads, one wonders what would be the final effects of following this proposal. After an initial burst of road building, it could hardly fail to switch a large financial burden from road operators on to the railways. One imagines then that the railways would be forced to contract sharply and would have to use their powers of discrimination vigorously just to keep solvent.

The main, and most welcome, value of the book is its power to provoke discussion. Although the major part is given to the problems just discussed, there are other interesting proposals, among them a suggestion for a British Road Corporation, to " provide an efficient road system." In 163 pages a remarkable amount of meat is packed.

MICHAEL BEESLEY

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Co-operative Independent Commission Report. (Manchester: Co-operative Union, 1958. Pp. xi + 320. 6*s.* 8*d.*)

BY a resolution of the 1955 Congress of the Co-operative Union an Inquiry Commission was set up to prepare a report and recommendations " designed to secure the greatest possible advantage to the Movement from its manufacturing, wholesale and retail resources." The Commission was to consist of " suitable persons not engaged in co-operative management or administration," and undoubtedly suitable persons were invited. Mr. Gaitskell became chairman, and three of the seven other members were

economists, Professor Jack, Dr. Jefferys and Lady Hall. Mr. C. A. R. Crosland acted as secretary and, as stated in the Preface, " made by far the most important contribution to the preparation of the report." The Report is indeed most excellently written and a pleasure to read.

Inevitably one harks back to the somewhat similar examination (though it included more aspects of Consumers Co-operation than the merely economic) published in 1938, and reviewed in the ECONOMIC JOURNAL for June 1938. Though written by Sir Alexander Carr-Saunders, Professor Peers and myself, this inquiry also had the benefit of official Co-operative co-operation (especially the services of Mr. George Darling) as well as consultation with a number of economists.

The outstanding impression of the present report is how little co-operative economic affairs have changed in the intervening twenty years. The co-operatives still pay very low salaries to their administrators, still avoid employing university graduates, still elect their full-time paid wholesale directors and still include many minute retail societies. Results, however, have not in twenty years stood still. Notably the retail capitalist multiples have greatly increased their lead. Their proportion of total national retail trade was (p. 3) round 14·0% in 1930–34, but 21–22% in 1952–56, while the co-operatives only advanced from round 10 to 11%. Again, apart from food, co-operative products form (pp. 14–15) a diminishing proportion of co-operative retail sales. In 1938 the co-operative movement appeared to assume it was triumphantly advancing, and had to be warned that it might become stationary; now, in 1958, it has proved to be stationary and has to be warned that it may fall behind.

The present report makes no bones about drastic, almost revolutionary, recommendations (and there is a still more drastic minority report signed by Colonel Hardie). Production, particularly in the non-food sector, is to be limited (pp. 244–5); dividends (the economic pivot of the Rochdale system) are to be stabilised in favour of ploughing back surplus into retailing facilities (pp. 238–9); smaller societies are to be more or less shamed into amalgamation (pp. 99–104, 242–3); capitalist monopolies are not to be fought (pp. 185–90); the wholesale societies are to give up their fulltime democratically elected Board (pp. 218–21); and a co-operative retail development society is to be centrally formed (pp. 252–5) to give technical advice and services generally, and to enlarge the scale of operation in dry goods.

For economic efficiency these measures of reorganisation and strategic withdrawal, are probably wise. The Commission, as set up, was not to be mainly concerned with the democratic and ideological aspect of co-operation. Nevertheless, enlargement of societies (particularly if their membership was scattered over a wide area) was found by the 1938 inquiry to lead to apathy, and there is no telling what demoralisation may not follow defeatism in the crusade against the monopolist or, for the more earthly, a fall in the " divi " really sufficient for development and new investment during inflation. The Commission recommend continuance of the policy of charging prevailing market prices, but if, as is quite likely, state anti-monopoly policy leads to retail price cutting, " divi " may have to be cut to vanishing point. Certainly the quality of co-operative goods and services will have to improve, but the present, unlike the previous, inquiry makes no attempt at consumer research. Indeed, little new research appears in the present report, with the exception of a useful Appendix, based upon savings surveys, comparing Co-operative shares and deposits and other liquid assets. The Report is frankly a working plan, though a well-reasoned one. But good use is made of economic research carried out in the past twenty years, official, co-operative (such as Mr. Hough's) and unofficial (such as Dr. Jefferys'); and the value of this research for background and comparison is made manifest.

It is undoubtedly in finance that the movement most needs the sort of advice that independent bodies can give. The 1938 examination pointed to large unused liquid resources in the form of government stocks held by the wholesale societies. The present inquiry makes no mention of these hoards (have they gone down the inflation drain?). But Part III makes an admirably searching analysis of the capital position and future sources of finance. The commission rightly finds the 7·4% plough-back surplus (p. 146) " profoundly disturbing " when compared with the corresponding 58·4% of capitalist retail companies. Unless it is to become just a post-Victorian period piece, let us hope the Movement will, this time, accept independent advice. The present Commission's recommendations are certainly specific enough.

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The Employers' Challenge: A Study of the National Shipbuilding and Engineering Disputes of 1957. By H. A. CLEGG and R. ADAMS. (Oxford: Basil Blackwell, 1957. Pp. viii + 179. 21*s.*)

THE central theme of this book is that the disputes in the shipbuilding and engineering industries in the spring of 1957 represented an attempt by British employers—and an attempt which failed—to alter the pattern of industrial relations which had grown up over the previous twenty or thirty years. That pattern had been one of avoidance of major industrial conflicts. Moreover, an examination of the nature of industrial disputes over an even longer period leads the authors to the conclusion that in times of prosperity (or rising prices) conflicts may be numerous but they are rarely severe. Further, in such periods, major strikes, when they do occur, are unlikely to arise over straightforward wages issues, which employers at these times are usually prepared to settle by negotiation and compromise. They are more likely to occur over questions of principle.

These conclusions therefore lead the authors to suppose that it is worth while looking behind what appeared to be straightforward wages claims in the two industries concerned to see whether some conflict of principle could afford a better explanation of a serious industrial conflict in a boom year than a mere argument over a matter of shillings and pence. Their conclusion is that a majority of organised employers had at last reached the opinion that continuous inflation was an even greater danger than industrial conflict. To enforce this view, they felt the need of Government support so that their position would not be undermined either by concessions in the nationalised industries or by pressure to preserve industrial peace in the private sector at the price of further wage concessions. Without an ally the employers could not win. They thought they had found one, but they had overestimated the strength—or the length—of Government support. They had miscalculated, and they lost.

The theme is an interesting and ingenious one, and it may well be right. There is much evidence which the authors adduce to support it. On the other hand, the attitude of both sides—in demanding and refusing wage advances—is a traditional one, and possesses certain ritual characteristics. The difference this time in the length to which that attitude was carried could be regarded as one of degree rather than of principle, as one of accident rather than intent. The authors' argument imports a degree of clarity and of subtlety of conscious calculation into the practice of industrial relations which those who engage in it may not frequently have observed. It also suggests a degree of unanimity of reasons for a common decision which is not by any means always to be found. In so far, moreover, as these reasons are based on confidential discussions, particularly when members of the Government are involved, they are rarely disclosed even to colleagues. The capacity in which advice, even of Ministers, is given is open to different interpretations by different people.

It is, of course, no new thing for the engineering employers to refuse wage advances, and to persist in refusal, even in periods of rising prices. As is shown in Appendix 3 of this book, only one of the general wage advances in the industry during the Second World War was negotiated. The remainder were awarded by arbitration. The boldness of the engineering employers during the War period in refusing advances they could have paid, and in constituting themselves the guardians of the national economy may, however, be explained by their knowledge that the final decision was unlikely to rest with them. There then existed other means, and in particular compulsory arbitration, for ensuring a nice balance between the conflicting ideals of avoiding inflation and preserving industrial peace.

The authors believe that in a modern democratic state with full employment it may be beyond the strength of both government and employers to enforce a national wage policy without the agreement of the trade unions. Indeed, it might well be added, as the experience of this country from 1948 to 1950 shows, that it is impossible in these circumstances to enforce it even with trade-union support.

The interest of this book lies not only in the analysis of motives, calculations and miscalculations of the parties involved in the engineering and shipbuilding disputes of 1957. It is an exceedingly valuable summary of the main features of industrial relations in this country since their last turning-point in 1926.

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The Family Life of Old People. An inquiry in East London. By P. TOWNSEND. Institute of Community Studies, Report No. 2. (London: Routledge & Kegan Paul, 1957. Pp. xvi + 284. 30*s.*)

THIS book is one of three studies prepared by the Institute of Community Studies, Bethnal Green, in which method, approach and area of study are all very similar. They have taken as their general frame of reference the network of family relationships existing in the area—or in anthropological terms the kinship system—within which to study specific problems. The present volume is concerned with the process of ageing in the borough of Bethnal Green.

It is an exciting report, alive with a real feel for the place and its people. The author emerges as a person of passionate convictions who has succeeded in capturing much of the resilence, humour and independence for which the people of the East End are famous. His general method of survey is an ambitious one. He touches many aspects of ageing, medical, social and economic, and in so doing attempts to combine, on the one hand, the approach of the social anthropologist who eschews questionnaires and emphasises the importance of identification with the group being studied, and, on the other hand, the method of the general social survey with its standardised interview schedule and emphasis on measurement. He seeks to quantify and generalise without losing the particular, the individual.

The survey began with a random sample of people over pensionable age obtained from doctors' lists in the borough. Nearly all of the 203 people contacted were seen at least twice, and some several times, most of them by Mr. Townsend himself. The picture which emerges is one which conflicts strongly with many currently held views about the relationships between old people and their families. Mr. Townsend finds an immensely strong and active family life, which becomes more important in old age, as extra-family activities diminish with ill health, reduced income and the like. He provides details of a complex exchange of services between the generations, particularly grandmother, daughter and grandchildren, which reduces considerably the claims which old people make upon the social services. The

corollary, that those without children, particularly those without daughters, are more likely users of domiciliary services or of institutional care is supported by a parallel study of the inmates of a local geriatric unit, a welfare home, and of those using the home-help service in Bethnal Green.

Mr. Townsend contrasts the secure position of the old woman able to adapt gradually to her changing physical capacities, and who may indeed, at the centre of a three-generation family, find new useful tasks, with that of the old man. The latter, on retirement, finds himself not only deprived of a sense of usefulness, of status and of income, but also thrown back into a family network which to a large extent excludes him, because the original roles within the family have been developed on the basis of the segregation of financial and domestic activities. Thus while old men with families may benefit from family care, they may also find difficulties created by the failure of family relationships to adjust to the changed conditions of retirement. This point is not easily reconciled with the author's general insistence upon the flexibility of the family which allows " different interests, needs and satisfactions to be judiciously composed."

But if there is some difficulty in sharing wholly Mr. Townsend's view of the beneficial role of the family, the case which he presents for the planning of social services to treat the old as family members is nevertheless impressive. He concludes, for instance, that housing policy should be concerned with keeping the extended family in close proximity, and that welfare services should be directed more towards the provision of assistance for the family than the provision of substitute family services. It would have been useful here to have some general consideration of the extent to which such policies would represent demands for additional resources as compared with a rechannelling of existing resources.

The economic aspects of his subject are not, however, Mr. Townsend's prime concern, and this may help to explain a rather disappointing vagueness in the section on poverty and financial help from the family. The picture here is a startling one—42% of his sample receiving National Assistance, 20–25% entitled to it but not claiming it and another 8–10% with personal income below the assistance level. In many respects this is a special feature of Bethnal Green—the national proportion of pensioners with assistance is only 25%; partly it is a question of definition, because Mr. Townsend is concerned to illustrate the role of family help, and so excludes from his definition of personal income things such as board money paid by children living at home with their aged parents.

But this vagueness also reflects a general problem of methodology. In his search for flexibility, Mr. Townsend appears to be less probing than he should be in the pursuit of information about some of the items, and, although the resultant imprecise information inevitably involves interpretation, he tells us little about how this is tackled. For instance, in one of his interview reports we are told that there was an awkward silence when information about board money was sought. " In such cases it seems quite wrong to press for details," comments Mr. Townsend. In this particular instance details were eventually forthcoming, but one would have welcomed discussion of how he treated other cases where similar difficulties were encountered. Or again in relation to family help we are told that some people preferred simply to say " my children are good to me," but we are not told how this information is fitted into the percentages of old people with various kinds of help. In addition to more information about the treatment of certain difficulties such as these, more description of the form in which questions were put would have been welcome. One or two examples given in the text are worrying. " Do you get as much help as you think you should [from your children]? " seems not only of doubtful value in itself but also a dangerous source of bias in the context of establishing the amount of help received.

In his own discussions of method Mr. Townsend stresses the importance of interpretation and speaks of this as a " subtle and complicated process." He is, of course, quite right—the presentation of social-survey results always involves interpretation—but it is important that the reader should be able to assess how the research worker has set about this task. It seems especially important when the intensive-interview method is used. Mr. Townsend attacks the standardised questionnaire which fits people into pre-determined categories without regard to their individual circumstances and idiosyncracies. This can certainly be dangerous, but so, too, can the process of adapting questions to make them meaningful to respondents, for this may merely mean a shift in the source of bias from respondent to questioner.

If, however, these weaknesses make one treat some of the conclusions of this study with caution, they do not detract from its value as a source of information and inspiration for future work in this field. That more work there must be is a unanimous conclusion which can be reached after reading this book, if only to satisfy the social conscience of an industrial society, which, on the one hand, provides the wealth to lengthen man's life span, while, on the other hand, rejecting him once his working days are over.

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Essays in Canadian Economic History. By H. A. INNIS. (Toronto: University of Toronto Press (London: Oxford University Press), 1957. Pp. vii + 418. 68*s*.)

THIS collection of essays is intended as a companion volume to the late Professor Innis's two great works on Canadian economic history, *The Fur Trade in Canada* and *The Cod Fisheries*. The essays are essential to a proper understanding of Innis's views on Canadian economic history; also, they

are a further expression of many general ideas not worked out fully in the two other books, and they deserve to be read in their own right.

Innis had an enormous knowledge of economic history, matched by an interest in economic problems of all kinds, at all times. Not many authors could write on such a variety of topics as is offered here: The Work of Thorstein Veblen; The Rise and Fall of the Spanish Fishery in Newfoundland; Liquidity Preference as a Factor in Industrial Development; The Church in Canada, and many other titles. This astonishing variety of subject matter is held together in two ways.

First, every essay has some bearing, more or less direct, on past or present economic problems in Canada. This is a source of extensive interest, for in many ways Canada was, and still is, one of the most fascinating and important of all meeting grounds of economic and political forces. As Innis points out, the reconstruction of the fur trade late in the eighteenth century was carried out by a French-Canadian population working under Anglo-American entrepreneurs; a hundred years later, American labour—especially skilled labour—and American labour organisations were taking an important part in both agricultural and industrial development in Canada. Between these two events Canada had played a large part in that " encircling movement of world trade which surrounded the globe first in the fur trade in which traders from Russia met traders from Europe in North America " (p. 327).

Secondly, there are a few themes which are repeated again and again, features of development which Innis clearly regarded as crucial, at least in the Canadian case. The supply of labour is one of these, the significance of overhead costs another. The most obvious, however, is transportation. Innis insists on the prime importance of water transport in developing trade in the St. Lawrence basin, trade based first on fish, then on furs, then on timber, and in each case directed towards European markets across the seas. Later, when population was increasing more rapidly and raw-material prices became subject to frequent and severe fluctuations, canals and railroads were constructed in order to reduce transportation costs. This development—and it is characteristic of Innis that he should take the political as well as the economic point—involved the reorganisation of government and the extension of its interests in the economic sphere: " The relation between governmental activity and water transport became an important factor in later developments " (p. 68).

The reader who comes to this book for its general rather than its Canadian interest will probably find most rewarding the essays entitled " The Canadian Economy and the Depression," " Significant Factors in Canadian Economic Development " and " Liquidity Preference as a Factor in Industrial Development "—this last, incidently, ill named, for it has nothing to do with liquidity preference in any sense in which an economist would ever use the phrase, but is a brilliant survey of the major gold rushes in the nineteenth century

and their consequences. In each of these essays Innis sketches in the grand design of economic development with an obviously masterly knowledge of detail. When writing in this way—and this, surely, was his forte—he is particularly illuminating when dealing with the problems of primary production. In this connection he makes several times the important point that primary production, when highly developed for the supply of distant metropolitan markets, is likely to require a good deal of fixed capital—railroads, grain elevators and the like—and is almost certain to need extensive credit facilities. His appreciation of this makes all the more surprising his comparative neglect of international capital movements.

Innis is one of the few economic historians—and he is probably the greatest of them—to have written in English with personal, intimate, sympathetic and extensive knowledge of the problems of an economy based on primary production. This makes his work peculiarly valuable. But on all topics he is interesting, and all his work has an invigorating tone of confidence and purpose. Perhaps this sprang from the belief which he expresses in these essays: " The success of measures designed to solve [contemporary] problems . . . is necessarily determined by their relation to problems of the secular trend. An analysis of the factors peculiar to a long-run development is essential to an understanding of immediate difficulties " (p. 123).

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The Combined Food Board. By E. ROLL. *Stanford University Food Research Institute, Studies on Food, Agriculture and World War II.* (Stanford, California: Stanford University Press (London: Oxford University Press), 1957. Pp. 385. 60*s.*)

THE Combined Boards, organised on the model of the Combined Chiefs of Staff, were not supra-national agencies, but formulators of policies agreed between the constituent governments. The Combined Raw Materials Board claimed to issue " mandatory recommendations," the Combined Food Board did not; but the difference was hardly even theoretical. No recommendation by either Board would be made unless its members believed themselves authorised by their governments to make it; and only if the machinery went wrong would each government fail to follow a recommendation by a note of formal acceptance. But what, in respect of food, was the government of the United States?

Mr. Roll, who on the United Kingdom side was one of the architects of the Food Board and throughout was closely concerned with its working, shows how much the Board depended on a definite answer to this question. In those days at least, the construction of a " United States position " from

the views of several interested departments was an unfamiliar technique. Furthermore, the main responsibility for food procurement and distribution more than once changed abruptly and, from the Board's standpoint, catastrophically. In March 1943, for instance, the Secretary for Agriculture lost his powers over food to an independent War Food Administrator, but continued as United States member of the Board for seven months; 1943 was not an impressive year for combined food planning. In contrast, Secretary Clinton Anderson, with the powers of a Food Administrator, became United States member in July 1945; and the Board in 1945–46, although the problems it encountered were incomparably harder, produced a clear-cut organisation and achieved distinct results. In fact, to make a producing country with the farming history of the United States take scarcity seriously required a crisis which was exceptionally obvious and severe.

Similarly, the relative success of the Board's commodity committees was closely correlated with the extent to which the United States required supplies of the commodity from abroad. Imported supplies could be brought under firmer control, their shortage was more easily understood, and for some of them the Commonwealth had significant contributions to make. The sugar and the oils and fats committees were operating with some hope of agreement even in the worst period of 1945, but allocation of meat had broken down by mid-1943. The case of cereals, far more important, requires separate explanation. The problem there was initially one of moving Canadian supplies; later, in appearance at least, there was actual shortage, independently of transport difficulties. The committee was one of the most painstaking and expert which the Board possessed. But, for reasons which others concerned with the Board found puzzling, cereals in late 1945 were removed from " allocation " and subjected instead to monthly " programming." The practical difference was nil, but one is not surprised to read that the change was widely misunderstood by the liberated countries. In fact, this piece of political ineptitude, for which the United Kingdom and Canada must bear part of the blame, contributed much to the pressure which brought the Board to an end on July 1, 1946. The cause was once more surplus-mindedness, over this commodity not an unknown disease among the trade experts of the United Kingdom.

Of the criticisms directed at the Board, one was that it was a sinister organisation to protect the " British." Certainly it did something to effect distributive justice, and there were moments when the Ministry of Food hardly seemed to realise what the main food producer was sacrificing. A London Food Committee constructed the Commonwealth " picture " (other than for Canada), and it was tempting to London to leave for Washington only the allocation of North American supplies. Gradually it was appreciated that the United States would not be satisfied with a combined body for which all the non-American work was done in another centre, and when the time came to associate liberated countries with the work of the Washington committees the additional membership was agreed without undue disharmony. Canada became a full member of the Board in October 1943; it had been a mistake, though fortunately the consequences were not serious, not to associate her from the outset, and Mr. Roll seems hardly convinced by the explanation he gives at p. 94.

Secondly, the Board could be accused of a superfluity of paper in relation to its results, and some of the documents quoted in Mr. Roll's appendices are certainly alarming. This criticism was heard more often on the British side, and is almost wholly unjustified. From its nature the Board had no international staff. In its later and better days it was served by a minute secretariat, to whom Mr. Roll might have given more whole-hearted praise; but the members of this, and also the secretaries of the commodity committees, were national staff who continued to have civil-service responsibilities to their own countries. The majority were members of the United States Office of Foreign Agricultural Relations, whose research had a high reputation, and who spoke their own language (the language of Mr. Roll's documents) to each other and to the Executive Officers of the Board.

Thirdly, it could be asked how much was achieved. A comparison between allocation and performance, especially in the period after European liberation, would have been interesting, but probably no adequate statistics are available. Mr. Roll does show that allocation never proceeded on any single principle, but the discussions leading to it normally produced some variation in the previously arranged plans of the producing countries, with, of course, a resulting gain to the importers. The Board's usefulness lay also, however, in other fields, especially in arranging combined purchasing schemes, with consequences not only upon prices but also in ensuring efficient procurement, especially in South America and India. Yet activities of this kind always had their critics in the State Department, and Mr. Roll's account of the Argentine meat contract, eventually secured in the autumn of 1945 after negotiations involving the French as well as the member countries of the Board, makes an exciting story to those interested in the internal perplexities of United States economic policy after Germany's defeat.

It might perhaps have been useful to relate some of the more difficult discussions more closely to the facts of the consumption (and stock) levels at the time operating in the member countries of the Board. But Mr. Roll's book is otherwise lucid and accurate, and his judgement is very sure. His knowledge and fairmindedness made him the obvious person to write it.

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Japan's Economic Recovery. By G. C. ALLEN. (London: Oxford University Press for the Royal Institute of International Affairs, 1958. Pp. xi + 215. 25*s*.)

Japan's Postwar Economy. By J. B. COHEN. (Bloomington, Indiana: Indiana University Press, 1958. Pp. xvii + 262. $6.50.)

Hokkaido. Its present state of development and future prospects. By F. C. JONES. (London: Oxford University Press for the Royal Institute of International Affairs, 1958. Pp. viii + 146. 21*s*.)

Japan's Finance and Taxation, 1940–1956. By SABURO SHIOMI. (New York: Columbia University Press, 1957 (London: Oxford University Press, 1958). Pp. xi + 190. 48*s*.)

BEFORE the Second World War the few people interested in the Japanese economy could have read all the major English works on the subject in a long week-end. To-day they would have great difficulty in covering the field in a long vacation. Not surprisingly, in view of the economic and strategic ties between their country and Japan, the Americans are the main contributors. One is reminded of the works of, among others, W. W. Lockwood, E. A. Ackerman, B. F. Johnston and E. O. Reischauer. The Japanese themselves are producing an increasing number of books and articles in English, but, with a few notable exceptions, British economists have written little about Japan. Here we have four books from the United States, Britain and Japan, by authors already well known to students of the Far East.

Probably no other Briton knows the Japanese economy better than Professor Allen, and few Americans know it as well as Professor Cohen. Both have already made detailed, scholarly studies of some aspect of the subject. They are therefore peculiarly fitted to write the concise, general and introductory outline of Japan's recent economic progress which is presented in the two books noted here. By any standards—even those of West Germany—the story of Japan's post-war recovery is remarkable and worth publishing. Despite loss of territory, destruction of capital assets during the War, the disruption of her trade with China, monetary instability, demographic problems and a host of other difficulties, Japan to-day stands economically more advanced than ever before. Except in overseas trade, her main economic indices were all higher in 1956 than before the War. Industrial output was twice its pre-war level. According to the International Monetary Fund statisticians, between 1950 and 1956 manufacturing output rose by 186% in Japan, national income by 121%. Even West Germany could not match this achievement. Japan had become the world's largest shipbuilder and textile exporter, and although her textile production no longer dominated her manufacturing, it was second only to that of the United States. All this, and a great deal more, has been achieved with much less sacrifice by labour than was the case before the War. In

fact, a notable feature of the past few years has been the rise in the standards of living and the greater share of labour in the national cake.

Japan's singular achievement is admirably described and illustrated statistically by Professors Allen and Cohen. Professor Allen's book is similar in lay-out and treatment to his *Short Economic History of Modern Japan*. There are chapters, *inter alia*, on money and banking, agriculture, industry, the *Zaibatsu*, industrial relations and foreign trade. Perhaps the non-tangible factors in the story are neglected, the "feel for the country" is lacking. But he has an extraordinary facility for collecting and sifting masses of evidence, and then packaging the results in neatly constructed readable chapters. In these days of esoteric sociological and economic writings on growth, the student will find Professor Allen's book, if prosaic, at least perspicuous.

Professor Cohen covers a similar field, although the two books differ in many respects. Potential reviewers are warned in the preface that this work is neither intended to be a definitive study nor so wide in scope as his *Japan's Economy in War and Reconstruction* (reviewed in this JOURNAL, March 1950). He has less to say than Professor Allen on individual industries, but a great deal more on trade and Japan's present and future role in the world economy. There are chapters on her ties with South-east Asia, America and the Communist bloc. Much emphasis is given to the dependence of Japan on America, not only for aid to bridge balance-of-payment gaps, but also for trade. The United States is her best customer and her greatest supplier. Japan is America's biggest external purchaser of wheat, rice and some other products. How far this pattern of trade should or can continue, and the possibility of extending Japan's commerce with Asia, are briefly discussed here. Professor Cohen is lavish in his use of statistics, mainly from United Nations and Japanese sources. Occasionally the comparative figures seem to be of dubious value. Is it meaningful, for example, to say that the world average rice yield (excluding the U.S.S.R.) was 18·2 kg. per hectare in 1955, or to compare yields in countries so divergent as Spain, Australia, Japan and Burma? Both Professors Allen and Cohen are certainly aware of the limitation of comparative international and Japanese statistics, although this awareness is not always conveyed to the reader. Japanese unemployment figures demonstrate the traps into which the unwary might fall. In 1956 the percentage of unemployed workers in the total working force was officially under 2, but, as Professor Cohen points out, to say that Japan's labour force was as fully occupied as Britain's would be fallacious. Over 50% of Japanese workers are not paid employees, and among these underemployment is rife.

Japan's fast economic growth and her astonishing post-war recovery sometimes make us under-estimate the economic problems still facing her. Professor Cohen rightly gives considerable emphasis to these problems. The main dangers for Japan arise from her scarcity of natural resources and land,

her heavy dependence on overseas trade and her large and growing population. Since the War the booming world economy, the Korean War and American aid have disguised the precarious nature of Japan's position. Although the birth rate has been falling, total population grew by 18 millions between 1940 and 1956. In spite of enormous industrialisation, there has been little reduction in the absolute numbers mainly occupied in agriculture and forestry since 1868, and these numbers actually increased substantially after the War. Here, surely, is a warning to underdeveloped, overpopulated countries who expect industrialisation to transform their demographic difficulties overnight. Except in textiles and some other lines, Japan is not as low-cost a producer as is generally believed. Her dependence on imported raw materials, inefficient plant and techniques, and other factors have made her a higher-cost producer than her main competitors in most of the heavy industries which are now the mainstay of the economy. One hopes that the measures she is taking to rectify these difficulties will be successful. But Japan's future prosperity, like Britain's, is ultimately dependent on the continuing expansion and liberalisation of world trade.

There is plenty in these two books of Professors Allen and Cohen which one would have liked to see developed further. The population problem, for example, hardly gets its due weight. Japan's attempts at planning, her attitude to Hokkaido, her commercial policy, the social environment after the War, are all discussed summarily. But one cannot expect comprehensiveness in works of this size and scope. Those whose appetites are whetted for further knowledge of Japan will find ample bibliographies to satisfy them.

Mr. Jones, the author of *Japan's New Order in East Asia*, here presents us with a short introduction to the history, economy and future prospects of Hokkaido, the large, underdeveloped island in the north of Japan. The Government, before and after the War, has achieved considerable success in developing this region. There are now 5 million Japanese settled there, compared with 100,000 in 1870, agriculture has been improved and new frost-resisting strains of rice planted. Extensive fisheries have been developed, and some extractive and manufacturing industries have grown. But, compared with the overcrowded, intensively industrialised main islands of Japan, Hokkaido remains underpopulated and backward. It is a salutary exercise to read this book after the two reviewed above, because it reminds one of the dangers of typifying Japan as a land of small plots, myriads of workshops and large factories. In the short space of 120 odd pages Mr. Jones can give us no more than a bird's-eye view of this region. There is a little history, a little geography, a good deal of description with tables of agriculture and industry, and an estimate of the present and future importance of Hokkaido in the Japanese economy. All is delivered in an orderly and unlaboured style. One would have liked more analysis of economic problems, especially the relative failure of the Five Year Development Plan,

but, as the bibliography shows, there are plenty of other sources where one can pursue one's individual interests.

The three books so far mentioned are all general, introductory and suitable for the elementary student. Dr. Shiomi's work is a much more indigestible mouthful, rather because of the nature of the subject than because the translation is in any sense inadequate. Here we have, for the specialist, a detailed study of Japan's national and local tax system since 1940. Every tax and change in tax is noted, down to the rate for tips for geisha. War expenditure, inflation and the policy of the occupation authorities have been the background to the present complex tax structure in Japan. A major tax reform was carried out in 1940, but during the War this had to be revised frequently when the Government realised that hostilities were going to be prolonged and enough funds could not be raised through bonds or borrowing. After the War the twin aims of reducing inflation and democratising the social structure determined fiscal policy. Then came the "ideal" system recommended by Dr. Shoup's mission, with its emphasis on direct taxes and decentralisation. Most of his proposals were enthusiastically adopted by the Japanese, but Dr. Shoup wisely realised that "no one who attempted a tax reform was ever appreciated by his own generation" (p. 90). It was soon discovered that the Shoup system was less ideal than had first been thought and, as a result of considerable criticism, modifications were introduced, although the basic aims were retained. The full details of this complicated story are given in Dr. Shiomi's book with abundant quantitative illustrations. In addition, he has a section on the development of the income and corporation tax, and he also provides us with the results of some special research he has done on the effects of taxation on Japanese income distribution. It is a painstaking, comprehensive study, although tedious to read after the lighter fare provided by the other writers.

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Sovetskaya Sotsialishicheskaya Ekonomika 1917–1957 (*Soviet Socialist Economy, 1917–1957*). Edited by L. M. GATOVSKI, I. A. GLADKOV, Y. A. KRONROD and I. D. LAPTEV. (Moscow: State Political Editors for the Institute of Economics of the U.S.S.R., 1958. Pp. 664. 11r. 50k.)

THIS is a symposium in honour of the fortieth anniversary of the Russian revolution. Twenty eminent Soviet economists review the progress of various sectors of the economy, and an attempt is made to draw some general theoretical conclusions. In common with other anniversary volumes in many lands, this one tends to dwell on success, but it would be wrong to regard it as an outsize propaganda pamphlet. It is fairly expensive, the printing of 50,000 copies is small by Soviet standards (compare the economics text-book, which ran into many millions). Most of the contributions are

scholarly in tone and serious in intent. They seem to be directed to a specialised readership.

Of course, the various contributions are of unequal value. For example, an essay by Efstafyev on " the activity and creative initiative of labour " is no more than a series of bald assertions that everything was, is and will be for the best. But others take their tasks much more seriously. Perhaps the most interesting for us are the essays by Notkin, Strumilin, Kronrod, Leontiev and Arakelyan, who, each in their own way, attempt to analyse problems of growth. In doing so, each endeavours to fill out the available official statistics with some independent calculations, often derived from pre-war and sometimes even non-communist publications. But this sometimes lands them in difficulties of which they appear to be unconscious.

The basic difficulty is this: an independent calculation of the relative position of the U.S.S.R. in past years will tend to be inconsistent with the official index of growth, in so far as this index is exaggerated. The extent of the exaggeration is such that the inconsistency tends to be too big to be explained by the well-known vagaries of index numbers or by differences of definition. The point may readily be illustrated as follows.

Kronrod quotes with approval the pioneering calculations of Professor Prokopovich, comparing the national income of Russia with those of the leading industrial powers in 1913. After adjustment to refer to the inter-war territory of the U.S.S.R. they give Russia precisely a fifth of the United States national income in 1913 and just about two-thirds of that of the United Kingdom. According to Soviet official statistics, repeatedly utilised by Kronrod and by other contributors, the Soviet national income in 1956 was 19·22 times greater than in 1913. The relevant indices for the United States and the United Kingdom are not readily available, but it may be sufficient to cite those used by the Russians themselves for analytical purposes (in *Vestnik Statistiki* No. 1/1958), which give a growth of about three and a quarter times for the United States and just under twice for the United Kingdom.

But if the Soviet national income was one-fifth of the American in 1913, it follows from these figures that it was greater than the American in 1956 by almost 20% in the aggregate, and even somewhat exceeded it on a *per capita* basis. It also would seem to follow that Soviet national income *per capita* is now something like double that of the United Kingdom. Obviously this is nonsense. The extent to which it is nonsense is also the extent to which the official Soviet index of growth must be regarded with some scepticism.

The same author, Kronrod, cites a pre-revolutionary calculation, according to which labour productivity in " factory industry " in Russia in 1910 was inferior to that of the United States " almost 3·5 times." In his contribution, Strumilin analyses data on " census industry " for 1913/14, and comes to the conclusion that industrial output per worker was 2·4 times

greater in the United States at the official rate of exchange. Allowing for the relatively higher prices of Russian industry, the true ratio could be as high as 4 : 1. Yet Notkin asserts, in his contribution to the symposium, that the United States had a *ninefold* superiority in pre-revolutionary times. Admittedly he includes artisans in the comparison, but it remains impossible to reconcile his figures with those already quoted from his two colleagues' papers. The cause of the discrepancy is, unfortunately, all too clear. Leontiev, in his contribution, claims that in the period 1913–55 industrial labour productivity rose 8 times in the U.S.S.R., 2·2 times in the United States, 1·4 times in the United Kingdom. This follows from the official data on gross industrial production and employment. It is wholly consistent with the estimate, now current in the U.S.S.R., that labour productivity in industry in 1955 was 40–42% of the United States. But the effect of using this estimate in conjunction with the exaggerated official index is to create a nonsense in 1913, by compelling the use of the impossible ratio of 9 : 1 for the sake of arithmetical consistency.

Strumilin runs into similar trouble. He cites a pre-war calculation according to which Soviet industrial productivity in *1937* was 40·5% of the United States, which implies that in the period 1937–55 it rose by about the same percentage in both countries. But the Soviet productivity index shows a much superior growth rate. Therefore, either the 1937 calculation was wrong, or the relative growth rate must be overstated.

Kronrod does seem to be somewhat worried by the indices he uses. He devotes a footnote to admitting the imperfection of the " 1926/7 prices " which form the base for most of the time-series, and he does point out that a recalculation in more recent prices would yield a different result. However, he insists that any corrections " would not basically alter the picture," and he attempts no corrections. Other Soviet writers (for instance, the statistician Ryabushkin) have been more critical than this, but perhaps an anniversary volume is not the place for challenging well-established statistical myths. It must be stressed, of course, that a more realistic measurement would still show a very rapid growth rate. It is a pity that a sounder statistical approach has not been authorised.

An interesting point made by Kronrod is that the national income of the Russian Empire increased by 50% in the period 1894–1913, which, he argues, was less than was achieved in the same period by the United Kingdom and Germany. A less scholarly argument by the same author consists in asserting that, in 1951, 60% of the national income of the United Kingdom, 58% of that of the United States was appropriated by the " capitalists " while only 40 and 42% respectively went to " working people." The purpose of such statements, in a book published under high academic auspices, is not clear.

Space does not permit an analysis of many other interesting and often controversial contributions. There is a quite first-rate survey of the develop-

ment of transportation by Khachaturov, and a very useful discussion of retail trade by Dikhtyar and Kulikov. An index of state retail prices for the period 1928–40 can easily be calculated from the figures cited there, and this, in a Soviet source, is new. (The 1940–56 period is covered by recent statistical compendia.) The effect is to show beyond a shadow of doubt that retail prices, in 1937 and in 1940, had increased since 1928 by more than had money wages. The weights are those of 1940, and independent calculations by scholars in the west have shown that the decline in the purchasing power of wages would be considerably greater if 1928 weights were used (for example, this emerges from the analysis made a few years ago by Janet Chapman).

This symposium, because of its relatively "festive" nature, is not the place to find much of the controversial matter which has enlivened Soviet economic discussion in the past few years. None the less, it contains much valuable material, with many well-written analyses of important aspects of the Soviet economy.

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NOTES AND MEMORANDA

TECHNIQUES, EMPLOYMENT AND RATE OF GROWTH

The object of this rate is to present the problem regarding the choice of techniques for an underdeveloped economy with considerable underemployment of labour. Our contention is that because of a possible divergence between the private and social cost of labour, even on the maximisation of rate-of-return criterion, the techniques chosen for the various industries of such an economy should be more labour intensive than those indicated by the prevailing real wage-rate. Further, for such an economy, there exists an alternative criterion for the choice of techniques: it could choose such techniques as would maximise its income and employment in the short run. Which of these two criteria or an admixture of the two it would adopt would depend upon its economic objectives.

Assumptions

The following asumptions are made:

1. There is considerable underemployment of labour in agriculture such that with appropriate agrarian reorganisation involving little capital expenditure the agricultural output would not be affected if the underemployed labour were taken away from agriculture.
2. When the surplus labour from the agricultural sector is removed and employed in the industrial sector the *per capita* output in the former sector would increase.
3. The *per capita* consumption, however, in the agricultural sector would not increase as much as the increase in the *per capita* output.
4. The cost of labour in terms of wage goods in the industrial sector, therefore, would be less than that measured by the given real wage-rate.
5. All profits are saved and invested, and all wages in the industrial sector are consumed.
6. There exists a choice for each firm between techniques of varying degrees of labour intensity.
7. The problem regarding the choice of industries or investment pattern is already solved in the light of the existing natural resources and the desired time-pattern of growth.

Rate-of-return Criterion

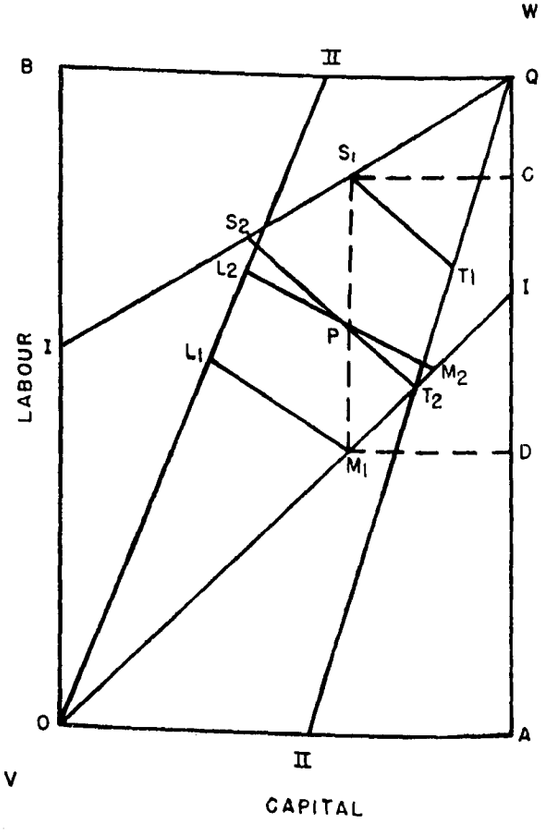
The problem to be solved now is: What techniques or input combinations to adopt for the various industries. The private firms obviously would adopt such techniques as would maximise their respective rates of profit, given the relative prices of various inputs. However, since the real wage-rate for labour is higher than the real social cost of labour (Assumption 4), the tech-

niques so chosen by private firms would not maximise the rate of social surplus (profits). For maximising the rate of return over cost from the social point of view, therefore, the techniques for various industries will have to be more labour intensive than those based on the prevailing real wage-rate.

It is easy to see that the techniques so chosen would also maximise the rate of growth of investment, income and employment, because of assumption 5.

Maximisation of Income and Employment Criterion

There exists, however, an alternative criterion for the choice of techniques. Since the marginal productivity of the underemployed labour in agriculture is zero or near zero, such an economy could maximise its income and employment in the short run by choosing the most labour-intensive techniques for its industries, from among all the available economically feasible techniques. This could be seen from the following diagram.



In the industrial sector the *available wage goods value of capital* is measured along the X axis in terms of wage units and is represented by OA, while the

available labour is measured along the Y axis and is represented by OB. There are two industries V and W, and two techniques are available for each of these two industries. Techniques I and II as shown with reference to the origin O represent the two techniques for the industry V and techniques I and II as shown with reference to the origin Q represent the two techniques for the industry W. OL_1 represents a certain output of V with technique II and OM_2 represents the same level of output with technique I; different points on the line L_1M_1 represent identical levels of output of V but with different combinations of techniques I and II. The lines LM_s are thus equal output lines for V. The level of output of V is shown by the distance of each such line LM from the origin O, such that the greater is this distance, the larger is the output. STs similarly are equal output lines for the industry W and are drawn with reference to the origin Q.

Now let us assume that at the given real social cost of labour, only technique I for each of the two industries is profitable. Suppose that on the basis of the maximisation of the rate-of-return criterion, only technique I for each of the two industries is chosen and QS_1 output for W and OM_1 output for V are produced, leaving CD amount of labour unemployed.

However, if techniques or the combination of techniques for each of the two industries were so chosen as to fully employ both available labour and capital it could be easily seen that outputs for both V and W could be larger than in the previous case.

By choosing, for example, technique I for V and technique II for W, full employment of both available labour and capital could be attained at point T_2, where the output for V would be OT_2 and the output for W would be QS_2; outputs of both the industries, thus, would be larger than in the previous case. Similar would be the case if a combination of both the techniques for each of the two industries were chosen so as to attain full employment of both capital and labour. For example, at point P, where the equal output lines L_2M_2 and S_2T_2 intersect, there would be full employment of both the inputs and larger outputs of both V and W. Output of V would be now OM_2 instead of OM_1, and the output of W would be QS_2 instead of QS_1.

Inadequacy of food output could put a limit to this process of attaining full-employment level of income immediately. It is assumed, however, that food output can be increased in such an economy by introducing minor innovations in agriculture involving an insignificant amount of additional capital.

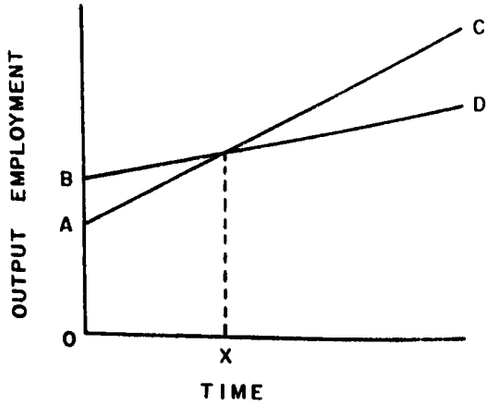
Choice between these Two Criteria

Thus an underdeveloped economy has also a problem of choosing between the two criteria for the choice of techniques: (*a*) Maximisation of the rate of return over cost, and (*b*) Maximisation of income and employment in the short-run.

If the first criterion is adopted, the rate of growth also is maximised.

With the second criterion, though full-employment level of income would be attained almost immediately, the rate of growth thereafter would be smaller than what would be with the first criterion, because of a lower rate of profits and hence of capital accumulation (Assumption 5).

The choice of techniques thus would depend upon *the desired time-pattern of growth*. The following diagram shows the time-pattern of growth on the basis of the two criteria mentioned above.



Time is measured along the X axis, and output and employment on the Y axis. OA gives the intial output and employment. AC shows the time-pattern of growth with the maximisation of rate of return over cost criterion. With the maximisation of income and employment criterion, full-employment level of output is immediately obtained so that there is a sort of a jump from A to B; thereafter BD shows the time-pattern of growth. Maximisation of income and employment criterion gives a higher average rate of growth than the other criterion for the period OX; but thereafter the average rate of growth would be smaller than under the maximisation of the rate-of-return criterion. The choice of techniques would depend upon which of these two time-patterns of growth or what combination of these two patterns is desired by an underdeveloped economy.

Concluding Remarks

In the economic literature on the subject [1] it is not sufficiently emphasised that the underemployment of labour affects directly only the choice of techniques and has no direct relevance for the choice of investment pattern. In fact, it is not realised that the problem of the choice of techniques and the problem of the choice of investment pattern, though inter-related, are analytically two distinct problems. This failure to distinguish analytically between these two problems has led to lack of clarity in the analysis of these problems. Further, these basically dynamic problems are analysed in static terms, and this has given rise to still more confusion.

In dynamic terms each set of production techniques with a certain investment pattern would give rise to a certain time-pattern of growth. The final choice regarding these two, therefore, would depend upon the desired time-pattern of growth.[1]

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[1] See, for example, P. N. Rosenstein-Rodan, "Problem of Industrialisation of Eastern and South-Eastern Europe," ECONOMIC JOURNAL, June-September 1943; A. J. Brown, *Industrialisation and Trade*, 1943; K. E. Kahn, "Investment Criteria in Development Programs," *Quarterly Journal of Economics*, February 1951; Walter Galenson and Harvey Leibenstein, "Investment Criteria, Productivity and Economic Development," *Quarterly Journal of Economics*, August 1955; B. Chenery Hollis, "The Application of Investment Criteria," *Quarterly Journal of Economics*, February 1953.

IMPORT DUTIES AND THE GROSS DOMESTIC PRODUCT AT MARKET PRICES: A REJOINDER

THIS rejoinder to Mr. J. L. Nicholson's reply [2] to my article [3] deals with the question of internal inconsistencies, gives a restatement of my argument and refers to a further consequence of the official treatment of import duties.

I

On the argument that the new definition of GDPm [4] results in internal inconsistencies, it is stated that there are no inconsistencies and that my "odd results" are due to my combining two systems. This appears to be true, but the use of two systems resulted from following the official "rule" for the derivation of GNPm given in *National Income Statistics—Sources and Methods* (p. 13), and quoted by me as an explanation of the method I followed. According to this "rule," the addition of taxes on expenditure net of subsidies to GNPf will produce GNPm. With this method the negative import item in the definition of GNPm is valued at factor cost, but this item is valued to include import duties in the new definition of GDPm, so that the inconsistencies cited by me are inevitable. Mr. Nicholson, in his note, removes the inconsistencies in the manner I suggest in my article (p. 649). He writes that "consistency demands that the same method be applied to the estimates at constant market prices and at current market prices of both the national and domestic product." Now we all know where

[1] For the development of the same idea in the Indian context, see "Planning—Basic Choices," *Economic Weekly*, January 1956, and "Role of Small Industries: Economic Pundits Confuse," *Economic Weekly*, April 28, 1956.

[2] J. L. Nicholson, "Import Duties and the Gross Domestic Product at Market Prices," ECONOMIC JOURNAL, LXVIII, 1958, pp. 393–6.

[3] "Expenditure Taxes, Imports and Gross Domestic Product at Market Prices," ECONOMIC JOURNAL, LXVII, 1957, pp. 644–54.

[4] In Section I the symbols used are those in my article.

we stand. GNPm is to be defined as C + I + X + Xi − M − Mi and GDPm is defined as C + I + X − M, with M valued to include import duties in both definitions, so that GNPm exceeds GDPm by net income from abroad (Xi − Mi). The inconsistencies are thus removed, but we now have two definitions (GNPm and GDPm) which differ from international practice (and cannot be calculated from *Blue Book* data alone), and a factor-cost adjustment consisting of taxes on expenditure net of subsidies and import duties.

Mr. Nicholson has not pointed out that the source of my error was the method for obtaining GNPm from GNPf given in *Sources and Methods*—that the " rule " is not only precise, but is precisely wrong. The nearest he comes to admitting this is in his footnote 1 on p. 394, in which he says that the statement in *Sources and Methods* " . . . was perhaps misleading in not referring at the same time to the recent change in the treatment of import duties." Is not this an understatement? To correct *Sources and Methods* requires more than a reference to the recent change in the treatment of import duties. The correction must give a new " rule "; that GNPm can be obtained by adding to GNPf taxes on expenditure net of subsidies and import duties.

II

In the argument of this section use is made of the following symbols:

Let Mx stand for the import content of exports;
Mch stand for the import content of home produced consumer goods and services, including imported consumer goods;
Mih stand for the import content of home-produced investment goods and services, including imported investment goods;
Ch stand for home-produced consumer goods and services, including the " added value " to imported consumer goods; and
Ih stand for home-produced investment goods and services, including the " added value " to imported investment goods.

In the aggregates at market prices (GNPm and GDPm), should the negative item of imports be valued to include import duties? Estimates at market prices of the aggregate value of goods,[1] both home-produced and imported, derive their importance from the fact that they record what is actually paid by final buyers for the goods. Since the value of an aggregate at market prices is a function of quantity and price, and expenditure taxes and import duties are included in the price, those taxes and duties must be included in the aggregate. If any part of the taxes or duties is not included, then the aggregate cannot be the aggregate at market prices.

In terms of the above symbols, total production in the home country is

[1] The word " goods " is intended to include services.

the sum of Ch + Ih + X. But this total includes the import content of the three categories of goods. This import content must be deducted from total product to obtain gross domestic product, that is the product due to the country's own resources and economic activity. Gross domestic product is, then,

$$\begin{aligned} & Ch - Mch + Ih - Mih + X - Mx \\ \text{or} \quad & Ch + Ih + X - Mch - Mih - Mx \end{aligned}$$

What is the value of this aggregate at market prices? Is it not the value of expenditure by final buyers on Ch + Ih + X, less what the home country pays to the overseas suppliers of Mch, Mih and Mx? Expenditure by final buyers on Ch + Ih + X is the sum of their factor costs less subsidies plus taxes on expenditure, including import duties. To obtain the market-price valuation of gross domestic product it is only necessary to deduct from this total expenditure by final buyers what is paid to the overseas suppliers of the imports. Since the import duties are not paid to the overseas suppliers of the imports, it cannot be appropriate to include those duties in the negative elements of the above definition.

Gross domestic product as defined in the previous paragraph is in terms of the actual goods produced in the home country. For some purposes a more useful approach is in terms of the goods made available for purchase in the home country from its own resources and economic activity. With this approach the significance of exports lies in the claim on overseas production earned by exports. Let us assume that the value of exports (money received from abroad for them) is equal to the value of imports (money paid abroad for them), so that export earnings pay for all the imports. M consists of Mx + Mch + Mih and, since M is equal to X, these import items may be substituted for X in the definition Ch + Ih + X − Mch − Mih − Mx. This produces Ch + Ih as the definition of gross domestic product. It is the sum of available consumer goods (C) and available investment goods (I). What is the market-price valuation of this aggregate (GDPm)? The market-price valuation of C + I is the total expenditure on C + I, which is the sum of the factor costs of C and I, including their import content at factor cost, less subsidies plus taxes on expenditure including import duties. In terms of the normal definition of GDPm as C + I + X − M, with X equal to M and both valued as in the rest of the world account, Table 7 of the *Blue Book*, X and M cancel out so that GDPm is equal to total domestic expenditure at market prices, that is C + I of Table 1 of the *Blue Book*. With the official definition of GDPm, when X is equal to M as defined above, GDPm is equal to C + I minus import duties, because import duties are added to M. It seems evident that the official definition undervalues the market-price valuation of gross domestic product by the amount of import duties. It does this, we are told, " because taxes on imports should not have the same effect on the

gross domestic product at market prices as taxes on the products of home industry, simply because the latter form part of the gross domestic product while imports do not." This statement seems to be wrong for two reasons. First, the importance of a tax lies not in its name, but in its incidence. Since the incidence is the same, the treatment of them should be the same. Secondly, the significance of exports is being ignored. Domestic production includes exports, but these goods are not available for purchase at home. As stated above, the significance of exports is that they provide the means for securing imports. We have a choice of retaining exports and adding their value, plus any sales taxes to which they are liable, to GDPm, or using the exports to pay for imports, and adding the cost of the imports, plus duties levied on them and any other "added value," to GDPm. This answers Mr. Nicholson's question, "How can a customs tax on tobacco form part of the gross domestic product of the United Kingdom?" (But it is only a part when that aggregate is measured at market prices.)

Finally, it may be useful to refer to a further consequence of the official treatment of import duties. It is desirable in national economic accounting that there should be meaningful relationships between the various aggregates. When GDPm is defined to include import duties there is such a relationship between it and total domestic expenditure at market prices (TDEm). TDEm consists of C + I at market prices, as in Table 1 of the *Blue Book*. It has been shown above that when X is equal to M, when X and M are valued as in Table 7 of the *Blue Book*, TDEm is equal to GDPm. This means that the market-price valuation of the goods made available for purchase in the home country by its own economic activity is equal to the total domestic expenditure on those goods at market prices. When X exceeds M, GDPm will exceed TDEm by the excess of X over M. The excess of X over M (or GDPm over TDEm) is a measure of the home country's saving from trading income. When M exceeds X, TDEm will exceed GDPm by the excess of M over X. The excess of M over X (or TDEm over GDPm) is a measure of the extent to which the home country is spending more than it is currently earning through its trading activities. When import duties are excluded from GDPm, as in the new official definition, a new relationship is set up between TDEm and GDPm, the meaning of which is obscure. Now, with the official definition of GDPm, TDEm is almost certain at all times to exceed GDPm because import duties are almost certain to be much larger in value than the excess of X over M.

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CAPITAL EXPORTS AND GROWTH FOR ARGENTINA, 1880–1914

THIS note has been prompted by Mr. J. Knapp's recent article in this JOURNAL [1] and will examine the effects of foreign loans on the Argentine economy in the years 1880–1914. It will be found that charges of "excess borrowing" are partly justified, but that nevertheless capital imports contributed in a very definite way towards reshaping this economy and towards stimulating economic growth. Evidence of real capital transfers will also be provided.[2]

Prior to 1880 the main developments in the Argentine economy had occurred in sheep-farming, with wool replacing hides as the main export staple: there were, however, developments in grain production, Argentina ceasing to import and beginning to export wheat by 1878. The late 1880s saw the strong boom (caused by a heavy concentrated flow of foreign funds) which brought about the Baring Crisis in 1890. Of this flow of foreign funds between 1885 and 1890 public borrowings comprised 35% (to some considerable extent public borrowings were employed in paying off service charges on previous foreign loans), railways 32% and land mortgage bonds 24%, and roughly half was raised by new issues in London.[3] After the crisis in 1890–91 foreign borrowings remained negligible until 1904, when (judging from new issues figures in London, which at this time formed 60% of Argentine foreign borrowings) foreign borrowing revived and expanded, until 1912. In accordance with the previous pattern, British investors took up railway and tramway stock, public-utility and governmental issues, whilst other interests largely financed the spectacular increase in frozen- and chilled-meat shipments in this period.

Throughout the period the importance of wool production gradually declined, first, as railway growth and immigration enabled the fertile pampas to produce grains profitably and thus brought about a steady growth in cereal exports; secondly, in the twentieth century as resources moved into the more profitable cattle-ranching activities. In gold peso values Argentine exports had expanded six times between 1881–85 and 1910–14, whilst imports expanded five times and foreign-debt service eight times. Exports per head increased 2·3 times, imports per head 1·8 times and debt service per head 3·0 times. The railway system, whose length had risen sevenfold, besides linking the pampas to the ports, had also enabled the market for domestically produced goods (*e.g.*, wine, tobacco, sugar) to expand. Electricity, water supplies, tramways and telephones had all arrived in the major

[1] ECONOMIC JOURNAL, September 1957, pp. 432–44.

[2] This contrasts with H. Myint's experience. See "The Gains from International Trade and the Backward Countries," *The Review of Economic Studies*, Vol. XXII, No. 2.

[3] These estimates are derived from J. H. Williams, *Argentine International Trade under Inconvertible Paper Money 1880–1900* (Harvard, 1920). The London New Issues have been computed by the author from *The Economist* "New Issues" sections.

towns. Without foreign investment and immigration little, if any, of this would have occurred, for the Argentine wealth-holder was interested only in land and real property—railways were an unknown to him (as late as 1913 over 90% of railway capital was held abroad), and it was through the railway that the whole pattern of production was so markedly moved towards grain and later towards cattle production. In outline such was the pattern of Argentine economic development, predominantly externally financed and oriented towards the world markets—in particular towards the British market.

How did the process of development affect the Argentine balance of payments? Normal Keynesian transfer theory would suggest that in periods of active foreign borrowing total import values would increase relatively to total export values, both on account of direct purchases of investment goods abroad from funds thus raised (*e.g.*, locomotives, rails) and because foreign funds transferred to finance domestic projects would set up multiplier processes in which increased incomes would induce increased (consumption) good imports.[1] Thereafter when foreign borrowing ceased, imports would fall relatively to export values beyond the old ratio owing to the service charges incurred through increased foreign indebtedness. This fall indeed would be initially the more severe if the investment projects were slow to mature and expand either the production of exportables or of import-competing goods. It is realised that this ratio of imports to exports can be affected by other forces, but it is believed that it does afford in the Argentine case an indication of the transfer of real resources in response to foreign investment.

Despite the shortcomings of Argentine trade statistics, it is possible to trace out such a changing pattern in Argentina's international accounts, which becomes more obvious when three-year moving averages of (*a*) total import values, (*b*) consumption imports, (*c*) investment imports, each expressed as a percentage of export values, are compared with a three-year moving average of London issues for Argentine governments and enterprises in Fig. 1.[2]

The ratio (*a*) lies above 100% for the years 1881 to 1890, when heavy foreign borrowing was occurring; once foreign borrowing ceased in 1890 the ratio falls sharply to 90% or less for the years 1891–97. This figure is high relatively to later years because the foreign-debt service was partially suspended in these years so far as government bonds were concerned, whilst falling world prices until 1896 depressed the export trade and profits of enterprises, thus reducing the dividend element. From 1898 to 1902 this ratio falls to 62%, because full service had been resumed on the public debt

[1] Furthermore, the quantity of goods available for export might diminish if rising incomes led to increased domestic purchases of exportables.

[2] It is necessary to use this partial indicator of foreign investment to obtain a continuous series. Its coverage is roughly 55%.

and dividend remittances had increased as foreign-owned enterprises were becoming more profitable: doubtless, too, with more prosperous conditions immigrants were remitting more to Europe. Thus all these increased "invisibles" fell as an extra claim on foreign-currency proceeds, which arose at this time almost entirely from sales of exports. When foreign investment revived in 1904 and later these borrowings brought about an increase in the ratio to an average of 90% for the years 1907–13. On account of increased

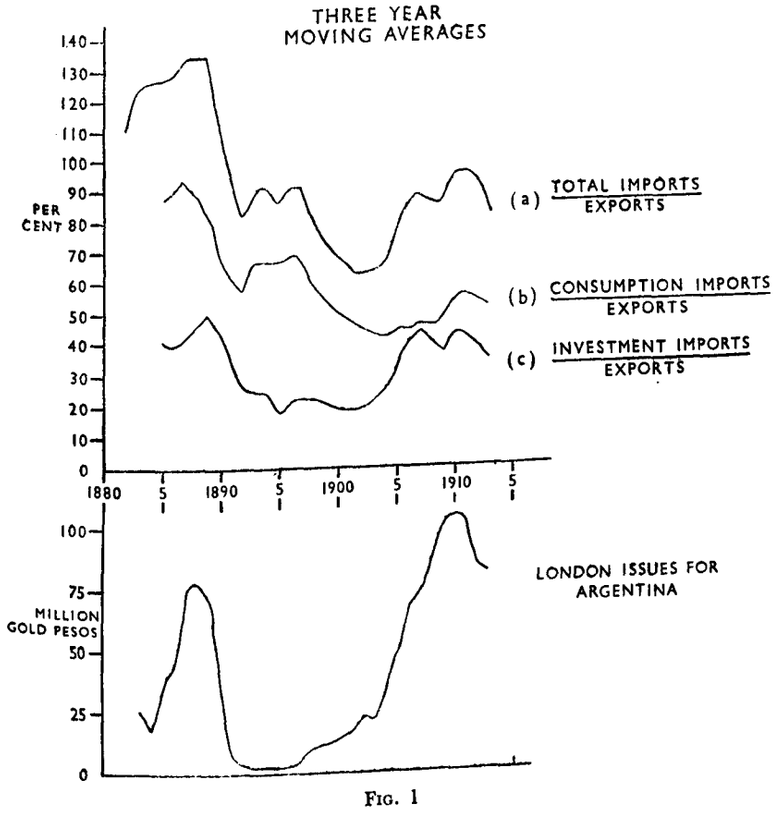


FIG. 1

service charges (which formed 35% of exports in 1911–14, as compared with 26% in 1881–83)[1], increased remittances and tourist expenditure abroad, and a lower ratio of foreign borrowing to export proceeds [2] this ratio does not reach the higher levels of 1881–90. Similar movements are apparent for ratios (*b*) and (*c*).

It may be concluded that in the periods when foreign borrowing was

[1] V. Phelps, *The International Economic Position of Argentina* (London, 1938), and J. H. Williams, *op. cit.*

[2] This may be estimated at 0·5 for 1881–85; 1·4 for 1886–90; 0·46 for 1911–14. Phelps' estimates for 1911–14, and Williams' for the earlier dates.

active transfers of real resources did take place. Of course, as borrowing was not continuous, but concentrated into two periods, it is vain to expect a continuous transfer of real resources to Argentina. Once loans are incurred, debt-service charges do represent a transfer of real resources away from the borrowing country—a serious matter if output does not rise as a result of foreign investment. But if the investment projects have engendered sufficient growth (which could not have been achieved by domestic savings alone on account of poverty), the economy will be able to finance such payments and enjoy a higher standard of living as well. This transfer of real resources away is the price paid for the rise in living standards which a concentrated application of foreign capital rendered possible.[1]

It is clear from Table I that in Argentina these capital imports did bring about economic growth, and changing patterns of production, and that variations in world prices affected export values significantly. Despite the increases in volumes exported, falling world prices until 1896 affected adversely export values, thereafter rising prices enhanced the rising volumes.

TABLE I

(Averages for 5-year periods)

	Population, '000.	Railway length, '000 km.	Cereal exports, '000 tons.	Wool exports, '000 tons.	Frozen meat exports, '000 tons.	Export values, million gold $.	Import values, million gold $.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1885–89	3066	6·5	389	129	12	92	119
1890–94	3612	12·7	1038	139	27	103	98
1895–99	4219	15·0	1711	211	56	131	106
1900–4	4860	17·7	3011	178	137	197	130
1905–9	5803	22·2	4825	170	239	335	267
1910–14	7203	31·1	5294	137	376	402	359

Sources: (1) Tornquist, *The Economic Development of the Argentine Republic in the Last 50 Years* (Buenos Aires, 1919), pp. 139, 140; (2) *ibid.*, p. 117; (3) *Extracto Estadistico de la Republica Argentina correspondiente al ano 1915* (Buenos Aires, 1916), pp. 67–73; (4) *ibid.*, pp. 67, 68; (5) *ibid.*, p. 58; (6) and (7) *ibid.*, p. 3.

Notes: Cereals = wheat and maize. (5) includes chilled beef. 5 gold pesos ($) = £1.

In summary, then, in Argentina foreign loans: (1) did increase domestic capital formation; (2) did increase output as the projects matured; (3) were transferred in real resources initially; *but* (4) gave rise to service charges as a continuing claim on (now expanded) real resources; (5) engendered the habit of borrowing abroad; (6) were excessive in the sense that governments found it (too) easy to raise finance in Europe for non-productive ventures or to pay existing debt service, whilst roguery and corruption were rife in the earlier period. The following quotation is illustrative of this latter point (6): "Everything is to go abroad; and this merry-go-round process—'simple

[1] Much dispute can arise on the question of whether an excessive price has been paid, or whether the distribution of gains between domestic population and foreign investors is "fair."

mechanism' the minister is pleased to call it—is to go on *ad infinitum* and keep us in gold till 'the innocents abroad' refuse to keep the 'simple mechanism' going, and then for Rabelais' 'bad quarter of an hour' with a vengeance."[1]

Nevertheless, it must be emphasised that the problem of railway building to tap the fertile pampas was solved (and perhaps could only have been solved) by capital exports from Europe rather than by mobilising domestic savings which were scanty—and the savers were not interested in railway risks. Lastly, ability to pay service charges after projects have been completed and output expanded is no evidence that these projects could have been financed *ab initio* from domestic savings.

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NEW MEASURES OF THE GROWTH OF FIRMS: A COMMENT

IN the June 1957 issue of the ECONOMIC JOURNAL Professor Florence reported[2] on an attempt to use the stock-exchange value of the shares and debentures of public companies to measure their size. For the larger English public companies in the industrial and commercial and the brewery sections of the *Stock Exchange Year Book* this measure was used to compare rates of growth between 1936 and 1951 of small and very large companies. The results were compared with those obtained using the book gain in net tangible assets as the measure of size. By the first measure the smaller companies grew at about the same rate on average as the larger companies; by the second measure the larger companies grew very definitely more than the smaller companies. Professor Florence considers this contradiction to be "a logical consequence of the basis of stock-exchange valuations" (p. 246) and sums up his argument by stating that: "The increase in the market value of its stocks and shares can be a very unsatisfactory measure of growth of a firm. To some extent, indeed, it measures the opposite of growth, namely the degree to which a company divests itself of assets by paying *out* dividends, rather than building up its resources" (p. 247).

The primary importance of distribution policy undoubtedly holds in the short-period determination of ordinary share prices, but even there does not extend to the pricing of non-participating preference shares and debentures. Ordinary share prices may vary directly with dividend-distribution ratios at any given time. However, when considering changes

[1] *South American Journal*, August 3, 1889, p. 142, its special reporter commenting on Finance Minister Varela's Banking Bills. The "simple mechanism" was the process of paying service charges on old governmental debt by fresh foreign borrowing.

[2] P. Sargant Florence, "New Measures of the Growth of Firms," ECONOMIC JOURNAL, Vol. LXVII (June 1957), pp. 244–8.

over a period of fifteen years it becomes necessary to take account of the process of growth of firms and of expectations that their growth will continue. Price appreciation over such a period is likely to be associated with the proportion of profits not distributed. Short-period pricing on the stock exchange may be in a large part a guessing game, with special importance attached to the current rate of dividend, but over longer periods share prices probably reflect the value of expected dividends and other benefits, partially discounted at present, or expected, rates of interest.[1] Even the stock exchange could not for long disregard the unwisdom of a dividend-distribution ratio so high that it impaired the efficiency of the firm by reducing its share of the market and its credit worthiness.

In the absence of conversion and voting rights the prices of non-participating preference shares and debentures tend to be dominated by considerations of security rather than dividends. An increased distribution to ordinary shareholders would, *ceteris paribus*, reduce security and so reduce market price. In so far as rising prices for these types of securities are associated with higher dividend distributions, this reflects expectations of continuing profits and growth which may bring greater security, or, perhaps, preferential rights to further issues of securities.

If dividend-distribution policies are unlikely to account for the contradiction reported by Professor Florence, some other explanation must be sought. The years 1936 and 1951 were considered comparable because each showed peaks in share prices rising about 13% over the average of the four neighbouring years. This condition may not be a sufficient safeguard.

(*a*) Price level is a factor determining change in share prices.[2] As shares at low prices tend to change more percentagewise than higher-priced shares, the distribution of low and high prices as between the small and large company groups is important. The extent of subdivision of shares and bonus issues would need to be taken into account.[3]

(*b*) The shares of debtor firms show greater appreciation in the market during a period of inflation than do the shares of creditor firms.[4] This being so, the financial structure of the companies in the two groups would need investigation. Significant changes could occur in a period of fifteen years. It is also possible that while 1936 and 1951 were peaks about the same distance above the average of the four neighbouring years, they may

[1] Cf. Oscar Harkavy, "The Relation between Retained Earnings and Common Stock Prices for Large, Listed Corporations," *Journal of Finance*, Vol. VIII (September 1953), pp. 283–97, and James E. Walter, "Dividend Policies and Common Stock Prices," *Journal of Finance*, Vol. XI (March 1956), pp. 29–41.

[2] S. Szatrowski, "The Relationship between Price Changes and the Price Level for Common Stocks," *Journal of the American Statistical Association*, Vol. 40 (1945), pp. 467–83.

[3] It appears that in England very large companies have revalued more than smaller companies. Cf. S. J. Prais, "The Financial Experience of Giant Companies," ECONOMIC JOURNAL, Vol. LXVII (June 1957), p. 254.

[4] R. A. Kessel, "Inflation-caused Wealth Redistribution: A Test of a Hypothesis," *American Economic Review*, Vol. XLVI (March 1956), pp. 128–41.

not have represented fluctuations of equal amplitude about the trend of share prices.

Whether these factors could account for the contradiction could be established only by thorough examination of the share-price distribution and trend and the financial structure of the companies included in the sample.

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ARROW AND THE "NEW WELFARE" ECONOMICS—A RESTATEMENT

SINCE Mr. Davis' remarks suggest that my paper may have given rise to misapprehensions, it may be worthwhile summarising, in a paragraph, my view of the recent history of welfare criteria in order to have Arrow's contribution, and my criticisms of it, in proper perspective.

The principle of compensation: (*a*) that a change which actually made some better off and no one worse off was an improvement in social welfare, was supplemented in 1939 by a criterion introduced by Kaldor and Hicks which marks the inception of the new welfare economies, a criterion based on hypothetical compensation; (*b*) a change which *could* make some better off without making any worse off was to be regarded as an advance in the community's welfare. It was put forward in the spirit of an efficiency indicator by whose measure, on the scale of "better" or "worse," we might agree to abide. Once Scitovsky had uncovered a mechanical defect in this indicator, it was extended, on the suggestion of Samuelson and others, to take the form (*c*), that a situation II was to be regarded as better than I if everyone could be made better off in II than in I *for every distribution conceivable* in the I situation. A sufficient condition for the fulfilment of this criterion, which eradicated the possibility of any ambiguity, was that the situation II contained more of some goods (resources) and no less of any good (resource) than existed in the I situation.

But having got this far, the new welfare economics led to a further development. Samuelson summarised the individual welfare possibilities latent in a collection of goods, or resources, in a utility possibility frontier—a boundary encompassing all the possible combinations of individual welfares. Consistent with the spirit of the original Kaldor–Hicks essay, we might now regard as an improvement for the community any outward movement of the complete utility possibility frontier. Alternatively—and this is very much to the point—we might argue that the acceptance of an outward movement of the utility frontier as an improvement in social welfare, on the grounds that everyone could be made better off, is a tacit acceptance of a Paretian-type social-welfare function of unspecified form. And though such

a welfare function be widely acceptable, it is, in a sense, arbitrary; of only limited use, not being specified; and only one of an indefinite number of such functions. Thinking along these lines, we might prefer to adopt a method (*d*), which is to regard the utility frontier as having no welfare implications of itself but, instead, embodying the requisite "technical" data prior to imposing any chosen social-welfare function—if a satisfactory one could be constructed—which reflected the ethics of the individuals in the economy.

Arrow, I take it, was concerned to discover whether or not such a thing as a social-welfare function could, in general, be constructed in a "satisfactory" manner given all the conceivable ways in which the individuals might rank any given alternative social states. His conclusion, with which I agree, was that—granted the "reasonable" conditions such a function had to meet—in principle this was not possible, though, I might add, this does not rule out the possibility that in some circumstances the alternatives facing society are such that, with the particular individual orderings, a solution which meets Arrow's requirements may be found.

Where do we stand to-day? As a consequence of ambiguities in the original Kaldor–Hicks–Scitovsky tests, (*b*) has given way to (*c*). As a result of Arrow's research, any hope for reaching (*d*), on his "reasonable" conditions, has to be abandoned. Some would like to amend one or more of his conditions in the endeavour to construct a social-welfare function which works. Others may feel content to hold on to the new welfare economics in the form (*c*).

What I wished to make plain in my paper was that, although welfare economics was indeed vulnerable to various sorts of criticism, nothing that Arrow had written need weaken our decision to adopt welfare criterion (*c*), the contrary impression notwithstanding. For, while I agree that Arrow was experimenting with the idea of using the principle of (hypothetical) compensation for the passage from individual ordering to the social ordering of alternatives, to dismiss it on the ground that "Scitovsky indifference is not transitive" is, first, to suggest that the principle itself is in error and, therefore, does constitute an attack on the new welfare economics, and, secondly, to dismiss it for manifestly wrong reasons, since the compensation principle in its (*c*) form goes beyond the Scitovsky criterion. In any case, few would endorse Scitovsky's footnote suggesting that self-contradicting community indifference curves might be taken to indicate a state of indifference for the community.

On the other hand, my strictures on Arrow's Possibility Theorem, as I see them now, were perhaps a little severe. What I wished to establish was that its conclusion had no real bearing on the traditional welfare economics. This proposition may have been apparent on a close examination. But a cursory impression could easily mislead on a matter which I hold to be important. Of related significance is the superficial view that the theorem demonstrates that if individuals have opposing interests any assumed

derivation of a social-welfare function which meets Arrow's conditions *necessarily* leads to a contradiction. Though, admittedly, it suffices for Arrow's thesis, we should be aware that contradiction is no more than a *possible* outcome. It seems useful to me to point this up, since, despite Arrow's resolution, interpersonal comparisons may be seen lurking about his consequence 3 (If $x'P_1y'$ and $y'P_2x'$, then $x'Iy'$) and a conclusion may be drawn, wrongly, that any welfare economics which chose to proceed on the assumption that interpersonal comparisons were possible was fated to perish through contradictions.

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A NOTE ON THE MARGINAL EFFICIENCY OF CAPITAL[1]

I

IN his *Economics of J. M. Keynes*, Dillard says that the marginal efficiency of an income-earning capital asset which has a finite life of n years may be defined by the expression:

$$S = \frac{Q_1}{(1+r)} + \frac{Q_2}{(1+r)^2} + \ldots\ldots + \frac{Q_n}{(1+r)^n} \quad . \quad (1)$$

where S is the current replacement cost of the asset, Q_1 is the net return expected from the asset in the first year of its life, Q_2 the net return expected in the second and so on and where r is the marginal efficiency of the asset. He then adds: "There will be some unique value of the marginal efficiency of this particular investment which will bring the two sides of the equation into equality."[2] In so doing he appears to be following Keynes, who defines the marginal efficiency as "*that* rate of discount which would make the present value of the series of annuities given by the returns expected from the capital-asset during its life just equal to its supply price,"[3] a form of expression which seems to indicate that Keynes also held the view that there will be one, and only one, value of r satisfying equation (1).[4]

The purpose of this note is two-fold. We shall begin by showing that, while it is possible to assert, with Dillard, that there will be some unique value of r satisfying equation (1) if the Q's—the expected returns—are all

[1] We wish to thank Mr. T. G. Collins of the University of Tasmania and Mr. C. S. Soper of the University of Cape Town for valuable help in the preparation of this note.

[2] See Dudley Dillard, *The Economics of J. M. Keynes* (London: Crosby Lockwood 1950), p. 136.

[3] See J. M. Keynes, *The General Theory of Employment, Interest and Money* (London: Macmillan, 1936), p. 135. (Italics ours.)

[4] Kurihara appears to hold the same view. See Kenneth K. Kurihara, *Introduction to Keynesian Dynamics* (London: George Allen and Unwin), 1956, p. 51.

positive, it is not possible to do so if one or more of them is negative.[1] Having shown this, we shall then proceed to consider its consequences for the Keynesian investment function.

II

In this section, then, we shall show that Dillard's assertion is substantially justified if all the Q's are positive, but not if one or more of them is negative.

Let us begin by rewriting equation (1) as

$$Q_1 p + Q_2 p^2 + \ldots\ldots + Q_n p^n - S = 0. \quad . \quad (2)$$

where $p = \frac{1}{1+r}$; and let us proceed to find out how many positive roots this nth degree polynomial in p will have provided that all the Q's are positive.

The left-hand side of (2) is a function of p (call it F) whose derivative is given by

$$\frac{dF}{dp} = Q_1 + 2Q_2 p + \ldots\ldots + nQ_n p^{n-1}. \quad . \quad . \quad (3)$$

If all the Q's are positive this expression is clearly positive for all positive values of p, which means that F is a monotonic increasing function in the range $p > 0$. In graphical terms the curve of F in the range $p > 0$ must be as indicated in Fig. 1; the curve must rise continuously from a point below the p axis.[2] This means that the curve will cut the p axis only once in the range $p > 0$; or, in other words, that F will equal 0 only once in the range $p > 0$. Thus, if all the Q's are positive, equation (2) will have one, and only one, positive root.

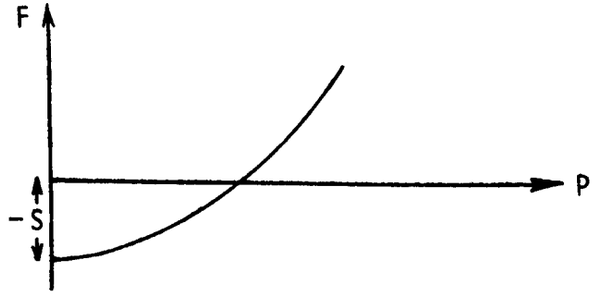


FIG. 1

From this it follows that, if all the Q's are positive, there will be one and only one value of r in the range, -1 to $+\infty$, which satisfies equation (1). This means, in turn, that there cannot be more than one positive value of r satisfying equation (1), although there may be none at all.

Thus, if we read Dillard's statement as, "There will be *no more than one positive* value of the marginal efficiency of this particular investment which will bring the two sides of the equation into equality" (as we are probably meant to do), we can regard it as a justifiable assertion provided that every item in the series of expected returns is positive.[1]

If, however, one or more of the Q's is negative we can no longer assert that $\frac{dF}{dp}$ is positive for all positive p, which means that we cannot assert that F is monotonic increasing. This means, in turn, that we cannot assert that the curve of F will cut the p axis only once in the range $p > 0$—that is, we cannot assert that there will be only one positive root of (2). There may be more than one, in which case there may be more than one positive value of r which satisfies equation (1), and Dillard's assertion can no longer be justified.

It may help some readers to see this possibility of more than one positive value of r realised in terms of some actual figures. Suppose that the capital-asset in question has a life of five years, that, at some given rate of investment in the asset, Q_1 is $+£15$, Q_2 is $-£25$, Q_3 and Q_4 are zero, Q_5 is $+£30$ and S is $£2{\cdot}2$. In this case a value of r of 1·2 will satisfy equation (1), and so will a value of r of 0·76.

Let us check this. With $r = 1{\cdot}2$ the right-hand side of equation (1) will be:

$$\frac{15}{2{\cdot}2} - \frac{25}{(2{\cdot}2)^2} + \frac{30}{(2{\cdot}2)^5}$$

$$= 6{\cdot}818181 - 5{\cdot}165289 + 0{\cdot}582113$$
$$= 2{\cdot}2$$
$$= S = \text{left-hand side}$$

With $r = 0{\cdot}76$ the right-hand side of equation (1) will be:

$$\frac{15}{1{\cdot}76} - \frac{25}{(1{\cdot}76)^2} + \frac{30}{(1{\cdot}76)^5}$$

$$= 8{\cdot}522727 - 8{\cdot}070764 + 1{\cdot}776472$$
$$= 2{\cdot}2$$
$$S = \text{left-hand side}.$$

[1] It makes perfectly good economic sense to admit this possibility. In an underemployment situation there will, presumably, be many assets which are characterised by negative Q's; and even in a full-employment situation there will, almost certainly, be some. Take a house, for example. Even in the best of times, the prospective investor in a house may well expect a negative return in each of the years in which it will have to be painted. Or consider an asset needed for the purpose of establishing a new business which will have to face strong competition from existing businesses. The prospective investor in such an asset may well expect a negative return from the asset in the early years of its life even if the general economic situation is highly favourable.

[2] Equation (2) indicates that $F = -S$ when $p = 0$. This is a negative quantity, since S mus be regarded as positive. Hence the curve of F must start from below the p axis.

[1] If we cannot rewrite the assertion in this way we cannot accept it even for the case where all the Q's are positive.

III

It remains to consider the consequences of the conclusions reached in the preceding section for the Keynesian investment function, which is

$$I = f(i)$$

where I is aggregate Investment Expenditure and i the rate of interest.

It will be recalled that this function is built on two conclusions: (1) that, for each asset, marginal efficiency is inversely related to the level of investment, and (2) that investment in each asset will be carried to the point where its marginal efficiency is equal to the rate of interest. From these two conclusions a further conclusion is drawn— namely that, once the rate of interest is given, the level of investment in each asset, and consequently the level of aggregate Investment Expenditure, is determined. In other words, it is concluded that the level of aggregate Investment Expenditure is a unique function of the rate of interest.

If, however, we admit the possibility that the discounting equations associated with some particular asset contain one or more negative Q's we can no longer argue in this way. For, in this case, as we have shown, there may be more than one marginal efficiency corresponding to a given rate of investment in the asset and so more than one rate of investment which will equate marginal efficiency and the rate of interest. In this event, we could not fix the level of investment in the asset, at a given rate of interest, by reference to conclusion (2) above; and this would mean, in turn, that we could not fix the level of Aggregate Investment at that rate of interest.

The importance of this conclusion obviously depends on how prevalent negative Q's are; it is of considerable importance if negative Q's are at all common and can be largely ignored if, as may well be the case, they are something of a rarity.

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THE REAL WICKSELL EFFECT

THE puzzle which goes under the name of the *Wicksell effect* [1] concerns the evolution of an economy which is undertaking deepening investment, increasing the ratio of capital to labour and capital to output, going down the production function, raising the degree of mechanisation of technique, lengthening the period of production or whatever you like to call it. As this process goes on, the real wage of labour rises and the rate of profit on capital falls. The puzzle concerns the effect of these changes on the value of an item of capital equipment.

[1] See, for example, T. W. Swan, "Economic Growth and Capital Accumulation," *The Economic Record*, November 1956, and I. M. D. Little, "Classical Growth," *Oxford Economic Papers*, June 1957.

The setting of the question is in the highest degree academic. We are asked to contemplate an economy in which accumulation is going on, with a falling rate of profit, subject to all the rules of long-period equilibrium, including the proviso that the technique of production is that which maximises profits. No adverse effect of the expectation of falling profits, and no short-period perturbations, are allowed into the argument. Since we are concerned with a traditional puzzle, we must set up the question in its traditional form.

To get the problem into simple terms we make the following assumptions:

(1) The whole economy divides into two sectors, producing consumption goods, which we shall call cloth, and investment goods, which we shall call looms. The workers in the first section we shall call weavers and in the second, engineers.

(2) One weaver operates one loom. There are three types of looms, Alpha, Beta and Gamma, representing techniques of descending degrees of mechanisation. A loom appropriate to a lower degree of mechanisation is produced by a smaller amount of engineering labour and yields a lower output of cloth than that for a higher degree. The engineers supply themselves with whatever tools they require, in their spare time, so that no investment in the investment sector comes into the story. The gestation period of each type of loom is very short. The gestation period of cloth is very short, so that a loom begins to yield output as soon as it is produced. The looms are highly durable and can be operated at full efficiency for an indefinite period.

(3) Let *Ca*, *Cb* and *Cg* be the rates of cloth output per man per week with the respective types of loom and *Ka*, *Kb* and *Kg* the amounts of engineering labour required to produce one of each type.

The weekly cloth wage per man *Wb* (uniform for all workers) is equal to *Cg* and the cloth wage *Wa* is equal to *Cb*. That is to say that when the Beta wage rate rules, Gamma technique only just covers its costs and yields no profit; when the Alpha wage rate rules, Beta technique yields no profit. (The violence of these assumptions is made for simplicity. Cases of greater elaboration can easily be devised).

(4) The labour force is constant. Workers are versatile, and any individual can work in either sector equally well.

(5) All wages are currently spent on cloth.

We have to contemplate accumulation going on under conditions of equilibrium. We shall proceed by postulating that a particular course of history is laid down in terms of real investment, and that everything else

adapts to it in such a way as to preserve equilibrium (say, through the operation of appropriate monetary and fiscal policy).

The history that we first specify is that the division of the labour force between weavers (Lc) and engineers (Li) remains constant, and that all workers are always fully employed. This means that a constant rate of investment in terms of labour time is being carried out throughout the story.

When our story begins the weavers are equipped with a mixture of Beta and Gamma looms, the cloth wage-rate is Wb and investment in Beta looms is taking place. As each new Beta loom is delivered a weaver has to be taken off a Gamma loom, which is then scrapped.

During this phase the cloth wage-rate remains constant and the total of current profits is gradually rising as looms yielding $Cb - Wb$ replace those yielding nil ($Cg - Wb$). The consumption of cloth by capitalists, to fulfil the postulated conditions, must therefore be increasing. Since the rate of investment, $WbLi$, is constant while income is increasing, there is a gradual decline in thriftiness going on.

Now a moment comes when the last Gamma loom has disappeared. All weavers are equipped with Beta looms. For investment to continue, Alpha looms must begin to be built. To fulfil our specified conditions the consumption of capitalists must fall and the cloth wage-rate rise to Wa, so as to make Beta looms unprofitable and release labour for use on Alpha looms. The next phase then proceeds exactly like the last one, with thriftiness gradually falling from the level to which it suddenly jumped. Since the given number of engineers now turn out fewer looms, the process of transition from Beta to Alpha techniques takes longer to complete than did the transition from Gamma to Beta.

We can equally well specify a different history. The proportion of current profits saved is constant, and investment adapts to it in such a way as to preserve full employment. Beginning again at the same point, the gradual rise in current profits as Beta looms replace Gamma leads to an increase in investment (to absorb increased saving). Workers are transferred from weaving to engineering and the whole process accelerates as it goes on. The number of weavers reaches a minimum, all supplied with Beta looms. Current profits are now at a maximum. Beta looms continue to be produced, but to man the new batch some workers have to be transferred back from engineering to weaving. As the rate of investment falls in consequence, profits fall and the ratio of cloth output to total income rises—the real wage-rate must rise to absorb the output of cloth.

The rise in wages goes on gradually (instead of suddenly as in the first story) until it reaches Wa.

At that level Alpha looms can be manned, investment begins to increase again and the wage-rate is stablised at Wa. The whole process begins again with Alpha looms replacing Beta and investment accelerating from the low level to which it fell during the transition.

Many variations on these stories can be devised. The only essential is to get round the corner from Gamma to Alpha without violating the condition of full employment.

Now consider the situation of an individual capitalist who owns n Beta looms when the story begins. They cost him $n(WbKb)$ in terms of cloth and his current profit is $n(Cb - Wb)$. If he consumed the whole of this he might on a superficial view be considered as doing zero saving, but in reality he would be consuming his capital. He would be behaving as though his current profit was expected to be permanent, whereas in fact his Beta looms will one day be scrapped (rendered obsolete by Alpha looms). To preserve his original capital (valued in terms of cloth) he must amortise it over the service life of the Beta looms. But when he comes to reinvest the original sum in Alpha looms, each costing $WaKa$, he finds that it cannot buy the equivalent of n Beta looms, for this would require an expenditure of $n(Kb \,.\, Wa)$, and he has provided himself with an amortisation fund of only $n(Kb \,.\, Wb)$. This is the Wicksell effect in real terms. It is the rise in the reproduction cost of a Beta loom above its historic cost due to the rise in the real wage-rate.

We rigged the initial assumptions so that there was no allowance for interest in the cost of looms. Let us now suppose that each type has a rather long gestation period. The appropriate interest rate to take into account is the current rate of profit ($Cb - Wb/WbKb$ during the Gamma–Beta phase of investment and $Ca - Wa/WaKa$ during the Beta–Alpha phase), for this represents the loss of profit due to having to wait for an investment to begin to earn. Now, at the moment of transition of the wage-rate from Wb to Wa in the first story, or gradually over the transition period in the second, this cost of waiting falls. The cost of a new Alpha loom then exceeds the original cost of an old Beta loom in a smaller ratio than $KaWa/KbWb$ because the cost of waiting over the gestation period (which we assume to be more or less the same in magnitude and pattern for both) is compounded at a lower rate of interest on the outlay of $KaWa$ than on that of $KbWb$.

It might happen then that the effect of a lower interest rate was so strong that the notional reproduction cost of Beta looms was less than their actual historic cost. If so, what appears to the individual capitalist as merely amortisation of the historic cost of looms is contributing to net saving for the economy.

This is sometimes called a "reverse Wicksell effect," but if we are thinking in real terms there seems no point in boiling up the cloth wages of engineers with the interest-cost of waiting in a single sum.

So far everything is quite above board. There is no mysterious revaluation of capital goods on account of a change in the interest rates. Indeed, there is no need to value the looms at all, and since the value of those in existence at any moment depends upon beliefs about their future, it is not at all obvious how we should set about doing it if we did.

The value of capital goods has a definite meaning only if future profits are believed to be known for certain, and a simple meaning only if the future rate of profit is expected to be constant. (A level of profits which is expected to alter in the future is not a single rate in the present, but a complex of rates applying to different lengths of future time.)

To discuss the value of capital goods we may set up the following case. We now assume that looms have a definite physical life at full efficiency (the one-hoss-shay assumption) and that we are examining an economy in static equilibrium. A stock of Beta looms is in use, of balanced age composition, and there is a flow of output of new looms just sufficient to maintain the stock in being. The wage-rate is Wb, and the surplus output of cloth $(Cb - Wb)Lc$ is being consumed by capitalists. It is possible on this basis to work out the rate of profit and the value of the stock of looms (with the assistance of Professors Kahn and Champernowne).

This case can be compared with others in which Gamma or Alpha techniques are in use, or with cases in which Gamma and Beta looms co-exist and in which Beta and Alpha looms co-exist. We can work out the rate of profit and the value of capital in each case and compare them. We can analyse the difference in cost of capital, and allocate it between the difference in the degree of mechanisation, the difference in the wage-rate and the difference in the rate of profit. This, again, is somewhat artificial, but it is all above board.

It is quite another matter to consider the effects of a change in the rate of profit. Let us imagine, in the situation where a balanced stock of Beta looms has been maintained for some time, that suddenly one day the capitalists grow more thrifty. The cloth wage-rate rises to Wa and the current rate of profit falls. Equilibrium is ruptured and all is in turmoil. Investment in Alpha looms has suddenly become profitable. There is a new static equilibrium position which can be reached after a period of positive investment has been worked through, and in that position there is a lower rate of profit.

If we begin already the day after wages rose to reckon the value of capital on the basis of a rate of interest equal to the Alpha rate of profit, then we certainly have to revalue capital goods. The value of existing Beta looms is raised (unless the effect of reduced cost of waiting is sufficient to offset the rise in the wages bill). An entrepreneur who has new Beta looms experiences a capital gain. One whose Beta looms were near the end of their life finds himself without a sufficient amortisation fund to replace them. We could work out the value of the total existing stock of looms at the new rate of profit. But there seems to be an inherent contradiction in discussing an out-of-equilibrium situation in terms appropriate to a static state. Moreover there is a good deal of haziness about the meaning both of the rate of profit and of the value of capital when the future rate of profit is no longer expected to be constant.

The difference between this financial pseudo-Wicksell effect and the real Wicksell effect is that in the first the initiating cause is a change in prices and the phenomenon to be discussed concerns book-keeping while in the second the initiating cause is an increase in productive capacity and the phenomenon to be discussed concerns output, consumption and the distribution of income.

Certainly, the question is only a class-room exercise. We do not expect a process of accumulation with a falling rate of profit, in real life, to be carried out with continuous full employment in equilibrium conditions. But that is the question that was asked.

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RENT AND THE AGRICULTURAL PRICE REVIEW

SINCE the first year of the War, the receipts of British agriculture have been largely determined by Government policy, which operated at first through State purchase of the principal products at fixed prices; and since about 1950, through State guarantees of minimum prices plus production grants. Over this whole period of fairly steady inflation, increases in costs have been offset partly by higher output per unit of input, partly by higher prices and partly by higher grants. By 1949 the net aggregate income was about five times the pre-war level, whether measured by the Central Statistical Office to include interest paid by farmers and depreciation on their equipment, or measured by the Departments of Agriculture to exclude these items. At that time, therefore, farmers were well ahead in the inflationary race; but in the last eight years, their advantage has been whittled down by increases in other incomes while farming incomes have been oscillating round £400 million (C.S.O.) or £310 million (M.A.F.F.).

TABLE I

Personal Income Before Tax

£ million

	1938.	1955.	1956.
Income from employment	3,022	11,221	12,222
Farming income *	69	394	406
Other income	1,981	4,192	4,422
Total	5,072	15,807	17,050

* Including depreciation and interest on loans.

Source: National Income and Expenditure, 1957.

The latest agreement between the Government and the National Farmers' Unions does not necessarily alter this trend; in the White Paper on Long-

Term Assurances for Agriculture (Cmnd. 23), the Government only undertook not to reduce in any one year by more than 2½% the aggregate of the guarantees, allowing for any ascertained changes in costs. Inflation elsewhere therefore might be accompanied either by a rising or by a slowly falling agricultural income, though the greater part of cost increases would be offset by higher prices or grants.

Among the costs listed in the summary table given in the annual White Paper, there appears the item " Rent and Interest." To anyone brought up in the Marshallian tradition, to include rent among costs is flagrant heresy; its conjunction with interest in a single total aggravates the offence. For if, at any agreed level of aggregate net incomes, farm rents are rising, then the aggregate of costs will rise; an increase in guarantees to offset the higher costs and to restore the net income will perpetuate the cycle. Fifty years ago, any attempt by the State to raise farmers' income above the level determined by the play of market forces would have been countered by the claim that all the increase would eventually accrue only to the owners of the land; but no such argument has been heard in the current situation.

TABLE II

United Kingdom Farm Receipts and Expenses

£ million

Years June to May.	1937/38.	1948/49.	1955/66.	1956/57.
Expenses:				
Rent and interest . . .	43	52	79	82
Other	206	223	1,019½	1,090½
Total . . .	249	575	1,098½	1,172½
Receipts:				
Total	308	865	1,423½	1,489½
Net Income	59	290	325	317

Sources: *Manchester Guardian* Review, 1952; Cmd. 8556, 9721; Cmnd. 109.

Indeed, in the circumstances of the post-war years this peculiar method of accounting was not so economically foolish, for the State. The operations first of war-time controls and then of the tenure provisions of the Agriculture Act, 1947, kept agricultural rents from rising with the rise in farm incomes; for the arbitrators who have adjudged rents between landowners and sitting tenants seem to have based their awards mainly on the average of existing rents, and not on the rent which an incoming tenant would offer for a new lease.[1] Hence during the 1940s, rents were low in relation both to farm income and to maintenance costs, both of which had risen sharply during the War; the average net income accruing to owners of tenanted farms can have been only a few shillings per acre for most of the post-war decade.[2]

[1] *Agricultural Register*, 1956/57, p. 190. [2] Central Landowners' Association.

The official mechanism controlling the landlord-tenant contract has thus prolonged the squeeze on landlords' incomes produced by the inflation of building costs. But rents are now rising, noticeably on the few new leases and less slowly than before on old leases; the aggregate figure for rent and interest has increased by £3 million in each of the last two years. The Government has announced its intention to modify Parts II and III of the Agriculture Act, 1947, so as to remove from the landlords some of the shackles which limit their bargaining power in negotiation with their tenants, so it is possible that the automatic escalator of farm costs embodied in the present mechanism may increase in speed. In these circumstances, what reforms or adjustments are desirable?

1. If the aggregate farm income continues to be held to about £300 million, while other incomes go on rising, the situation may cure itself; the level of farm income may fall so far behind earnings in other professions that fewer people wish to farm, and the level of rents may become stabilised at some level rather higher than that ruling at present. But this development can hardly be regarded as a desirable reform.

2. The officials may have in mind some ideal standard of average rent. When this has been attained, the review procedure will be reformed so as to demolish the escalator. This could be achieved by taking rents out of costs and adding the final sum to the aggregate net income of farmers. Agricultural policy would then concentrate on the size of the combined income of farmers and landowners, ignoring the division of the sum between the two partners.

3. The statistics about rent might be disregarded, both because they are unreliable in themselves and because owner-occupation is now probably the norm in British agriculture and no longer the exception.

The Agricultural Departments offer to the public eye only the combined figure for rent and interest calculated for the harvest year from June to May, and published annually for the annual price review. But the Central Statistical Office publishes, for calendar years, estimates of aggregate farm income plus interest plus depreciation of farming capital which is also given separately in another table.[1] By suitable adjustments, we can thus deduce that for the harvest year 1955/56, aggregate farm income plus interest amounted to £338 million, and aggregate interest paid therefore amounted to £13 million. The aggregate of rent therefore becomes £79–£13 millions, or £66 million in this year. Further the C.S.O. has committed itself to the opinion that in 1954, net rents (gross rents less maintenance costs) amounted to only £16 million, giving about £50 million for such costs. If we ignore the area of rough grazings, these figures allow a gross rent of about £2 per acre on the 31 million acres of crops and grass in the United Kingdom, and a net rent of about 10*s*., after deducting costs of repair and upkeep. And these average figures do roughly tally with the small amount

[1] *National Income and Expenditure*, 1957, pp. 2, 66, 71.

of other evidence available, such as that collected in the Farm Management Survey and by the Central Landowners' Association.

But the statistical basis of these estimates is highly speculative, in view of the trend towards owner-occupation. The Agricultural Departments take, as the start of their calculations on rent, the 1936 rating valuations; they obtain from their local sleuths estimates of current changes in rents per acre on tenanted farms, which they then average to cover the total area of agricultural land, whether owned or rented. The farms included in the Farm Management Survey are selected because of their farming systems and totally without reference to their tenure; owners are asked to give the estimated rental value, which again is presumably the value of 1936 adjusted upwards by as many unknown quantities as there are owner-occupiers filling in the forms. Now before the War more than half the agricultural land in this country was held on some kind of lease, and rents were negotiated fairly freely in a reasonably active market. It is common knowledge that the proportion of tenanted farms to the total has fallen markedly in the post-war period and is still falling. Until there is another census of ownership and rents, we do not know just how misleading this basis may have become, but it is clearly not statistically respectable. And if more than half the land in this country is now owned by its occupiers, as seems likely, rental values might become quite misleading. If, for instance, there were only 1,000 tenanted farms in the country, a small levy on the others would enable these tenants to pay their fortunate landowners, say, £10 per acre. This would then become the standard assumed for owner-occupiers; on the 31 million acres in cultivation and grass the assumed rent would then aggregate £310 million, which would be added, on the one hand, to the costs of the impoverished farmers which the Government was bound to recoup, and on the other, to the incomes of the owner-occupiers.

I suggest that it would not only be more orthodox in theory but also more sensible in practice to omit rent altogether from the statistics of the agricultural price review. Instead two items are required, one to be added to costs and the other to aggregate farm income. In a community consisting mainly of owner-occupiers, the division between costs of operation and costs of maintenance has become unreal. If the owner-occupier was taken as the norm, there could be included both in these national aggregates and in the Farm Management Survey all the costs of repairs and upkeep of buildings. The very large rise in these costs in the last twenty years has been obscured by their inclusion in gross rents, and owner-occupiers have been underpaid on this account. Similar costs incurred by estates could perhaps be provided for an adequate sample of tenanted farms through the Central Landowners' Association and the Cambridge Department of Estate Management.

There would remain an item which we might call "capital charges," representing the interest earned by the owner of the land and its fixed

equipment, some of which will be paid away in the form of interest on mortgages. Here we have, of course, the pure rent of economic theory, and here we are up against a double difficulty. In this country the non-monetary returns from the ownership of agricultural land, with or without occupation, have been sufficiently valued to keep the monetary return low. The industrial and urban majority can hardly allow on land the market rate of interest, when the supply of landowners is perfectly adequate at a much lower return, of 1 or 2%. And secondly, we cannot entirely evade the vicious circle whereby capital values depend on the income earned, which must in some way be related to capital values. But I think we could substantially reduce the amount of vice if we linked the income to be earned with the sale value of agricultural land, taking a stability of values as the general aim. As Sturmey [1] and Ward [2] have shown, the sale value of agricultural land is determined by a wide range of factors—the value of house property, the possibility of capital appreciation, the favourable treatment of land for death duties, the availability of mortgages, the recent and expected rate of interest. The level of agricultural prosperity, as measured by farming income, is only one factor among many, though possibly still the most important. It is noteworthy that the sale value of agricultural land has been fairly stable, or slightly falling, since 1951, since, in fact, the aggregate net farm income was stabilised, while rents have continued to rise.[3] If an item of "capital charges" was added to the net farming income at its present level of £16 million we should then get an item of some £340 million accruing to farmers as occupiers and owners; any transfers by them of part of this income to others by way of rent or interest on mortgages would not affect the total sum. The annual statistics for the price review would then be revised as follows:

TABLE III

Revised Review Statistics, 1955/56

	£		£
Farm Expenses:		*Farm Receipts*	1,423½
Interest	13		
Maintenance Costs	50		
Other	1,019½		
Total	1,082½		
Net Income:			
Farming	325		
Capital Charges	16		
Total	341		

[1] S. G. Sturmey, "Sale Value of Farm Land and the Long Term Rate of Interest, England and Wales, 1918 to 1950," *Farm Economist*, VIII, 1.

[2] J. T. Ward, "Rate of Yield on Investment in Tenanted Farms, England and Wales, 1937–9 to 1951," *Farm Economist*, VIII, 7.

[3] P. D. Martin, "Sale Value of Agricultural Land," *Farm Economist*, VIII, 6.

Some such system has been adopted in New Zealand for assessing the standard price of butter fat, which is related to average costs collected from a sample of farms on the assumption of occupying ownership.[1]

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OFFICIAL PAPER

THE COHEN COUNCIL ON INFLATION

THIS note is intended as a review of the central issues raised by the First Report of the Council on Prices, Productivity and Incomes.[2] The idea of such a council may be said to have originated in the proposal made in May last year by the Court of Inquiry into the engineering dispute, that " an authoritative and impartial body " should be appointed to give guidance on the wage problem.[3] The grounds for and nature of the Court's proposals were set out as follows:

> " The wages problem in recent years has become an integral part of an inflationary situation which confronts the whole economy. Employers see in the recurring annual demands for wage increases a form of pressure which raises their production costs and which is so general that it cannot be associated with the economic condition of a particular industry. Unions, on the other hand, feel impelled to press for higher wages to compensate for the upward movement in retail prices and to provide in advance some protection against the further rise in retail prices which is anticipated. Both sides of industry are anxious that the inflationary process should be terminated but are unable to agree upon the appropriate measures to attain that end. In each industry it is perhaps inevitable that each party should take a sectional view of its own interest though on both sides of industry as a whole there are to be found spokesmen who have a consciousness of the larger issues which are involved and who have a genuine desire to meet them " (para. 54).
>
> " The appropriate body to conduct the authoritative and impartial examination of the wider problems of wages policy in an inflationary setting should be a small body with which the Treasury would be associated and should be composed of persons whose knowledge and experience of these wider problems were firmly established. We think it important, too, that the British Employers' Confederation, the T.U.C., and the nationalized industries should be associated with it. . . . It is our hope that a body of the kind which we have in mind would command the respect of Employers and Unions alike and that it would do something to weaken the sectional approach to wage problems which now generally prevails " (para. 60).

[1] *Annual Reports of the New Zealand Dairy Board.*

[2] *First Report of the Council on Prices, Productivity and Incomes* (H.M.S.O., February 1958).

[3] *Report of a Court of Inquiry into a Dispute between employers who are members of the Engineering and Allied Employers' National Federation and workmen who are members of the Trade Unions affiliated to the Confederation of Shipbuilding and Engineering Unions*, Cmnd. 159, presented to Parliament May 1957.

The Government pursued this suggestion but failed to secure the support for it of the two sides of industry. What emerged therefore was not a representative body but the present Council consisting only of three independent members.[1] The role it was expected to play was not clearly defined in its terms of reference:

> " Having regard to the desirability of full employment and increasing standards of life based on expanding production and reasonable stability of prices, to keep under review changes in prices, productivity and the level of incomes (including wages, salaries and profits) and to report thereon from time to time " (*First Report*, para. 1).

The publication of its First Report does nothing to settle those questions about the Council's function which were left unsettled at the time of its appointment. It can, for instance, be argued that the publication of the Council's First Report and the discussion to which it gave rise, has helped to consolidate public awareness of the danger of excessive wage increases; and that this together with the use by the Government of its own influence has already helped to slow down the pace of wage inflation.

If this were true it would be paradoxical, for the Council itself can hardly have intended to play this role. From its Report it is clear that it regards the appropriate remedy for inflation to be the restraint of demand —not the kind of restraint which is induced by public exhortation or persuasion. Only the Government can restrain demand; so that on this view of things the proper quarter to which the Council should address its advice can only be the Government itself. But in this case, is there any need for an independent, semi-official, advisory body? Detached bodies set up to give the Government economic advice have not worked well in the past,[2] and the Council would not appear to have been constituted with this function in mind.

What view one takes of these matters, and most matters discussed by the Cohen Report, must depend in large part on the view one takes about the nature of inflation. The major questions raised by the Report are therefore the old questions: Why do prices rise? and How should the rise be stopped? It seems best to confine the present review entirely to these general issues. The Cohen Report was expressly intended for a non-technical audience,[3] and could therefore hardly do justice to the complexity and difficulty of the questions at issue. Though economists in this country hold widely different opinions on these questions, there has so far been little attempt at direct

[1] The Council was appointed in August 1957: the members being Lord Cohen (chairman), Sir Harold Howitt and Sir Denis Robertson.

[2] See, for instance, Sir Edward (now Lord) Bridges' Stamp Memorial Lecture on *Treasury Control* (London: Athlone Press, 1950), pp. 13–14.

[3] Cohen Report, para. 3.

controversion, nor to state views in a form which invited controversion. " But if we are to make any progress at all, we must go on exchanging opinions and seeking to set forth . . . the ultimate reasons for our own attitudes . . . in the hope that in this way we may eventually come to greater agreement. . . ." [1]

It may be worth repeating that the question at issue is essentially practical, namely, whether the only major step we have to take to stop prices rising (or to keep the rate of rise within the limits we agree to regard as tolerable) is to reduce the level of demand. As is already well known, the Council tend to emphasise the role of demand in the generation of price inflation: arguments I have put forward elsewhere give less importance to the role of demand.[2] But the purpose of the present review is not to rebut the general conclusions of the Cohen Report. Its aim is rather to controvert or discuss the constituent elements or arguments underlying its general conclusions; and by sorting out the issues and relating them to empirical data to help scientific discussion.

Concentration on these issues involves neglecting various other matters discussed in the Report; in particular, more political matters, such as rent control or Mr. Thorneycroft's September measures; and also the several interesting but subsidiary issues, such as the question whether the pound is undervalued, which are dealt with in the Appendices to the Report. It also seems best not to discuss the Council's emphasis on stopping and even reversing, rather than merely moderating, the rise in prices. In my view an *absolute* emphasis on price stability as an aim is logically inconsistent with a belief in demand as the controlling factor in the rate of price inflation.[3] But this, too, is plainly a question subsidiary to the main issues.

I. Possible Theories of Price Inflation

In order to define the standpoint of the Cohen Report it seems best to start by distinguishing various possible theoretical positions, of which there are several intermediate between the extremes of pure *demand* and pure *cost* inflation. Having indicated the spectrum of possibilities, it is easier to " place " the point of view of the Cohen Report. One reason for approaching the matter in this way is that attitudes to inflation are coloured by very

[1] L. C. Robbins " Thoughts on the Crisis," *Lloyds Bank Review*, April 1958, p. 2.

[2] In particular, in " Analysis of the Generation of Price Inflation," *Oxford Economic Papers*, October 1956.

[3] To a "demand inflationist," inflation is never out of control, it is merely uncontrolled: if the Government so decides, a slow inflation may continue indefinitely without danger; and this might be thought worthwhile. If, however, one believes that trade unions can get higher money wages by asking for them, this implies that there is no radical resistance in the economy to the occurrence of inflation: the barrier is merely custom and inertia. It seems to me therefore that those who ascribe rising prices mainly to cost pressures should be more fearful of the dangers of prolonged inflation, and more anxious to arrest it, than those who attribute rising prices mainly to the pressure of demand.

general, more or less implicit, assumptions about how the economy works; and in particular about the degree to which it is sensitive to " market forces." It is difficult to bring such general preconceptions to the test of evidence, without first making them explicit.

There seem to be at least four ways in which the influence of demand might be thought to operate. It makes a difference whether the first impact of an increase in demand is supposed to be upon prices, or upon wages; and in either case the reaction may be supposed to be rather rapid and free, or alternatively, more slow working. Having described these possibilities, we can consider the possible interaction of demand and cost influences.[1]

(a) *First Impact on Prices, Prices being Flexible*

The traditional emphasis in economic theory is to regard the economy as a self-equilibrating mechanism, in which relative prices are sensitive to demand, and supplies are sensitive to relative prices. In such analysis interest centres on the equilibrium achieved " in the long run." Being trained in this method of thought, the natural starting-point for an economist is to suppose that the average price level is freely responsive to the level of total demand, so that if there is excess demand, prices will rise, to achieve a temporary equilibrium. This was the argument of Keynes in *How to Pay for the War*:

> " Now if the public voluntarily save £1,350 million, that is to say the whole of the difference between their incomes of £4,600 million and the value of the available goods, namely, £3,250 [million], at pre-war prices, obviously the problem is solved. . . .
>
> " [However] let us suppose that, instead of saving the necessary £1,350 million, the voluntary savings of the public are, in the first instance, only £700 million, and that they try to spend the rest of their incomes, namely £3,900 million, on goods worth only £3,250 million at pre-war prices. *Obviously prices will have to rise* 20 *per cent which will equate supply and demand;* for the goods will then be worth £3,900 (£3,250 + £650) million, which is just equal to the desired expenditure. Moreover, those who have sold for £3,900 million goods which only cost them £3,250 million will have the balance of £650 million left over as extra unspent income, just the amount the Government requires.
>
> " It soon appears, however, that this only solves the problem momentarily. For we have no reason to expect that the whole of the unspent windfall profits of £650 million will represent permanent savings. A certain time will elapse. . . . But in the next innings, so

[1] The following scheme of classification has similarities with that proposed by R. Turvey (see " Some Aspects of the Theory of Inflation in a Closed Economy," Economic Journal, September 1951). But he considered the extreme cases of wages and prices being flexible or inflexible and was chiefly concerned with the interaction between the factor and goods markets. Here the emphasis is more on half-way cases and on the possible interaction of cost and demand influences in the same sector. It has seemed unnecessary to spell out the whole range of logical possibilities.

to speak, it will be added to the total of potentially spendable incomes. . . ." [1]

This view would imply that whenever there was excess demand price inflation was rapid; and also that profits were very variable: neither of these corollaries appears realistic.[2] It is also an observable fact, on which Keynes himself remarks,[3] that many sellers do not typically charge what the market would bear in inflationary conditions.

(b) *First Impact on Prices, Prices being Relatively Inflexible*

If there is something less than perfect competition, and if the typical price is an administered price, it is still possible to suppose that prices will be sensitive in some degree to the level of demand. Much of the theory of demand inflation can therefore be preserved. But the change is important. Custom and habit have to be recognised as barriers against the inflationary effects of high demand. Nothing can then be said *a priori* about the pace of inflation. Even quite considerable excess demand might cause little rise in prices: for in the same way that demand may be " suppressed " by direct controls, so a continuous state of excess demand is possible if prices are sticky. If the degree of price flexibility were rather small, profits might not vary noticeably from year to year in the face of varying demand conditions.

(c) *First Impact on Wages, Wages being Flexible*

Alternatively, the emphasis may be put on the sensitivity of labour costs to high demand. Even if prices are not very sensitive to the level of demand, it may be argued that wages will rise—or rise more rapidly—when there is high demand. The rise in wages will raise labour costs, and firms will pass this on as higher prices. In the discussion of inflation since the War the theory that prices bore the first brunt of inflation has fallen into the background and the emphasis has been gradually transferred to wages: by now the typical picture is probably not that of high prices and high profits drawing up wages, but of high wages pushing up prices. The change may seem small, but the difference is important. This view implies that the rise in wages is a response to high demand not only for labour, but also for products. The price of products must be presumed to be less flexible than is the price of labour. We are then in a mixed situation. There is certainly demand inflation in the labour market; but it is a nice question of terminology whether product prices are to be regarded as demand determined or

[1] J. M. Keynes, *How to Pay for the War* (London: Macmillan, 1940), pp. 62–3: my italics. The phrase " windfall profits " recalls the essentially similar account in the *Treatise on Money*.

[2] See Section III (*a*) below.

[3] " But the psychology which provoked previous price-inflations is not present to-day. So far from there being a natural tendency to raise prices in response to an unsatisfied demand, manufacturers and retailers are as reluctant to charge higher prices except in response to an actual rise in cost as the public are to pay them " (*How to Pay for the War*, p. v).

cost determined: for they could be supposed to rise only when costs had risen first.

In its most " competitive " form, this view treats wages as being freely determined in response to demand at the level of the individual plant or factory. As is well known, actual weekly earnings are considerably larger than what would be earned by working at nationally agreed wage-rates for the " standard " week, and wage-earnings have tended to increase more rapidly than wage-rates. The difference is due partly to such factors as overtime pay, and partly to bonus payments, which can be varied by individual employers. One extreme view is to regard *wage-earnings* as freely variable by employers and dependent only on demand. It is a corollary of this view that nationally agreed *wage-rates* have no influence on earnings and that trade unions are engaged in shadow boxing.

(d) *First Impact on Wages, Wages being Inflexible*

As against this, it is possible to hold that wage payments have become institutionalised so that, like prices, wages are by no means freely sensitive to demand. Nevertheless, they may still be supposed to be sensitive to demand in some degree, in either or both of two ways:

(*i*) Wage payments by individual employers may be regarded as sticky, but flexible in some degree to the level of demand facing firms.

(*ii*) Wage earnings may be thought to be determined by the rates negotiated by trade unions; but the " bargaining strength " of the unions may be supposed to depend on the level of demand, either in the economy as a whole or at least in separate industries.

These two types of influence could work together in combination. Thus wage earnings may be regarded as made up of a " rates " element and a " bonus " element (the former perhaps a function of the general, the second of the firm's, level of demand).

Classification of Four Types of Demand Inflation

	Behaviour of prices.	Behaviour of wages.	Type of demand inflation.
A	Flexible	Semi-flexible or inflexible	Fairly open inflation, first impact on prices
B	Semi-flexible	Semi-flexible or inflexible	Semi-repressed inflation, first impact on prices
C	Semi-flexible or inflexible	Flexible	Semi-repressed inflation, first impact on wages
D	Semi-flexible or inflexible	Semi-flexible	Rather fully repressed, first impact on wages

These different versions of how demand inflation works imply different pictures of how the economy operates. Some of the types of economy indicated above rule out the possibility of cost inflation. In particular, if

prices respond *freely* to demand, they cannot also be rigidly linked to costs. But if, on the other hand, prices are not perfectly flexible, they may be fixed with some reference to costs. It is possible to believe that in the latter case those who supply input (labour or materials) by raising their prices are able in certain circumstances to push up product prices also:

(*a*) Trade unions can be conceived to push up wages provided that prices and wages are imperfectly flexible, and that the latter are influenced in some degree by the rates agreed in national negotiations. Thus "*wage pressure*" *is consistent with the fourth type of demand inflation, D above.*

(*b*) Where commodities are traded on a world market their price may be regarded as fixed by world demand; and a rise in costs (originating in a rise in demand *elsewhere*) may be regarded as forcing up prices of products here.[1] This would be possible provided only that prices are not *perfectly* flexible. Thus "*import cost inflation*" *is consistent with any but the first type of demand inflation,* i.e., *types B, C and D above.*

Wherever prices are neither perfectly rigid nor perfectly flexible, it is possible to regard them as being jointly determined, in part by demand and in part by cost influences. Thus: (*a*) wage costs may be thought of as partly determined by trade-union pressure (perhaps activated by a rising cost of living) and partly by the demand for labour; (*b*) prices may be thought of as partly determined by costs, but the profit margin may be considered to be a function of demand. There are clearly therefore various possible combinations of cost and demand inflation which, however, will not here be systematically catalogued.[2]

Trade unions (and perhaps commodity producers also) are in a sense always exerting pressure for higher prices. There is no need to single this out as a separate influence unless it is effective; and unless its effectiveness is not merely a function of demand conditions but may vary independently of the latter. One example of such an independent force would be effective pressure for wage increases in compensation for price increases.[3]

It is sometimes argued that cost pressures are never in fact effective except when there is excess demand; so that cost inflation is not a theoretically tenable concept, but an illusion.[4] The argument is that firms will not for

[1] Even in a perfectly competitive economic system, the prices of manufactured products would rise in such circumstances. Which type of reaction is taking place in any actual case can perhaps be distinguished only by the timing of cost and price changes.

[2] In the article already referred to (*Oxford Economic Papers*, October 1956) I tried to show how "cost" and "demand" explanations of price changes could be integrated: see particularly paras. 36–45.

[3] This example assumes, as I believe can be shown, that variations in the rate of price increase are not typically correlated with variations in the pressure of demand.

[4] This thought may have underlain the remark of the Governor of the Bank of England:

"My Lord Mayor, I hear and read much learned discussion about whether we are in a 'cost-push' or 'demand-pull' inflation. I suspect myself that they are parts of the same animal and I am reminded of a fascinating creature in one of the nursery books called the 'push-me-pull-you.' If we can shoot one end of that animal, the other end will not long survive." (Speech at the Lord Mayor's dinner to the Bankers and Merchants of the City of London, October 8, 1957.)

long consent to pay higher wages unless they expect to be able to sell the same volume of goods at higher prices; and that they will not be able to sell as much unless there is excess demand. Neither part of this statement seems true:

(*a*) Particularly when the firms in an industry are all affected by a similar increase in costs, it appears quite common for them to raise prices even when this may react unfavourably on their sales.[1]

(*b*) Even if this were not the case, it is still true that if all firms raise wages, the incomes out of which the goods will be purchased will be raised by as much as the costs of production.[2] Firms will therefore in fact be able to sell the same volume at higher prices.

It is certainly true that prices and wages can rise when demand is not excessive or even high. This being so, there seems no reason why cost pressure should not be one possible cause of rising prices.[3]

There is also a rather similar argument that rising prices are impossible without an elastic money supply.[4] This raises another large range of questions. But it may be permissible to say here shortly that this argument seems to be a variant of the argument about the necessity of high demand. Various views are held about the way in which monetary restriction works. If the "money supply" is held constant in face of cost pressures tending to force up the value of the national product, one may believe that the velocity of circulation will reach an absolute limit beyond which it cannot be increased. Or (more reasonably in my view) one may believe that while there is no real limit to the velocity of circulation, such monetary restriction will raise interest rates. But the effect in either case, whether slow or fast, must operate via a reduction in the pressure of demand. If, then, costs can rise although demand is not high (as argued above), they can also rise even though the monetary supply is fixed.[5]

[1] It may be worth instancing here the developments in textiles in 1951–52. The rise in costs was very large, and if passed on as higher prices it was bound to raise the relative price, and thus reduce sales, of clothes. Prices were, however, raised, even though there was then a recession in demand for textile products.

[2] This is strictly true only for a closed economy or the world as a whole.

[3] This cautious formulation is intended to refer to the fact that prices and wages were rising in the late thirties, without, however, going on at this stage to speculate as to the precise cause of the rise in prices and wages then.

[4] For instance, Professor Robbins has written recently: "... there are many observers of the situation, whose judgement I respect, who would differ considerably in emphasis, giving most weight throughout to the push of costs, less to the pull of demand, than I find appropriate. But on one point I hope we should all be agreed: namely, that none of this could happen if there were a sufficiently strong control of the supply of money" (*Lloyds Bank Review*, April 1958, p. 6).

[5] Recent experience certainly shows that (whether or not because of cost pressures) prices may rise although the money supply (as usually defined) is constant.

There seems then to be only one *general* ground for denying that cost inflation is a possible independent explanation of rises in prices, namely, that the process of price and wage determination is such as to rule out the possibility of cost influences. The part played in this process by trade unions is one of the key questions which needs to be discussed. Part of the effect of high demand may work through affecting what trade unions do—provided only that they are an effective part of the chain of cause and effect. But in this case there seems no general reason why they should not also exert some independent influence, not purely reflecting the level of demand. Two sorts of evidence seem then to be relevant. Evidence about the working of the economic system may throw light on how demand impinges and upon which sectors of the economy. The relative importance of demand and cost influences may, however, vary, and their importance in any actual situation can be decided only in the light of particular evidence.

If it is true that most prices are jointly determined by cost and demand influences it may be difficult to define terms precisely. Suppose, for instance, that prices in some period rise 10%; and that if total excess demand had been zero, they would have risen only 5%. The latter might be called the cost-inflation element in the price rise. But if demand had been yet lower, the rise in prices might well have been less also, so that cost inflation as defined above would itself contain a demand-sensitive element. Only if this is not the case is the definition of the cost influence clear cut.

II. The Doctrine of the Cohen Report

The emphasis in the Cohen Report is on demand as the main cause of price inflation. The leading statement is perhaps the opening of Chapter III (on "The Causes of the Rise in Prices and Incomes, 1946–57"):

> "What has been the cause of the rising trend of prices and incomes since the end of the war? Viewing the period as a whole, we incline to think that the main cause has been an abnormally high level of demand for goods and services in general, maintained for an abnormally long stretch of time" (para. 78).

The Report is, however, not always fully explicit on the subsidiary but still important questions. Examples of such questions are the degree to which demand would have to be reduced to stop prices rising; or the point of impact of the force of demand. It is not entirely clear whether cost inflation is regarded as theoretically impossible or merely unimportant in fact. But at various points in the Report there are statements about how price rises occur which seem logically to imply that cost pressures were and are operative. Most essays in economics (including doubtless this review) contain inconsistencies, and this must especially be true of a document produced in committee for a non-technical audience. The present critique is therefore intended less as criticism than as a way of elucidating the issues.

The Report does not attempt to discuss fully the evidence on which its view is based. It has therefore seemed most convenient to defer discussion of the empirical evidence to Section III. Comments are grouped below under three heads.

(a) *Whether* High *Demand or* Excess *Demand Is to Blame*

The tone of the discussion suggests that the Council considers demand not only to have been high, but in considerable excess; and that it is *excess* demand that is to blame for rising prices. Thus the country is described as having pursued since the War various objectives which made "in the aggregate a greater demand" than could be fully satisfied (para. 78). This view also seems implied by such phrases as that unfilled vacancies were "well in excess" of the number of unemployed (para. 81), or that total demand needs "damping down" (para. 134). There is one passage where *excess* demand is explicitly mentioned as the cause of rising prices and wages (para. 83). But in this passage it is *local* excess demands that are being talked about; and the Council might argue that not only must there be no general excess but also no "pockets" of excess demand, so that even "high" demand (*i.e.*, with some "pockets" of excess) could be inflationary.[1]

There is then room for doubt as to how far the Council wished deflation to go. The Report contains apparently critical references to full employment (para. 80 and Summary 13); and in commenting on the increase in unemployment between January 1956 and January 1958, it remarks that "no one should be surprised if it proves necessary to go somewhat further than that" (para. 135). Nor is there any discussion of the fact (noted, however, in Chapter II, "Facts and Figures") that in the years 1934–39 wages and prices rose, though unemployment was of the order of 10–15% and demand (presumably therefore) very low.[2] Various reasons might be given for supposing that an extreme deflation is not now necessary to stop prices rising. But the point is worth discussing, because the virtue of disinflation as a route to price stability depends entirely on the lengths to which it requires to be carried.

(b) *The Point of Impact of High Demand*

The next question to consider is what the Report has to say on the "point of impact" of high demand. The answer, perhaps excusably, is indefinite. Thus in most cases when rising prices are mentioned as an

[1] The Council argue in this passage that inflationary effects may spread beyond the area where there is excess demand. The implications of such a process of transmission are examined more closely below.

[2] After the Report was published Lord Cohen made a statement denying that the Council was in favour of a return to massive unemployment (in a statement to a meeting of economists at the London School of Economics, reported in *The Times* for March 28, 1958). But though various figures were quoted about increases in unemployment envisaged by other people, no indication was given of what the Council itself proposed.

effect of high demand, " rising incomes " seem to be mentioned also (*e.g.*, paras. 78 and 83); this is formally correct (since a rise in prices is always an increase in someone's income), but evades the question of causal priority. When the effect on profits is touched on, there is a careful refusal to regard profit inflation as universal (which would imply that the first impact was on prices); but the possibility that costs might be increased by demand is not fully explored:

> " In many cases the first effect of a rising stream of money demand is on trading profits; even if the tide of inflation reaches them first in the guise of an increase of costs, business men are usually well placed for protecting their profit margins " (para. 93).

Nevertheless, it seems fair to say that the implicit emphasis is on the way demand affects wages, for this is discussed a good deal, while the (direct) effect on prices is hardly discussed at all. The most detailed discussion of the impact of demand (para. 83, to be quoted in full later) puts the emphasis on wages as the variable:

> "There may be no excess of demand for bread, but the baking industry may be forced to raise the wages paid to its employees by the fact that wages have risen in the steel industry, where there is excess demand.

A separate chapter is devoted to " wages under controlled demand," of which the message is briefly this:

> ". . . a policy of damping down the intensity of total demand . . . must be expected . . . to cause a check or reversal of that tendency of the rate of rise in average earnings to outstrip the rate of rise in standard wage rates . . ." (para. 134).
>
> " Much more important and difficult is the question of the effect to be expected from a decline in the intensity of demand on the behaviour of negotiated wage rates " (para. 136).

At this point the Council states rather forcefully its belief that a decline in the intensity of demand will " stiffen the resistance of employers to claims for increased *wage rates* " (para. 137, my italics). This clearly envisages the fourth category of demand inflation, type D in Section I above—though other types of effect (as on wage *earnings*) are equally clearly envisaged also.

It is a corollary of the view that demand affects wages rather than prices that prices should be regarded as relatively " sticky "; and the existence of such stickiness is explicitly mentioned at one point:

> " . . . in a phase of *moderately* reduced demand, formal or informal arrangements for the maintenance of prices, . . . may exercise a greater influence than they do either in positions of *very high* demand, when they are largely ineffective, or in positions of *very low* demand, when they are liable to be disrupted by ' cut-throat competition ' " (para. 118).

(c) *The Possibility of Cost Inflation*

It seems useful next to comment on a series of scattered remarks which, taken together, seem inconsistent—or at least rather difficult to reconcile—with the emphasis given in the Report to the sufficiency of disinflation as a remedy for rising prices.

There is one interesting passage which has already been referred to, where the Council attempts to deal with the variety of conditions likely to exist in different sections of the economy, and of the consequential interactions between them:

> " The view that the main cause of the rise in incomes and prices is to be found in the general level of demand does not, of course, mean that in every case of a rise in wages or prices the immediate cause is an excess of demand *at that point.* There may be no excess of demand for bread, but the baking industry may be forced to raise the wages paid to its employees by the fact that wages have risen in the steel industry, where there *is* excess demand. The baking industry may give the increase with some apprehension of the effect on their costs and prices and so on their sales. But in a general environment of buoyant demand and monetary expansion it will generally turn out that the rise in wages which caused these anxieties has also ensured that the demand for bread will not be checked by the rise in its price " (para. 83).

This statement seems to carry two implications:

> (i) Though wages rise in industries faced with excess demand, it is implied that they do not fall in industries faced with inadequate demand. This in turn would seem to imply that the benefits of a general policy of disinflation must beyond a point rather rapidly diminish as fewer and fewer pockets of excess demand are left.
>
> (ii) The absence of excess demand for one industry's products is no bar to its raising its prices. It would seem to follow that the absence of excess demand in the economy as a whole may remove a positive force making for price increases, but does not provide a positive hindrance to other forces making for price rises, if they exist.

Together these seem a significant qualification to the efficacy of a policy of disinflation.

It is consistent with this view that various Government measures should be regarded as exerting an " upward push " upon prices (independent, that is, of any effect they have on the level of demand). Those mentioned as having this effect are subsidy reductions (para. 86) and rent decontrol (para. 87).

It is also admitted that the rise in import prices exerted an upward pressure upon prices independent of the effect of high demand. Thus the Report refers (para. 85) to the " two short phases, 1946 to 1948 and 1950

to 1951, during which British import prices rose very sharply, in each case on the average by about a quarter." At least as regards the second of these occasions " the working through " of the increase in import prices " played an important part in the development of prices and wages during the next few years " (para. 85). This is at least an important qualification to the view that high demand was the main cause of rising prices—even if only the direct effect of rising import costs, not any indirect effect via higher wage claims, is considered.[1]

But the most important question is how far trade unions have played or can play an independent role in promoting price increases. The passage in the Report on this question does not make it clear what view the Council takes:

> " We have laid greater stress on the demand side of the story than some whose opinions we have studied. But we are well aware that, whatever *might* have been the case, the wage advances were in fact secured by workpeople organized in powerful Trade Unions and using, among many other weapons in their armoury, arguments based on preceding movements of the cost of living. That such Unions exist and such arguments are used may have great importance for the near future even if it should be of less importance than some people suppose in explaining the recent past. Whatever its initiating cause, the habit of demanding large and frequent increases in monetary rewards grows by what it feeds on, and may be found to persist after any technical justification for it in the state of the labour market has passed away . . . " (para. 89).

It may be that this means that wage claims will then be effective,[2] though perhaps only during a transitional period. But even so, it leaves many doubts:

(*a*) It is not clear why wage pressure should then be only a temporary phenomenon. But if it is more than temporary, then the removal of demand inflation has not alone been enough to arrest the process.

(*b*) If wage pressure can be effective when there is no excess demand, it is not clear why it should not have been operative also (as part-cause of the rise in prices) when there was excess demand.

[1] The *direct* effect of the rise in import costs can be regarded as accounting for almost one-quarter of the rise in prices in the period 1946–54: see Table V of my article in *Oxford Economic Papers*, October 1956.

[2] This is not a necessary interpretation of the phrase " technical justification," but is suggested by an argument to the same effect by Professor Robbins:

> " It is probably true to say that, when you put the brake on a demand inflation you are then confronted with the danger of a cost inflation. If the trade unions have got into the habit of cashing in on the demand inflation every spring, then very naturally they will tend to go on trying to do so for a time even though the increase of demand has slackened. They will continue to press for increased wage-rates; and now, if inflation proceeds, it can be described as having its origin on the side of costs " (*Lloyds Bank Review*, April 1958, p. 6).

As already pointed out, the Report admits the effectiveness of other sorts of cost pressure. The case against believing in the effectiveness of trade-union pressure requires therefore to be separately established.

The Report, moreover, appears to be somewhat inconsistent on this question:

(*a*) It seems to imply that wage claims based on a rise in the cost of living *could* be effective:

> " Claims for increased wages will no doubt be based largely on increases in the cost of living. It cannot be denied that the cost of living has risen substantially in the past year, but we do not think this is conclusive. *It must also be remembered* by all concerned . . . " (para. 138, my italics).

(*b*) If wages were determined by demand, exhortation ought to be useless; yet in the above passage the Council appears to be writing as if their words would have an influence on those concerned.

(*c*) The Council rejects the idea that the Government or some other body should announce a percentage figure each year of the amount by which average money wages might increase without overtaking the rise in productivity. But it rejects the idea on the grounds that no industry would be content with less than the average increase (para. 147 and summary 31). This can only mean that some trade unions would be discontented, and that they have some power to affect the increase in wages they get.

At one point (para. 88) the Council refers to—

> " a school of thought which takes rather a different view as to the main cause of the rise in prices. This view lays great stress on the power of Trade Unions. . . . It states that, if wages and other incomes are pushed up, the level of money expenditure will tend naturally to rise with them. It follows, so the argument runs, that there is nothing in the economic system which ensures that the rate of increase of money wages and other incomes is kept within the limit of the growth in average productivity. When they exceed that limit—as they have done in recent years—businesses in general find that their costs per unit of output have gone up; but they also find no difficulty in raising their prices so as to maintain their profits. The exact level of demand has not, according to this account, been crucial to the result of the successive wage-rounds. . . . " [1]

To my mind, no good reasons have been given for rejecting this view out of hand; [2] indeed, if the foregoing critique is correct, many passages in

[1] I have intentionally truncated this passage so as to confine attention to what seem to me the main points.

[2] The following paragraph (89) of the Report rather dodges the issue. It says that no confident answer is possible because it is so hard to imagine what would have happened if trade unions had been non-existent or weak. But if it is difficult to say precisely how greatly they contributed to the price rise, it is equally difficult to be confident that high demand was the main cause of rising prices.

the Report itself are consistent with it. The next section therefore considers how far such questions can be tested against the empirical evidence.

III. The Possibilities of Empirical Verification

When we try to explain why prices rise it is evident that the situation to be explained is complex, and that useful hypotheses have to explain *groups* of inter-related facts. This necessarily makes verification or rejection difficult. The following sections first discuss the relevance of some of the facts quoted in evidence in recent discussion, either in the Cohen Report or elsewhere. There follow some suggestions for further research.

(a) *Evidence Cited in the Cohen Report and other Recent Discussion*

The Cohen Report quotes two kinds of evidence that high demand has been the cause of rising prices. The first is that since the War unfilled vacancies notified to the employment exchanges have generally been well in excess of the number of the unemployed (para. 81). But as the Report itself admits (as a possible view, not its own: para. 88), this is " evidence of the persistence of a high demand for labour, but not of its being the main cause of the inflation." Thus, though consistent with the Report's thesis, it does not demonstrate it.

Expressed as a proportion of the number of employees, the excess of unfilled vacancies over unemployment has never in the post-war period been more than a few per cent; this, however, is consistent with the excess demand for goods and services having been considerable.[1] The smallness of the observed excess therefore neither proves nor disproves its influence.

The second piece of evidence cited by the Report (para. 82) is that, partly because employers have been willing to pay more than nationally agreed wage-rates, wage-earnings have generally risen faster than wage-rates as measured by the Ministry of Labour's index. Here again, however, the evidence does not bear the weight put on it, as the Report again (as a possible view not its own) admits:

> " . . . though this disparity may reflect the pressure of employer demand, it has other causes as well: and in any case it remains true that much the greater part of the rise in earnings can be accounted for by the rise in wage-rates " (para. 88).

The main question (discussed in sub-section (*b*) below) thus seems to be how far the course of *wage-rates* has been affected by the level of demand.[2]

[1] See the chart on p. 69 of the Report and also the article by Mr. Dicks-Mireaux and myself (*Oxford Economic Papers*, February 1958), from which the figures are quoted.

[2] Professor Robbins in interpreting the evidence in the same sense as the Cohen Report adds this comment:

> " The demand for labour was so strong that, even if the trade unions had been much weaker, it is probable that a similar movement would have taken place. Indeed, paradoxically enough, it might have been more accentuated: the cumbersome process of collective bargaining tends to take longer than the operations of freer markets " (*Lloyds Bank Review*, April 1958, p. 5).

To show that demand alone would have been enough to account for the rise in wages, even if trade unions had been weaker, is, however, not to the point. If the process of wage determination is indeed (as Professor Robbins says) cumbersome, wages may now by no means respond perfectly freely to demand. To show demand is high is therefore not to show it was causally important.

It is convenient at this point to refer also to the behaviour of profits. The evidence is perhaps sufficient to reject the idea that prices are highly variable, and thus to reject the theory of demand inflation categorised as type A in Section I above. This theory requires that the onset of high demand should be met by a profit inflation. The mobilisation period in the early years of the last war (the situation in fact discussed by Keynes in *How to Pay for the War*) ought to be a good test case. But it does not seem that there was any great increase in the share of profits over these years.[1] The economy was then " controlled "; but it is difficult to believe that the controls then existing were highly effective. The same objection could in any case not be used for the reverse case of the depression of 1929–32; there was then some decline in the percentage share of profits, but by only a few percentage points.[2] Inspection of the national-income data back to 1870, and of such figures as there are of profits as a share of turnover in different industries, reveals some variation in profits.[2] But the variation seems too narrow to be compatible with the picture of a freely adjusting type of economy.

The relative stability of profits has, however, also been quoted in an almost opposite sense, as evidence that cost inflation cannot have been operative. Professor Robbins, for instance, says: " If the prime movement had been on the side of costs, the prospect of profits would have been continually threatened." [3] Professor Paish argues similarly, but is more cautious, saying only that if wage push were the reason for price rises " one would have expected that in the initial stages of the renewed inflation the wage rises would have been, to some extent at least, at the expense of profits." [4] But the argument seems no more conclusive than the other two. It would be valid only if demand imposed a ceiling to the price level —which cannot be supposed to be the case if one admits the possibility of cost inflation. For a cost inflation is hardly likely unless employers can and do increase prices.

Any direct and obvious reason for believing in demand inflation thus

[1] The share of profits and rent (or of profits alone) in gross national income declined through the War. Profits and rent as a percentage of national product, *excluding the income of the armed forces*, seem to have risen by 1 or 2 points between 1938 and 1940 (or profits alone by 3 points). (See *Statistical Digest of the War*, H.M.S.O. 1951, Table 180.)

[2] Data and references are quoted in my " Analysis of the Generation of Price Inflation," *Oxford Economic Papers*, October 1956, paras. 63–4.

[3] *Lloyds Bank Review*, April 1958, p. 5.

[4] " Inflation in the United Kingdom, 1948–1957," *Economica*, May 1958, p. 95, being Professor Paish's memorandum to the Cohen Council.

seems to fall to pieces when critically examined. The same would be true of direct and obvious reasons for believing in cost inflation.

(b) *Suggestions for Possible Research*

To end this review on a more positive note, it may be worth making suggestions about the kind of further research which might throw light on the questions at issue. Two questions in particular are suggested as accessible to further research, namely, price behaviour and wage determination.

Two approaches to the question of price determination suggest themselves. It might first be useful to have a general survey, sector by sector, of different markets describing the procedure of price changing and its frequency. The aim would be to make a general assessment of the degree to which prices were freely sensitive to demand (my own impression would be that the area of administered or conventionalised pricing would be shown to be fairly extensive). A review of the operation of price controls might also be interesting in this connection. It would also be relevant to have a summary of available indications of the extent of excess demand for goods and services: [1] for if heavy excess demand persists, this itself implies that prices are fairly insensitive to demand.

It would, second, be instructive to have a series of studies of the price behaviour of individual industries.[2] The main aims would be to gauge the reaction respectively to changes in the pressure of demand, and to changes in costs. Information on the length of any lag between cost and price changes would also be valuable (see below). The period of the rise in import costs in 1950–51 and their subsequent fall would thus be particularly important. Such studies would undoubtedly throw light on many matters other than price fixing, and ought perhaps to be conceived with wider questions in mind.

A key question in considering wage determination is the role of trade unions. It is at present a matter of uncertainty how far the rises agreed in national negotiations influence wages actually paid: it might, for instance, be that the latter are chiefly determined by the conditions of demand with which separate firms (or perhaps industries) are faced. Considerable light should be thrown on this by analysis of the relative movements of wage-rates and wage-earnings. Such analysis cannot well be done on the basis merely of time series of two national averages. But until recently only a single national average wage-rate series was publicly available.[3]

[1] It has already been argued that this is likely to be very different from the excess demand for labour, of which statistics of unemployed and unfilled vacancies provide an indication.

[2] A pioneering example of a behavioural study based on aggregative data for various industries was Dr. L. Rostas' *Productivity, Prices and Distribution in Selected British Industries*, N.I.E.S.R. Occasional Papers XI (Cambridge University Press, 1948).

[3] Indices of wage-rates in different industries have recently been published by E. Devons and R. C. Ogley in *The Manchester School* for May 1958. These figures may make possible some comparisons of rates and earnings in different industries. But it has to be remembered that while the rates figures refer to various *occupations*, the earnings figures refer to industries, many of which employ workers belonging to many different occupations.

Two complementary approaches to the study of wage determinaton seem possible. Again it would seem useful to have a series of studies industry by industry, describing the procedure of wage changes and the institutional background, and analysing the statistical material, official or other, available in each industry.

Second, it would seem worth subjecting the available official data of wage-rates and earnings to closer statistical analysis than they have yet received. The results published by Professor Brown [1] suggest that before the War the rate of wage change was strongly influenced by the level of unemployment, but that any such relation since the War has been swamped by the dependence of wage changes on price changes. This suggests that it would be worth testing the more refined hypothesis that the rate of wage change is a function both of previous price changes and of the pressure of demand for labour.[2] Multiple regression analysis of time series might therefore be applied both to wage-rate and wage-earnings data.[3] It might also be possible to test the hypothesis that relative wages are affected to some degree by the relative strength of demand for labour in different industries.[4]

It is evident that research into this type of problem quickly runs into difficult territory. But it is hard to believe that even the data at present available have been at all fully exploited. Research and—equally important—the discussion of the results of research, both take time. But the questions at issue are empirical questions and there can be no other way to provide the answers.

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[1] A. J. Brown, *The Great Inflation* (Oxford University Press, 1955), pp. 90–103.

[2] While wage changes may be a function of price changes, price changes are presumably also a function of changes in labour costs. It might well be impossible to treat price changes as an independent variable in explaining wage changes unless the time lag in one or other of the relations was considerable. Hence, as already suggested, information on cost–price lags would be valuable.

[3] Some work on these lines is being undertaken by Mr. Dicks-Mireaux at the National Institute.

[4] There are, however, tricky problems in testing such a hypothesis. For instance, if relative earnings were very sensitive to differences in excess demand, they would *eliminate* excess demand; and there would then be *no* correlation between relative wage changes and relative demand as observable.

CURRENT TOPICS

THE Annual General Meeting of the Royal Economic Society was held on Thursday, July 17 at the London School of Economics. Sir Robert Hall was elected to the office of President in succession to Sir Alexander Carr-Saunders, who was re-elected Vice-President. Sir Donald MacDougall was elected to an Honorary Secretaryship in the place of Sir Robert Hall, and Professor Brinley Thomas was elected to the Council. With these exceptions, the Council and Officers were elected without change for 1958–59. After the formal business Sir Alexander Carr-Saunders delivered his Presidential Address on " The Place of Economics and Allied Subjects in the Curriculum."

THE Secretary reported on the membership and finances as follows:

	1957	1956	1939	1914
New Fellows and Library Members elected . . .	445	436	490	50
Fellows lost by death, resignation or default . . .	378	402	496	33
Number of Fellows and Library Members on December 31	6,172	6,105	4,572	694
Total Compounders included in above total . . .	1,747	1,739	1,155	159
Surplus of Income over Expenditure	£1,313	—	—	278
Surplus of Expenditure over Income	—	31	38	—

Professor C. F. Carter, Professor of Applied Economics in the Queen's University, Belfast, has been elected to the Stanley Jevons Chair of Political Economy in the University of Manchester, vacant through the resignation of Professor Arthur Lewis.

DR. THOMAS WILSON of University College, Oxford, has been elected to the Adam Smith Chair of Political Economy in the University of Glasgow in succession to Professor A. L. Macfie.

Studies in Economic History, the collected papers of George Unwin, arranged by Professor R. H. Tawney and published by the Royal Economic Society in 1927, have for many years been out-of-print. They have now been reprinted by Messrs Frank Cass and Company, 91 Southampton Row, London, W.C.1, and are available as before on special terms to members

of the Royal Economic Society. The published price is 55*s.*; the special price to members is 35*s.*; application by the latter should be made through the Secretary of the Royal Economic Society, The Marshall Library, Downing Street, Cambridge, accompanied by a remittance.

THE Trustees of the Houblon-Norman Fund, on the recommendation of their Advisory Committee, have made the following awards for 1958/59.

Research Grants

Mr. E. A. Boehm, Lecturer in Economics, University of New England, Armidale, New South Wales.	The Economic Depression in Australia in the 1890's.
Mr. A. B. Cramp, Research Student, London School of Economics. (Renewal.)	Operation of Bank Rate, 1822–60.
Mr. K. F. Dixon, Westminster Bank Ltd.	Early Stages of Development of the London Money Market.
Mr. R. M. Fitzmaurice, Midland Bank Ltd.	Banking in Cornwall, 1700–1900.
Mr. J. Jewkes, Professor of Economic Organisation, University of Oxford. (Renewal.)	Economics of the Evolution of the Aircraft.
Dr. V. C. Lutz.	Banking in Italy.
Dr. G. J. de C. Mead, Bank of England. (Renewal.)	Intendants, as part of the Financial and Administrative System in France in the 18th Century.
Mr. R. C. Opie, Lecturer in Economics, London School of Economics.	Banking in Germany.
Dr. Sidney Pollard, Lecturer in Economic History, University of Sheffield.	The Genesis of Modern Management.
Mr. Neil Runcie, Lecturer in Economics, New South Wales University of Technology.	Hire Purchase in the United Kingdom and the British Dominions.
Dr. S. G. Sturmey, Lecturer in Political Economy, University College, London.	British Shipping.
Dr. Brinley Thomas, Professor of Economics, University College of South Wales and Monmouthshire.	Home Investment and Foreign Lending in the United Kingdom, 1890–1913.
Mr. G. A. Yewdall, Research Student, University of Leeds. (Renewal.)	Population movements in certain northern towns during the early part of the nineteenth century.

An offer of awards for 1959/60 will be made in due course. Further information may be obtained from the Secretary, Houblon-Norman Fund, c/o Bank of England, London, E.C.2.

THE following have been admitted to Life Fellowship of the Society:

Ballester, J. H. McLughan, H. E. I. Varma, V. P.
Jayawardena, N. U.

THE following have been admitted to Fellowship of the Society:

Ackroyd, D.	Evans, D. M.	Olaseinde, F. O.
Akkara, P. V.	Gill, W. T. H.	Onyebuchi, O.
Allhusen, D.	Goate, P. J.	Oshima, Prof. H. T.
Andic, F. M.	Gurg, M. C.	Osman, H. A.
Appleton, P. G.	Hagger, A. J.	Perkins, Dr. J. O. N.
Attwood, T. J.	Hamlyn-Harris, H. L.	Peters, O. O.
Barber, Prof. W. J.	Head, J. G.	Price, H. G.
Batty, J. C.	Hillan, J.	Rees, G. L.
Belshaw, Dr. M.	Hunt, Miss S. B.	Sailors, Prof. J. W.
Bercow, S.	Ita, A. O.	Scott, I. D., Jnr.
Bernasek, N.	Jayachandran, Prof. G.	Scott, J. W.
in den Bosch, Dr. B. J.	Jones, R. C.	Shuetrim, C.
Candler, Dr. W.	Kotas, R.	Siegel, Prof. P. N.
Chapman, R.	Mar, P.	Singh, J.
Chawcour, E. S.	Morgan, D. F. P.	Snelgrove, G. F.
Chokshi, R. B.	Murphy, Prof. M. E.	Speedy, S. L.
Colley, G. A.	Natarajan, P.	Stobbe, Dr. A.
Dack, C.	Nayak, U. N.	di Tella, Dr. G.
Eady, G. E.	North, J. O.	Thompson, F/L R. J.
Eltis, W. A.	Ogu, C. S.	Van Noord, A.
Esteve, T. A.		

THE following have been admitted to Library Membership of the Society:

Banco Nacional de Fomento, Tegucigalpa, Honduras.
College of Technology, Art & Commerce, Oxford.
Committee for Economic Development, Washington.
Institute of Economic Development & Research, University of the Philippines.
National Economic Council, Manila, Philippines.
Punjab National Bank Ltd., Delhi.
The Research Unit Ltd., London.
Service de la Statistique et de la Mécangraphic de la Cote d'Ivoire, Abridjan.
United Kingdom Information Services, Toronto.

RECENT PERIODICALS AND NEW BOOKS

Journal of the Royal Statistical Society

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Gospodarka Planowa (Polish text)

FEBRUARY 1958. *The Main Problems of the 1958 Economic Plan. The Level and Allocation of Producers' Fixed Investment:* W. LISSOWSKI. *Planning the Long-term Development of Motor Transport in Poland:* W. JURASZYŃSKI. *In Search of the Right Direction to Expand the Polish Coke and Chemical By-products Industry:* A. PIEŃKOWSKI. *On the Long-term Programme for the Development of Forestry and Timber Production:* R. FROMER and W. FABISZEWSKI. *Methods of Drawing up Regional Manpower Balances:* W. CZRKOWSKA. *Economic Achievements of the Rumanian People's Republic. Yugoslav Foreign Trade:* T. GRANFIL. *The Reorganisation of Retail Trade in the German Democratic Republic:* K. KRASZEWSKI. *Why the Introduction of Modern Technology Fails to Improve the Economic Situation in France. The Influence of Rural Non-farm Employment and Farm Output and Farmers' Living Standards:* I. KOWALSKA. *New Methods of Regional Planning in the Łódź Voivodship:* E. SAPKOWSKI.

MARCH 1958. *The Conditions of General Equilibrium of Production and Consumption in a Socialist Economy:* K. ŁASKI. *New Co-ordinative Methods in Economic Planning:* K. PORWIT. *The Long-term Development of Ferrous Metallurgy (1960–75):* J. GWIAŹDZIŃSKI. *The Economic Effects of Chemicals Production Based on Coke-gas:* A. MARKOWSKI and M. RAKOWSKI. *On the Profitability of Cattle and Pig Breeding:* A. BODNAR and E. GRZELAK. *The Major Problems of the Economic Development of the Polish Coastal Regions:* W. MYŚLENICKI. *Statistics and the Needs of Wage-research:* W. KRENCIK and S. SPOTAN. *Regional Statistics and the Requirements of Local Authorities:* K. PODOSKI. *On Trade Statistics once again:* M. MALICKI. *Changes in Planning and Economic Management in Czechoslovakia:* H. SWIDZIŃSKI. *Some Problems of the Second Chinese Five-year Plan (1958–62). Investments in 1957:* A. SZERWENTKE. *The Workers' Fund for 1957 in Ship Repair-yards:* E. OLEJNICZAK.

Plánované Hospodářství (Czech text)

No. 4, 1958. *Introducing New Methods of Management in the Economy. The Further Expansion of Scientific and Technical Co-operation between the Soviet Union and Czechoslovakia:* N. PEROVSKY. *The Growth of the Productivity of Labour:* M. PICK. *Concentrating the Production of Building Materials in Individual Districts:* A. BOŘUTA. *Forms of Concentrating Production in Monopolistic Capitalism and under Socialism:* R. KOCANDA. *Questions of the Efficiency of Investment in Long-term Planning:* V. KOMAREK. *The Current Practice of Price Formation:* V. VRAŠTIL.

No. 5, 1958. *The Present State of Czechoslovak Agriculture and its Long-term Development Prospects:* J. KASKA and others. *Factory Transportation:* K. DOLANSKÝ. *Raising the Efficiency of Power-plant Construction:* V. SILHAN. *Problems of Long-term Planning:* J. KOLÁŘ. *Against the Wrong Interpretation of the Method of Wholesale Price Formation:* M. POPELKA and J. TYPOLT. *Planning and Price-formation in Building:* O. STRÁDAL. *The Lowering of the Real Wages of American Workers:* A. KAC.

Planovo Stopanstvo (Bulgarian text)

No. 1, 1958. *The Extension of Credits for Small Mechanisation Projects:* D. KHRISTOV. *The Co-ordination of Road Haulage:* N. KONSTANTINOV. *On the Direct Supply of Metals under Agency Contracts:* D. ASENOV. *On the Planning and Organisation of Material–Technical Supply:* R. PICHIKOV. *On the Organisation and Planning of Material–Technical Supply:* I. VRANCHEV. *Planning Technical Progress:* N. VALEV.

Finansi i Kredit (Bulgarian text)

No. 1, 1958. *The Appeal by the Party and Government. The State Economic Plan and Our Tasks:* K. LAZAROV. *The Functions of the Financial System in the General Economic Law of Socialist Accumulation:* G. MANEV. *The Economic Efficiency of Capital and Long-term Credits:* D. SAPUNDZHIEV. *For a Uniform System of Agricultural Price-formation:* B. PETKOV. *Cost Accounting at the Workshop Level in Certain Enterprises in Ruse:* M. DEVEDZHIEV. *The Financial Situation in Indonesia.*

No. 2, 1958. *The Tenth Anniversary of the Soviet–Bulgarian Treaty of Friendship, Co-operation and Mutual Assistance. The 1958 State Budget and Tasks of Finance Agencies:* K. LAZAROV. *Socialist Construction and the Law on Voluntary Contributions (in Labour and Money) for Local Amenities:* I. DIMITROV. *The Improvement of the Collection of Turnover Tax by Means of the Introduction of Patents:* S. KUNCHEV. *Fundamental Trends of Bourgeois Theories on Money in the Light of Marxism:* YA. ALEKOV. *The Bank's Use of Clearing Payments between Enterprises:* S. KITANOV.

Ikonomicheska Misl (Bulgarian text, French and Russian summaries)

No. 1, 1958. *The Communist Cause is Invincible. On the System of Premia in Our Industry:* I. ILIEV. *The Transfer of MTS to Autonomous Finance:* G. MOMESHKI. *The Influence of Retail Trade on the Production of Consumers' Goods:* A. MILOSHEVSKI. *The Industrialisation of the Underdeveloped Countries of South-East Asia and Their Economic Links with the Imperialist Powers:* T. VULCHEV. *Egyptian Foreign Trade and Bulgaro–Egyptian Economic Relations:* D. VASILEV. *Data on the Extension of Working Hours in the German Federal Republic:* T. LEVASHKY.

No. 2, 1958. *The Fundamental Tasks of the 1958 Plan. The Bulgarian Budget for 1958:* K. LAZAROV. *On Some Problems of Specialisation in Engineering:* K. LOZANOV. *The Distribution of Capital Investments and Overheads in Complex Industrial Enterprises:* D. YOSHINOV. *The Development and Consolidation of Collective Farms at a Higher Level:* P. KIRANOV. *Different Factors in Our Population Growth:* D. BALEVSKY and M. MINKOV. *On Establishing the Profitability of Economic Units:* TS. TSOKANOV. *Conference on Bulgarian Export Problems:* YU. PATSOVA.

Ekonomist (Serbo-Croat text)

No. 1–2, 1957. *Non-economic Functions and Their Place in the National Economy:* M. MACURA. *Net and New Investment:* F. VASIĆ. *Some Fundamental Problems of Industrial Location:* B. SREBRIĆ. *The Social Product:* B. HORVAT. *Disparities between Yugoslav Foreign Exchange Rates:* M. FRKOVIĆ. *Urbanisation and Yugoslav Economic Development:* D. STEFANOVIĆ. *A Survey of the New Economic Organisations of Western Europe:* M. PETKOVIĆ. *Training Technicians in the Soviet Union:* M. VITEZ. *A Survey of the First Meeting of the Use of Mathematical and Statistical Methods in Economic Research:* D. NIKOLIĆ.

Ekonomski Pregled (*Serbo-Croat text, English summaries*)

No. 1, 1958. *The National Wealth of Yugoslavia at the End of 1953:* I. VINSKI. *Cost Comparisons Between Enterprises as a Method of Improving Efficiency:* J. GOJANOVIĆ. *Motive-power in Croation Industry:* V. HUDIN.

No. 2, 1958. *Workers' Councils: Their Social Function, Current Problems and Future Development:* D. ČALIĆ. *Problems of Vegetable Marketing:* A. STARC and P. CIMER. *Housing Problems:* D. RAČIĆ. *The Classification of Assets of Economic Organisations:* I. VITEZ.

Statistikai Szemle (*Hungarian text, English and Russian summaries*)

JANUARY–FEBRUARY 1958. *The Trend of Intensity in Stockbreeding during the Past Century:* A. KISS. *Indexes of Industrial Production:* O. LUKÁCS. *Level and Intensity of Production in Co-operative Farms:* J. FILE and J. SZILAGYI. *Some Problems of Production-cost Statistics:* Z. ROMAN. *The Gross or Net Characteristics of Indexes Expressed in Value:* L. DRECHSLER.

MARCH 1958. *On the Evolution of the Hungarian Official Statistical Service:* R. HORVÁTH. *Construction-in-process in the State Building Industry:* O. KEREKES. *On Mining Activity in 1958:* L. OHRENSTEIN and L. OROS. *Measuring the Productivity of Labour:* B. KORDA. *The Work of the Statistical Directorates in 1957: Calorific Food Consumption in Hungary:* GY. BALOGH. *Meeting of the Methodological Committee for Industry and Construction of the Central Statistical Office.*

Kozgazdasági Szemle (*Hungarian text, English and Russian summaries*)

No. 3, 1958. *Accuracy Limits in Calculating Profits and Material Incentives:* L. LUKÁCS. *Peasant Production and the Level of Real Income:* F. VÁGI. *Methods of Assessing the Efficiency and Profitability of Productive Investments:* M. MANDEL and others. *Quantitative Relations between Conditions of Production, Value of Production and Efficiency in Co-operative Crop Production:* J. SEBESTYÉN. *The Capitalist World Market in the Past Two Years:* I. VAJDA. *Some Problems of Political Economy and the Third Edition of the Economics Textbook:* GY. VARGA. *Economic Aspects of Traffic on Public Highways:* A. FEKETE. *On the Methods of Improving Co-operative-farm Income Distribution:* K. GYÖRFI.

No. 4, 1958. *The Main Characteristics of the Present Trends in the Capitalist Economy:* N. V. ORLOV. *Calculating the Profitability of Industrial Exports:* GY. CUKOR. *New Results in Co-operative Farming:* L. GÖNCZI and P. KIS. *Some Problems in the Distribution of the Means of Production:* A. MÁRIÁS. *Ricardo and the Problem of Value:* A. MÁTYAS. *World Agricultural Production and Trade Since the War:* V. JORGOS. *Western Europe's Energy Problems:* T. SZECSKÖ.

No. 5, 1958. *Marx's Life Work Triumphant:* Zs. ESZE. *The Law of Value in a Capitalist and in a Socialist Economy:* GY. GÖNCÖL. *The Crisis of Overproduction in the Militarised Economy of the U.S.A.:* F. MOLNÁR. *Some Problems Concerning the 1958 Budget and Our Method of Economic Management:* M. TIMÁR. *Some Data on the History of Farm Co-operatives in Hungary Before 1945:* B. NAGYPATAKI. *The Scientific Session of Economists of Socialist Countries:* GY. VARGA. *Experiences with the Direct Export Activities of Producer-enterprises:* K. SZIGETHY. *Biogas—a New Source of Energy in Agriculture:* M. RIBIANSKY. *An International Seminar in Prague on the Problems of Engineering Economics:* J. FÁTH.

Probleme Economice (*Rumanian text, French and Russian summaries*)

No. 1, 1958. *State Capitalism in Rumania under Popular Democracy:* S. POP. *Some Problems of Economic Calculation and Pricing in Building:* I. BLAGA. *The Place of Czechoslovakia in the Socialist System of the World Economy:* V. KAIGL. *The Role of State Capitalism in Some Underdeveloped Countries:* I. VEVERCA. *On the Methodology of Costing and Determining Efficiency on Collective Farms:* S. HARTIA and V. BAGHINSCHI. *Some Aspects of the Dynamics of Labour Productivity at the Flacăra Roşie Leather Plant, Bucharest:* GH. BELLU. *The State of Business in the U.S.A. Is Deteriorating:* L. STROJA. *From Partial to Full Truth:* GH. BODEANU. *Recent Data on the Centralisation and Concentration of Power in the U.S.A.:* T. SCHATELES.

No. 2, 1958. *Ten Years Since the First Congress of the Rumanian Workers' Party. Some Problems Concerning the Determination of Amortisation Rates in Rumanian Industry:* A. VAINER. *On the Development of Fuel Supplies:* L. MEDIANU. *A New Phase in the Direct Study of the Economic and Social Reality of Rumania:* G. RETEGAN. *A Marxist Critique of the Theory of Neo-Serfdom:* I. ADAM. *The Economic Conception of Rent in Bulgarian Collective Farms:* V. MIŞEV. *The Place of Latin America in the Capitalist International Division of Labour:* T. BECK. *The Effect of Bare Patches in Vineyard on Yields and Costs in the Odobeşti State Farm:* GH. IONIŢĂ.

No. 3, 1958. *One Hundred and Ten Years Since the Communist Manifesto:* S. EMIL. *On the Assimilation of New Products in Engineering:* V. SAVA. *The Reinforcement and Extension of Collective Property—Expression of the Consolidation of the Management of the Collective Farms:* C. COJOCARU and P. AVRAMESCU. *Some Aspects of the Increasing Decay of Rumanian Capitalist Finance Following the 1929–33 Crisis:* A. VIJOLI. *Rural Credit Co-operatives during the Transition Period in China:* TSEN LIN. *Some Problems of the Value Theory of the Labour Force and of Absolute Pauperisation:* J. KUZYNSKI. *Some Bourgeois Theories on the Industrialisation of Underdeveloped Countries:* GH. NISIPEANU. *On the Economic Efficiency of Some Industrial Investments in the Light of the Socialist International Division of Labour:* P. JICA and I. HAFFNER. *On the Methodology of Costing Collective-farm Produce:* I. STAN. *The Influence of Fodder upon the Cost of Meat:* GH. IONIŢĂ. *The Area Drawn Upon by the Weekly Market at Budeşti:* S. PERŢ.

No. 4, 1958. *Lenin on the Importance of His Co-operative Plan. For an Uninterrupted Growth of Socialist Agriculture. Some Particularities and Limitations of the Law of Value in Foreign Trade:* M. HOROVITZ. *The Importance of a Rational Use of Oil for Greater Profits in the Oil Industry:* T. HANCIULESCU. *Efforts to Establish a System of Indicators for Collective-farm Management:* S. NICA and G. VÎLCEANU. *From the Economic Thought of Dionisie Pop Martian:* S. SUTĂ-SELEJAN. *The Armaments Race in the U.S.A.—a Source of Monopoly Profit:* V. VASIN. *The Characteristics of a New Type of Super-monopoly—The European Coal and Steel Community:* I. ANGHEL. *Aspects of the Development of Manpower in Collective Farms of the Timşoara Region:* R. GEORGESCU.

NEW BOOKS

British

Advertising. London: Unilever, 1958. 8″. Pp. 15.

[In 1957 Unilever spent on advertising a sum nearly equal to its gross profits. Lord Heyworth ha therefore taken the opportunity of the annual general meeting of Unilever to make some remark on the subject and to defend advertising against the criticisms it commonly attracts. Some of hi arguments are those standard in the literature, such as the argument that advertising makes possibl large-scale production. Others are less familiar and have particular reference to the type o product sold by Unilever. Prominent among these is the argument that advertising and promotio campaigns induce consumers to try out a new product and so become acquainted with its merit and willing to go on buying it.]

The Agricultural Register (New Series). Changes in the Economic Pattern, 1956–7 Oxford: Agricultural Economics Research Institute, University of Oxford, 1957. 9″ Pp. viii + 234. 21*s*.

[This is a revival of a publication that used to be brought out by the Oxford Agricultura Economics Research Institute before the War. Most of its space is taken up with a useful digest o information about policy and practice regarding prices and marketing of agricultural products i Great Britain. Briefer particulars are also given on policy towards agricultural imports; the labou position in agriculture; rents, land prices and credit facilities; and the use of fertilisers an machinery.]

ANDRUS (J. R.) and MOHAMMED (A. F.). The Economy of Pakistan. London Oxford University Press, 1958. 9″. Pp. xviii + 517. 45*s*.

[To be reviewed.]

BLACK (D.). The Theory of Committees and Elections. London: Cambridg University Press, 1958. 9″. Pp. xiii + 242. 30*s*.

[To be reviewed.]

COLEMAN (D. C.). The British Paper Industry, 1495–1860. A study in industria growth. London: Oxford University Press, 1958. 8½″. Pp. xvi + 367. 55*s*.

[To be reviewed.]

CRUFT (A. G.). The Management Counsellor Speaks to You. Edinburgh: W. & R. Chambers, 1958. 9″. Pp. xvi + 160. 15*s*.

[This is a reprint of a series of shrewd and well-informed short articles that originally appeared in *The Scotsman*, designed to give advice to small business-men on how to exercise more effective control over their businesses.]

DAVISON (J. P.), SARGANT FLORENCE (P.), GRAY (BAREARA) and ROSS (N. S.). Productivity and Economic Incentives. London: Allen & Unwin, 1958. 9″. Pp. 306. 35*s*.

[To be reviewed.]

DAYSH (G. H. J.) (Ed.). A Survey of Whitby and the Surrounding Area. Eton: The Shakespeare Head Press, 1958. 11″. Pp. xiv + 254. 63*s*.

[This survey was undertaken at the request of the Marquis of Normanby. Most of the contributors are members of the staff of the University of Durham. The aspects covered are the geology of the area, its population, its growth and character, its economic position, its function as a holiday resort, its communications and its harbour. The purpose of the survey is to provide the evidence on which a plan for the future of the area might be based. In his introductory survey, Professor Daysh suggests that prominent among the objectives of policy should be development of the holiday industry and strengthening of the links with Tees-side, to which many of the inhabitants of Whitby already travel to work. He does not feel that the circumstances of the area offer much promise of successful industrial development.]

DOWNIE (J.). The Competitive Process. London: Duckworth, 1958. 8½″. Pp. 199. 25*s*.

[To be reviewed.]

DUNNING (J. H.). American Investment in British Manufacturing Industry. London: Allen & Unwin, 1958. 9″. Pp. 365. 35*s*.

[To be reviewed.]

The European Common Market and Free Trade Area. A series of lectures delivered in November and December 1957 under the joint auspices of the Department of Extra-Mural Studies of the University of London and the Institute of Bankers. London: The Institute of Bankers (10 Lombard Street, E.C.3), 1958. 8½″. Pp. 73. 5*s*.

[This contains five lectures. They are "The Experiences and Achievements of the European Coal and Steel Community," by Fernand Spaak; "The European Common Market and Economic Integration," by D. J. Ezra; "The European Common Market: Little or Big Europe?" by Paul Bareau; "The Challenge of the Free Trade Area," by Ronald Brech; and "The Commonwealth and the Free Trade Area," by Frank W. Holmes.]

GRONDONA (L. ST. C.). Utilizing World Abundance, by the inauguration of a system to establish accessible reserves of essential commodities so administered as to achieve continuity of supply with reasonable price stability at realistic levels. London: Allen & Unwin, 1958. 9″. Pp. 190. 21*s*.

[Reviewed in this issue.]

HABERLER (G.). Prosperity and Depression. A theoretical analysis of cyclical movements. New revised and enlarged edition. London: Allen & Unwin, 1958. 9″. Pp. xviii + 520. 28*s*.

[In the new edition of this celebrated work, Parts I and II appear unchanged in the form in which they were published in the second edition in 1939. The sections comprising Part III in the 1941 edition, which contained a useful account of certain post-Keynesian developments in the formal theory of the cycle, are now omitted. Some readers may regret this. In their place Professor Haberler puts three recent papers he has published in this field: "Monetary and Real Factors affecting Economic Stability," originally delivered at the International Economic Association's Rome Congress in 1956; "Notes on the Present State of Business Cycle Theory," first published in German in 1953; and "The Pigou Effect Once More," reprinted from the *Journal of Political Economy* of June 1952.]

HUGHES (J.). Plan for Steel Re-Nationalisation. London: The Fabian Society, 1958. 8½″. Pp. 29. 2*s*.

[The author argues the case for re-nationalisation of steel, mainly on the grounds of the timorous attitude towards expansion adopted by the industry in recent years. In discussing the lines that a re-nationalisation programme should take, he maintains that it is important to base the new structure of control on a proper understanding of the location of power in the industry as it is at present. To this end he suggests that the British Iron and Steel Federation should be transformed into an instrument of public control and all its functions taken over by a new Steel Control Board.]

INTERNATIONAL ASSOCIATION FOR RESEARCH IN INCOME AND WEALTH. Bibliography on Income and Wealth, Volume VI, 1953–4. Edited by Phyllis Deane. London: Bowes & Bowes, 1958. 10″. Pp. 139. 37*s*. 6*d*.

[This is a double volume in its series, covering two years' publications. Over a thousand items are listed, classified and provided with full annotations to indicate their contents. "Income and Wealth" is interpreted broadly to cover a wide range of subjects.]

KOHR (L.). The Breakdown of Nations. London: Routledge & Kegan Paul, 1957. 8½″. Pp. 244. 30*s*.

[The author's thesis is that all the main evils of the modern world spring from the excessive size of social and political units. He suggests that large units create power, and that power inevitably stimulates impulses of regression and inhumanity—"the insolence of office." He advocates therefore the dismemberment of the great powers and the establishment of a world of small states. The book contains much that is stimulating and original, but the author's leaning to a golden-age interpretation of earlier times, particularly in the economic sphere, somewhat weakens confidence in his judgment on other matters.]

LANSDELL (N.). The Atom and the Energy Revolution. Harmondsworth: Penguin Books, 1958. 7″. Pp. 200. 2*s*. 6*d*.

[This report was originally commissioned by a firm of management consultants. The author describes the present state of world demand and supply of energy, the methods of releasing and exploiting atomic energy, the organisations in existence for atomic-energy development and the question of radiation risks. He ends with a brief chapter on the economic impact of atomic energy.]

MCCORD (N.). The Anti-Corn Law League, 1838–1846. London: Allen & Unwin, 1958. 9″. Pp. 226. 25*s*.

[This is a political history of the League—its origins, its organisation, the personalities within it, the techniques it employed. The author has drawn on some surviving papers of the League's leaders that have not previously been used by historians. In describing the League's tactics, Dr. McCord is at pains to emphasise the difference between its position and that of a modern pressure group, in that it was not able to exercise much influence at the real source of power, namely within Parliament itself. Peel's final decision in favour of repeal owed comparatively little to the activities of the League as such.]

MATHER (L. C.). The Accounts of Limited Company Customers. London: Waterlow, 1958. 9½″. Pp. 99. 12*s*. 6*d*.

[This is a reprint of a series of articles on company accounts, designed for the guidance of the branch-banker, which were originally published in *The Bankers' Magazine*.]

MEADE (J. E.). The Control of Inflation. An inaugural lecture. London: Cambridge University Press, 1958. 7″. Pp. 52. 5*s*.

[To be reviewed.]

PANDIT (V. L.). The Evolution of India. London: Oxford University Press, 1958. 7½″. Pp. vii + 46. 6*s*.

[This book consists of three lectures by India's High Commissioner in the United Kingdom on "Evolution in India," "Education in New India" and "Planning in New India." The aim is to provide an outline of Indian history and an account of the Government's objectives and achievements in education and planning. The author well conveys the awareness in India of her economic and social problems and the determination to create a new democratic society with higher standards of living.]

PELHAM (R. A.). Fulling Mills. A study in the application of water power to the woollen industry. London: Society for the Protection of Ancient Buildings (55 Great Ormond Street, W.C.1), 1958. 8½″. Pp. 16. 3*s*.

[The author, who is Lecturer in Geography at the University of Southampton, traces the history of water-driven fulling mills in this country since the twelfth century. Fulling was for

centuries the only branch of textile manufacture that made use of mechanical power, and the author describes how the mechanisation of this one branch influenced the history of the woollen industry as a whole. Practically no ancient water-driven fulling mills are still in use, but in a great many cases modern factories are located on the site of an ancient mill and manufacture of some sort has been carried there continuously. The past locational requirements of fulling mills have thus had an influence on the location of industry to-day.]

POOL (A. G.) and LLEWELLEYN (G.). The British Hosiery Industry: A Study in Competition. Third report. Leicester: Leicester University Press, 1958. 10″. Pp. 35. 7*s.* 6*d.*

[The first two reports in this series were noticed in the ECONOMIC JOURNAL of March 1956 and December 1957. This third report, which is a very interesting one, is concerned with pricing policy in the industry. The structure described by the authors is one where there are many firms but great differentiation of product, so that there is not as a rule a single market price which the producer has to take as given. It is found that almost all firms in the industry go through the procedure of calculating their average costs on each line and deriving therefrom a full cost price. This full cost price, however, is not normally the price that is actually charged. That is determined rather by considerations of what the market will bear. The authors believe that costing practice in the industry is often very imperfect, with the result that firms are wrongly informed as to which lines are or would be most profitable. The emergence of the large buyer may help to correct this and to assist in the reduction of costs generally.]

RANGNEKAR (D. K.). Poverty and Capital Development in India. Contemporary investment patterns, problems and planning. London: Oxford University Press for the Royal Institute of International Affairs, 1958. 9″. Pp. xii + 316. 42*s.*

[To be reviewed.]

ROBERTS (B. C.). National Wages Policy in War and Peace. London: Allen & Unwin, 1958. 9″. Pp. 180. 15*s.*

[To be reviewed.]

SHONFIELD (A.). British Economic Policy since the War. Harmondsworth: Penguin Books, 1958. 7″. Pp. 288. 3*s.* 6*d.*

[To be reviewed.]

THOMSON (SIR GEORGE). The Strategy of Research. Southampton: University of Southampton, 1957. 8½″. Pp. 18. 2*s.* 6*d.*

[In this lecture Sir George Thomson discusses the factors making for success in scientific research. Among the topics he deals with are the qualities of mind needed in the individual research worker, the problem of over-narrow specialisation, ways of avoiding staleness, and the organisation of research institutes.]

TORRENS (R.). Letters on Commercial Policy. With an Introduction by L. C. ROBBINS. London School of Economics Series of Reprints of Scarce Works on Political Economy, No. 14. London: London School of Economics, 1958. 9″. Pp. x + 80. 18*s.*

[The letters here reprinted were first published in 1832–33. They are notable for their treatment of the role of demand in foreign-trade theory and for containing the germ of the terms of trade argument for protection. The conclusion which Torrens himself drew from his argument was in favour of a system of reciprocity and a colonial customs union.]

TREGONNING (K. G.). Under Chartered Company Rule. North Borneo 1881–1946. Singapore: University of Malaya Press (London: Oxford University Press), 1958. 9″. Pp. vii + 250. 30*s.*

[The British North Borneo Company, which administered North Borneo with sovereign rights from 1881 to 1941, was the longest lived of the nineteenth-century chartered companies. Mr. Tregonning has used the company's surviving archives to provide a detailed history of it and the territory it administered. He describes its problems of policy and its internal polemics, and analyses its limited but still creditable achievements in the provision of transport, the encouragement of exports, the recruitment of labour, in health and education, and in the suppression of slavery and rebellion.]

Urban Motorways. Report of a conference organised by the British Road Federation in 1956. London: British Road Federation (26 Manchester Square, W.1), 1957. 11½″. Pp. 245. 55*s.*

[A motorway is defined as a highway limited to motor vehicles, with two separate double-stream carriageways, limited access and no traffic crossing it. The subject of the Conference whose proceedings are here reported is the use of such motorways in built-up areas. Much of the space is occupied by description of the operation of urban motorways in individual cities in the United States and elsewhere.]

ZAUBERMAN (A.). Industrial Development in Czechoslovakia, East Germany and Poland, 1937–56. A Chatham House Memorandum. London: Oxford University Press for the Royal Institute of International Affairs, 1958. 10″. Pp. 70. 4*s.* 6*d.*

[The author critically analyses the statistical basis of the official indices of industrial production in Czechoslovakia, East Germany and Poland, and provides alternative indices constructed on principles more congenial to normal statistical practice in Western countries. The chief difficulties arise from the communist practice of measuring production gross rather than on a value-added basis, from the choice of appropriate prices as weights, and from changes in the area and population of the countries in question since before the War. The tentative conclusions drawn from these calculations yield much of interest. It appears that Czechoslovakia and Poland have achieved a moderate advance relatively to other European countries, but that Eastern Germany has decidedly lost ground.]

Australian

CAMERON (B.). The Elements of Economics. Melbourne: Melbourne University Press, 1957 (London: Cambridge University Press, 1958). 7″. Pp. 82. 8*s.* 6*d.*

[The object of this booklet is to provide a bird's-eye view of economic theory so as to acquaint the beginning student with the general outline of the subject before he embarks on more thorough study of it, and thereby enable him to see the various aspects of it in their proper context. The aim is laudable and the exposition is clear. But one wonders whether the author has not tried to squeeze into his very small compass more of the substance of economic theory than is required for the purpose and more than the reader is likely to be able to take in without a good deal of assistance.]

KARMEL (P. H.). Applied Statistics for Economists. A course in statistical methods. Melbourne and London: Pitman, 1958. 9″. Pp. xi + 452. 65*s.*

[This provides a fairly thorough coverage of the methods normally taught in courses on statistics for undergraduate students reading economics. The ground covered includes collection and presentation of material, frequency distributions, sampling and significance, regression and correlations, time series, social accounts, index numbers and population statistics. Illustrative examples are drawn from Australian material.]

LAMBERTON (D. McL.). Share Price Indices in Australia. An examination of the measurement and significance of changes in share prices together with new indices for the period July 1936–December 1957. Sydney: The Law Book Company of Australasia, 1958. 9″. Pp. x + 114. 42*s.*

[The main purpose of this report is to present new monthly indices of ordinary and preference share prices based on Sydney market data for the years 1936–57. The statistical sources and methods of compiling the indices are fully explained. The statistical chapters are preceded by an introductory section bringing together some data on the place of share capital in the Australian economy and discussing the theory of share-price determination. The latter discussion is a survey of the existing literature of the subject, not an analysis of the author's newly prepared data.]

Canadian

BLAKE (G.). Customs Administration in Canada. An essay in tariff technology. *Canadian Studies in Economics* No. 9. Toronto: University of Toronto Press, 1957 (London: Oxford University Press, 1958). 10″. Pp. 193. 28*s.*

[This is a history of customs administration in Canada since the earliest times. Much of the space is occupied with matters of administrative detail, but the author is concerned thoughout to indicate the way in which administrative practice has combined with legislative enactment to shape Canadian foreign economic policy.]

BRECHER (I.). Monetary and Fiscal Thought in Canada, 1919–1939. Canadian Studies in Economics, No. 8. Toronto: University of Toronto Press, 1957 (London: Oxford University Press, 1958). 10″. Pp. xii + 337. 42*s*.

[The author's detailed narrative reveals that thought and policy on problems of economic stabilisation in Canada in the inter-war period followed broadly similar lines to those shown in other countries: the technique of analysis was ill-adapted to deal with the problem of fluctuations, and government policy, particularly in the fiscal sphere, exerted a net destabilising effect. A large part of the discussions which took place and which the author describes were concerned with monetary policy.]

Indian

BHATTACHARYYA (D.). India's Five-Year Plans, 1951–1961. An economic analysis. Calcutta: Udayan Granthagar, 1957. 8½″. Pp. 119.

[Here is another of the many books on Indian planning. There are the usual introductory chapters on the objects and theory of planning, surprisingly a paragraph on the dangers of planning, and some discussion of problems of capital formation. Then follows a digest of the first and second five-year plans. There are three footnotes, no index and a great number of tautologies. But the elementary student will find this a useful enough introductory guide to the subject.]

CHACKO (K. C.). The Monetary and Fiscal Policy of India. Bombay: Vora, 1957. 9″. Pp. xiv + 386.

[Currency and banking in British India educed studies from a large number of scholars, including Lord Keynes, but it has been a relatively neglected subject in recent years. This is therefore a useful survey of the Indian monetary system, which includes chapters on the money market, the Reserve and Commercial Banks, war financing and development finance. There is a chapter on co-operative societies and rural credit which stresses the urgency of improving the present situation, in which 75% of borrowing by the peasantry is from money-lenders at high rates of interest. The author has several pertinent criticisms of recent Indian fiscal and monetary policy, although many will disagree with his support or the argument that India should gradually withdraw from the sterling bloc and establish a completely independent currency. This is a competent, well-written book, but the absence of an index is a serious defect.]

DHAR (B.). The Sterling Balances of India. Calcutta: Nababhavat, 1956. 9″. Pp. vi + 142. Rr. 7/8.

[Half of this short book describes the repatriation of India's sterling loans during the War and condenses what the author has already written on the subject in *India's Sterling Position and the War* (1944). The remainder includes a discussion of the "repudiationist school" *(sic)* in Britain, international schemes of settlement, post-war agreements between India and the United Kingdom and a plea for an internationally agreed procedure for dealing with similar problems in the future.]

Foreign Exchange Crisis and the Plan. An Occasional Paper of the National Council of Applied Economic Research. Bombay: Asia Publishing House, 1957. 9″. Pp. 31.

[This monograph is intended to be the first of a series of monthly papers which will act as the precursor of a regular journal. It deals with the relation between India's Second Five-Year Plan and her recent foreign-exchange problems. The following causes are among those enumerated for India's imports having risen above the level anticipated in the Plan: estimates of internal food production were much too optimistic; estimates of the foreign-exchange requirement of parts of the Plan have been considerably revised upwards; import prices have risen; defence expenditure has risen; and high imports by both the private sector and certain Ministries were undertaken in anticipation of a general foreign-exchange shortage. Having analysed the cause of the trouble, the authors consider the ways in which the availability of foreign exchange could be increased within the framework of the Plan and the ways in which the Plan might if necessary be altered and rephased in the face of the foreign-exchange crisis.]

GHOSH (O. K.). The Indian Financial System. Allahabad: Kitab Mahal, 1958. 9″. Pp. 140. Rs. 5/–.

[The four main sections of this work deal with the financial relations between the Central Government and the States, the budget, expenditure control and the audit. There is some comparison with other countries, but the whole is far too slight and general to be of much value.]

JAIN (P. C.). Problems in Indian Economics. Allahabad: Chaitanya Publishing House, 1956. 9″. Pp. 688. 25*s*.

[This is a new edition of a work first published in 1953. It is divided into five parts, on agriculture and co-operation, industry and labour, trade, tariffs and transport, currency, banking and finance and public finance and planning. There is a long historical survey, but most of the book is concerned with describing the various sectors of the Indian economy from 1947 to 1955 It is a compendium of valuable information, but its usefulness is greatly limited by the absence of a bibliography and index. Indian writers and publishers should surely realise that in works of this size an index is indispensable.]

KUCHHAL (S. C.). Corporation Finance: Principles and Problems. Allahabad: Chaitanya Publishing House, 1957. 9″. Pp. viii + 519. 20*s*.

[India's determination to develop large-scale industrialisation makes the subject of corporate financing of great importance. Here we have a full and competent survey of recent methods and problems of financing Indian industries. There are chapters, *inter alia*, on company promotion, the stock exchange, managing agents, the role of the banks, insurance companies and investment trusts and the State's role in finance. There is a balanced account of the place of foreign capital in India, although it is not clear how much-needed private foreign investment can be attracted without a change in the present political and economic climate.]

MATHUR (A. S.) and MATHUR (J. S.). Trade Union Movement in India. Allahabad: Chaitanya Publishing House, 1957. 9″. Pp. xvi + 303. Rs. 10/–.

[This is a useful addition to the very limited number of studies of Indian trade unionism. There is an adequate description of the evolution of the movement, with abundant statistical illustration and an account on the usual lines of trade union structure, finance, leadership, politics and methods of collective bargaining. Despite considerable progress, trade unionism remains comparatively undeveloped in India. Less than 3% of workers who could be organised are members, and there remain serious problems connected with finance, political rivalry and the attitude of employers. The authors analyse these and other defects and suggest ways in which they might be overcome.]

NAIDU (B. V. N.) and DATTA (H. K.). Fundamentals of Business Organisation and Management. Madras: Seshachalem, 1957. 9″. Pp. xix + 620.

[This is the fourth edition of a book which first appeared in 1947 with the explicit aim of providing a text-book for the Indian B.Com. degree. It contains a great deal of second-hand information about joint-stocks, managing agents, distribution, public utilities, co-operation and the like. Inevitably it is too superficial for any but the elementary reader, and the knowledgeable will find few original contributions. Because of the wide field covered, generalisations abound, some of which are misleading and even naïve. Thus we find a description of "the transformation of medieval industry characterised by handicraft system into the domestic system, and of the domestic system further into the factory system as a result of the industrial revolution" (p. 1). Or again, is it true that "modern advertisement insists on sincerity and truth"? (p. 551). Apart from defects of this nature, which could be rectified in future editions, this is a serviceable text-book.]

PATVARDHAN (V. S.). Food Control in Bombay Province, 1939–1949. Poona: Gokhale Institute of Politics and Economics, 1958. 9½″. Pp. xii + 210. Rs. 7/50.

[Bombay was a net importer of food grains even before the War, and during the war years the isolation of Burma and growing population necessitated Government action to maintain food supplies at reasonable prices. This is a detailed study, based on the official records of the Bombay Secretariat, of the evolution and implementation of State policy. It is replete with statistics, but there is no index.]

Taxation and Foreign Investment. An Occasional Paper of the National Council of Applied Economic Research. Bombay: Asia Publishing House, 1957. 9½″. Pp. viii + 164. Rs. 9/50.

[The important residual role of the foreign investor in Indian industrialisation is now being widely and officially admitted. This well-produced study discusses the disincentives to foreign investors which arise from the Indian tax system, and the amendments which might be made. The various taxes for which foreign companies and individuals are liable are systematically examined, and comparison with other countries is made. Among the serious deterrents noted are the tax on bonus issues, the personal income and company taxes and the expenditure and wealth taxes, the last for their adverse psychological effects. Minor amendments might remove some of the disadvantages of these taxes with little loss of revenue. But, unless the foreign investor is to be exceptionally favoured (which would be politically impracticable) and unless other more serious obstacles are eradicated, overseas capital will remain shy of Indian industries. The proposals in this book are, however, a step in the right direction.]

Utilization of Primary Energy in India. An Occasional Paper of the National Council of Applied Economic Research. Bombay: Asia Publishing House, 1958. 9½". Pp. 70. Rs. 5/75.

[This monograph gives a statistical analysis of the production, consumption and distribution of coal, electricity and oil. There is a short descriptive section and thirty tables containing information on, for example, the distribution of petroleum by industrial origin, the use of hydro power, the energy input of certain industrial products and the cost of energy in manufacturing industries.]

WADIA (P. A.) and MERCHANT (K. T.). Our Economic Problem. Bombay: Vora, 1957. 9". Pp. xv + 825. 30*s*.

[This massive tome is the fifth edition of a work first published in 1943. Like other works of its kind, it contains a vast amount of information on all the sectors of the Indian economy, including the five-year plans. As well as the usual chapters on agriculture, industry, population and the like, there are useful studies of labour, industrial relations and the financing of industry. Because the authors cover so wide a field, many subjects are dealt with superficially, and this book is more of a general introductory survey of the Indian economy than an analysis of Indian economic problems.]

Ceylonese

LOGANATHAN (C.). Democracy and Economic Development in Asia. Colombo: Nadaraja, 1957. 8½". Pp. 23.

[The author is General Manager of the Bank of Ceylon. He puts forward here a scheme for a Development Savings Bank, which he believes would make an important contribution to the problem of finance mobilisation in Ceylon and other countries that are similarly placed. The funds for the Bank would come partly from compulsory contributions from all persons subject to taxation, and partly from voluntary contributions, which would be eligible for income-tax relief.]

SARKAR (N. K.). The Demography of Ceylon. Colombo: Ceylon Government Press, 1957. 10". Pp. 289. Rs. 10/45.

[This is an excellent comprehensive study of Ceylon's population, well illustrated with statistical tables, diagrams and bibliography. Population has increased from 4 to 8 millions in the present century, and is likely to exceed 10 millions by 1976. In the absence of greatly accelerated economic growth, increasing pressure on the land, more unemployment (or, at least under-employment), and serious social and political upheavals are likely. Dr. Sarkar deals with these problems and their possible solutions very briefly. His main concern is a quantitative analysis of population figures. There is a rigorous statistical treatment, with full explanation of the methods used, of recent censuses, marriage, birth and mortality figures, disease, public health, Indian immigration, literacy and kindred problems. The whole is a most useful contribution to our knowledge of Ceylon.]

American

BAKER (E. F.). Printers and Technology. A history of the International Printing Pressmen and Assistants' Union. New York: Columbia University Press, 1957 (London: Oxford University Press, 1958.) 9½". Pp. xviii + 545. 55*s*.

[This is a history of the largest of the American printing unions. As the title indicates, one of the main themes is the impact of technical change on an essentially craft union. Craft conflict within the union and conflicts with unions representing other printing workers have been prominent in the industry's history, and at the present time major jurisdictional disputes are arising out of the growth of new techniques of reproduction.]

BANFIELD (E. C.) with the assistance of L. F. Banfield. The Moral Basis of a Backward Society. Glencoe, Illinois: The Free Press, for the Research Center in Economic Development and Cultural Change of the University of Chicago, 1958. 9". Pp. 204. $4.00.

[This is a sociological analysis of a village in southern Italy. It is an unusually incisive and interesting piece of work. The question posed by the author at the beginning of the book may at first sight seem a not altogether fruitful one: it is why there is in the village a complete lack of any collective activity for the common good of the sort that would be found, say, in an American community of the same size. The immediate answer which is invited, and which the author would not entirely deny, is that such action, even if it were undertaken, could do relatively little to alleviate the grinding poverty which afflicts the village. However, it could do something, at least in the long run. But as the argument proceeds, it emerges that there is more to it than that. The author's vivid analysis of the social relations in the village reveals that although poverty is acute, an important part of the misery and perpetual fear of calamity that preoccupies its inhabitants is not due to poverty alone, but also to the all-pervading mutual distrust that applies to everyone outside the family (defined in the narrow sense of husband, wife and dependent children). Thus the fate of the orphan—until recently a very common one—was all the more to be dreaded because other relatives would not regard themselves as obliged to help. Similarly with other possible catastrophes. The prevailing ethos is defined by the author as "amoral familism"—more or less equivalent to a Hobbesian state of "war"—in which everyone is actuated solely by the short-run material interests of himself and his family and assumes that others will be too. This means that any form of collective action is impossible, whether on a small scale (agricultural improvements requiring co-operation between neighbouring cultivators) or on a larger scale (attempts to improve educational facilities, the deficiencies of which in the village are keenly felt). The author attributes the prevailing ethos largely to the absence of the institution of the extended family, which in turn is attributed tentatively to circumstances of land tenure. This is perhaps the least convincingly argued section of the book, and would have gained by fuller comparisons with other poor agrarian communities where physical conditions are similar, but the ethos is different (the only comparison made by the author is a brief one with northern Italy).]

CAMPS (M.). The European Common Market and Free Trade Area. A progress report. Princeton, New Jersey: Center of International Studies, Princeton University, 1957. 11". Pp. 30.

[This is a summary of the course of negotiations during the period December 1956 to November 1957, and an appraisal of the situation, as it existed at the end of that time.]

CHAMBERLIN (E. H.), BRADLEY (P. D.), REILLY (G. D.) and POUND (R.). Labor Unions and Public Policy. Washington, D.C.: American Enterprise Association, 1958. 9". Pp. 177. $4.50.

[This contains four essays: "The Economic Analysis of Labor Union Power," by E. H. Chamberlin; "Involuntary Participation in Unionism," by P. D. Bradley; "States Rights and the Law of Labor Relations," by G. D. Reilly; and "Legal Immunities of Labor Unions," by Roscoe Pound. The general drift of these essays is to point the need for increased control over the powers and privileges enjoyed by labour unions in the United States. Professor Chamberlin in his contribution is especially concerned to indicate the analogy between the activities of labour unions and monopolistic practices of a type which if engaged in by employers would be universally condemned.]

COHEN (J. B.). Japan's Postwar Economy. Bloomington, Indiana: Indiana University Press, 1958. 8½". Pp. xvii + 262. $6.50.

[Reviewed in this issue.]

DOBRIANSKY (L. E.). Veblenism. A new critique. Washington, D.C.: Public Affairs Press, 1957. 9½". Pp. xii + 409. $6.00.

[The author sets out to give a full systematic exposition and synthesis of Veblen's multifarious and wide-ranging writings. While not dissenting from the commonly held view that Veblen's work was uneven and not always closely reasoned, Professor Dobriansky is able to exhibit a more systematic pattern in it than many critics have been able to find. In his criticism of Veblen, he is especially concerned to view him in the broad historical context of Western thought, particularly philosophical thought. The author is Associate Professor of Economics at the Jesuit University Georgetown.]

FARNSWORTH (H. C.). Multiple Pricing of American wheat. Present system *versus* two-price system. Stanford, California: Stanford University Food Research Institute, 1958. 9". Pp. 50. $1.00.

[The author describes first the many well-known disadvantages of the present American price-support programme for wheat. She then considers an alternative scheme that has recently been mooted under which one price would be established, by government support, for a limited quota of domestic sales, and another much lower price for all other sales. She advances grounds for believing that this scheme would in fact fail to achieve the results claimed for it and would introduce new distortions. She believes that the only real solution is to permit a more thorough-going adjustment of wheat prices to the level dictated by supply and demand.]

GOLDSMITH (R. W.). Financial Intermediaries in the American Economy since 1900. Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Oxford University Press), 1958. 9½". Pp. xxxv + 415. 68*s*.

[To be reviewed.]

GORDON (L. J.). The Function of the Consumer in a Free Choice Economy. Westport, Connecticut: The Calvin K. Kazanjian *Economics Foundation (P.O. Box 431)*, 1958. 9″. Pp. 51.

[This contains two lectures. In the first Professor Gordon considers the position of the consumer and the meaning of consumer's choice in the economy of to-day. In the second he discusses various ways in which consumers could be made better informed and more competent to exercise the function of choice. Professor Gordon cogently shows the unreality of the conception of the consumer implied by much economic theory: a conception which disregards ignorance, irrationality, the malleability of tastes by advertising and the non-economic motives affecting choice. The evidence he quotes on the unscrupulous techniques adopted by advertisers to mould public tastes to the shape desired makes a striking contrast to the picture painted by Lord Heyworth, in his address on *Advertising* (noticed on another page in this issue), of the producer humbly seeking to find out what the public wants and then trying to provide it. One doubt suggested by Professor Gordon's stimulating lectures is whether the problems raised in his first lecture are not too fundamental to be entirely solved by solutions of the type recommended in his second. If consumers buy goods largely as prestige symbols or because of the semi-conscious associations fostered by advertising, will the provision of improved consumer information services, however desirable, really suffice to restore consumer's choice to a rational basis?]

HABERLER (G.). Growth and Balance in World Trade. A challenge to American foreign economic policy. Cambridge, Mass.: Harvard University, 1958. 8½″. Pp. 21.

[This inaugural lecture was delivered by Professor Haberler on the occasion of his appointment to a newly founded chair at Harvard. It has two main themes. The first is the prime importance of inflation as a cause of balance-of-payments deficits, and the consequent necessity of avoiding it. The second is the desirability of a radical reduction of American tariffs, both on economic grounds and in order to counter the dangers of a Soviet trade offensive.]

HARDWICKE (R. E.). The Oilman's Barrel. Norman, Oklahoma: University of Oklahoma Press, 1958. 8½″. Pp. xi + 122. $3.75.

[This is a pleasantly discursive account of the history of the 42-gallon barrel, which is the unit of measurement in the oil industry. The author's researches take him from the incredibly diverse range of liquid measures in use in Elizabethan England through the early history of the American oil industry up to certain problems of measurement that still give trouble in Texas to-day.]

HAUSER (P. M.) (Ed.). Population and World Politics. Glencoe, Illinois: The Free Press, 1958. 8½″. Pp. 297. $6.00.

[This contains eleven papers delivered at a conference held at the University of Chicago in 1954. They survey aspects of world population problems, viewed in relation to standards of living, the pace of economic development and the balance of world power. The contributors are John D. Durand, Frank W. Notestein, W. S. Woytinsky, Simon Kuznets, Everett E. Hagen, Dorothy Swaine Thomas, Joseph J. Spengler, Kingsley Davis, Frank Lorimer, Irene B. Taeuber and Quincy Wright.]

HENNING (C. N.). International Finance. New York: Harper & Brothers, 1958. 10¼″. Pp. xix + 481. $10.00.

[The purpose of this text-book is to provide within a single volume a treatment of the economic theory and current problems of international finance and a fairly full technical description of commercial practice in the finance of foreign trade and other international transactions.]

HOLLAND (D. M.). The Income-Tax Burden on Stockholders. Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Oxford University Press), 1958. 9¼″. Pp. xxv + 240. 40*s*.

[This provides a measurement and analysis of the differential burden on stockholders in the United States caused by the existence of the two types of tax on corporate earnings: the essentially proportional tax on corporate earnings and the progressive tax on dividends received as personal income. It is found that for stockholders in any income bracket the system causes distributed corporate profits to be taxed more heavily than other types of income. For undistributed profits, regarded as part of the income of the stockholder, the result is the same as for distributed profits in the case of the less-well-off stockholders, but the richer ones pay less tax on this class of income than they would do if all income were taxed on the same basis. The author then considers the extent to which these findings are altered if regard is had to stockholders' income from all sources, as distinct from their income from stockholding; if corporate taxes are assumed to be partly shifted to the consumer; and if depreciation is calculated in a different way. Finally, an estimate is given of the net loss to the revenue that would result if special corporate tax provisions were abolished and corporations were taxed in the same way as partnerships. The order of magnitude of the tax loss in 1955 would have been such as to require an increase in personal tax rates of about 3·3% applied to all tax-payers to offset it.]

JENNINGS (SIR I.). Problems of the New Commonwealth. Durham, North Carolina: Duke University Press for the Duke University Commonwealth-Studies Center (London: Cambridge University Press), 1958. 8½″. Pp. xi + 114. 19*s*.

[In these lectures the Master of Trinity Hall discusses some of the economic and political problems of India, Pakistan, Ceylon and Malaya. He devotes particular attention to the legacy of British rule, on which he is anxious to clear up certain misconceptions.]

LEITER (R. D.). Labor Economics and Industrial Relations. College Outline Series, No. 81. New York: Barnes & Noble (105 Fifth Avenue, New York 3), 1958. 8″. Pp. xvi + 320. $1.95.

[This short text-book for American students is designed mainly as a digest of the principal facts and problems, to be supplemented by the use of other text-books and oral instruction.]

MALLORY (W. H.) (Ed.). Political Handbook of the World. Parliaments, parties and press as of January 1, 1958. New York: Harper & Brothers for the Council on Foreign Relations (London: Oxford University Press), 1958. 10″. Pp. 229. 35*s*.

[This contains very brief summary accounts of the parliamentary and governmental institutions of almost all the countries in the world, with lists of members of governments, and also lists of national newspapers and their political affiliations.]

PIQUET (H. S.). The Trade Agreements Act and the National Interest. Washington, D.C.: The Brookings Institution, 1958. 9″. Pp. 61. $1.25.

[The author examines the historical background of the Trade Agreements Act and recent trends in its application. He argues that the fundamental irreconcilability between the principles of the international division of labour and the politically necessary provision that tariff reductions should not go to the point where serious injury is caused to a domestic producer might be overcome by a scheme under which producers damaged by foreign competition were given special government assistance to transfer to some other line of activity.]

ROGERS (J.). Automation—Technology's New Face. Berkeley, California: Institute of Industrial Relations, University of California, 1958. 7½″. Pp. 94. 50c.

[This is one of a series of pamphlets designed to give a readable digest of the results of recent work on matters of current interest. The author gives a lucid description of the technological principles involved and discusses the implications for labour, management and the economy generally.]

SAPIR (M.). The New Role of the Soviets in the World Economy. A supplementary paper of the Committee for Economic Development. New York: Committee for Economic Development, 1958. 9″. Pp. 56. 50c.

[This is a survey of the "economic offensive" carried out by the Soviet bloc in recent years in under-developed countries.]

TAEUBER (C.) and TAEUBER (I. B.). The Changing Population of the United States. A volume in the Census Monograph Series. New York: John Wiley for the Social Science Research Council and the Bureau of the Census of the U.S. Department of Commerce (London: Chapman & Hall), 1958. 9½. Pp. 357. 62*s*.

[This is one of a series of monographs based on Census material. It brings together and discusses data on changes that have taken place over time in the size and characteristics of the population of the United States. Aspects dealt with include geographical distribution, education, migration, marital status, fertility, mortality, income and participation in economic activity.]

TRAGER (F. N.). Building a Welfare State in Burma, 1948–1956. New York: Institute of Pacific Relations (333 Sixth Avenue, New York 14), 1958. 8½″. Pp. ix + 118. $4.00.

[This provides a well-documented general survey of economic problems and policies in Burma during the first eight years of independence. The author was formerly Director of the Point Four programme in Burma.]

VERNON (R.). Trade Policy in Crisis. Essays in International Finance, No. 29. Princeton, New Jersey: International Finance Section, Princeton University, 1958. 9″. Pp. 24.

[In this pamphlet the author argues that the growth of protectionist sentiments in the United States, together with an increase in the amount of initiative displayed by European countries, has deprived the United States of the leadership in the sphere of international trade policy that she enjoyed in the period after the War. He suggests various ways in which it might be feasible for the United States to move to a more active and imaginative policy of international economic unification.]

VINER (J.). The Long View and the Short. Studies in economic theory and policy. Glencoe, Illinois: The Free Press, 1958. 8½″. Pp. vi + 462. $7.50.

[To be reviewed.]

WILCOCK (R. C.) and SOBEL (I.). Small City Job Markets. The labor market behavior of firms and workers. Urbana, Illinois: Institute of Labor and Industrial Relations, University of Illinois, 1958. 9½″. Pp. 170. $3.50.

[This contains two case-studies of labour-market behaviour in small American towns. It deals with questions of mobility, job choice, the supply of labour to the individual firm and so on. The situation found in the two areas under study is compared with that shown in earlier empirical studies of labour markets in larger towns. An important theme of the study is the role of women and others on the fringe of the labour force.]

WOLF (W. B.). Wage Incentives as a Managerial Tool. New York: Columbia University Press (London: Oxford University Press), 1957. 8½″. Pp. 143. 28*s*.

[This book claims that previous literature dealing with incentive methods of payment, by its concentration on specific techniques and practices, " has lost sight of the general problem and has failed to induce formulation of the major concepts necessary for a proper perspective on the subject." It therefore aims to supply the deficiency. It includes a short description of some of the wage-incentive systems and examines their impact on costs as observed in a number of case studies. No attempt is made in this connection " to calculate the impact . . . in dollars and cents." Rather, the writer " has observed their operation and proceeded, on the basis of logical reasoning, to infer their impact." His conclusions are " that wage incentives as a determining force release tendencies toward increased earnings, improved production control, increased intensity of work, grievances over standards of output, grievances over changes in job conditions, slowdowns, ceilings on output, falsification of production reports, decreased effectiveness of lower level supervision, resistance to change, and friction between and within work groups." He offers certain " precepts and caveats to guide practitioners in the use of wage incentives." His final advice is that " the best approach to the problem of whether or not to use wage incentives is to begin with the assumption that they are not needed and then carefully examine the pros and cons of their use." His final conclusion is that " wage incentives are often credited with results that properly belong elsewhere."]

WOLMAN (W.). The Development of Manufacturing Industry in the State of Washington. Pullman, Washington: Bureau of Economic and Business Research, State College of Washington, 1958. 9½″. Pp. 208. $4.00.

[This is an interesting essay in the field of regional economic growth. Part of the author's purpose is to present a factual record of the growth of individual manufacturing industries in the area, but much of this material is consigned to an appendix, and the main text is cast in a clear logical framework. The structure and rate of growth and productivity of manufacturing industry in Washington are compared with those in the United States as a whole, and an analysis is given of the locational factors contributing to the differences found.]

ZIMMERMANN (E. W.). Conservation in the Production of Petroleum. A study in industrial control. New Haven: Yale University Press, 1957 (London: Oxford University Press, 1958). 9½″. Pp. xxii + 417. 48*s*.

[The procedure by which production in the United States oil industry is controlled ostensibly in the interests of conservation has often attracted criticism as being in reality no more than a monopolistic restriction of output designed to keep prices up. In this monograph the author discusses the problems and history of conservation in the industry and evaluates the policy currently pursued. His conclusion is a very favourable one. He believes that the charge of monopolistic restriction is unjust and that a policy like the one adopted is essential, first, in order to prevent waste, and secondly, in order to ensure equity between producers in face of the well-known problems caused by the free movement of oil underground between neighbouring properties. While denying that the system amounts to a price-fixing scheme, the author seems implicitly to yield some ground to this contention in his frequent insistence on the importance of preventing prices from falling unduly ow.]

French

MORAZÉ (C.). Les Bourgeois Conquérants. Paris: Armand Colin, 1957. 9½″. Pp. xi + 491.

[This is a panoramic picture of the social and economic history of the world in the nineteenth century. The author sums up thus: " science et progrès ont pour cent cinquante ans choisi les bourgeois d'Europe. Science et progrès choisissent qui les sert mieux." The book is sumptuously produced with many illustrations.]

MORICE (J.). La demande de l'automobile en France. Paris: Armand Colin, 1957. 9″. Pp. xv + 218. Ffrs. 1800.

[This is a statistical study in two parts of the demand for private motor cars in France. The first consists of a time-series analysis of additions to the car stock for the period 1921–31, and of the total demand (including replacements) for the period 1931–38. The second and larger part of the book is a cross-section study of both the stock of cars and its growth in the pre-war decade by Departements. The book concludes with a conditional forecast up to 1970. The statistical data used in the various calculations are fully reproduced in an appendix.]

German

VON ARNIM (V.). Die Welttabakwirtschaft. Kiel: Institut fuer Weltwirtschaft, 1958. 9″. 73. DM. 10.

[A largely statistical review of world production, trade and consumption of tobacco and its products.]

BIEHL (M.). Der Obst-, Gemuese- und Gartenbau im Nordosten der Vereinigten Staten von Amerika unter der Konkurrenz subtropischer Landesteile. Kiel: Institut fuer Weltwirtschaft, 1958. 9″. Pp. ix + 173, with a separate volume of tables. DM. 30.

[A detailed study of the fruit- and vegetable-growing industry in the North-Eastern parts of the United States and its development since the turn of the century. Special attention is paid to the increasing competition of produce from the southern states, which have the advantage of a favourable climate. As Dr. Biehl shows, however, the Northern producers have been able to hold their own by a continuous improvement of methods and a shift to products of higher quality; this process has been materially helped by the steady increase in demand.]

BOUSTEDT (O.) and RANZ (H.). Regionale Struktur- und Wirtschaftsforschung. Bremen: W. Dorn Verlag, 1957. 10″. Pp. 218.

[Social or economic geography rather than economics is the province of this book, which is chiefly concerned with the technical aspects of regional research. The first half deals with the problems of selecting regions and collecting regional statistics; the second part is devoted to economic research on a regional basis, and deals with various descriptive rather than analytical devices such as regional accounts and input–output models of interregional trade. The discussion of all these largely methodological matters is enlivened by a great number of examples of applications in various countries.]

KOZIOLEK (H.). Probleme der Wirtschaftsentwicklung der Deutschen Demokratischen Republik in der Zeit von 1950–1955. Kiel: Institut fuer Weltwirtschaft, 1957. 9″. Pp. 22. DM. 1.50.

[A brief lecture on economic conditions in Eastern Germany which mainly consists of a numerical comparison of its post-war achievements with that of the Federal Republic.]

VEIT (Q.). Changes in Monetary Policy and Their Consequences. Frankfurt: Fritz Knapp (Berliner Strasse 44), 1957. 8½″. Pp. 215. 18*s*.

[This provides a well-informed survey of certain aspects of monetary policy in Germany, the the United States and Great Britain in recent years. Part I describes changes in economic structure that have taken place since the classical era of monetary policy—changes that have generally tended to lessen the efficacy of monetary policy, notably the increase in the public sector of the economy and the reduction in borrowers' sensitivity to interest changes. Part II gives a comparative survey of the techniques of monetary control that have recently been used in various countries. Part III is concerned with special aspects of the German banking situation. One of the themes running through the book is that although interest-rate changes have lost much of their influence on borrowers' willingness to borrow, the rate of interest retains great importance in its effect on the price and availability of liquidity to banks and hence on their lending policy.]

WEISE (H.). Der Deutsche Weinbau im europaeischen Markt. Kiel: Institut fuer Weltwirtschaft, 1958, 9″. Pp. 71. DM. 10.

[A monograph on the present conditions of the German wine-growing industry, with special reference to the current restrictions on wine imports and the implications of the European common market.]

Swiss

EISNER (G.). Kaufkraftuebertragungen durch Oeffentliche Finanzen. Winterthur: P. G. Keller, 1956. 8½". Pp. xvi + 128.

[This is a doctoral thesis on the redistributive effects of financial public policy. The author has devised five different measures of overall redistibution, and these are applied to various published estimates of the redistribution achieved in the United States, the United Kingdom and Denmark. The book also contains an extensive section on definitions and concepts and a short discussion of the ustifications put forward for redistributive policies.]

VON GERSDORFF (R.). Masznahmen zur Foerderung der Privaten Kapitalbildung im Portugiesischen Reich. Zurich: Polygraphischer, 1958. 9". Pp. 265. Sfr. 12.45.

[The apparent object of this book is to discuss the problems of capital formation in underdeveloped countries, with special reference to Portuguese conditions; but in the execution of this scheme the analysis is virtually effaced by the example. As a handbook about Portugal, however, this dissertation contains much useful (and often diverting) information, and there is little doubt that the author is thoroughly familiar with his subject.]

GRISARD (G. E.). Der Britische Kohlenbergbau. Zurich: Polygraphischer, 1957. 9". Pp. 131. Sfr. 12.45.

[This monograph on the British coal industry is mainly concerned with its historical development and the conditions that finally led to its nationalisation. Although the main emphasis is on economic factors, technical and institutional matters receive a good deal of attention throughout the book.]

KELLENBERGER (E.). Die Steuern und ihre Reform. Bern: Staempfli, 1957, 9½". Pp. 396. Sfr. 34.20.

[This is the second volume of a series devoted to " Errors and mistakes in economics " by the same author. The present book combines an extended but lively discussion of the existing structure of taxation, with chief references to Swiss conditions, with a spirited argument in favour of an alternative system: the net additional income generated by government expenditure should be traced to its ultimate recipients and fully taxed away or, as Professor Kellenberger insists, " returned to the State."]

Dutch

LOEB (G. F.). Industrialization and Balanced Growth, with special reference to Brazil. Groningen: Wolters, 1957. 9". Pp. viii + 159. D.fl. 11.90.

[To be reviewed.]

Danish

HOFFMEYER (E.). Dollar Shortage and the Structure of U.S. Foreign Trade. Copenhagen: Ejnar Munksgaard; Amsterdam: North-Holland Publishing Company, 1958. 10". Pp. 232.

[To be reviewed.]

Greek

ZOLOTAS (X.). Monetary Stability and Economic Development. Athens: Bank of Greece, 1958. 9½". Pp. 33.

[The author is Governor of the Bank of Greece. In this able address he surveys the ways in which fiscal policy, credit policy and other instruments of planning may be best used in the Greek economy at the present time in order to reconcile the two objectives of monetary stability and economic development.]

Israel

BARKAY (R. M.). The Public Sector Accounts of Israel, 1948/49–1954/55. In two volumes. Vol. I: pp. xiv + 155; Vol. II: pp. 362. Jerusalem: Falk Project for Economic Research and Central Bureau of Statistics, 1957. 12½".

[This contains elaborate consolidated accounts of the expenditure and receipts of public-sector agencies in Israel, together with full explanation of sources and methods.]

CITRON (Z.) and KESSLER (A.). Investments in Manufacturing Made Through the Investment Center. Jerusalem: Falk Project for Economic Research in Israel (24 Hillel Street), 1958. 12½". Pp. 69.

[This is a statistical analysis of investment in manufacturing firms approved by the Government Investment Center. The status of Approved Enterprise carries with it privileged treatment in various matters of taxation, allocation of scarce materials and foreign exchange, etc. The approved investments are analysed with respect to size and type of firm, nature of product, employment created and gestation period.]

Japanese

YAMANAKA (T.) and KOBAYASHI (Y.). The History and Structure of Japan's Small and Medium Industries, with two specific surveys. Tokyo: Science Council of Japan, 1957. 8½". Pp. 89.

[Although Japan is a highly industrialised country with many large-scale factories, the small-medium industries have persisted to a remarkable extent. This is another, and by no means the best, of a number of recent studies on this subject. (Cf. *The Smaller Industry in Japan:* noted in this JOURNAL, March 1958.) There is an assessment of the extent of small business in Japan compared with Britain and the United States, a brief historical survey and a short study of the metal-toy and auto-parts industries.]

Egyptian

RAJ (K. N.). Employment Aspects of Planning in Under-developed Economies. National Bank of Egypt Fiftieth Anniversary Commemoration Lectures. Cairo: National Bank of Egypt, 1957. 9½". Pp. 48.

[In these three closely reasoned lectures Professor Raj considers some of the problems raised by unemployment in framing development plans for countries such as India. He begins by pointing out that by no means all the unemployment in such countries is of the disguised variety characterised by low or zero marginal productivity. There is much open unemployment where traditional forms of agrarian organisation have been disrupted and handicraft industries have been destroyed by competition. Whether the unemployment is mainly open or mainly disguised depends largely on conditions on land tenure, as may be seen by comparing the disguised unemployment of parts of northern India with the more open unemployment in south and central India. The two types of unemployment pose distinctly different problems for the planner. This point is further developed in the second lecture, where the author considers the extent to which the existence of unemployment may be taken to imply a potential slack out of which investment may be financed. Professor Raj considers that there is only a limited amount of truth in the commonly held view that men can be put to work on investment without any extra real cost because they can go on being supported by their families. For one thing, this does not apply to those suffering from open unemployment. (There seems to be a certain gap in the argument at this stage in that it is not explained how these people subsist as things are.) Hence the most promising sources of finance for investment are reduced consumption by property owners and the increase in output that accrues from the investment that is done. On the other hand, the pressure to concentrate for this reason on quick-yielding investment may conflict with other considerations affecting the most desirable direction for investment to take. Rapid technological advance in consumption industries helps create employment only in so far as the surplus thereby generated facilitates investment. For various reasons this may not happen. Moreover, there is a marked tendency for the further progress which it does stimulate to take place within a narrow enclave, thus enlarging the gap between the stage of development of different sectors in the economy, much as the gap between industrial and backward countries has been enlarged in the international sphere. For these reasons a case exists for concentrating most investment initially on social overhead capital and spreading what capital is available for consumption industries thinly and without attempting to revolutionise existing methods of production.]

Official

BRITISH

INTERDEPARTMENTAL COMMITTEE ON SOCIAL AND ECONOMIC RESEARCH. Guides to Official Sources: No. 4: Agricultural and Food Statistics. London: H.M. Stationery Office, 1958. 9½". Pp. 71. 4*s.* 6*d.*

[The longest section in this handbook consists of a tabulated and cross-referenced classification of the principal official data currently available in this field. This is preceded by lists of the sources where they appear and an enumeration of the series.]

AMERICAN

East–West Trade Developments 1956–1957. Tenth Report to Congress under the Mutual Defense Assistance Control Act of 1951. Washington, D.C.: U.S. Government Printing Office, 1958. 9″. Pp. 62.

[This gives a factual survey of the course of East–West trade, of the economic activities of the Soviet bloc in under-developed countries and of recent changes in the China Trade control programme. An appendix gives in detail the regulations in force in a number of countries governing trade with the Soviet bloc.]

INTERNATIONAL

BANK FOR INTERNATIONAL SETTLEMENTS. Twenty-eighth Annual Report. Basle: Bank for International Settlements, 1958. 11½″. Pp. 228.

[In addition to the usual useful survey of monetary and other developments during the year, this report contains an analysis of the flow of savings and of capital-market transactions in various western European countries and in the United States.]

INTERNATIONAL LABOUR OFFICE. Social Security. A workers' education manual. Geneva: International Labour Office, 1958. 9½″. Pp. 132. 4*s*. 6*d*.

[This manual provides a useful survey of the problems involved in schemes of social security and how they are tackled in different countries. The broader economic questions of the proper scope and functions of social security and its relation to national finances as a whole are not very fully dealt with, but much of the material included has a bearing on them.]

INTERNATIONAL MONETARY FUND. Summary Proceedings of the Twelfth Annual Meeting of the Board of Governors, September 1957. Washington, D.C.: International Monetary Fund, 1958. 9½″. Pp. ix + 169.

[This contains the speech made by the Managing Director of the Fund, Per Jacobsson, in presenting its Twelfth Annual Report, together with statements by the Governors for various countries. Mr. Jacobsson in his speech describes the circumstances that led to a considerable increase in the year ending September 1957 in the use made of the Fund's resources. The assistance granted by the Fund fell into four main classes: that arising from emergency needs, notably in connection with the Suez crisis; that granted to countries whose balances of payments on current account were imperilled by ambitious development plans; temporary assistance to cover seasonal disequilibria; and assistance to certain Latin American countries designed to help them to put their external currency arrangements on a simpler and more stable basis. Mr. Jacobsson expresses his satisfaction that " a majority of countries are now succeeding in making monetary and fiscal policy the principal means of dealing with their payments problems."]

UNITED NATIONS. Demographic Yearbook 1957. New York: United Nations, 1958. 11½″. Pp. viii + 656. $6.50.

[The greater part of this year's issue consists of data on mortality. Briefer tables are also included on population size, births, marriages and migration. An introductory chapter surveys the form and causes of the current decline in mortality.]

UNITED NATIONS. Economic Survey of Asia and the Far East, 1957. Bangkok: United Nations, 1958. 11″. Pp. 261. 18*s*.

[After a brief introductory section on the position in the ECAFE region in 1957, the greater part of this report is taken up with a more general survey of the problems of development as they have affected differently situated countries in the region since the War. Separate chapters deal with Japan, India, China, countries dependent on the export of primary commodities, war-ravaged countries and land-locked countries.]

UNITED NATIONS. Economic Survey of Latin America in 1956. Prepared by the secretariat of the Economic Commission for Latin America. New York: United Nations, 1957. 11″. Pp. 183. 18*s*.

[The first two parts consist of a survey of trends in the region in 1956, with separate treatment of the growth of production in the main sectors. The third part contains two special studies: the first on the effects of industrialisation on import structures and external vulnerability in the region generally and in its several countries, the second on productivity of land and labour in Latin American agriculture.]

UNITED NATIONS. Energy in Latin America. A study prepared by the secretariat o the Economic Commission for Latin America. Geneva: United Nations, 1957. 11″. Pp. 268. 18*s*.

[This contains a survey of consumption of energy in Latin America in total, in different forms and in different sectors, based on specially collected data running from 1925; an analysis of the energy resources of the region, of efficiency in the use of energy in it and of the financial aspects of energy production; and projections of supply and demand prospects in 1965. This last section includes estimates of the amount of investment required for expanding energy production, viewed in relation to total capital formation and the foreign-exchange position.]

UNITED NATIONS. Statistical Yearbook 1957. New York: United Nations, 1958. 11½″. Pp. 674. 46*s*.

[This follows the same lines as previous issues. It has been improved and enlarged in various ways. Improved co-operation from Eastern European authorities has made it possible for the first time to give reasonable coverage of all European countries, with the exception of Albania.]

UNITED NATIONS. Water for Industrial Use. New York: United Nations, 1958. 11″. Pp. 44. 3*s*. 6*d*.

[This report was prepared by the United Nations Bureau of Economic Affairs with the help of an outside consultant. It surveys the relationship between water supply and industrial development and outlines the tasks that need to be set about at national and international levels in order to procure the best use of water resources.]

UNITED NATIONS COMMISSION ON INTERNATIONAL COMMODITY TRADE. Commodity Survey, 1957. New York: United Nations, 1958. 11″. Pp. 218. 18*s*.

[This report is made up of two parts: an analysis of developments in commodity markets during the year, and a background study dealing with changes in the course of production and trade in primary commodities during the first post-war decade.]

UNITED NATIONS FOOD AND AGRICULTURE ORGANISATION. Mediterranean Development Project, Interim Report on Mediterranean Forestry Programs in Relation to Agricultural Rehabilitation and General Development. Rome: F.A.O., 1957. 13″. In five parts with country reports. Copies obtainable from the Director-General, F.A.O.

[This substantial report is the work of a team that was headed by Dr. Thomas Balogh. In addition to a great deal of detailed material on forestry and agriculture, it includes interesting general sections on the problems of development in the Mediterranean region. Stress is here laid on the importance of securing an adequate expansion of demand. A noteworthy suggestion made is that in the circumstances prevailing in Mediterranean countries, a case exists for deliberately pursuing a policy of temporarily unbalanced development in order to stimulate the response towards the establishment of a new balance at a higher level. Public works are suggested as the spearhead of change, both because of their capacity to create employment and demand and because of the need for social overhead capital.]

UNITED NATIONS FOOD AND AGRICULTURE ORGANISATION. Sea-fish Marketing in the Federal Republic of Germany. Rome: F.A.O., 1957. 9″. Pp. 143. 7*s*. 6*d*.

[This describes the structure of the Geman fishing industry, the wholesale and retail institutions through which fish is marketed, and the factors affecting the demand for fish.]

UNITED NATIONS FOOD AND AGRICULTURE ORGANISATION. Yearbook of Food and Agricultural Statistics: Production. Rome: F.A.O., 1958. 11″. Pp. xi + 452. 17*s*. 6*d*.

[This contains data on crop and livestock production, on agricultural inputs and on prices. Figures are given for 1954, 1955 and 1956 and for the average of the years 1948–52.]

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THE ECONOMIC JOURNAL

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THE CARDINAL UTILITY WHICH IS ORDINAL[1]

Despite the frequent disclaimers,[2] the phrasing of many of the discussions of the Neumann–Morgenstern utility index continues to invite reading into them the mistaken view that the utility index is, or is intended to be, just another device for measuring neoclassical introspective utility, and differs from the latter only in being defined exclusively for risky propositions. As one who once fell into this trap, I am perhaps oversensitive to this matter. In this paper, I attempt to make clear the nature of the N–M index and its distinction from the measure which plays so great a role in the neoclassical literature. I shall show, in fact, that in the neoclassicist's sense, the N–M index turns out to be just an ordinal measure.

First, let us try to see what use its inventors and their successors have made of this important device. It is *not* the purpose of the Neumann–Morgenstern utility index to set up any sort of measure of introspective pleasure intensity.[3] Such a measure of "strength of feelings" is totally unnecessary in the theory of games for which the N–M utility theory was constructed. Rather the utility measure was set up for purposes of calculation, or rather of prediction (in the subtler sense of the word) to permit the theorist to *determine in the absence of the player* which of several risky propositions the player will *prefer*. For the solution of a duopoly game must predict which strategy each player will choose (prefer), and the theory must therefore be able to predict how each player will rank risky[4] strategic decisions.

The theory makes this prediction not by measuring subjective utility but by assuming preference patterns for the individual, patterns which have sometimes been described as "rational." It is assumed (in any of several

[1] I am heavily indebted to William Bowen, Robert Dorfman, Robert Kuenne and Richard Quandt for their very helpful comments and suggestions.

[2] See, *e.g.*, Milton Friedman and L. J. Savage, "The Expected Utility Hypothesis and the Measurability of Utility," *Journal of Political Economy*, Vol. 60, 1952, esp. p. 473.

[3] This is documented in and should have been made clear by Ellsberg's excellent "Classical and Current Notions of 'Measurable Utility,'" Economic Journal, Vol. LXIV, September 1954.

[4] Indeed the theory is constructed to a large extent to pave the way for the analysis of the "mixed strategy" into which the player himself introduces elements of risk partly to cloud his opponent's foresight.

sets of axiom systems) that the person's preferences are so structured that a limited number of observations will reveal his ranking of all the other relevant alternatives.

More specifically, suppose we are given two lottery tickets, one of which offers the prize A with probability P (so that there is probability $(1 - P)$ of being subjected to the loser's penalty, B). Let the corresponding elements of the other lottery ticket be A', B' and P'. If this individual's mind works as required by the N–M axioms we should be able to predict correctly which of the lottery tickets he will prefer (choose) without having asked him his opinion of the two alternatives. Rather, as is shown in the Appendix, we need only inquire about his attitudes toward the prizes and penalties, A, B, A' and B', and even these need be *ranked* only against an arbitrarily chosen imaginary lottery ticket which is used as a standard of comparison. In fact, these assertions hardly require proof—we have assumed that the person's mind works in such a consistent predictable pattern.

Then where does the " cardinal utility measurement " enter this matter? The answer is that the word " cardinal " has been used, misleadingly, to mean two entirely different things. One denotation is the introspective absolute marginal pleasure measurement which I have heard one well-known game theorist indignantly call " metaphysics." The other, game theoretic, use of the word " cardinality " is entirely operational. The prediction as to which of the two lottery tickets will be chosen is most conveniently made with the aid of a numerical calculation. We are given the person's ranking of the prizes and intend to predict from these data which ticket he will choose. We want to find numbers (cardinal utility measures) which permit us to make this prediction.

The problem is like that of finding two pieces of cloth in a shop which together are large enough to cover our table at home. We wish to predict which two pieces will do this without having to take them home, try them and return them for exchange if they turn out to be too short. Numbers can help us here. We know that a table 3 yards long can easily be covered by two cloths whose lengths are $1\frac{1}{2}$ yards and $2\frac{1}{4}$ yards. Similarly, Neumann and Morgenstern have shown us how to find numbers which can help us to predict the person's ranking of the two lottery tickets. This clever device is essentially what is meant by their cardinal utility measure.

But note that this is not cardinal utility in the old-fashioned sense. Not a word has been said about successive increments of some item yielding diminishing (or increasing) marginal joy. Indeed, in the old-fashioned sense the N–M index is a sheep in wolf's clothing—it is nothing but an ordinal measure, after all! For it has been used to predict, but to predict only *rankings* of lottery tickets!

What specifically is meant, then, when N–M utility is called " cardinal "? This (and the equivalent assertion that the measurement is unique up to a linear transformation, or that it permits two degrees of freedom) refers only

to the predictive power of the index. This is best brought out by contrast with two less-powerful types of measurement scale.

The weakest type of index (one which conveys very little information) is one which serves only to *associate* items in two different collections. For example, persons in a newspaper group photograph are sometimes identified by placing a number next to each face and the same number beside the corresponding name in a list printed underneath. Here we set up the linguistic convention that any one man's name and face are given the same number. The numbers themselves do not matter and can be transformed in any way we like (we can exchange any number for another), provided no two faces bear the same number.

A ranking conveys somewhat more information, and in order to be able to transmit these data the numbers which measure them must be more circumscribed. To take the standard illustration, harder minerals are given higher numbers. The same information can be conveyed by any other set of numbers provided that we satisfy the linguistic convention that of two rocks the one with the higher number in the initial numbering also bears the higher subsequent number.[1] We say that the index which measures, or rather describes, a ranking is unique up to a monotone transformation.

Finally, we come to " cardinal measurement " which conveys still more information than did either of the other types of measure. It permits us, from what we know about two items in isolation, to *predict* something about them in combination. For example, our index of cloth length permitted us to predict whether two pieces of cloth of given lengths would cover a table whose dimensions are known without actually laying the pieces of cloth end to end. Here we have still less choice in the numbers which can convey the information. On the linguistic convention that we *add* lengths [2] the numbers which we assign to the lengths of any two pieces of cloth must add up to the number which we assign to the length they can cover together. This leaves us no more than two choices [3] (two degrees of freedom)

[1] Clearly other linguistic conventions might do—*softer* minerals might be given higher numbers.

[2] Here again we might use other conventions. Any process which uniquely assigns a third number to any two will do the trick. We might, for example, use logarithmic rulers with slide-rule scales and get used to multiplying lengths—10 in. and 5 in. = 50 in. But the point is that to convey information we must start off with some sort of language. We must first set up our linguistic conventions in any convenient way and then find the numbers which correctly convey the information in this language.

[3] Actually a length measure conveys even more information than this, and so we have only one choice in assigning numbers to lengths—we can only decide on a unit of length—whether we will measure in centimetres or in inches. The point is that in length we have a well defined zero. Mathematically, zero is defined as a number which when added to another leaves the latter unchanged. A non-existent piece of cloth (a piece of zero length) has an analogous (the mathematician calls it " isomorphic ") property. Hence in measuring length we have only one degree of freedom, the choice of unit of measurement, and a length measure is said to be unique up to a proportionate transformation. When measuring utility or temperature (without an absolute zero) we have two degrees of freedom—the choice of unit and the zero (freezing of water or some other point as in Fahrenheit measure), and hence these measures are said to be unique only up to a linear transformation.

in assigning these numbers. Once we call A " 3 yards " and B " 4 yards " we are forced to call A and B together " 7 yards," we are forced to call A and B and another piece like A " 10 yards " and so on. Similarly, in N–M utility measurement we want to assign to lottery-ticket prizes utility numbers which, when they are processed arithmetically in accord with the linguistic convention chosen,[1] will assign a utility number to the lottery ticket that ranks that lottery ticket correctly in relation to other possible tickets. And here again, once we pick such utility numbers for any two alternatives we are left no choice on the numbers to be assigned to other alternatives. This, then, is the sense in which the N–M utility measure is cardinal—it is richer in that it conveys more information than does an ordinary ranking obtained, for example, by directly asking any individual to state all his preferences. In effect, it is an economy device which requires an interviewer only to ask the subject to state *some* of his preferences—his ranking of lottery ticket prizes. With the aid of the N–M utility index (if it is applicable to this person) the interviewer can then *deduce* by himself the person's ranking of all other alternatives from the answers he has already received. But it must be emphasised that the N–M index still conveys information *only* about the individual's preference ordering.

But, it has been objected, the argument so far has only purported to indicate what its authors intended of the utility measure. Is it not possible that the index can do more, and measure marginal joy (or compare increments of satisfaction) as well? It is, after all, illegitimate to argue that Columbus failed to discover America by documenting his intention to find a new sea route to India.

Despite Professor Robertson's attempt to ascribe marginal subjective utility measurement powers to the index,[2] I shall argue that no such interpretation will do here. Such an interpretation must confuse marginal utility with another closely related concept, the marginal rate of substitution. We have long known that ordinal utility is perfectly compatible with the discovery of the *ratios* of the marginal utilities of two items (their marginal rate of substitution for one another). It is not the same to say that for me the marginal utility of apples is declining (a statement which to me has no operational meaning) and to say that I will offer successively smaller amounts

The linguistic convention employed by Neumann and Morgenstern is that utilities can be added actuarially, *e.g.*, given a lottery ticket which promises a prize A with probability of $\frac{1}{3}$ and the alternative B with the probability of $\frac{2}{3}$, the ticket's utility will be evaluated at $\frac{1}{3}$ the utility of A plus $\frac{2}{3}$ the utility of B. In the appendix to this article I show when this convention can convey the information required of it, *i.e.*, numbers assigned in this way will rank lottery tickets correctly in accord with a person's preferences.

We can then say that the N–M index is cardinal in the mathematical sense that it yields numbers which can in turn meaningfully be multiplied by probability numbers and added. But this addition is meaningful just in *predicting rankings* correctly, which is all it is intended to do.

[2] See D. H. Robertson, " Utility and all What? " ECONOMIC JOURNAL, Vol. LXIV, December 1954, esp. pp. 671 and 674–5.

of money for additions to my stock of apples. It would be completely naïve to try to measure the subjective old-fashioned " cardinal " joy of apple possession in money terms because money itself is not calibrated in utility terms and its utility cannot be assumed constant.

But an attempt to interpret the N–M index as an old-fashioned cardinal measure is naïve in precisely this way. The N–M construction, instead of asking " how much more money for an additional apple?", validly takes as its behavioural criterion " How much higher must be the probability of winning some prespecified prize in order to compensate me for not receiving an additional apple? " In effect, it deals not with the marginal utility of (say) income, but with the ordinalist's substitute, the marginal rate of substitution between (the ratios of the marginal utilities of) income and the probability of winning the prespecified prize. As it should be, this is good cardinal measurement only in the game theorist's useful sense. Only if we are prepared to assume that we know the behaviour of the denominator of the *MRS*, the marginal subjective utility of an increase in the probability of winning,[1] can we go on to make deductions about the marginal *subjective* utility of apples from N–M index data.

In any event, the N–M theory and this assumption are totally irrelevant for one another. The N–M index can serve its purpose (prediction of the ranking of lottery tickets) perfectly well without any such premise. Contrariwise, while an assumption of constancy (or some other known pattern) of the subjective marginal utility of the probability of winning, P, can give us a neoclassical index of subjective marginal utility, it can do so without recourse to any of the N–M apparatus. We need only multiply the marginal rate of substitution of apples for P by the marginal utility of P to obtain a figure for the marginal utility of apples.

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APPENDIX

The Neumann–Morgenstern Utility Measure

It may be worth deriving the statements on the N–M utility index which are made in the text, since no simple statement seems to be available in the literature.

[1] It may appear from the notation of the N–M index that this marginal utility is assumed to be constant. For, writing L for the standard lottery ticket, we have in the notation of the Appendix

$$U(L) = U[P : E, D] = PU(E) + (1 - P)U(D)$$

by the N–M linguistic convention (3), where $U(E)$ and $U(D)$ are the two constants whose choice is permitted by the index's two degrees of freedom. Hence the N–M marginal utility of P,

$$\frac{dU(L)}{dP} = U(E) - U(D) = \text{a constant}$$

In this theory there is, however, no reason to interpret the value of $dU(L)/dP$ as an index of the change in the individual's subjective pleasure. The constancy of $U(E) - U(D)$ is of no more significance than the use of a constant monetary unit—the dollar—when items are ranked in terms of money (which surely does not commit us to a belief in a constant subjective marginal utility of money).

First let us list a set of assumptions sufficient to assure predictability of the person's preferences:

To do this it is convenient to employ the following notation: For any alternatives A and B let $A \text{ I } B$ mean A is indifferent with B and for any alternatives A and B and any (probability) number P where $0 \leq P \leq 1$, let $[P : A, B]$ represent a lottery ticket which offers the probability P of obtaining prize A, and $1 - P$ of obtaining prize B. Using this notation, we may now list five assumptions about an individual's preference structure which suffice to assure that his preferences among lottery tickets will be predicted correctly by an N–M utility index:

Assumption 1. Transitivity: If for this person $A \text{ I } B$ and $B \text{ I } C$, then $A \text{ I } C$.

Assumption 2. Continuity of Preference as a Function of P: For any three outcomes E, A and D, if E is preferred to A and A is preferred to D, there exists a (probability) number P_a such that $0 < P_a < 1$ and $A \text{ I } [P_a : E, D]$.

Assumption 3. Independence: If $A \text{ I } B$ then $[P : A, C] \text{ I } [P : B, C]$ for any C and any probability P. This states that if two investments involve equal probabilities of attaining outcomes which are different but are in themselves equally valuable, the two investments will be equally attractive.

Assumption 4. For any alternatives E and D, and any probability numbers r and r', if E is preferred to D, then $[r : E, D]$ is preferred to $[r' : E, D]$, if and only if $r > r'$. This states that other things being equal, we will always prefer the investment opportunity with the greater probability of a favourable outcome.

Assumption 5. Compound Probability Arithmetic: For any alternatives E and D and any probability numbers P, P_a and P_b,

$$[P : [P_a : E, D], [P_b : E, D]] \text{ I } [r : E, D],$$

where r is a probability number given by $r = PP_a + (1 - P)P_b$. This requires some explanation. The first bracketed expression represents a compound lottery ticket which offers the probability P of winning. If the ticket holder wins, however, rather than a definite prize he obtains another lottery ticket $[P_a : E, D]$. If he loses, he is given, instead, the inferior lottery ticket $[P_b : E, D]$, with the same prizes but poorer odds. What is the probability of eventually coming out of all this with the grand prize, E? There is a probability P of winning the better lottery ticket which offers E with probability P_a, so the probability of getting E in this way is PP_a. However, if he loses the first draw, a loss which will occur with probability $(1 - P)$, the ticket holder still has the probability P_b of getting E, so that there is a probability $(1 - P)P_b$ of his obtaining E in this way. The total probability of obtaining E is then $PP_a + (1 - P)P_b$.

We may now interpret this last assumption to say that the person's psychology is such that he will evaluate a compound lottery ticket in terms of the probabilities of winning the ultimate prizes.

It has sometimes been asserted that " rational persons " will behave as these five assumptions require, but we need not get into this dispute here.

Let us now choose some lottery ticket to be used as a standard against which other alternatives can be evaluated. It is convenient (but not necessary) to assume that this ticket offers to the winner eternal bliss (E) and to the loser damnation (D), so that any alternative, A, which we bring to be evaluated against this standard ticket will presumably be no better than E and no worse than D.

By assumption 2, for any such A, there will be a probability number $P_a (0 < P_a < 1)$ such that $A \text{ I } [P_a : E, D]$. We can now prove the following

theorem: Given any two lottery tickets $[P : A, B]$ and $[P' : A', B']$ and a person whose preferences never violate assumptions 1–5, if we obtain (say by his introspection) the four probability numbers P_a, $P_{a'}$, P_b and $P_{b'}$ chosen so that

$$(1) \qquad A \text{ I } [P_a : E, D], \text{ and } B \text{ I } [P_b : E, D], \text{ etc.}$$

then from these numbers it is possible to predict which of the two lottery tickets will be preferred.

Proof: We begin by evaluating our first lottery ticket in terms of E and D.

$$[P : A, B] \text{ I } [P : [P_a : E, D], [P_b : E, D]] \quad \text{(by assumption 3)}$$

$$\therefore \qquad [P : A, B] \text{ I } [r : E, D] \quad \text{(assumptions 1 and 5)}$$

where r is the probability number $PP_a + (1 - P)P_b$. Similarly, the second lottery ticket can be evaluated in terms of E and D as

$$[P' : A', B'] \text{ I } [r' : E, D] \text{ where } r' = P'P_{a'} + (1 - P')P_{b'}.$$

Therefore, by assumption 4, the individual must prefer $[P : A, B]$ to $[P' : A', B']$ if and only if

$$(2) \qquad r = PP_a + (1 - P)P_b > P'P_{a'} + (1 - P')P_{b'} = r',$$

and he will be indifferent between these tickets if and only if $r = r'$. But by hypothesis, P, P' are numbers given by the terms of the two lottery tickets, and P_a, P_b, $P_{a'}$ and $P_{b'}$ were found out by observing or questioning our individual. r and r' can then be evaluated directly and the higher of these two numbers must, by assumption 4, correspond to the preferred lottery ticket. Q.E.D.

Let us now see how the N–M index is constructed and prove that it can be used to predict correctly the choice of lottery ticket. As already indicated, we employ the following linguistic convention (definition) for evaluating the " utility " of a lottery ticket in terms of the utilities of its prizes:

$$(3) \qquad U[P : A, B] = PU(A) + (1 - P)U(B)$$

That is, if $P = \frac{3}{4}$ so that the odds of winning are 3 to 1, then we evaluate the utility of the lottery ticket at $\frac{3}{4}$ the utility of victory plus $\frac{1}{4}$ the utility of defeat. But we note that this is only a convention. To show that it is usable we must first indicate how these utility numbers can be found and then we must prove that they must always assign a higher utility number to the preferred lottery ticket.

To see how the utility of any alternative, A, can be found we first assign arbitrary " utility " numbers

$$(4) \qquad U(E) > U(D)$$

to eternal bliss (E) and damnation (D) in our standard lottery ticket. Now we can find $U(A)$ by recalling (1) and defining

$$(5) \qquad U(A) = U[P_a : E, D], \; U(B) = U[P_b : E, D], \text{ etc.}$$

so that by (3)

$$U(A) = P_a U(E) + (1 - P_a)U(D), \text{ etc.}$$

Hence by finding P_a in (1) the utility number $U(A)$ can be computed.

Finally, I give a proof of the statement that these utility numbers rank lottery tickets correctly so that $U[P : A, B] > U[P' : A', B']$ if and only if the former is the preferred lottery ticket, *i.e.*, if and only if (2) holds.[1]

[1] The proof can easily be extended to the case of indifference.

Proof: The utility of the first lottery ticket is

$$U[P:A,B] = PU(A) + (1-P)\,U(B) \qquad \text{(by convention (3))}$$
$$= PU[P_a:E,D] + (1-P)U[P_b:E,D] \qquad \text{(by (1) and (5))}$$
$$= P\{P_aU(E) + (1-P_a)U(D)\} + (1-P)\{P_bU(E) + (1-P_b)U(D)\} \qquad \text{(by (3))};$$

which, multiplying out and rearranging terms

$$= \{PP_a + (1-P)P_b\}U(E) + \{P(1-P_a) + (1-P)(1-P_b)\}U(D)$$
$$= \{PP_a + (1-P)P_b\}U(E) + \{1 - PP_a - (1-P)P_b\}U(D)$$
$$= rU(E) + (1-r)U(D) \qquad (6)$$

Similarly the utility of the second lottery ticket is

$$U[P':A',B'] = r'U(E) + (1-r')U(D) \qquad (7)$$

Thus comparing (6) and (7) we see that since by (4) $U(E) > U(D)$, the first lottery ticket will have the higher utility number if and only if $r > r'$. But we have just seen (2) that this condition also guarantees that that lottery ticket will be preferred. Thus we have proved that convention (3) will always assign a higher utility number to the preferred lottery ticket as we require.

ALFRED MARSHALL AND THE COMPETITIVE FIRM[1]

SINCE Marshall's death, his Representative Firm has been widely studied and frequently criticised.[2] Less attention has been devoted to the individual firms which make up the competitive industry, and whose characteristics largely determine the character of the Representative Firm itself. This relative lack of interest in Marshall's competitive firm is perhaps partly explained by the fact that he never put forward a clear and concise theory of the individual business. As Triffin says, " Marshall's occasional remarks about the firm's behaviour are nowhere integrated into the main trend of an analysis, narrowly clustered around 'industrial' concepts." [3] And Samuelson comments on " the paradox that Marshall with whom the doctrines of partial equilibrium and industry analysis are inseparably associated, nowhere presents a complete or satisfactory theory of the industry in its relationship to the firms which make it up." [4]

Despite this apparent reluctance to present his views on the firm in the shape of a comprehensive theory, there is no lack of hints as to what these views were. Schumpeter has pointed out that Marshall assembled " practically all the bricks and all the mortar required for the theory of the individual firm," [5] thereby anticipating many features of more recent analyses. He also suggests that " the later theory of imperfect competition may fairly be traced to him. Though he did not elaborate it, he saw the phenomenon more clearly than most of those who did. In particular, he did not exaggerate its importance." [6] Nor was Marshall merely an abstract theoriser; he tried hard to ensure that his theory gave a realistic picture of the industrial scene in his day.

In these circumstances it seems unfortunate that more attempts have not been made to clear up the obscure parts of Marshall's discussions of the firm and industry. Among his interpreters, Mr. Shove, in the 1930 Symposium, gave perhaps the most comprehensive and accurate commentary on Marshall's views, pointing to the emphasis on the limited life of the individual firm and on market imperfections. Sir Dennis Robertson also closed his

[1] I am greatly indebted to Sir Dennis Robertson for his comments and criticisms, as also to my colleagues Professor G. C. Allen, Dr. Marian Bowley and Dr. Alfred Stonier.

[2] See especially, P. Sraffa, "The Laws of Returns under Competitive Conditions," ECONOMIC JOURNAL, 1926, p. 535; Lionel Robbins, "The Representative Firm," ECONOMIC JOURNAL, 1928, p. 387; A Symposium on " Increasing Returns and the Representative Firm," ECONOMIC JOURNAL, 1930, p. 79; " Alfred Marshall's Theory of Value," Ragnar Frisch, *Quarterly Journal of Economics*, 1950, p. 495; J. N. Wolfe, " The Representative Firm," ECONOMIC JOURNAL, 1954, p. 337; Sir Dennis Robertson, *Economic Commentaries* (London, 1956), especially pp. 12–25.

[3] *Monopolistic Competition and General Equilibrium Theory*, p. 8.

[4] *The Foundations of Economic Analysis*, p. 207.

[5] J. A. Schumpeter, *History of Economic Analysis*, p. 997 n.

[6] *Capitalism, Socialism and Democracy*, p. 78 n.

contribution to the 1930 Symposium by stressing the importance which Marshall attached to the relatively short life of the individual firm. In his more recent contribution Sir Dennis has re-emphasised this point, as well as bringing out the fact that Marshall explicity allowed for the existence of imperfect competition. The present paper accepts this general line of argument as the basis for a rather fuller account of Marshall's views on the individual competitive firm.

Two main strands of thought have to be considered. First, Marshall was concerned, at any rate by implication, to analyse all the various types of market form with which the competitive firm might be faced. Second, he brought in several dynamic qualifications to the argument, namely, expectations, and the forces of growth and change.

We begin with an important general question, namely, the way in which Marshall's thought developed. Professor Robbins has made much of the fact that both the Representative Firm and also most of the discussion on increasing returns, which was later to lead to such controversy, did not appear at all in the First Edition of the *Principles*, published in 1890; they were added a year later, in the Second Edition. Professor Robbins rightly concludes that the introduction of the Representative Firm at this stage was " the result of the changes in the parts of Book V dealing with the notion of increasing returns under competitive conditions." [1] It is, however, perhaps a little unfair to brand it, as he does, " an afterthought." [2] It is perfectly true that the concept did not appear at all in the First Edition of the *Principles*, though the idea of the life cycle of the firm did, in much the same form as it now occurs on pp. 314–17 of the *Principles*. Marshall was already emphasising the fact that when output rose the extra production was likely to come from a firm just struggling into business and whose cost conditions were not typical. The problem whether decreasing costs were compatible with competitive equilibrium—the problem which the Representative Firm was intended to solve—had already been troubling Marshall for some years. Nor was his difficulty caused by the attacks of any critic; he had lighted on it himself, at an early stage, in his reading of Cournot.

> " You say that, *à propos* of Increasing Returns, you are inclining to lay stress on the incomplete utilisation of existing productive facilities. That is of course one of my chief hobbies. My confidence in Cournot as an *economist* was shaken when I found that his mathematics *re* I.R. led inevitably to things which do not exist and have no near relation to reality." [3]

[1] *Op. cit.*, p. 388 n. [2] *Ibid.*, p. 387.

[3] This must refer to the criticism, voiced by Marshall in the *Principles*, that some economists " among whom Cournot himself is to be counted, have before them what is in effect the supply schedule of an individual firm; representing that an increase in its output gives it command over so great internal economies as much to diminish its expenses of production; and that they follow their mathematics boldly, but apparently without noticing that their premises lead inevitably to the conclusion that, whatever firm first gets a good start will obtain a monopoly of the whole business of its trade in its district " (*Principles*, p. 459 n.).

> " One of the chief purposes of my Wanderjahre among factories, etc., was to discover how Cournot's premises were wrong. The chief outcome of my work in this direction, which occupied me a good deal between 1870 and 1890, is in the ' Representative Firm ' theory . . . as well as the parts that directly relate to supply price for I.R." [1]

This, of course, merely serves to heighten the mystery about the Representative Firm. Had Marshall already invented it by 1890? Or had he studied the problems of increasing returns without it? On the other hand, it becomes clear that Marshall himself was quite as aware of the apparent contradiction between increasing returns and competitive equilibrium as were his later critics. It also follows that the explanation of this contradiction which he put forward in the Second Edition of the *Principles* was deliberately and specifically designed in an endeavour to prove that there was *no* contradiction between competitive equilibrium and increasing returns within the individual firm. Is it possible that the reason why Marshall left this somewhat arid and intricate discussion out of the First Edition was his perpetual fear of making the discussion too difficult to give him that audience among business-men which he so much desired?

With the publication of the Second Edition in 1891, all the main threads in Marshall's theory of the firm had now seen the light of day, though there were some changes in the relevant sections of the *Principles* in later editions. For example, in the Fourth Edition (1898), though there was no major change of substance, considerable sections of the text were moved into other chapters or into footnotes. After 1898 there were two major changes. As we shall see in more detail later, the passage on the " trees in the forest " was altered in the Sixth Edition (1910) to allow for the growing importance of joint-stock firms. The important Appendix H grew gradually from a footnote to Chapter 5 of Book V in the First Edition to reach almost its present form by the Fourth Edition, as a " Note on the Pure Theory of Stable and Unstable Equilibria." It took its final shape in the Fifth Edition (1907) with the addition of the present first section.

However, while these changes are both interesting and important, the fact remains that Marshall's scheme of thought was virtually complete by 1890, which, in turn, implies that his views on competitive business were largely determined by the impressions he had gathered of British industry in the 1870s and 1880s during his visits to firms. This helps to explain the small part played by joint-stock firms in his theory, and also his considerable emphasis on producers' fears of " spoiling the market," which must have struck him during so depressed a period as the 1870s and 1880s. Perhaps, too, his discovery of the existence of excess capacity owed something to the prevailing depression.

Many of the changes which Marshall made in the various editions of the *Principles* will be noted as we proceed. For simplicity, page references

[1] From a letter to A. W. Flux, dated March 7, 1898. *Memorials of Alfred Marshall*, pp. 406–7.

are embodied in the text and, unless otherwise stated, these are to the Eighth Edition of the *Principles* before the reprint of 1950 which (most regrettably) altered the pagination.

I

The first main section of this paper considers the markets faced by Marshall's competitive firm. Marshall gave no full or tidy classification of market forms, and *obiter dicta* about them are well scattered in both the *Principles* and *Industry and Trade*. There is much to be said for consulting *Industry and Trade*, where Marshall summarises the main features of his theoretical scheme within the compass of a single, short chapter (Book II, Chapter 1). The terms competition and monopoly are used in the present-day fashion, it being stressed that " they shade into each other by imperceptible degrees " (*I. & T.*, p. 178). Marshall's classification of markets is not very explicitly related to this distinction; he writes of " open " and " monopolistic " markets. The term " open " market seems to cover all those markets where there is a number of competing firms, but where oligopolistic interdependence in price–output policy is ruled out.

Even so, numerous types of " open " markets are possible, each shading into each other, and each of these has its place in the *Principles*. For the usual pedagogic reason, Marshall begins with the simplest case, and proceeds to more complicated ones. The first discussion of pricing in a competitive industry (Book V, Chapter 3) occurs during a study of " The equilibrium of normal demand and normal supply," and the conditions assumed are those of pure competition. It is postulated that " there is much free competition;[1] that is, buyers generally compete freely with buyers and sellers compete freely with sellers " (p. 341). With these assumptions, Marshall found it possible to postulate that " there is only one price in the market at one and the same time " (pp. 341–2). This result is possible because, " although everyone acts for himself, his knowledge of what others are doing is supposed to be generally sufficient to prevent him from taking a lower or paying a higher price than others are doing " (p. 341).

Marshall makes it clear that these assumptions are only intended to be provisional; normal demand and supply are being studied " in their most general form " and *consequently* " we are neglecting those features which are special to particular parts of economic science, and are confining our attention to those broad relations which are common to nearly the whole of it " (p. 341).[2] These relatively simple assumptions suffice throughout the preliminary discussion of equilibrium (Book V, Chapter 3), and for most

[1] In the first four editions of the *Principles* the word " much " did not occur, and the words *free competition* were italicised.

[2] Marshall also says, from the First Edition onwards, " We have already inquired to some extent, and we shall have to inquire further, how far these assumptions are in accordance with the actual facts of life "; but it is never made clear whether, and if so where, this further inquiry takes place.

of the discussion of long- and short-period supply conditions as illustrated by reference to the fishing industry (Book V, Chapter 5). Since he is concentrating attention on the response of supply, over time, to a once-for-all change in demand, Marshall makes demand conditions as simple as possible by considering a relatively homogeneous product like fish, and by implying that the market is near-perfect.

When he considers manufactured goods, however, a subtle difference creeps in. It is suggested that such products can also be homogeneous, at least where the goods are " so simple and uniform that they can be sold wholesale in vast quantitites " (p. 286). Besides most " raw produce " such homogeneous goods include some " plain and common " manufactured goods like " steel rails " and " calico " (p. 286). The difference between agricultural and manufactured goods sold in " large and open " markets, then, need not be in any lack of homegeneity in the products. The difference is that, with manufactured products, the producers, even of homogeneous goods sold in Marshall's " large and open " market, can often exert some influence on each others' price policy. This new factor comes out clearly when, towards the end of Chapter 5, Marshall turns the discussion, by implication, from fish to manufactured goods and studies the effect on supply price " of the expectation of a low price " (p. 374). He explains that if, in a slump, " producers had no fear of spoiling their markets, it would be worth their while to produce for a time for any price that covered the prime costs of production and rewarded them for their own trouble " (p. 374). In practice, however, they do not do this, but stop producing altogether as soon as the price reaches a level " which is nearly always above, and generally very much above the special or prime cost for raw materials, labour and wear-and-tear of plant, which is immediately and directly involved " (pp. 374–5).

This must mean that Marshall's " large and open " market for manufactured goods does not contain enough firms to experience pure competition. Even in the " large and open " market, a producer can incur the " resentment " and " odium " of other producers if he sells too far below " full cost " in a depression. One is surely justified in supposing that the guilty producer could not be singled out for such treatment unless the number of firms in the industry were smaller than perfect competition would require. On the other hand, the producer is apparently more worried by the personal criticisms of others than by any economic actions on their part. As Sir Dennis Robertson has put it: " It seems to be not so much of their trade policy that Marshall's typical[1] producer moves in fear, as of their personal behaviour to him (and no doubt to his wife) when he meets them outside the chapel or in the club." [2] An additional reason for supposing

[1] I take it that the intention here is, rightly, to imply that Marshall's " typical " producer operates in conditions of monopolistic competition.

[2] *Economic Commentaries*, p. 15.

that the number of firms in the " large and open " market for manufactured goods will not be very big is that it is small enough to allow " formal or informal agreement with other producers to suspend production for fear of further spoiling the market " (p. 374).

Here, then, we are concerned with monopolistic competition which occurs, not because products are heterogeneous, but because the number of producers is less than in perfect competition. I can, however, see no reason for supposing that the number of firms concerned is small enough to give rise to oligopoly in the strict sense of *really* few sellers; as we shall see later, Marshall rules out this type of oligopoly from the analysis of the *Principles*. There is, however, a hint of oligopoly in the sense that, despite the large number of firms, each seller does consider the effects of his action on his rivals. Sir Dennis Robertson has written, " It is not so clear to my mind whether the theory necessarily implies an element of oligopoly, in the sense in which that ugly word is now used to denote (whatever the numbers involved) a regard by the producer for the effect of his actions on the price or output policy of his competitors." [1]

A second type of situation which Marshall seems to have in mind in this discussion of " spoiling the market " is more complex: he speaks of the producer's " own customers." In other words, we are now concerned with monopolistic competition based on product differentiation, either through physical differences in the product, through the " goodwill " of the individual producer or through transport costs and other geographical factors. It is true that, in the passage just quoted, Sir Dennis does not mention this distinction, but it seems valid, and, in correspondence between us, Sir Dennis has accepted it. Let me quote Marshall's own words more fully. " Each man fears to spoil his chance of getting a better price later on from his own customers; *or*, if he produces for a large and open market he is more or less in fear of incurring the resentment of other producers, should he sell needlessly at a price that spoils the common market for all " (p. 374; my italics). It is surely not going too far to see in that word, " or," the implication that Marshall is here concerned with two different situations, in one of which the individual firm has its " own " customers, and in the other of which it sells in a large " common " market.

Whatever the truth on this particular point, Marshall certainly did draw a specific distinction between " general " and " special " markets. The goods sold in these latter markets are, in his terminology, specialities. To quote Shove: " the goods made by each firm are slightly different from each other—substitutes but not perfect substitutes." [2] Marshall gives several reasons why such goods have a limited market (p. 287). Some " aim at creating a new want, or at meeting an old want in a new way." Some are " adapted to special tastes," and for that reason cannot have " a

[1] *Economic Commentaries*, p. 15.
[2] Shove, *op. cit.*, p. 106.

very large market." Others " have merits that are not easily tested, and must win their way to general favour slowly."

Marshall does not give specific instances of these goods, when he is discussing the special market, apart from a mention of " the Regent Street shoemaker " (p. 458 n.). Elsewhere, however, in a discussion of increasing returns (p. 392 n.), he mentions particular brands of sewing-machines and electric-light bulbs as being more or less imperfect substitutes for each other.[1] The reasons given for this lack of homogeneity are that—

> " in these cases the things do not really satisfy the same wants, they appeal to slightly different needs or tastes; there is still some difference of opinion as to their relative merits; or else perhaps some of them are patented or in some other way have become the monopoly of particular firms. In such cases, custom and the force of advertising may keep rivals in the field for a long time; particularly if the producers of those things which are really the best in proportion to their expenses of production are not able effectively to advertise and push their wares by travellers and other agencies " (p. 391 n.).

Although he thus distinguished between the general market served by a number of producers and the special market in which the individual firm had its " own " customers, Marshall never tried to state the relationship between such " general " and " special " markets explicitly; perhaps he never intended that it should be so stated. Nevertheless, the matter is so central that some attempt at fuller explanation seems essential.

The main difficulty is that Marshall seems to have used the terms to cover two different situations:

> (*a*) where the general market is the sum total of all the special markets of the firms in the industry, and
>
> (*b*) where the general market in which all firms compete is completely distinct from the special markets of all these individual firms. For example, market gardeners may each have their own local markets, but also supply a general market at Covent Garden.

The following quotations are those where Marshall seems to be considering case (*a*):

> With " manufactures, which are adapted to special tastes, [every firm] is likely to be confirmed[2] more or less to its own particular market; and, if it is so confined, any hasty increase in its production is likely to lower the demand price in that market out of all proportion to the increased economies that it will gain; even though its production is but small relatively to the broad general market for which in a more general sense it may be said to produce " (pp. 457–8).
>
> " This may be expressed by saying that when we are considering an

[1] In the first three editions of the *Principles* this discussion was part of the text; it became a footnote in the Fourth Edition (1898).
[2] Earlier editions of the *Principles* show that this is a misprint for confined.

individual producer we must couple his supply curve—not with the general demand curve for his commodity in a wide market, but with the particular demand curve of his own special market. And this particular demand curve will be very steep; perhaps as steep as his own supply curve is likely to be,[1] even when an increased output will give him an important increase of internal economies" (p. 458 n.).

This seems to lead to the conclusion that the general market is the sum total of all the special markets, a conclusion which is strengthened by the fact that Marshall seems to imply that "the relations between the individual producer and his special market" add up to "those between the whole body of producers and the general market" (p. 459).

Marshall seems, then, to have been concerned mainly (perhaps solely) with case (*a*) in the *Principles*, from which all the above quotations are taken. In *Industry and Trade*, however, he is concerned with case (*b*).

> "Everyone buys, and nearly every producer sells, to some extent in a '*general*' market, in which he is on about the same footing with others around him. But nearly everyone has also some '*particular*' markets: that is, some people or groups of people with whom he is in somewhat close touch: mutual knowledge and trust lead him to approach them, and them to approach him, in preference to strangers" (*I. & T.*, p. 182).

If this interpretation is correct, Marshall changed his emphasis between the *Principles* and *Industry and Trade*. Since we are here mainly concerned with the views on the individual firm which Marshall put forward in the *Principles*, it is on case (*a*) that we concentrate.

Can one produce a reasonable interpretation of case (*a*)? The general market is here made up entirely of buyers who normally patronise a particular seller, though presumably Marshall would have been the last to deny that there would be a perpetual but marginal movement of clients from one firm to another. The demand curve for this broad, general market will be given by the lateral addition of the particular demand curves of all the individual special markets. This assumes, of course (*pace* Mr. Sraffa), that the products of all the various firms are nearly enough homogeneous to permit one to regard them as different varieties of the same broad commodity. So, for example, if all the demand curves of all the individual special markets displayed the same elasticity at every price, the general market would also exhibit that same elasticity.

The general demand curve is here assumed to be drawn up on the usual Marshallian assumption, namely, that each firm in the industry charges the same price as each other firm; in other words, this demand curve is the same as Chamberlin's *DD'* market curve. But it is also possible for each individual producer to postulate the existence of a curve like Chamberlin's

[1] In the Second Edition, this reads, "And this particular demand curve will generally be very steep, steeper than his own supply curve is likely to be."

subjective *dd'* curve, showing how much the individual producer would sell, at various prices, if he were to raise or lower *his* price but all other producers held their prices constant. This *dd'* curve would have a higher elasticity of demand than *either* the individual producer's "particular" demand curve *or* the "general" demand curve for the broad market. The individual firm, being small by comparison with the whole market, could on these assumptions hope to attract a few customers from each of its rivals relatively easily; in other words, it could expand its output considerably without having to lower its prices very far *if* other producers held their prices constant.

However, only in abnormal circumstances, such as a slump, does Marshall envisage firms selling in their rivals' markets on any scale. Moreover, he stresses the difficulty of selling outside one's own special market, where "goodwill" is considerable. Only "when trade is slack" will a producer "try to sell some of his surplus goods outside his own particular market," and he will have to do so "at prices that do little more than cover their prime costs" (p. 458).

So, even if he could assume that all his rivals' prices remained unchanged, an individual price-cutter would gain little. He might be able to obtain higher prices outside his own special market than he could hope to obtain within it, for any given expansion of sales; yet he would find the marginal costs of selling outside his own market much higher. It is these high selling (including transport) costs which are the main factor confining firms within their own special markets, at any rate in the short run. In a sense, all this is very pedestrian, and it may be unwise to try to interpret Marshall so explicitly, but it seems important to spell out this relationship between the general and special market.

It is not certain whether Marshall intended the assumption of a single price, ruling throughout the market, with which he begins in Book V, Chapter 3, to hold more generally throughout the *Principles*, though in *Industry and Trade* he is more explicit. "A producer, a wholesale dealer or a shopkeeper, who has built up a strong connection among the purchasers of his goods has a valuable property. He does not generally expect to get better prices from his clients than from others. But he expects to sell easily to them because they know and trust him" (*I. & T.*, p. 182).

Nevertheless, even here, there are the usual Marshallian exceptions. The suggestion is that, in his own particular market, a producer "does not sell at low prices in order to call attention to his business, as he often does in a market where he is little known" (*I. & T.*, p. 182). On another occasion, in the *Principles*, he writes of 'a few special bargains . . . made at lower prices without much affecting the general market" (p. 375). Despite these qualifications, however, it seems that Marshall did intend to imply that there was a single price, ruling broadly throughout the general market of each industry. And even these exceptions may be more apparent

than real; many of them will represent price reductions which can quite legitimately be looked upon as creating an alternative weapon to the selling costs which have to be incurred by a producer in bringing his goods to the notice of potential customers.

On reflection, however, it becomes apparent that we here face a serious dilemma. If all the special markets of the individual firms were clearly separate there would be little competition in the industry; the producers would be monopolists and not competitors. Consequently, prices would tend to differ from firm to firm and, even if they did not, the whole concept of an industry would be in danger of breaking down. This is precisely Triffin's criticism of later theories of monopolistic competition; it is also a point which Sraffa stressed in his 1926 article. Commenting on Marshall's suggestion that where products are heterogeneous one should couple the producer's supply curve, not with the general demand curve, but with his own particular demand curve, Sraffa wrote, " It is clear that such particular curves can by no means be compounded so as to form a single pair of collective demand and supply curves." [1] Indeed, he went on to conclude that even the smallest degree of heterogeneity of product would lead to a position where each producer behaved like a monopolist.

On the other hand, it will not help to assume that firms can compete easily in each others' special markets. Quite apart from making nonsense of the whole concept of the special market, this would lead to one of the very results which that concept was intended to avoid. The individual firm would be able, where increasing returns were being experienced, to monopolise the whole market; increasing returns and competitive equilibrium would be irreconcilable. It follows that Marshall is here walking a logical tightrope. The analysis may well lead either to Mr. Sraffa's situation, where every firm is a monopolist, or, alternatively, it may be necessary to concede that increasing returns and competitive equilibrium are *not* compatible.

There is no sign that Marshall ever posed this dilemma quite so explicitly; though there is equally no sign that he deliberately dodged doing so. He would surely have tried at least to walk the " tightrope." Perhaps the most significant evidence in favour of this view is that, on pp. 460–1 of the *Principles*, immediately after the discussion of special and general markets, Marshall proceeds to discuss the drawing up of the industry's supply curve. He cannot have been entirely oblivious of the objections to such a procedure, where the products of the industry were heterogeneous, and the fact that he thought it legitimate to construct this supply curve suggests that the degree of heterogeneity he was postulating was not great. (Was this one of the things which Schumpeter had in mind when he said that Marshall " did not exaggerate " the importance of monopolistic competition?). This view is strengthened by the fact that in *Industry and Trade* Marshall includes both

[1] *Op. cit.*, p. 546.

" general " and " particular " markets within the classification of " open " markets. It is true that in the *Principles* there is the distinction between " special " markets and " large and open " markets; is it over-interpreting Marshall to suggest that whilst in the " special " market the element of " largeness " had disappeared, the quality of " openness " remained? Or, to be more precise, while the " special " market must lie near the borderline between competition and monoply, it always lies on the competitive side of that borderline?

On the other hand, Marshall gives reasons for supposing that the fear of cut-throat competition in times of slump will be especially great in an industry where there are many special markets; though he is most explicit in the early editions of the *Principles*. When each firm has to acquire a market of its own, this increases " fears of spoiling his own particular market, or incurring odium from other producers for spoiling the common market " (Second Edition, p. 489). It seems to follow that there may be some justification for Mr. Sraffa's suggestion that " the forces which impel producers to raise prices " are, in this kind of situation, " much more effective than those which impel them to reduce them." [1] However unwilling we may be to go all the way with Mr. Sraffa in concluding that a monopolistic situation is the only logical result, it is clear, not only that the dilemma is far from being solved in the *Principles*, but also that Marshall's room for manœuvre is very small indeed.

In the *Principles*, then, Marshall not only considers perfect competition, but also monopolistic competition—both with and without product differentiation. But what of oligopoly? Oligopoly does not fit easily into Marshall's classification; with the qualification mentioned above,[2] he specifically rules it out from the *Principles* because it is incompatible with his scheme of analysis.

" Those manifestations of nature which occur most frequently, and are so orderly that they can be closely watched and narrowly studied, are the basis of economic as of most other scientific work; while those which are spasmodic, infrequent and difficult of observation, are commonly reserved for special examination at a later stage " (Preface, p. xiii). This, he explained, was the reason for his decision to leave over " the study of large businesses " until *Industry and Trade*.

> " When any branch of industry offers an open field for new firms which rise to the first rank, and perhaps after a time decay, the normal cost of production in it can be estimated with reference to ' a representative firm ' . . . a study of such a firm belongs properly to a volume on Foundations. So does a study of the principles on which a firmly established monopoly, in the hands of a Government department or a large railway, regulates its prices with main reference indeed to its own revenue; but also with more or less consideration for the wellbeing of its customers.

[1] *Op. cit.*, p. 548.

[2] See p. 678.

> " But normal action falls into the background, when Trusts are striving for the mastery of a large market, when communities of interest are being made and unmade. . . . Such matters cannot be fitly discussed in a volume on Foundations: they belong to a volume dealing with some part of the Superstructure " (Preface, p. xiii).

Or again, writing of situations where, because of increasing returns, the production of a commodity " is apt to fall almost entirely into the hands of a few large firms," Marshall suggests that the " production of such a commodity really partakes in a great measure of the nature of a monopoly; and its price is likely to be so much influenced by the incidents of the campaign between rival producers, each struggling for an extension of territory, as scarcely to have a true normal level " (p. 397).

Since his analysis did not claim to deal with such industries, Marshall must have viewed their growth with some misgivings. In *Industry and Trade* he considered this point. He began by stressing the relative smallness of private firms in the late nineteenth century.

> " Under these conditions, a very large capital in the aggregate was distributed over many firms of moderate size, each with its own individual life, and its own personal relations with employees. If any firm became slack in enterprise or weak in purpose it passed away and made room for others. . . .
>
> " But in the new age joint stock control has become universal in regard to railroads; and it has become general even in regard to manufacturing and other industries which have an urgent need for alert and versatile administration " (*I. & T.*, p. 315).

Marshall goes on to explain that since these industries are subject to increasing returns, a firm could build up a monopoly position " provided its own vigour remained unimpaired." Then comes what seems to be a significant sentence. " In old times there was often much difficulty on this score; but that has diminished greatly during the last three or four generations " (*I. & T.*, p. 315). Nor is this all; a little later, Marshall writes:

> " It is not possible to say how far this position is changed by the expansion of joint stock companies with a potentially perpetual life; but every recent decade has contained some episodes which suggest that it may probably be greatly changed, either in substance, or in the methods by which new life is brought into old bodies.
>
> " A private firm without great vigour is sure to die; a large joint stock company has special advantages, many of which do not materially dwindle with age . . . it has special opportunities for the introduction of new blood into its management " (*I. & T.*, pp. 315–16).

This seems to represent a significant change in Marshall's view of the joint-stock company as compared with that which appeared in the *Principles*. On the other hand, in the first section of Appendix H, which was added in 1907, Marshall suggested that perhaps, after all, his analysis was not so seriously affected by the existence of oligopoly as one might have supposed.

He was not certain that the oligopolistic group " must be regarded as *prima facie* a monopoly," and could not be analysed in terms of " normal behaviour," for " the last years of the nineteenth century and the early years of this have shown that even in such cases competition has a much greater force, and the use of the term ' normal ' is less inappropriate than seemed probable *a priori* " (p. 805). The analysis of the *Principles*, he thought, was perhaps capable of adjustment to deal with the problems of oligopoly. But the study of oligopoly in the strict sense of really small numbers of leading firms is explicitly ruled out from the book as it stands. Marshall's competitive firm is one with a sufficiently large number of rivals for any oligopolistic " circularity " in price policy to be ruled out.

II

We turn now from market forms to the dynamic qualifications through which Marshall tried to bring realism into an otherwise static analysis. The stress laid by Mr. Shove and Sir Dennis Robertson on Marshall's way of treating the relatively short life of the individual firm shows that this is something which must be studied in detail. But there are other dynamic factors too. So far as Marshall's short-period analysis is concerned, there is only one dynamic qualification—expectations. These come into the analysis in the form of the entrepreneurs' fears of " spoiling " either their own special markets or the common, general market In both cases the fear is that an " immoderate " policy now will " spoil his chances of getting a better price later on " (p. 374). If producers " glut the market " they " tend to prevent prices from reviving " (p. 375). This qualification apart, Marshall's short-run analysis of the firm is static. But it seems more sensible to regard this fear of " spoiling the market " as a qualification to a single, unitary theory, rather than to adopt Frisch's procedure of suggesting that the firm is a " quantity adapter " when times are good and a " price adapter " when they are bad. One is thereby spared the difficulties inherent in " Frisch's dichotomy." [1]

While his short-run theory is basically static, Marshall's long-run analysis is greatly modified by the dynamic qualifications of growth and change. Marshall seems to use the term long-run in two senses. The first, and best known, defines it as the period of time within which substantial changes to fixed plant can be made. But there is also the implication of a long run on the demand side. Although Marshall finds it possible to study the reactions of supply to once-for-all change in demand conditions because, " those demands which show high elasticity in the long run show a high elasticity almost at once " (p. 456), he also allows for the fact that " a long or short time may be required for developing the new and extended uses of the commodity " (p. 456). Again, " the increase in consumption arising from a

[1] Robertson, *op. cit.*, p. 14.

fall in price is gradual" (p. 807). It follows that whether or not there is also a process of gradual growth affecting the whole economy—which there will be—the firm will have to wait some time before it reaps the full benefit of a reduction in its prices. This means that even if a firm is producing in conditions of increasing returns it may not be able to extend its sales very quickly. The stress is always on "gradual growth" (p. 501); we should "expect a gradual increase in demand to increase gradually the size and efficiency of this representative firm" (p. 460). It is this kind of discussion presumably which Mr. Guillebaud has in mind when he regards Marshall as sometimes using the term long period to stand "conceptually for the Never-never land of unrealized tendency."[1]

So much for growth; what of the forces of change? There are hints that Marshall, like Schumpeter after him, put some reliance on competition from new firms and new products to ensure that, even in monopoly, competitive elements were not wholly absent. For example, he suggests that the most a firm producing in conditions of increasing returns can hope for is "monopoly limited by the consideration that a very high price would bring rival producers into the field" (p. 286). This is "potential competition" in the modern sense. In the long run, this potential competition may become actual; "time is on the side of the more economic methods of production; his distant competitors will gradually get a stronger footing in the place, unless he or some new man adopts improved methods" (p. 398). But perhaps the best instance of such a passage, one indeed that is almost pure Schumpeter, is in *Industry and Trade*.

> "The ownership of exclusive facilities for production or trade in the modern world does not always suggest to a man of sound judgment that he should pursue a severely monopolistic price policy. On the contrary, he will keep a watchful eye on the sources of possible competition, direct or indirect. If it appears that those sources are likely to prove large and strong, and that the pace at which competitive supply runs is likely to become considerable before long: then he will not make full use of his power, but will adjust his prices to obtaining a firm hold on the market before he can be caught by competitive supply 'following quickly at his heels'" (*I. & T.*, pp. 396–7).

This leads to the final, and most important, of the dynamic elements in Marshall's theory of the firm—again a factor of change. This we may call, though Marshall himself did not, the "life cycle" of the firm. The concept was introduced partly in a endeavour to give a realistic picture of the nineteenth-century industry and partly to help to show how there could be competitive equilibrium under increasing returns. We have seen that when Marshall brought in market imperfections to help resolve the dilemma these led to problems of their own by raising doubts as to whether the solution really was a competitive one. But while this question is important, it does

[1] Cf. Robertson, *op. cit.*, p. 16.

not seriously affect Marshall's own solution. For he put the main burden in solving it on one of his favourite biological concepts—the life cycle of the firm.

Marshall insisted that the efficiency of the private firm was a function of its age and of that of its founder. By this he justified himself in suggesting that there were many industries where it was virtually impossible for the individual firm to become a monopolist. The firm would start life as a struggling new entrant, but, provided it survived, it would grow. Indeed, the "new man" might go far, working his way into an established industry by his "energy and flexibility" (p. 285) and progressively increasing his output and strength. "And it is true that, if, as his business increased, his faculties adapted themselves to his larger sphere, as they had to his smaller; if he retained his originality, and versatility and power of initiation, his perseverance, his tact and his good luck for very many years together;[1] he might then gather into his hands the whole volume of production in his branch of his trade for his district" (pp. 285–6). (This qualification that the most a firm can hope for is a monopoly in its own district is always present. Cf. p. 459 n.)

However, Marshall is convinced that this cannot be. "Long before this end is reached, his progress is likely to be arrested by the decay, if not of his faculties, yet of his liking for energetic work" (p. 286). "Nature still presses on the private business by limiting the length of the life of its original founders, and by limiting even more narrowly that part of their lives in which their faculties retain full vigour" (p. 316). On the death or retirement of the owner, the firm would pass to his children, who would have age at least on their side. But Marshall does not rate their chances very highly. For a time, all may go well. The established connection of the firm, and the ability and interest of its employees, may mean that "mere assiduity and caution" will keep it going with reasonable success. "But when a full generation has passed, when old traditions are no longer a safe guide, . . . then the business almost invariably falls to pieces" (p. 300), unless it can be handed over to "new men."[2] A likely eventuality is that the children, or if not then certainly the grandchildren, will refrain from taking active control, and will sell out to a joint-stock company or a private firm.

[1] In the Second Edition this read "for a hundred years together," giving some idea of the length of time which Marshall thought it would take for a firm to come to dominate the industry. The same time period is still mentioned in the Eighth Edition (p. 315).

[2] The North Country expression "Clogs to clogs in three generations" is well known, though it is notable that Marshall does not use it. Instead, he gives the impression that, while "a century ago" it was often said that "the families of a rich man and his coachman would probably change places within three generations," conditions have now improved. He goes on to say that it is in the United States of America that the phrase "from shirt sleeves to shirt sleeves in three generations" is common, because of "the greater changefulness of conditions" and "the greater difficulty of keeping a business abreast of the age." Lord Stamp has called attention to the similar German expression, "the third critical generation" (ECONOMIC JOURNAL, 1926, p. 687). (See *Principles*, p. 621 n.)

This leads to a point which has been touched on already. What of the joint-stock concern? As we have seen, Marshall's views on this point changed over time. The passage in the " trees in the forest " which, in the first five editions, had read " as with the growth of trees, so it is with the growth of businesses " was changed in the Sixth Edition (1910) to read " as with the growth of trees, so it *was* with the growth of businesses as a general rule before the great recent development of vast joint-stock companies " (p. 316). Yet Marshall still believed that his hypothesis of the life cycle held " in many industries and trades." He also added the qualification that, while the joint-stock firm might grow in size, *it would not obtain increased internal economies* as it grew.

Nevertheless, it should not be supposed that Marshall had no doubts about the idea of the life cycle. In the Second Edition of the *Principles* he pointed out that it was subject to " an objection " (p. 487).

> " The objection is that the decay of human energies is after all a slow process, and that, if a large output would cost much less in proportion than a small one, an able and energetic man could often find the means of increasing his output tenfold or more within a period very short in comparison with the length of his own life. This also must be admitted. It is true that a man who is prospering can often borrow capital so fast, that the expansion of his business might be very rapid, if he could both market his new output, and at the same time obtain very important internal economies by every increase of his output " (Second Edition, p. 487).

In all the editions after the First, Marshall expressed the view that these two conditions—

> " are seldom combined in the same industry. There are many trades in which an individual producer could obtain much increased ' internal ' economies by a great increase of his output; and there are many in which he could market that output easily; yet there are few in which he could do both. *And this is not an accidental, but almost a necessary result* [my italics].
>
> " For in most of the trades in which the economies of production on a large scale are of first-rate importance, marketing is difficult. There are, no doubt, important exceptions. A producer may, for instance, obtain access to the whole of a large market in the case of goods which are so simple and uniform that they can be sold wholesale in vast quantities. But, most goods of this kind are raw produce; and nearly all the rest are plain and common, such as steel rails and calico; and their production can be reduced to routine, for the very reason that they are plain and common . . . in short there remains no very great difference between the economies available by a large and by a very large firm; and the tendency of large firms to drive out small ones has already gone so far as to exhaust most of the strength of those forces by which it was originally promoted " (p. 286).

In the Second Edition Marshall included a paragraph here to explain that even in these industries firms might be able, by cutting out middlemen in distribution, to build up their own sales connections and make the market imperfect; so it would not be amenable to complete monopolisation. This argument was later dropped.

In all the Editions after the First, however, Marshall proceeded to explain that there were many industries where considerable internal economies were available but where none of these could be turned to advantage. The goods in question were specialities, and the firms therefore had their own special, limited markets, which could not be extended at all quickly. As a result, Marshall thought that though the firms in question were capable of reducing unit costs as they expanded their output, they would not in fact be able to increase their output, because they remained limited to a small market which was acquired only " slowly and expensively " (p. 287). There was also the Schumpeterian point that " the very conditions of an industry which enable a new firm to attain quickly command over new economies of production, render that firm likely to be supplanted quickly by still younger firms with yet newer methods " (p. 287). Here again, it is the " life cycle " which is at work; " the full life of a firm seldom lasts very long."

Most of the above discussion is based on pp. 285–7 of the *Principles*; the earlier discussion of general versus special markets (pp. 678–83) was based on pp. 457–9. It is therefore very significant indeed that, in the Second and Third Editions of the *Principles*, these two sections of the argument, now separated by some two hundred pages of text, between them comprised almost the whole of Chapter 11 of Book V. They constituted a well-argued and impressive (though not, of course, conclusive) case in favour of Marshall's contention that even where industries were subject to increasing returns, the number of firms would remain relatively large, partly because of the life cycle, and partly because markets were imperfect. The separation of the two passages into different Books of the *Principles* occurred in the Fourth Edition (1898), and one cannot help feeling that much later confusion would have been avoided if the change had not taken place.[1]

It is clear, then, that Marshall conceived the individual business as possessing " unexhausted " internal economies, as the passage in the letter to Flux, quoted above, shows. These economies could not be turned to advantage because of the " life cycle " and market imperfections. But an increase in the demand for the product of the whole industry, which would presumably be shared more or less equally among all the " special " markets, would allow a rise in output and a fall in unit costs. As Mr. Shove argued, it would not be inconsistent to claim that, while firms may not be able to

[1] There is therefore certainly justification for Edgeworth's comment, in his review of the Second Edition of the *Principles* (ECONOMIC JOURNAL, 1891, p. 615), that the special difficulty which the law of increasing return presents " is stated more prominently " than in the First Edition. But was this difficulty really removed " more completely," as Edgeworth also claims?

increase their *share* of a constant aggregate output of the industry without experiencing a rise in costs of selling and transport, " if the aggregate output *does* increase, these diseconomies are absent or smaller so that, in that event, the expansion of individual firms *does* yield a net gain in efficiency." [1] It is Marshall's dynamic qualifications which must not be overlooked in any attempt to give an accurate summary of his analysis.

In Marshall's own day the life cycle was by no means an unreasonable hypothesis, though even for that period it had its faults, as Marshall himself seems to have seen. For example, he wrote: " Continued rivalry is as a rule possible only when none of the rivals has its supply governed by the law of increasing return . . . if one of them conformed to the law of increasing return the rivalry would soon cease . . . its advantage over its rivals would be continually increased until it had driven them out of the field " (p. 391 n.). Or, again, some industries " no doubt " have a large, common market *and also* increasing returns ; " they are in a transitional state, and it must be conceded that the statical theory of normal demand and supply cannot be profitably applied to them " (p. 501).

The most obvious conclusion is that the whole of Marshall's theory of the firm was a child of its own times, and one naturally wonders whether it is still worth studying to-day. In the post-Marshallian discussions it is Mr. Shove who has made the most interesting comment on this particular point.

> " In most industries we are faced, not with a population of transitory firms, each being born, rising to maturity and passing on through old age to death, but with a number of more or less permanent business units or employment nuclei, each with its own individuality, each expanding and contracting from time to time as its luck waxes or wanes, its managers grow slack or make way for new blood, fashion ebbs and flows, but continuing in existence more or less indefinitely; and we must conceive of equilibrium in the industry as a whole as arising, if it arises at all, from a dovetailing of their various phases of efficiency." [2]

This raises at least two problems which merit empirical study. First, is it realistic to suppose that the joint-stock firm is naturally less mortal than Marshall's private firm, particularly since he usually conceives of these as being taken over by " new men " when disaster comes? Second, do modern industries often (or even sometimes) display the kind of equilibrium which Shove describes? These are the kinds of question which Marshall would surely have been asking to-day, and, beginning from a more benevolent attempt to understand what Marshall had to say about the industry of his own day, these are the kind of questions which modern economists need to study and answer if our theory of the individual firm is to develop and improve.

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[1] Shove, *op. cit.*, p. 105.

[2] *Ibid.*, pp. 114–15.

SOME MARSHALLIAN CONCEPTS, ESPECIALLY THE REPRESENTATIVE FIRM

IN a recent article in the ECONOMIC JOURNAL (June 1954) on " The Representative Firm," Mr. J. N. Wolfe alleged that Mr. Sraffa and Professor Robbins had, in articles written more than twenty-five years age,[1] driven this Marshallian concept from the pages of the text-books. His intention is to revive and reinterpret the concept.[2] While I believe that Mr. Wolfe exaggerates the lethal effects of the Sraffa–Robbins articles—certainly in the United States—and while I sympathise with his aims, I believe that part of his reinterpretation is erroneous. He has, moreover, failed to notice a recent valuable article, "Alfred Marshall's Theory of Value," by Ragnar Frisch,[3] which gives the representative firm a high place. The pages which follow attempt to interpret some Marshallian concepts " about which one may rise even from a hundredth reading of Marshall with a certain muzziness in the head . . ." [4]

The first question to ask is: The representative firm is representative with respect to what? The answer is, I think, that it is representative with respect to its *unit cost*. But a principal assumption of the article by Professor Robbins was that the firm was representative with respect to *size*. Marshall does refer to size (and occasionally to organisation), but representativeness in such matters is not vital to his argument.

Confirmation of the view that unit cost is the key can be found in many statements in the *Principles*.[5] On p. 317, where the representative firm is mentioned for the first time, the marginal note is: " Forecast of our study of the cost of production in a *representative firm*." And in the accompanying paragraph (discussing the causes which govern the supply of a commodity) Marshall writes: " We shall have to analyze carefully the normal cost of producing a commodity, relatively to a given aggregate volume of production; and for this purpose, we shall have to study *the expenses of a representative producer* for that aggregate volume." On p. 342 he writes, " let us assume that the normal supply price of any amount of that commodity may be taken to be the normal expenses of production by that [representative] firm."

[1] P. Sraffa, " The Laws of Returns under Competitive Conditions," ECONOMIC JOURNAL, 1926, pp. 335–50; Lionel Robbins, " The Representative Firm," ECONOMIC JOURNAL, 1928, pp. 387–404.

[2] In his recent book, Professor E. H. Chamberlin states that if he " were doing it over again to-day some variety of carefully defined ' representative firm ' might be substituted " in his *Monopolistic Competition* for the ' uniformity ' assumption. *Toward a More General Theory of Value* (New York, 1957), p. 301.

[3] *Quarterly Journal of Economics*, November 1950. This article was a part of his lectures on economic theory given at Oslo University, 1933–38.

[4] Sir Dennis Robertson, *Economic Commentaries* (London, 1956), p. 17.

[5] All references are to the Eighth Edition.

Marshall's references to the *size* of the representative firm fall under two sets of assumptions: (1) where aggregate output of an industry is constant; (2) where aggregate output of an industry expands because of a sustained increase in demand.

The first case is explained in Book V, Chapter V, with the warning that " the complex problem of value must be broken up " (p. 366). Marshall had already, in Chapter II, discussed the *market* equilibrium in which " supply is limited to the stores which happen to be at hand . . . so that it cannot be influenced by cost of production " (p. 330). Now he is to examine the equilibrium of *normal* supply and demand of which the extreme simplification is " the stationary state." How much stationariness is to be assumed? Marshall here, as always, shied away from extreme conditions; in particular, he did not want to assume that " in our stationary state every business remained always of the same size and with the same trade connection." He preferred to assume that the representative firm—

> " remains always of about the same size, as does the representative tree of a virgin forest, and that therefore the economies resulting from its own resources are constant: and since the aggregate volume of production is constant, so also are those economies resulting from subsidiary industries in the neighbourhood, etc. That is, its internal and external economies are both constant " (p. 367).

Thus Marshall is here discussing conditions of stationariness as a preliminary to examination of the nature of short-run normal equilibrium. Even in an industry stationary with respect to aggregate output, firms may realistically be presumed to pass through a cycle of growth and decline; at any point of time their sizes and organisation will be dissimilar, and so will their unit costs. Attention should, therefore, be centered on the representative firm because its unit cost will govern value; it, and only it, is in equilibrium.[1]

If Marshall's analysis had stopped with the short-run normal equilibrium, the concept of the representative firm might not be profitable.[2] Of course, Marshall did not stop here. But I urge that, even in this simple case, Marshall's presentation has the special merit of keeping in view the presence of many non-representative firms even when the industry is in short-run normal equilibrium. Moreover, the identity of the representative firm changes because there is always movement up and down within the industry. Some firms will be gaining, others will be losing, internal economies.[3]

[1] Mr. Wolfe's statement, *op. cit.*, p. 343, that " Marshall's firm is never actually in equilibrium " seems to me to be wrong, and so also is his opinion that the representative firm has " unexhausted " internal economies (p. 341).

[2] This was Robbins' view, *op. cit.*, p. 396, where he called the device " superfluous " and " unnecessary."

[3] Frisch says (*op. cit.*, p. 409): " Occupying a central position in Marshall's theory of value is his conception of a *regular life cycle* for a private firm." Here again Robbins' view (*op. cit.*, p. 402) that the representative firm " preserves its essential identity while undergoing progressive expan-

For the representative firm, to be sure, internal economies are constant. But non-representative firms are not to be precluded, in this Marshallian stationary state, from altering the scale of plant and from achieving a better or worse distribution of overhead. Although the total number of firms in the industry remains the same, firms will rise and fall. The rising firms will, for a time, be able to lower unit cost by enlarging their scale of plant until they reach an equilibrium point; they will then be representative, and no more internal economies will be open to them. The declining firms, as their sales shrink, will not be able to cover overhead costs; they will have an inefficient distribution of overhead. *External* economies are *not* available to any firm—rising, falling or representative—because aggregate output of the industry is constant.

The theory of the short-run normal, slurred so deliberately by Marshall, was explored thoroughly in the 1920s and 1930s by economists who spelled out explicit assumptions, ranging from perfect to imperfect competition. In the process, Marshall was sometimes declared to have assumed perfect competition. Mr. Wolfe argues, and correctly, that this was erroneous.[1]

Marshall nowhere drew a set of curves (and he was a pioneer in their use) appropriate to the individual firm, and to it alone. His curves relate always to the industry or " trade "; and this is so even when they indicate also the cost situation of the representative firm.[2] Although Marshall never drew the familiar U-shaped curve, his abbreviated exposition shows that he had thought out its essential features: a division of cost into prime and supplementary, an equality of average cost, marginal cost and price at the equilibrium point (*Principles*, p. 810). Perhaps he foresaw, and shrank from, a formulation that required a narrow definition of a commodity, of marginal cost and of competitive conditions. But while Marshall *chose* to be fuzzy about all of them, he shows an amazing awareness of alternative definitions, as I shall now show.

In discussing what is a commodity, he states:

> " The question where the lines of division between different commodities should be drawn must be settled by convenience of the particular discussion. For some purposes it may be best to regard Chinese and Indian teas, or even Souchong and Pekoe teas, as different commodities; and to have a separate demand schedule for each of them.

[1] It seems unnecessary to offer more than a few references in support of this point, since it will be supported by the subsequent argument. Marshall on p. 341 states that he assumes " that there is no close combination among dealers on either side." But " normal does not mean competitive " (p. 347). Firms are very much concerned over " spoiling their markets " and avoiding resentment of other firms (p. 374); firms in some industries are supposed to have particular markets (p. 458).

[2] Sir Dennis Robertson seems unclear about this in his *Economic Commentaries*, pp. 19–20. He refers to the chart on p. 344 of the *Principles*, where Marshall represents the *long-run* normal supply curve *both* of the industry and of the representative firm. In this diagram Marshall indicates that when the industry produces *OM* units (yards of cloth), the *cost per unit* to the representative firm is *MP*. But *OM* is not the amount produced by the representative firm.

> While for other purposes it may be best to group together commodities as distinct as beef and mutton, or even as tea and coffee, and to have a single list to represent the demand for the two combined" (*Principles*, p. 100, note; see also pp. 105 and 391).

Emphasis of differentiation was not a feature of his formulation; he could, therefore, regard a number of firms producing substitutable commodities as making up an industry. His demand and his cost curves relate to a *commodity*, broadly defined—"fish," "fresh meat," "tea." The fact that resources are grouped into appropriate bundles to form firms is recognised, but Marshall always keeps in his exposition the diversity of these firms in any industry with respect to their unit cost, and, as a consequence, their size, organisation, profitableness. A representative firm can be recognised among this diversity, and, for purposes of brevity, analysis can be centered on it. But a firm does not typically remain representative, and sight should never be lost of the many firms which, at a point of time, are non-representative.

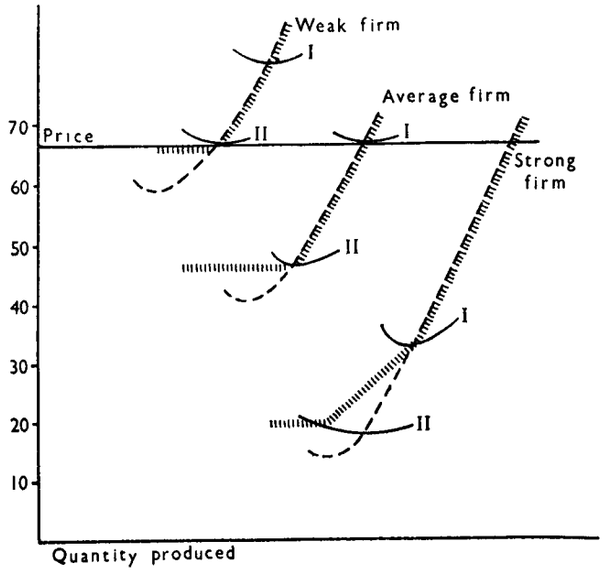
Since Marshall never drew curves appropriate to the individual firm, he did not draw a demand curve for an individual firm. He did, however, refer on one occasion to "the particular demand curve" for the product of a firm in an industry "adapted to special tastes" (*Principles*, pp. 457–8). Such a demand curve would, he says, be "very steep" because each firm would "be confirmed [sic] more or less to its own particular market." But Marshall nowhere assumes a horizontal demand curve; for him the demand curve for a commodity inclines negatively throughout the whole of its length.[1]

Another and related feature of Marshall's exposition is that the significance of marginal cost is played down.[2] In the short-run normal situation when the representative firm is in equilibrium so that price equals its average and marginal cost, the path of its marginal-cost curve shows how expansion or contraction of its output would take place in response to price changes. In the diagram below (which is adapted from Frisch) the solid lines I and II represent respectively total unit cost and variable unit cost, while the broken lines represent marginal unit cost. The shaded lines represent the actual behaviour of each of the three types of firms with

[1] Confusion sometimes still crops up concerning the meaning of the "demand curve" for a firm. For example, Sir Dennis Robertson, *op. cit.*, pp. 18–21, seems to think that the horizontal demand curve for a firm in perfect competition is a true demand curve, indicating the demand of buyers for a product. This is not so. The horizontal curve indicates merely the assumption made by the *firm* concerning the effect on its revenue of an attempt by it to expand or contract its sales—that its effect on price is zero. But such a curve does not show consumer response, and Sir Dennis' criticism of Frisch for drawing a sloping demand curve for the product of an industry, and *for the representative firm*, is not relevant. Perhaps the assumption of Marshall most relevant to the modern assumption of a horizontal average revenue curve is "that there is only one price in the market at one and the same time" (p. 341).

[2] Mr. Wolfe has glimpsed this aspect of Marshall. He argues that the representative firm fits into the anti-marginalist economics of Mr. P. W. S. Andrews.

respect to output as price changes. For the average, *i.e.*, the representative firm, the shaded line coincides with marginal cost with the exception of the lower portion (after price has fallen to 46 cents). This divergence indicates that, when price falls to 46 cents the average firm will halt production and cease to be guided by its marginal cost. But the marginal-cost curves of the weaker and stronger firms will be much less informative with respect to output behaviour. The weak firm, in the event of a fall in price below the equilibrium level of 66 cents, will halt production. The strong firm, confronted with a sharp fall in price, will practise what Frisch calls "a restrictive



strategy," *i.e.*, after price falls to 33 cents, it will curtail production more sharply than is indicated by the downwards path of the marginal cost curve, and when price falls to 20 cents, it will halt production.[1]

In short, even in the simple case of the short-run normal, Marshall focuses attention of "the nature of marginal production" (*Principles*, p. 372) rather than on the marginal cost of a small parcel of goods. The "true marginal supply price for short periods . . . is nearly always above, and generally very much above the special or prime cost" (*Principles*, pp. 374–5); it is prime cost *plus* a slice of supplementary. In the difficult case of the long-run normal, when the supply of the stock of appliances can be altered, the concept of a marginal increment is much more intricate. He advises his readers that this will require "a more detailed study of that

[1] The marginal-cost curves for the weak and the strong firms will, however, show their output response to an *increase* in price above the normal of 66 cents.

extremely complex notion, a marginal increment in the processes of production of a representative firm " (*Principles*, p. 376 note).

The next step for Marshall is to modify his stationary state by assuming a long-run increase in demand for the product of an industry. " In this world . . . every plain and simple doctrine as to the relations between cost of production, demand and value is necessarily false: and the greater the appearance of lucidity which is given to it by skilful exposition, the more mischievous it is " (*Principles*, p. 368). He turns, therefore, from the stationary state to " the *statical* method " and his well-known " illustration from the fishing trade." The commodity produced is " fish." The price of fish oscillates because of short-run changes; it oscillates also because of general forces which, if long sustained, will cause firms to readjust their stock of " the appliances for production." An increase in demand which promises to be permanent may, therefore, bring about a decrease in the cost of production of fish.

The increase in demand and aggregate production will have a short-run effect on every firm, from weak to strong, prolonging the life of the former and increasing the profits of the latter. The important effect for the industry as a whole is, however, best studied by examining the effect on the representative firm, *i.e.*, the firm which was in equilibrium before the change and which will show also the new position of equilibrium.[1]

The increase of demand will not, in the short run, bring new *internal* economies to the representative firm. A scale of plant appropriate to the prior situation will remain appropriate to a situation in which the only change is a larger aggregate output for the industry. If the representative firm had access to internal economies, when it supplied 1% of an industry output of 1,000,000 units, an industry output of 1,100,000 would not bring new access. What of the effect on rising non-representative firms? They would certainly reach a representative position more quickly, but their unit cost in equilibrium should then be identical with the prior one. Only if the assumption is made that the larger output and profits lead to a structural change in the industry, *e.g.*, that firms, instead of producing varieties of a commodity, are able to specialise, would a lower cost emerge. While such an assumption may be realistic, it seems to stretch even Marshall's flexible premises too far. Prior equilibrium in an industry would appear to debar the emergence of specialisation *internal* to it.

Would the increase in demand bring *external* economies? Would firms in subsidiary trades be able to secure economies—internal economies—and thereby reduce the unit costs of what they supply to the original (fishing) industry? Here again the answer is in the negative. If a subsidiary industry was in equilibrium before the increase in demand, why should

[1] Frisch says: " The representative firm is to give a miniature illustration of the supply side, in the sense that if we want to know how total supply will react, we may simply study how the representative firm will react " (*op. cit.*, p. 512).

its representative firms, any more than representative firms in the original industry, now gain internal economies? Nor is the argument advanced by focusing attention on rising non-representative firms unless, as above, the assumption of a structural change in the industry is made.

Suppose, however, that the subsidiary industry is *not* in equilibrium. More specifically, suppose it is a loosely defined number of firms, none of them in a representative position, producing a variety of products, rather than a type of product. The increase in demand might then stimulate specialisation, with lower unit costs of some of the products. Or suppose that the larger demand for the product of the original industry stimulates the development of better—more specialised—marketing facilities.[1] In both cases external economies would accrue to the original industry.

This interpretation is, I believe, that of Allyn Young. He argued that the chief economies of increasing returns arose out of extension of capitalistic or roundabout methods of production, which, in turn, depended on extension of the market.[2] The individual firm cannot do much to make its operations more roundabout, and, therefore, secure economies. Roundabout methods, with their potential economies, are achieved by the splitting-off or segregation of " the operations of specialized undertakings which, taken together, constitute a new industry " (p. 539). These counter forces, which defeat the forces making for economic equilibrium, are pervasive and deeply rooted; they are the essence of what Marshall calls " the high theme of economic progress " (*Principles*, p. 461).

In all cases the external economies which come to the representative firms in the original (fishing) industry may, *with a lag*, open to them the chance of new *internal* economies. The average cost of the representative firm may move to a lower position because of internal *and* external economies.[3]

The Marshallian concepts of external and internal economies, and of increasing and decreasing cost, are marks of disequilibrium in the economy;

[1] Sraffa had this possibility in mind. See " Increasing Returns and the Representative Firm," ECONOMIC JOURNAL, 1930, p. 92.

[2] "Increasing Returns and Economic Progress," ECONOMIC JOURNAL, 1928, pp. 527–42. He opened his article with the warning that the apparatus of economists for dealing with technical questions of equilibrium " may stand in the way of a clear view of the more general or elementary aspects of the phenomena of increasing returns."

[3] The increase in demand and the growth in output of the industry may, however, *not* bring economies. If firms in the subsidiary industries are unable to produce at lower cost, external economies will not develop for firms in the original industry. The outcome will be either long-run constant or increasing cost. In the latter case it is reasonable to suppose that the chief effect of the increase in demand will be a larger number of firms in the industry with no change in the size of the representative firm. Sir Dennis Robertson (*op. cit.*, p. 19) thinks, incorrectly in my opinion, that Frisch left out the possibility of such a change in the number of firms. Sir Dennis supposes long-run constant cost in an industry where the representative firm cannot expand except at higher unit cost. In this case, an increase of demand would bring multiplication of the number of firms. A diagram would show the short-run average total unit cost curve of the representative firm moving to the right along a horizontal line. Each point of tangency would indicate the long-run equilibrium output of the industry; it would *not* indicate output of the representative firm.

their existence indicates disequilibrium. Marshall wanted to go beyond the sterile concept of complete static equilibrium. He therefore broke with it by assuming equilibrium in an industry, with disequilibrium among the firms within the industry. This made necessary the device of the representative firm; it is in equilibrium and it shows the normal. This formulation required also the concept of internal economies (but not of external, or of decreasing or increasing, costs). Marshall then took a next step away from static equilibrium by assuming an increase of demand which put the industry out of its equilibrium. As a result, the concept of external economies emerged, and with it, the concepts of increasing and decreasing cost.

In this modest exercise in the statical method the only force allowed out of the " pound called *ceteris paribus* " is a sustained increase in demand.[1] But this change, operating on firms which are diverse in terms of their prospects, may bring about the phenomenon of decreasing unit cost. The concept of the representative firm was, therefore, necessary to deal with (limited) dynamic change.[2] For the long-run case of decreasing cost, the term " margin of production " has no significance, and " the term ' margin ' should be avoided " (p. 805). The significant unit is not " a single rifle or yard of cloth," but the representative firm.

Marshall never pushed analysis of decreasing cost beyond an elementary stage. He was aware that decreasing cost would, if it continued, lead to monopoly (*Principles*, pp. 286, 397 and 459); and his brief discussion of this case deals always with *internal* economies, especially improved organisation. While the focus might seem to make monopoly in industry a pervasive and acute issue, Marshall showed little concern about it. Perhaps he thought the operation of decreasing costs was very long-run. Or perhaps he felt that, while economies of organisation were larger as aggregate output grew, these were often offset by increases in marketing costs (*Principles*, p. 286).

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[1] Substantive new inventions are *not* to be supposed. *Principles*, pp. 460 and 497.
[2] Robbins, *op. cit.*, p. 396, argues the opposite.

A PYRRHIC VICTORY

I

EVER since the publication of the General Theory, a struggle has gone on between the Keynesian and the adherents of what has become known as the Loanable-fund Theory. In famous papers Ohlin and D. H. Robertson opened the counter-attack on the General Theory; the last and apparently victorious gun was fired by S. C. Tsiang, in an article, " The Liquidity Preference and Loanable Funds Theory," in the *American Economic Review* of September 1956.

A future historian of doctrine will recall this controversy with mixed feelings. For, with minor exceptions, the loanable-fund theorists did not criticise the empirical assumptions of the Keynesian approach—its behavior functions as we may say; and although they justly disputed certain conclusions of the General Theory as not following from the Keynesian definitions and empirical assumptions, the purified Keynesian model, set up by Reddaway, Hicks and Lange, through its mathematical symbolism, made sure of the logical approach and allowed a simple answer to such heatedly disputed questions as to whether an upward shift in the saving propensity would lower or raise the interest rate.

Nor was it the aim of the loanable-fund theorists to re-examine the history of doctrine and to show that the Keynesian approach was virtually contained in some older writers of this denomination; at least as far as the present writer's knowledge goes, they never have quoted an author who before 1936 had demonstrated that the combination of the liquidity preference, as function of income and the interest rate, with the consumption function and the " marginal efficiency of capital " suffices to determine both income and interest rate. Surely, John Stuart Mill, who seems to have been the first to formulate a demand supply approach to determine the interest rate,[1] did not dream of it. The loanable-fund school was only interested in showing that from Keynesian building blocks (possibly with slight modifications) there could be constructed also a *flow* equation, in which one side is identifiable with the demand for loans as function of the interest rate and the other side with the supply of funds, also as function of the interest rate.

But is it really worthwhile developing " equivalent " models—in other words, models which express the same thing as has been expressed before in an, after all, not much more complicated way? And if we have two

[1] *Principles of Political Economy*, Book III, Chapter XXIII. The classicist authors only bothered about profits; in Senior's *Outline of the Science of Political Economy* (1836), *e.g.*, the term " interest " does not appear.

equivalent models which shall we choose? Secondly, are the *behaviour* functions common to both the Keynesian and the loanable-fund model to be considered as undisputed—in other words, do we have now a macro-economic interest-rate theory on solid foundation?

To answer the first question let us consider Mr. Tsiang's model. Also the Keynesian will recognise that Tsiang avoided the Marshallian fallacy [1] of treating in the demand function the income as a parameter, which would be independent of the interest rate. Neither Ohlin or Robertson showed a great interest in these aspects of the Keynesian approach. Nor did, to mention another well-known attempt, W. Fellner and H. Somers show such interest in their geometrical construction of the loanable-fund approach.[2]

Tsiang's procedure is to embed a Robertsonian demand-supply equation—" Planned current gross saving plus net decrease in the demand for idle money plus net creation of new money = current planned gross investment [3] "—into a system of behaviour function for consumption, investment, holding of idle funds and supply of money. We call this equation " Robertsonian " not so much because, with modifications, it is a symbolic presentation of Robertson's scheme of 1940, but primarily because saving is defined as the difference of Robertsonian income (income earned " yesterday ") and current consumption. Past income may have been chosen in lieu of the Keynesian currently earned income because Tsiang wanted only the interest rate to appear as endogenous variable in a supply-demand equation for loanable funds, making this equation in a sense self-sufficient.[4] In any case, Robertsonian saving is the only concept usable in the loanable-fund approach; defining saving on the basis of current income inevitably

[1] Marshall was, of course, aware that income is one of the determinants of saving; see *Principles*, Book IV, Chapter VII, paragraph 7. But his aversion to algebraical equation systems prevented him from formulating a theory which would do justice to this relation.

[2] " Alternative Monetary Approaches to Interest Theory," *Review of Economic Statistics*, Volume 23, February 1941. The model is, moreover, over-determined. In the Chart 2, supply of money, the curve M, indicating the existing quantity of money, is obtained by adding three components which were independently determined as functions of the interest rate or introduced as parameter, viz., the fund M_a designed to acquire commodities, the fund M_b designed to be retained and the fund M_c designed to acquire claims; but M is also described as an independent function of the interest rate, portraying the willingness of the banking system to provide money. (If M were a parameter it would be represented by a perpendicular line, again different from the total of the components.) Algebraically we have $M_a(r) + M_b(r) + M_c = M(r)$; this determines the interest rate r and does not leave room for the authors' second equation $M_a(r) = L_a(r)$, where L_a is the supply of claims.

[3] We are going to discuss in the text the meaning of the term " planned " in connection with gross saving. In connection with gross investment the term indicates the current demand for investible funds and is identical with Keynes' investment plus depreciation.

Gross investment is, of course, not identical with the demand for loans. Let us assume that the decisions about increasing the firm's own capital and about consumers' loans are governed by the same factors as gross investment, viz., " yesterday's " income and the interest rate.

[4] Tsiang calls " yesterday's " income an " exogenous " variable, in terms of which the truly endogenous variables can be expressed. However, if current income is given in terms of income one period backward, the time path of income is determined by the initial conditions, and yesterday's income is not truly exogenous.

leads to something like the Keynesian model. In the Keynesian definition monetary expansions cannot finance investment, in the sense of increasing its current rate, without creating an equal amount of saving; therefore not both, monetary expansion and saving, can be entered additively. Nor can we deduct in the saving-investment equation monetary funds withdrawn from circulation; we need a second monetary equation such as the Keynesian for completing the model and determining the interest rate. In the Robertsonian approach, on the other hand, the increase in the active money stock since " yesterday " though acquired to-day by some economic unit (through its exertions or through capital liquidation) is not yet " saving " of the economic unit; monetary expansion which had materialised ***before*** " to-day " affects also the Robertsonian income and saving and cannot be entered as a separate source of financing investment.

It should be noted that the distinction between the two approaches is purely terminological and that the quantities entered in the Robertson–Tsiang basic equation for changes in the money stock and the idle balances depend on the length of the " day," which can be chosen arbitrarily. In particular, it would be erroneous to associate the Robertsonian *definition* of income and saving and of the time lag appearing in it with the *behaviour function*, in which consumer spending is related not to the currently earned income but to income earned some time before the spending materialised; Tsiang, indeed, considers both current consumption and current investment as governed by " yesterday's " earned income, but this hypothesis concerning the behaviour functions is not an essential part of his system, and could be replaced by functions in which consumption and investment are related to current income.[1] One could even use the Robertsonian income concept,

[1] The original Keynesian model can be easily transformed into a flow equation. Let us assume a linear relation between transaction balances T_t and income Y_t and choose the time unit so that $Y_t = T_t$; furthermore, let us treat M_t as a function of the current bank reserves R_t and the interest rate r_t. Denoting the speculative or " idle " balances by $Mi_t = Mi(r_t)$, we have:

$$(1)\ Y_t \equiv C_t + I_t$$
$$(2)\ M_t \equiv T_t + Mi_t + Y_t + Mi(rt)$$

The second equation can be re-written as total differential where, following Tsiang, we denote by $\Delta x_t = x_t - x_{t-1}$ a small finite change in any variable x_t.

$$(2a)\ \frac{\delta M}{\delta R}\Delta R_t + \frac{\delta M}{\delta r} - \Delta r_t = Y_t - Y_{t-1} + \frac{dMi}{dr}\Delta r_t$$

Adding (1) and (2a), cancelling and rearranging, we obtain:

$$(3)\ (Y_{t-1} - C_t) - \frac{dMi}{dr}\Delta r_t + \frac{\delta M}{\delta R}\Delta R_t + \frac{\delta M}{\delta r}\Delta r_t = I_t$$

This is Tsiang's equation (7).

The procedure throws some light on the state of equilibrium indicated by the Keynesian model. In the Keynesian equilibrium all transaction balances are in the hands of income receivers. Firms' money holdings (if any) would only consist of " idle " balances and of transaction balances designed to finance investment, not to pay workers nor to acquire materials during the process of reproduction; for the latter purpose firms by selling commodities would *temporarily* acquire transaction balances between time-points t and $t + 1$.

though consumption is related to currently earned income, and write consumption as a function of " to-morrow's " Robertsonian income, although, of course, nobody would use so clumsy a conceptual framework.

It is worth noting that the Swedish distinctions between expected and unexpected, intended and unintended, voluntary and involuntary, planned and unplanned magnitudes have tended to become fused with the Robertsonian time-lag concept, *i.e.*, have been transformed from the description of behaviour into definitions. Robertsonian saving is then termed intended, expected, voluntary, planned, and the difference between Keynesian and Robertsonian saving is the unexpected, unintended, involuntary, unplanned component; any reference to the actual processes of anticipation and planning is removed.[1]

But though logically the question of how to define income and saving must not be confused with the question of what consumer's behaviour is empirically, the requirement of simplicity of a conceptual framework will lead the economists to choose the Robertsonian concept if the consumer in a well-defined way looks to past income, and the Keynesian notion if he does not. The positive form of the condition " if the consumer looks in a well-defined way, etc.," is deliberately chosen. One has argued that the very impossibility of spending current income earned in a very short period—say one hour—*during the same period* militates against the use of the Keynesian concept; for the Keynesian marginal propensity to consume from currently earned income would then be zero for a very short period,[2] and positive for a longer period. The use of the Robertsonian concept would indeed avoid these complications provided only that the " day " is approximately of the same length for the vast majority of income receivers. If this is not the case and if no orientation to past income can be established for the bulk of consumers, the use of the Robertsonian income concept and of the loanable-fund formulation has no advantage. We must either be satisfied with something like the Keynesian model, in which the behaviour functions are defined for sufficiently long periods, or we must find dynamic links outside the consumption function.

II

We have shown that for reasons of expediency the choice between the Keynesian and the equivalent Loanable-fund version is to be decided on *empirical grounds*. It depends on the consumer's orientation to current or past income. Even here the loanable-fund theorists shied away from the discussion of the behaviour function itself. In all other cases they accept

[1] Note, *e.g.*, the use of the Swedish concepts in Lundberg, *Studies in the Theory of Economic Expansion*, pp. 90, 140, 164. For a criticism of the original Swedish concept see G. Haberler, *Studies in Income and Wealth*, Volume 2, 1938, p. 155–8, especially footnote 25, and H. Neisser, " The Nature of Import Propensities and the Foreign Trade Multiplier," *Economia Internazionale*, August 1949.

[2] Would that be correct also when the earned income *falls*?

the Keynesian functions.[1] But there would have been good reasons to doubt the theoretical validity of both the consumption function and the investment function (or " marginal efficiency of capital ").

Marshall had recognised the influence of both income and interest rate on the flow of current saving; and Keynes was satisfied to take over the function, shifting to income the accent away from the interest rate (which was restored by Hicks). However, the pure theory of saving as developed by Irving Fisher and Ramsay and accepted by the mathematical economists does not support the view that for a given level of income, Keynesian *or* Robertsonian, and a given interest rate the individual's flow of saving would be constant over time.[2] In this theory, saving is considered as resulting from maximisation of satisfaction *over time*, the horizon possibly being extended to encompass the satisfaction of future generations. For given income, current and expected, for a given pattern of tastes and needs and a given interest rate, the consumer would aspire rather at a certain stock of assets to be enjoyed during retirement or other low-income periods in his life, and would not set aside period by period the amount of saving which a consumption function such as the Keynesian would indicate.

Before accepting either the Keynesian model or the loanable-fund version, a re-examination of the theory of saving seems to be indicated. Do the other motives of saving—the " impurities "—operate in the direction of a constant flow of saving, given income and the other variables? Or do, under certain conditions, even the consumers' endeavors to maximise satisfaction over time bring about in the aggregate a flow of saving proportionate to aggregate income?[3]

Even more serious doubts exist as to the theoretical validity of the

[1] Tsiang, indeed, also attacks Keynes' liquidity preference. He claims that this function is " dependent " on the investment and consumption functions (p. 554, footnote 20, and p. 555, top). Liquidity preference is here meant in a wider sense, including the " preference " for transactions balances; the independence of the demand function for idle balances is not questioned. But this is a confusion of the *quantity* M_1 of transaction balances (plus precautionary balances) actually held in equilibrium with the *function* $L_1(Y)$, which relates this quantity to income—a confusion facilitated by the convention according to which one frequently uses the same symbols for the quantity *and* the function. If the right side of Keynes' monetary equation is broken up into additive components $M = M_1 + M_2 = L_1(Y) + L_2(r)$ and we write $M_1 = L_1$—$[I(Y) + I(r)]$, it is clear that we can insert for C and I *any* function without impairing the independence of the L_1-function; though, of course, if Y and r are *determined*, M_1 is also determined. This result is concealed in Tsiang, because, quite justifiably, he took as L_1-function a constant, and, by choosing the time unit appropriately, made this constant equal to unity. Changing in this way the function $M_1 = L_1(Y)$ into $M_1 = Y$ does not make the L_1-function " dependent " on the other function; on the contrary, $M_1 = Y$ holds *regardless* of the form of these functions.

[2] From the econometric angle attention has been drawn recently to the Fisher approach by F. Modigliani and R. Brumberg, *Utility Analysis and the Consumption Function*, in: *Post-Keynesian Economics*, edited by K. K. Kurihara (1954), and by M. Friedman, *A Study of the Consumption Function* (NBER Monograph No. 63, 1957).

[3] In a not yet published larger study, *The Demand for and Supply of Capital Funds*, the present writer was able to answer this question in the affirmative for times of favourable investment opportunities.

investment function. What justifies the assumption that, given prices, interest rate and production functions, the firms will take in the same amount of funds period by period? Is it not classical teaching that the current supply of capital funds if maintained at a certain level will *depress* the interest rate, except for sustenance from technological progress or appropriate growth in the other factors? The same Mill who first formulated the loanable-fund theory states (*ibid.*, paragraph three): " since, when a few years have elapsed without a crisis, and no new and tempting channel for investment has been opened in the meantime, there is always found to have occurred in those few years so large an increase of capital seeking investment, as to have lowered considerably the rate of interest." The conclusion would be that, for a given production function and given levels of variables, the firm wishes to *possess* a certain operating capital, *i.e.*, to be indebted to a certain amount, not to borrow, period by period, a certain amount.

Writing the stock demand function, by which we replace the investment function, as $D[r(t)]$ and abbreviating the supply of funds function as $s(r_t, Y_{t-1})$, where r is the interest rate and Y is income, we would have, in the aggregate, another " loanable-fund " theory

$$\int_0^t s[r(t), Y(t-1)]dt = D[r(t)]$$

The difference between the flow-demand approach

$$s[r(t), Y(t-1)] = f[r(t)] \text{ (where } f \text{ is the flow-demand),}$$

and the stock-demand approach is obvious. Tsiang can belittle it only because for him the difference is not a difference in *behaviour* functions (his supply demand equation also contains *stock*-demand and *stock*-supply function), but in *equations*. From our stock-demand equations we could derive a flow equation

$$s[r(t), Y(t-1)] = dD/dt = D'\dot{r}$$

Does that make the two approaches, Tsiang's supply-demand equation mentioned above and our stock-demand equation, " equivalent "?

III

We may hope that the theoretical work in the field of the interest-rate theory will turn away from the shadow boxing of Keynesian and loanable-fund theorists to the real problems, some of which we have sketched in the preceding section. Let us express here also the desire that a closely related issue will not be resurrected, viz., the discussion of whether the interest rate is determined in the market for loans or in the market for money, or, as it is also expressed, not by the supply of and demand for loanable funds, but by the supply of and demand for money. The historian of economic doctrine

will be even more surprised by this formulation than by the desire to find in loanable-fund terms a statement " equivalent " to the Keynesian model: for the simple reason that there is no separate market for money nor a demand for and supply of money separate from the demand for and supply of commodity and loans.

Already Hicks had correctly termed this issue a sham issue (*Value and Capital*, Chapter XII, Section 1). But he could not persuade the parties in the dispute, because he retained the notion of the demand for and supply of money as separate from the demand for and supply of commodities and loans: " to say that the net acquisition of money by trading is zero taken over the whole community, is the same thing as to say that the demand for money equals the supply of money " (*ibid.*, Section 3). By no means! The first statement is an identity, the second, according to Section 3, second paragraph, must be understood as an equation between functions such as the demand and supply functions for sugar.[1]

Professor Lange [2] faithfully drew the conclusion from the Hicksian approach by defining the supply of money (S_n), meaning the good serving as *numéraire*, as the sum of the outlays for all commodities, including assets but excluding the *numéraire*, and the demand for money (D_n) as the sum of all proceeds from selling commodities, including assets but excluding the *numéraire*. S_n and D_n become in this way functions of all prices $p_1 \ldots p_{n-1}$, a relation later disregarded by Lange. These demand and supply concepts are not more useful than the Hicksian ones.[3]

The origin of this unfortunate quarrel can be found in a certain twist which Keynes at some place gave to his system. Having realised the impossibility of Marshall's partial equilibrium approach in the theory of interest, having rewritten Marshall's supply-demand equation as what amounts to " Saving as function of income equals investment as function of the interest rate and the parameter expectations," he then restored the partial equilibrium approach by adding a monetary equation in which, confusedly, the behaviour is described as a function of only one variable, namely

[1] " To determine the n prices, we have $n - 1$ equations of supply and demand for the $n - 1$ commodities (exclusive money), one equation of supply and demand for loans, and *one for money*." (Italics mine!)

[2] " Say's Law: A Restatement and Criticism," *Studies in Mathematical Economics and Econometrics* (1950), p. 50.

[3] Lange then proceeded to add to the outlay for commodities the demand for the *numéraire* and to the sales proceeds the supply of the *numéraire*, obtaining an identity (aggregate outlay plus aggregate intake equals aggregate intake plus aggregate outlay), which he baptised with the grand name of " Walras' law," because, allegedly, " Walras was the first to recognise its fundamental importance." The reference given to Walras (*Économie Politique Pure*, § 116) is to a passage in the *Theory of Exchange of Several Commodities for One Another*; the term " Walras' Law " would better be reserved for the parallel passage in the *Theory of Production* (paragraph 206); here Walras states the equality of the revenue obtained by the productive services and the sales value of the products including the *numéraire*. This is an identity only in absence of money proper; in presence of money proper it is a condition of *monetary equilibrium* in the sense of Say's law, whose role in Walras' system deserves a renewed careful analysis.

the interest rate (and the parameter conventional interest rate). " If, however, we introduce the state of liquidity preference and the quantity of money and these between them tell us that the rate of interest is r_2, then the whole position becomes determinate " (*General Theory*, Chapter 14, Section I, p. 181). This approach confused the liquidity preference in the narrower sense, which is the desire to hold speculative balances, with the liquidity preference in the wider sense, viz., the holding of balances of all kinds, where also income appears as a determining variable.

Whatever the empirically correct behavior functions for the holding of balances, the monetary equation in the Keynesian model, in which the stock demand for balances is equated with a given stock or supply of money, cannot be considered as referring to a separate market for money, but reflects some facets of the behavior of consumers and investors, which *at the same time* governs the supply and demand for commodity and loans.

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ON GROWTH MODELS AND THE NEO-CLASSICAL RESURGENCE [1]

I. THE ATTACK ON THE GROWTH MODELS

THE relatively prosperous decade of the fifties has been replete with retreats from the economics of the thirties. It is good that economists are ready to meet the social issues of their own day; the problem of underemployment in a developed capitalist economy has hardly the urgency of yesteryear. But ills rooted deep in the structural relations of an economic system have a way of recurring, unless those structural relations are adequately and permanently changed. There is hence purpose in clarifying and preserving from distortion in later lights some of the now older diagnoses.[2]

In recent journals several respected economists have joined the attack on growth-cyclical models of the Harrod–Domar–Hicks variety. I submit that these models are such, in their inspiration and assumptions, that the attacks can be successful only with the inclusion of an apparently unintended target—Keynes. I propose to make clear the Keynesian content of the growth models and to redress somewhat the current balance by defending and building upon the Keynesian heritage.

The banners of the attackers are strikingly similar. James Tobin rebels against the concept of " straight and narrow paths from which the slightest deviation spells disaster." [3] Kenneth Boulding ridicules the " H–D–H " or " Hiccup " dynamic with its " dismal," " gloomy," " masochistic " prophecies.[4] Robert Solow rejects " the characteristic and powerful conclusion of the Harrod–Domar line of thought . . . that even for the long run the economic system is at best balanced on a knife-edge of equilibrium growth." [5] All three see the basic problem raised by the Harrod–Domar–Hicks growth model enthusiasts as the unique result of (arbitrary and unwarranted) assumptions of fixed proportions of the factors of production. More completely, in the words of Tobin, " Contemporary theoretical models of the business cycle and of economic growth typically possess two related

[1] The writer is indebted to Norman F. Byers, Alfred H. Conrad, F. H. Hahn, Harry G. Johnson, Alvin L. Marty, Tibor Scitovsky, Robert Solow, James Tobin and Fred M. Westfield for helpful reactions and suggestions. He wishes to acknowledge, in particular, the valuable and detailed comments of Robert H. Strotz. The paper was prepared in part during the tenure of a Social Science Research Council Faculty Research Fellowship.

[2] This paragraph was written, with perhaps pardonable truculence, in the pre-recession summer of 1957.

[3] " A Dynamic Aggregative Model," *Journal of Political Economy*, Vol. LXIII (April 1955), 103–15.

[4] " In Defense of Statics," *Quarterly Journal of Economics*, Vol. LXIX (November 1955), especially pp. 492–5.

[5] " A Contribution to the Theory of Economic Growth," *Quarterly Journal of Economics*, Vol. LXX (February 1956), 65–94.

characteristics: (1) they assume production functions that allow for no substitution between factors and (2) the variables are all real magnitudes; monetary and price phenomena have no significance" (p. 103).[1] Generally, the attackers argue that with consideration of variable-factor proportions and flexible prices, *unlike* in the Harrod–Domar–Hicks models, not one but a variety of warranted rates of growth become possible and the economy will be free to adjust to whatever rate is appropriate for full employment.

II. What Harrod, Domar and Hicks Really Said

It can be shown quickly that the growth models *did* encompass variable factor proportions and reasonable operation of the money–price mechanism. First, in Harrod's formulation, G_w, the warranted or self-sustaining rate of growth, depends upon s, the proportion of income saved (or that proportion remaining after saving is utilised in "autonomous" investment and export balances), C_r, the "required" or equilibrium, current capital–output ratio which leaves entrepreneurs satisfied, and d^* (for "deepening"),[2] the proportion of output absorbed in lengthening the production process or increasing the capital–output ratio. Algebraically,

$$G_w = \frac{s - d^*}{C_r} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

or

$$G_w C_r + d^* = s \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.1)$$

In this latter form the above equation expressed directly the condition of equality between the proportion of output for which there is investment demand ($G_w C_r + d$) and the proportion of output saved (s).[3] If the actual rate of growth is less than the warranted rate, investment demand must then be less than saving, and the rate of growth of output and (eventually) the rate of output must turn down. But if G_n, the "*natural*" rate of growth or maximum rate of growth of which the economy is capable under conditions of full employment, is less than G_w, then the *actual* rate at full employment would have to be less than G_w. It follows that investment demand would have to be less than saving at full employment. Thus full employment could at best represent a momentary position of disequilibrium. A critical aspect of the problem, then, can be formulated as how to prevent G_w from exceeding G_n. One way to do this is to have deepening—a positive value of d^*. Harrod states explicitly, "d may have a positive value because of the nature of the inventions occurring. It may also have a positive value because the rate of interest is falling. Our aim should be to get such a progressive reduction in the rate of interest that

$$G_w C_r = s - d = G_n C_r."$$

Harrods adds, "If d is positive, C_r will increase through time, and may eventually become so great as to enable us to dispense with d."[1]

Now, increasing capital intensity stemming from lower interest rates implies changing factor proportions and indeed, with linear, homogenous production functions (as assumed by Solow and Tobin), changes in the capital–output ratio must mean changes in factor proportions. Thus Harrod is saying that factor proportions *may* change so much—the economy *may* get so capital intensive—that the rate of growth necessary to absorb saving (the "warranted" rate, G_w) will be reduced to an acceptable level. But, Harrod continues, "The question we now have to ask is whether there will be any natural tendency for the rate of interest to come down sufficiently. *This is the crux of the matter* [emphasis added, R. E.], the crux, perhaps, of that modern economic situation to which we shall revert, when the post-war shortages cease." I submit that there can be no doubt that in Harrod's model factor proportions are quite variable and the money–price mechanism is free to operate as it will; there is no uneconomic, arbitrary, technological

[1] In "Complementarity and Long-range Projections," *Econometrica*, October 1956, pp. 429–50, which came to the writer's attention when this paper was in penultimate draft, P. J. Verdoorn also relates the Harrod–Domar models to an assumption of complete lack of substitutability of factors. The implication of Verdoorn's work is that this complementarity assumption may prove not unreasonable for purposes of prediction or as a description of the medium-long-run adjustment powers of the economy. But Verdoorn's thesis is also consistent with the argument we shall develop, that there *is* substitutability but that *economic* constraints limit crucially the range of admissible factor ratios.

[2] Harrod used the symbol d to denote deepening; we have changed this to d^* in order to avoid confusion with the differential and derivative symbol, d.

[3] If we write capital as

$$K = \Upsilon \cdot \frac{K}{\Upsilon} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.2)$$

investment can be written

$$I = \frac{dK}{dt} = \frac{K}{\Upsilon}\frac{d\Upsilon}{dt} + \Upsilon\frac{d(K/\Upsilon)}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.3)$$

and the ratio of investment to income is

$$\frac{I}{\Upsilon} = \frac{d\log\Upsilon}{dt} \cdot \frac{K}{\Upsilon} + \frac{d(K/\Upsilon)}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.4)$$

For the equilibrium condition described by the warranted rate of growth it is presumed that K/Υ, the actual, current capital–output ratio, is the ratio currently *demanded*, and therefore equals C_r. Then if $\frac{d(K/\Upsilon)}{dt}$, or "deepening," is taken as the time rate at which entrepreneurs *demand* (*desire*) that the capital–output ratio change, $\frac{I}{\Upsilon}$ is the ratio of investment *demand* to output. The warranted rate of growth is that value of $\frac{d\log\Upsilon}{dt}$ (Harrod's G) for which

$$\frac{d\log\Upsilon}{dt} \cdot \frac{K}{\Upsilon} + \frac{d(K/\Upsilon)}{dt} = \frac{I}{\Upsilon} = s = \frac{S}{\Upsilon}, \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.5)$$

or that value which makes investment demand equal saving.

[1] *Towards a Dynamic Economics* (London, 1948), p. 96. This corresponds precisely, as should become clear below, to Solow's positive value for the rate of change of the capital–labour ratio ($r > 0$), leading eventually to an equilibrium ratio, r^* (*loc. cit.*, p. 70).

constraint.[1] However, as more capital is used, other things remaining equal, the return on capital must fall. The difficulty is that this fall may conflict with the Keynesian floor to the rate of interest or, more generally, with the rate of return on capital which entrepreneurs will find acceptable.

Domar, similarly, is clear in pointing out that the crucial issue is not whether capital–output ratios are fixed but rather whether they are free to adjust in such a manner as to eliminate " The Problem of Capital Accumulation." [2] Raising the question of the American economy's ability to continue indefinitely absorbing new capital at its rapid post-war rate, Domar writes:—

> " Implicit in this worry is the belief that the possibilities of the so-called deepening of capital (in the sense of an increasing ratio of capital to output) are limited. Therefore the amount of capital that the economy can absorb, at a given income level and over a given period of time, is limited as well. . . . We have thus assumed, at least for the purpose of this discussion, that there exists a fairly stable ratio between annual output (or national income) and the capital stock needed for its production, this ratio to be indicated by the letter s. While, strictly speaking, we shall treat s as a given constant, it need not be so. It is certainly not the same among various firms and industries. The national average (if such exists) can be made a function of time, interest rate, or of something else. *But it must have some stability, because if s can be anything, our argument falls through and we are back at the Knight–Simons Position*" [that " investment opportunities are practically unlimited "].[3]

Finally, Hicks would have cyclical fluctuations about a growth trend develop with any of a wide variety of capital–output ratios (as well as saving ratios and lags).[4] Hicks argues that any values of the accelerator above the " Upper Point " will generate a " strong " cycle when equilibrium is disturbed, values merely above the " Middle Point " will lead the system into strong cycles, and even values merely above the " Lower Point " will contribute to some (damped) cyclical fluctuations. And Hicks devotes much space in his " inspection of the ceiling " and his analysis of " the monetary factor " to a consideration of whether the forces that transform the accelerator or the desired capital–output ratios are likely to eliminate the troublesome instability and departures from full employment which the H–D–H models all suggest. Hicks' answer, of course, is not encouraging. But again, the difficulty is due to incapacities of adjustment of the monetary framework and of the economic system generally and not an arbitrary assumption of (technologically determined) corners in the production isoquants.

[1] Cf. Harrod's amplification of this point in his " Comment " on Harold Pilvin's " Full Capacity *vs.* Full Employment Growth," *The Quarterly Journal of Economics*, Vol. LXVII (November 1953), pp. 553–9.

[2] *American Economic Review*, Vol. XXXVIII (December 1948), pp. 777–94.

[3] *Ibid.*, pp. 777–9, emphasis added.

[4] J. R. Hicks, *A Contribution to the Theory of the Trade Cycle* (Oxford, 1950).

III. " A Dynamic Aggregative Model " with Some Keynesian Parameters

The issues may be fairly joined by constructing a model which draws heavily upon the elegant presentations of two of the critics, Solow and Tobin, and utilises such a model to consider conditions or assumptions sufficient to give the peculiar or particular Harrod–Domar–Hicks results. We shall consider first the factor-proportion question, assuming initially that private saving equals the change in physical capital and is some constant ratio of output. Later we shall enlarge the area of debate by introducing a more general saving function, complete with a " Pigou effect " and a new " dynamic Pigou theorem."

The Production Function, Factor Proportions and the Rate of Profit

Let us assume, with Solow and Tobin, that net output is a linear, homogeneous function of capital and labour:

$$Y = F(K,L) \qquad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

and that output consists of only one good, which may be consumed or retained as capital (invested). Writing $r = K/L$ for the capital–labour ratio, we may, on the basis of the homogeneity assumption, factor out L and rewrite the production function:

$$Y = L \cdot F(r,1) \qquad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$

We may further assume diminishing marginal returns to each factor of production, throughout the economically relevant range of factor proportions, so that, in particular,

$$\frac{d^2F}{dr^2} < 0 \qquad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$

But since in equilibrium the rate of profit, i, is presumed to equal the net marginal product of capital, we may write

$$i = F_K \equiv F_r \qquad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (5)$$

and, consequently, substituting in (4),

$$\frac{di}{dr} < 0 \qquad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (6)$$

In words, i must be a monotonic, decreasing function of r; an increase in the capital–labour ratio must mean a decrease in the rate of profit.

Taking Harrod's system as representative for our purposes, we may express his symbols as

$$C_r = \frac{K}{Y} = r\frac{L}{Y} = \frac{r}{F(r,1)} \qquad . \quad . \quad . \quad . \quad . \quad . \quad (7)$$

and

$$d^* = \frac{d(K/Y)}{dt} = \frac{dC_r}{dr} \cdot \frac{dr}{dt} \qquad . \quad . \quad . \quad . \quad . \quad . \quad (8)$$

where r is the capital–labour ratio corresponding to the equilibrium capital–output ratio, C_r, and

$$\frac{dC_r}{dr} = \frac{F(r,1) - rF_r}{[F(r,1)]^2} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (9)$$

Hence, substituting in (1) and simplifying terms, and denoting $F(r,1)$ by F,

$$G_w = \left(\frac{d \log Y}{dt}\right)_w = \frac{s}{r} \cdot F - \frac{d \log r}{dt} + \frac{d \log F}{dt} \quad . \quad (10)^1$$

But since $F(r,1)$ is total output per unit of labour and rF_r is the return to capital per unit of labour, for all economically relevant values of r (where the share of capital is less than unity) we obtain from (9) the condition that

$$\frac{dC_r}{dr} > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (11)$$

or that Harrod's C_r, the capital–output ratio, varies in the same direction as the capital–labour ratio. From (8) and (11),

$$d^* \gtreqless 0 \text{ as } \frac{dr}{dt} \gtreqless 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (12)$$

or deepening depends upon an increase in the capital–labour ratio: moreover,

$$\frac{dd^*}{d\left(\frac{dr}{dt}\right)} > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (13)$$

i.e., deepening is a monotonically increasing function of the rate of change of the capital–labour ratio. Now, dismissing negative values of C_r, as economically irrelevant, and negative values of $s - d^*$ as unlikely and uninteresting in the present context, we see from (1) that

$$\frac{\partial G_w}{\partial C_r} < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (14)$$

and

$$\frac{\partial G_w}{\partial d^*} < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (15)$$

Then, combining (14) and (11),

$$\frac{\partial G_w}{\partial r} = \frac{\partial G_w}{\partial C_r} \cdot \frac{dC_r}{dr} < 0 \quad . \quad . \quad . \quad . \quad . \quad (16)$$

and combining (15) and (13),

$$\frac{\partial G_w}{\partial\left(\frac{dr}{dt}\right)} = \frac{\partial G_w}{\partial d} \cdot \frac{dd^*}{d\left(\frac{dr}{dt}\right)} < 0 \quad . \quad . \quad . \quad . \quad (17)^1$$

In words again, Harrod's warranted rate of growth may be reduced by an increase in the capital–labour ratio (16) as well as by an increase in the rate of change of the capital–labour ratio (17).

But now we shall introduce some reasonable parameters into our production function. Critics of the growth models deal with functions which implicitly or explicitly (like the Cobb–Douglas illustration Solow employs) imply the assumption that the marginal net product of capital is always positive, regardless of how high the capital–labour ratio rises; barring demand problems it must always pay to invest. This, indeed, is one of the "crucial" assumptions [2] on which the growth model *critiques* rest. It embodies again

[1] Noting that

$$\frac{d \log F}{dt} = \frac{d \log Y/L}{dt} = \frac{d \log Y}{dt} - \frac{d \log L}{dt} \quad . \quad . \quad . \quad . \quad . \quad (10.1)$$

we may write the actual rate of growth of output

$$\frac{d \log Y}{dt} = \frac{d \log K}{dt} - \left(\frac{d \log K}{dt} - \frac{d \log L}{dt}\right) + \frac{d \log F}{dt} \quad . \quad . \quad . \quad . \quad (10.2)$$

Since saving is presumed to be realised (whether consistent with entrepreneurial equilibrium or not),

$$\frac{s}{r} \cdot F = \frac{sL \cdot F}{K} = \frac{1}{K} \cdot \frac{dK}{dt} = \frac{d \log K}{dt} \quad . \quad . \quad . \quad . \quad . \quad (10.3)$$

so that, substituting in (10.2),

$$\frac{d \log Y}{dt} = \frac{s}{r} \cdot F - \left(\frac{d \log K}{dt} - \frac{d \log L}{dt}\right) + \frac{d \log F}{dt} \quad . \quad . \quad . \quad (10.4)$$

But then, where

$$\frac{d \log K}{dt} - \frac{d \log L}{dt} = \frac{d \log r}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad (10.5)$$

(10.4) becomes identical with (10): the actual rate of growth of output equals the warranted rate when the capital–labour ratio is actually changing at the rate $\frac{d \log r}{dt}$ consistent with entrepreneurial equilibrium.

[1] These results may also be obtained directly in terms of r. Again denoting $\frac{Y}{L} = F(r,1)$ by F, we may write

$$C_r = \frac{K}{L} \cdot \frac{L}{Y} = \frac{r}{F} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (16.1)$$

Then, substituting in (1),

$$G_w = (s - d^*) \frac{F}{r} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (16.2)$$

The partial derivative of G_w with respect to r, assuming s and d^* constant, is then

$$\frac{\partial G_w}{\partial r} = -(s - d^*) \frac{(F - rF_r)}{r^2} \quad . \quad . \quad . \quad . \quad . \quad . \quad (16.3)$$

As explained above in regard to (11), we may take $F - rF_r$, the relative share of labour, as positive. Hence, where

$$s - d^* = \text{constant} > 0, \frac{\partial G_w}{\partial r} < 0 \quad . \quad . \quad . \quad . \quad (16.4)$$

And the partial derivative of G_w with respect to d^*, with s and r assumed unchanged, is

$$\frac{\partial G_w}{\partial d^*} = -\frac{F}{r} < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (17.1)$$

[2] Solow warns that: "A 'crucial' assumption is one on which the conclusions do depend sensitively, and it is important that crucial assumptions be reasonably realistic. When the results of a theory seem to flow specifically from a special crucial assumption, then if the assumption is dubious, the results are suspect" (*loc. cit.*, p. 65). But he charges this to the Harrod–Domar model.

the optimistic notion of unlimited investment opportunities; it should not be surprising that it yields optimistic conclusions. Let us, however, in curiously more classical vein,[1] recognise that in any given period, or with a given production function, there is a limit to the extent to which greater round-aboutness of production will pay for itself. All we are arguing is that with a given quantity of labour there is some finite amount of capital at which the diminishing *net* marginal return to capital will reach zero. With more than that amount of capital the marginal net product of capital will be negative; additional capital will not realise, and hence should not be expected to realise, sufficient returns during its life-time to pay for itself. We thus add the further description of our production function,

$$F_K \gtreqless 0 \text{ as } K \lesseqgtr K_0,\ L = L_0 \quad . \quad . \quad . \quad . \quad (18)$$

or utilising the homogeneity assumption and defining $r_0 = \frac{K_0}{L_0}$,

$$i = F_K \equiv F_r \gtreqless 0 \text{ as } r \lesseqgtr r_0 \quad . \quad . \quad . \quad . \quad . \quad (19)$$

Now the existence of r_0, a limit to the profitable extensibility of the capital–labour ratio, will prove sufficient to admit the possibility of the " H–D–H " difficulties,[2] but, if we wish to get more Keynesian, we can add a liquidity trap at say i_1, where $i_1 > 0$ and is the rate of return equal to the floor to the rate of interest. To i_1 will correspond some capital–labor ratio, say r_1, where $r_1 < r_0$ and

$$i = F_K \equiv F_r \gtreqless i_1 \text{ as } r \lesseqgtr r_1 \quad . \quad . \quad . \quad . \quad (20)$$

Hence there is an upper limit to the value of r, which may be denoted by r_0 or r_1, depending upon whether we wish to assume that the rate of (net) profit can fall to zero or only to some value above zero. Since from (16) it can be seen that G_w is a monotonically decreasing function of r, for any given values of s and d^* $\left(e.g.,\ d^* = 0 = \frac{dr}{dt}\right)$, there is then a lower limit to G_w. If this lower limit is still higher than the actual or maintainable rate of growth the economy is in for the H–D–H maladies.

But what if there is deepening, that is, d^* and $\frac{dr}{dt}$ are positive? Here we

[1] Consistently, for example, with the formulation by John M. Cassels, " On the Law of Variable Proportions," reprinted from *Explorations in Economics* in *Readings in the Theory of Income Distribution*, pp. 103–18.

[2] The simplifying assumption of linear homogeneity of the production function enables us to meet the Solow–Tobin type *critiques* on their own ground, but it is a stronger assumption than we require. The Harrod–Domar–Hicks problem may be exhibited by any production function in which, with the given (presumably exogenous) growth of labour supply and the rate of capital accumulation consistent with the saving function, the marginal net product of capital is declining, and has no non-negative lower bound.

are referring not to a *higher* but to an *increasing* capital–labour ratio. As we noted in (17), the greater the rate of increase of the capital–labour ratio, other things equal, the less the warranted rate of growth. Thus we may concede that if the warranted rate of growth is too high there is always some rate of change of factor proportions which will be sufficient to make the warranted rate of growth any necessary lower figure. We are not, however, out of the woods. For, in accordance with (6), an increasing value of r must mean a decreasing rate of profit. But since $i \gtreqless 0$ or $i \gtreqless i_1$, eventually (with $\frac{dr}{dt} > \epsilon;\ \epsilon > 0$),

$$\text{as } r \rightrightarrows r_0 \text{ or as } r \rightrightarrows r_1,\ \frac{di}{dt} \rightrightarrows 0 \quad . \quad . \quad . \quad . \quad (21)$$

Then, writing

$$\frac{dr}{dt} = \frac{dr}{dF_r} \cdot \frac{dF_r}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (22)$$

we can see that since, as stated in (5), in equilibrium, the rate of profit equals the marginal product of capital or $i = F_r$, as

$$\frac{di}{dt}\left(= \frac{dF_r}{dt}\right) \rightrightarrows 0,\ \frac{dr}{dt} \rightrightarrows 0 \quad \text{unless } \frac{dr}{dF_r} \rightrightarrows -\infty \quad . \quad . \quad (23)$$

and, substituting $di = dF_r$ in (22) and (22) in (8), we derive,

$$d^* = \frac{dC_r}{dr} \cdot \frac{dr}{di} \cdot \frac{di}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (24)$$

To paraphrase our equations once more, where the capital–labour ratio is increasing $\left(\frac{dr}{dt} > 0\right)$, deepening is taking place ($d^* > 0$), and then, as Harrod (among others) points out, the warranted rate of growth is reduced and thereby relief is found. But deepening ($d^* > 0$) requires a falling marginal net product of capital, and hence a falling rate of profit $\left(\frac{dF_r}{dt} = \frac{di}{dt} < 0\right)$. There is a limit to how far the rate of profit can fall, and hence, unless the marginal net product of capital falls asymptotically to this limit (so that $\frac{dr}{dF_r} \to -\infty$, the unlimited investment opportunities argument again), there is a limit to how long any given rate of deepening (any given positive value of d^*) can be maintained. Thus we should observe that the rate of deepening is curbed not only by price and money rigidities and direct institutional constraints on the rate of fall of the equilibrium rate of return on investment $\left(\frac{di}{dt}\right)$; whatever the freedom from constraints, as long as there is a lower limit to i (even if only at $i = 0$), i cannot fall fast for long without hitting bottom.

The Saving Function, Asset Preferences and "Pigou Effects"

We shall now abandon the assumption that saving equals the change in physical capital and is a constant proportion of output. We shall instead introduce the saving function,

$$\frac{dW}{dt} \equiv S = S\left(Y, i, K, \frac{M}{P}\right) \quad . \quad . \quad . \quad . \quad (25)$$

where W stands for wealth or total accumulated savings and is defined as

$$W \equiv K + \frac{M}{P} \quad . \quad . \quad . \quad . \quad . \quad . \quad (26)$$

the total of physical capital and the real value of cash balances, so that saving is defined as

$$\frac{dW}{dt} \equiv S \equiv \frac{dK}{dt} + \frac{M}{P}\left(\frac{d\log M}{dt} - \frac{d\log P}{dt}\right) \quad . \quad . \quad (26.1)^1$$

We may therefore, substituting in (10), rewrite the formulation of the warranted rate of growth as

$$G_w = \left(\frac{d\log Y}{dt}\right)_w = \frac{1}{K} \cdot S\left[L \cdot F, i, K, \frac{M}{P}\right] - \frac{M/P}{K}\left(\frac{d\log M}{dt} - \frac{d\log P}{dt}\right) - \frac{d\log r}{dt} + \frac{d\log F}{dt} \quad . \quad (27)$$

We shall assume that saving is positive (at least initially) and linear, homogeneous in income and wealth. Thus with a constant rate of profit and a constant ratio of wealth to income the saving–income ratio will likewise remain constant.[2] To the extent that the converse is true and, in particular, that the desire to save is dissipated with increasing income and wealth, our whole problem would, of course, at least ultimately, disappear. But that converse assumption has not to my knowledge been argued to be

[1] Saving is thus identically equal not to investment but to the sum of investment and the change in the Government's real, net obligation to the private sector of the economy. The definition is analogous to that used in national-income accounts, where saving is made equal to the sum of investment and the government deficit. It should be realised that, consistent with this definition, private saving equals income (after taxes) plus government transfer payments and capital gains, including the increase in the real value of cash balances, minus consumption. This formulation, in view of our concern with price flexibility, would seem superior to that usually offered (and accepted by Tobin), where saving is identified only with the change in capital stock. That formulation is, of course, identical with ours if the real value of cash balances is assumed to be fixed. But in a model including variable prices and ruling out money illusion, it seems preferable to identify the behavioural saving function as that describing the aggregate of individual additions to net worth, whatever the form in which these additions are embodied. We join Tobin in adopting the simplifying assumption that there are no bonds and that the only stores of value are physical capital and government-issued money.

[2] This would appear consistent with the statistical and theoretical work by Kuznets, Modigliani, Duesenberry, Friedman and others. Tobin's assumption that saving is zero for some positive income (*loc. cit.*, p. 104) is not appropriate for the long-run saving function which is relevant.

currently relevant, and will not be entertained. Our saving function may be further described by the following partial derivatives:

$$S_Y > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (25.1)$$

$$S_i \gtreqless 0 \quad \text{but} \cong 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (25.2)$$

$$S_K < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (25.3)$$

and

$$S_{M/P} < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (25.4)$$

With the possible exception of (25.2), in which it is assumed that the interest elasticity of saving is not sufficient to make any difference, these would not appear, in the present context at least, to be controversial. And in this context (25.2) need be disturbing only to those who stand on the original neo-classical position that the rate of interest can be expected to vary sufficiently to ensure the equality of investment demand and saving under conditions of full employment.

The form in which savings are held will be described by an asset preference function,

$$\frac{M}{P} = M(K, i, Y) \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (28)$$

the satisfaction of which defines a condition of portfolio balance. This function has the general specifications,

$$M_K > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (28.1)$$

$$M_i < 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (28.2)$$

and

$$M_Y > 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (28.3)$$

But we shall also endow it with the Keynesian characteristic that the demand for liquidity becomes absolute as the rate of return on investment approaches some lower limit. Thus we add,

$$M_i \rightrightarrows -\infty \text{ as } i \rightrightarrows i_1, \text{ or merely, as } i \rightrightarrows 0 \quad . \quad . \quad . \quad (28.4)$$

since money is presumed to be a non-depreciating store of wealth, and hence

$$i \geqq i_1 \text{ or } i \geqq 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (28.5)$$

Our system is now complete, and the issue can be specified as follows. Is an actual rate of growth of output equal to the solution for the warranted rate in (27) necessarily consistent (or attainable) with the full-employment conditions,

$$\begin{cases} L = L_s, \text{ the labor supply,} & (29) \\ \dfrac{d\log L}{dt} = \dfrac{d\log L_s}{dt} \quad . \quad . \quad . \quad . \quad . \quad . \quad . & (29.1) \end{cases}$$

and the profit maximisation or "economic" relationship

$$F_r = i \geqq i_1 \text{ or } \geqq 0 \quad . \quad . \quad . \quad . \quad . \quad (30)$$

along with the related constraints upon r and $\frac{dr}{dt}$ expressed in (19), (20) and (23)? Or we may pose the issue in perhaps more familiar guise: can we be sure of equality between the rate of change in the capital–labour ratio determined by saving and changes in labour supply and the rate of change in this ratio acceptable to entrepreneurs under the constraints of the production function and market-determined asset preferences, *i.e.*, can

$$\frac{S}{K} - \frac{M/P}{K}\left(\frac{d\log M}{dt} - \frac{d\log P}{dt}\right) - \frac{d\log L_s}{dt} = \frac{d\log r}{dt}\,? \qquad . \quad (31)$$

Within the framework of an analogous set of relationships,[1] it has been argued (by Tobin), " In this model, unlike those of Harrod, Hicks and others, failure of the labor supply to grow at the rate necessary for balanced growth [constant capital–labor ratio] does not mean that growth at a slower rate is impossible." [2] The rate of profit must fall, it is conceded, as the capital–labour ratio grows, and " Portfolio balance requires, therefore, that a given increment of capital be accompanied by a greater price decline than in the case of balanced growth. But there is some rate of price decline that will preserve portfolio balance, even in the extreme case of completely inelastic labor supply."

This argument, however, is clearly invalid if the " given increment of capital " would bring the marginal net product of capital below i_1 (or below zero), thus violating condition (30). Portfolio balance can then be preserved only if the price decline reduces the increment of capital (saving) sufficiently so that $F_r \geqq i_1$ (or 0).

But can the static " Pigou effect " rescue us? Must there always be *some level* of prices (above zero) for which real cash balances will be so large that the supply of saving will be reduced to whatever amount is consistent with the exogenous growth of the labour force and an *economic* capital–labour ratio? For this to be true it must be made clear that our assumption that $S_{M/P} < 0$ is not sufficient.[3] As indicated by Patinkin,[4] the reduced rate

[1] In which, however, functional saving is defined as the change in capital stock (cf., footnote 1, p. 716, above) and is dependent only upon income, thus excluding the Pigou effect, but is assumed (" crucially ") to be zero for some positive income producible under conditions of full employment (cf., footnote 2, p. 716, above).

[2] Tobin, *loc. cit.*, p. 107. The word " possible " in the text seems clearly to have been a misprint, and I have taken the liberty of changing it to " impossible " in my quotation.

[3] It is interesting to note that the Pigou effect, which we are here admitting, implies a curious type of money illusion to which illusion-hostile neo-classicists might wish to take exception. For an increase in the real value of cash balances makes society no wealthier in " real " terms, that is in goods. The illusion of greater wealth is accepted by private individuals in so far as they consider the balance sheet of only the private sector of the economy, and do not reckon that society is in some sense the debtor as well as the creditor of each dollar of government obligation.

[4] Don Patinkin, " Price Flexibility and Full Employment," as reprinted in American Economic Association, *Readings in Monetary Theory*, especially pp. 267–9, and *Money, Interest, and Prices* (Evanston, Illinois, 1956) p. 236.

of saving resulting from increased cash balances may involve an asymptotic relation in which the total possible effect is finite:

$$\frac{\partial^2 S}{\partial (M/P)^2} > 0 \text{ so that } S_{M/P} \to 0 \text{ as } M/P \to \infty \qquad . \quad (25.5)$$

The economic plausibility of this argument is suggested by the observation that the acquisitive motive, as well as the desire to better oneself, to pass more on when one leaves this world than one had when one entered, are fundamental parts of the capitalist ethic. Who really finds that he is rich enough and ceases trying to get richer? But if society, no matter how great its wealth, will always strive to accumulate more, we can have no assurance that, even aside from expectational and other dynamic considerations,[1] the saving ratio can be made sufficiently low.[2]

But there is still a way out for the growth model critics. Under the restrictive conditions we have assumed, there must be a consistent solution for the warranted rate of growth as defined in (27)—if we do not require price stability. For with a constant nominal quantity of money, M, we can, from (25) and (26.1), write the increment of capital

$$\frac{dK}{dt} = S\left(Y, i, K, \frac{M}{P}\right) + \frac{M}{P} \cdot \frac{d\log P}{dt} \qquad . \quad . \quad . \quad (32)$$

With falling prices $\frac{M}{P} \cdot \frac{d\log P}{dt}$ is, of course, negative and (at least mathematically) there is nothing to prevent this negative value from being indefinitely great, reducing $\frac{dK}{dt}$ to any necessary level, regardless of the supply of saving.

" Equilibrium " can thus be maintained by a perpetual fall in prices, in which the community " saves " by increasing the real value of cash balances. Paraphrasing somewhat Patinkin, we have a " dynamic Pigou theorem," [3] which suggests that there is some *rate of fall* of prices sufficient to satisfy the excess of the full employment desire to save over whatever investment demand may be forthcoming. The reader may estimate for himself the probability of finding expectations functions, let alone institutional flexibilities, which would make such a solution economically plausible.

[1] Of course, few to-day, in any event, would argue that the Pigou effect could be expected to maintain generally full employment in a dynamic system with the substantial fluctuations in demand which have characterised Western economies.

[2] It has been argued that underlying the portfolio balance equation is the desire of individuals (and the community) to split increments of wealth as between physical and monetary assets in order to minimise risk (Tobin, pp. 106–7). This would suggest that increments of wealth in the form of cash balances would increase the demand for physical capital, although its expected return were not thereby improved. But it can also be argued that as wealth increases, in line with the saving motives discussed above, its marginal utility approaches a positive asymptote and the hedging incentive would disappear as marginal utility became constant.

[3] Cf., Patinkin's *static* " Pigou theorem " in " Price Flexibility and Full Employment," p. 271.

Our system has been endowed explicitly with the neo-classical complements of variable factor proportions, flexible prices, cash-balance effects and a *fixed* linear, homogeneous production function (thus ruling out the employment of capital-using innovations like a *Deus ex machina* to set the plot straight). By way of summary, we shall describe the operation of this system when confronted with a rate of growth in the labour supply (ultimately Harrod's " natural rate of growth ") less than the " proper " full-employment rate warranted by the supply of saving. And by way of simplification of exposition we shall consider the case (suggested by Tobin) where the supply of labour is " completely inelastic . . . with respect to the real wage and with respect to time."

Since the rate of saving is (by hypothesis) positive, the ratio of capital to labour must increase continuously and the rate of profit must fall continuously. As the rate of profit falls the community becomes disposed to take larger and larger proportions of increments of wealth in the form of money. With a fixed stock of money, successive increments of wealth will then require successive declines in the level of prices. But as the rate of profit approaches the value of i at which M_i approaches minus infinity we find the community approaching a situation where no further increase in the stock of capital and decline in the rate of profit is consistent with portfolio balance, regardless of the decline in the price level (or alternately, increase in the quantity of money). The rate of profit cannot (in equilibrium) fall below the point of infinite elasticity of the demand for money because the community stops accepting further increases in capital (which is what lowers the value of i) as i reaches that lower limit. But this means that positive saving can take place only in the form of the increased cash balances stemming from falling prices. And it is only thus that the relatively too large (positive) warranted rate of growth is reducible to equality with the natural rate.

There is no assurance that such a solution, of perpetually falling prices, would prove dynamically stable when we admit the role of expectations. For price declines generating expectations of further price declines would increase the relative attractiveness of money as compared to physical capital, and might leave no point of equilibrium as long as there were physical capital of which individuals might dispose. I shall not attempt to explore further the difficulties along these lines, but, in any event, it is on this solution of perpetually *falling* prices—a " dynamic Pigou theorem "—that a rejection of the *possibility* of the growth model problems would have to rest.

IV. Conclusion

The implications of recent models of economic growth and fluctuation of the Harrod–Domar–Hicks variety have been challenged as the consequence of arbitrary assumptions of rigid technological relationships and/or rigid price relationships. This challenge is unfounded.

For the Harrod–Domar–Hicks models require no more in the way of a production function than most of us would be willing to grant as reasonable. Specifically, they do require a schedule of *net* marginal productivity of capital declining in such a way that there is a limit to the capital–labour (or capital–output) ratio which is economically feasible. This limit may be reached at the point where the marginal efficiency of investment equals the rate of interest set by the Keynesian liquidity trap. It may even be reached only at the point where the marginal net product of capital is zero (and the marginal efficiency of investment also zero if expectations are founded on reality). But limit there must be.

And if there must be an *upper* limit to the capital–output ratio, there must, for any saving ratio, be a *lower* limit to the rate of growth of output (or labour) which will be consistent with the saving forthcoming. This minimum " required " rate of growth can then be reduced only to the extent the saving ratio can be reduced. If the saving ratio will not adjust automatically, via interest-rate changes or " Pigou effects," to whatever value is consistent with whatever rate of growth of output obtains, then there remains some minimum " warranted," " equilibrium " or " full-employment " rate of growth. This rate of growth is thus determined jointly by the upper limit to the automatic, free adjustment of the capital–output ratio and the lower limit to the automatic free adjustment of the saving ratio. If we do not obtain this rate of growth we are in some kind of trouble—an underemployment trouble which the models merely seek to explain, not create.

We are not always in this kind of trouble. We may not always face a problem of capital–output ratios and saving ratios determined by free economic forces being inconsistent with underlying determinants of economic growth such as population and the development of additional natural resources. The problem may become remote for substantial periods of time because of various social or governmental pressures (intended or unintended) upon these ratios. But whether or not the problem is at any moment of time crying for solution, it does exist. And in view of the historical record of cyclical instability, uneven growth and recurring periods of unemployment in the (private-profit-motivated) capitalistic economies we have known, the problem seems important. It is perhaps a mark of the technological backwardness of economic theory that the " H–D–H dynamic " arrived so late. It will certainly (in the view of this observer) be a mistake to hasten to discard it.

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CONCENTRATION OF EXPORTS AND IMPORTS: AN INTERNATIONAL COMPARISON[1]

THE major purpose of this study is to examine the commodity concentration of exports and imports of as many countries as possible, and thus to indicate the degree to which the economic fortune of a country is dependent upon one or a few goods. This measure has bearing on many aspects of the country's economic position, some of which will be mentioned in the present paper. The method employed in the measurement of concentration will be explained in the first section. In the following section the results will be expounded and, in particular, attention will be drawn to the implications of the findings for the well-known controversy over the effect of a devaluation on the terms of trade of the devaluing country. In the third and last section the study will be carried somewhat further by the measurement of the geographic concentration of exports and imports; that is, the concentration of each country's trade according to its distribution among countries, rather than among commodities.

I

Defining the " commodities " involved is the first, and probably crucial, step in measuring the degree of commodity concentration of exports and imports by commodities. The results obtained by different definitions may differ not only in their magnitudes but also in their signs. Whatever classification of commodities is adopted, it is essential that it should be consistently applied to both exports and imports. Likewise, if we are to make meaningful international comparisons, the same classification must be used throughout.

Fortunately, this can be done at present, owing to the increasing use of the Standard International Trade Classification (SITC) in reporting international trade figures. This use is urged by the United Nations, and in the 1955 volume of the United Nations *Yearbook of International Trade*, the trade of sixty-eight countries and territories is recorded according to the SITC. The present study is based on this material.

Selecting the method of classification does not in itself solve the problem of definition. It remains to decide in what detail and fineness should " commodities " be defined. In the SITC, commodities are classified into 10 *sections* (one-digit code), 52 *divisions* (two-digit code), 150 *groups* (three-digit code) and 570 *items* (five-digit code). From a practical point of view, it would be very inconvenient to select, for our purposes, the five-digit code, both because the readily accessible data would not permit it and because

[1] I am indebted to Professors Simon Kuznets, Fritz Machlup and Don Patinkin for searching criticism and numerous suggestions, and to Mr. Dov Genichovsky for extensive assistance in calculations.

the amount of work involved in calculation would be too great. But practical considerations aside, it still seems justifiable to select the three-digit code. If fineness in classification is carried beyond this, commodities that are very close substitutes in consumption or production, or both, would be defined as separate goods, and exports or imports that are quite homogeneous, for the purpose of this study, would appear as heterogeneous. On the other hand, if the one-digit or two-digit code is adopted, so that commodities are classified into just ten sections, or fifty-two divisions, goods that are distinctly apart from each other would be grouped together, so that our comparisons would not be very meaningful. Hence it was decided to use the three-digit code and to make the comparison for those countries only, among the fore-mentioned sixty-eight, whose statistics are recorded in this form. Forty-four such countries and territories are found in the 1955 volume of the *Yearbook*. Where information was available, figures for 1954 were taken; otherwise, 1953 and, in very few cases, 1952 figures were used.[1]

The degree of concentration is measured by the Gini coefficient of concentration.[2] If there are n export goods, the annual value of exports of any good i is x_i, and the annual value of total exports is X, the coefficient of concentration of exports will be

$$\sqrt{\sum_{1}^{n}\left(\frac{x_i}{X}\right)^2}$$

and likewise for imports. For convenience, this is multiplied by 100. Obviously, the highest possible coefficient is 100, where all exports consist of a single good. The lowest possible coefficient is $\frac{100}{\sqrt{n}}$. In our case—where $n = 150$—this coefficient would be about 8·2, and represents the case in which the country's exports are equally divided among all groups.

Before presenting and interpreting the coefficients obtained, some shortcomings of the method should probably be pointed out. The most serious among these is that fact that, once commodities have been defined, they are regarded as equally different from each other, although some are close substitutes while others are bad substitutes. That this may be a severe deficiency may perhaps be best visualised by looking at a specific country. Take, for instance, Finland, whose exports are overwhelmingly composed

[1] The main work for this study was carried before the 1955 volume of the *Yearbook* became available, and hence is based on that for 1954. The later volume was then used to add four countries to the forty for which information had already appeared in the 1954 volume. I strongly believe that, in practically all countries, changing the year, the record of which serves as basis for calculations, would call forth only minor changes in the numerical magnitudes of the coefficients of concentration, and that the results obtained on the basis of any single recent year indicate the fundamental present-day structure of trade of the country concerned.

[2] This method was also used by Albert O. Hirschman, *National Power and the Structure of Foreign Trade* (Berkeley and Los Angeles: University of California Press, 1945), Chapter VI. Hirschman measured the geographic concentration of trade, not the commodity concentration. We shall refer further to Hirschman's study in Section III.

of wood and paper products. These do not appear as one group, but as several,[1] among which Finland's exports are distributed quite evenly. Finnish exports thus appear not to be particularly concentrated, and the coefficient of commodity concentration of exports is as low for Finland as it is for other countries whose exports are, in fact, much more heterogeneous, in the sense that they consist of goods that are much less substitutable for each other. This deficiency is not, of course, the fault of SITC, since it would persist in any form of classification. It might have been possible to overcome it by assigning " distances " between any pair of commodities (say, according to their cross-elasticities of demand), and taking them into account in formulating the coefficients. In practice, however, this procedure does not seem feasible.

Another point to be noted is that certain groups are of the catch-all, *i.e.*, the " n.e.s." (not enumerated separately) type, and often these groups are large. Moreover, they are more important in the industrial sections, and may thus form a bias towards a higher degree of concentration where exports or imports are largely industrial. It seems, however, that in no single case is this shortcoming important enough to detract from the meaningfulness of the results.

Likewise, it should be remarked that the *Yearbook* statistics refer only to trade in goods, and not in services. Again, for most countries this does not seem to be a severe handicap, since trade in services is usually small, compared with the amount of trade in goods. In some countries, however, where exports of services are relatively substantial,[2] and where they consist of very few items (such as, for instance, shipping in Norway), the coefficients of commodity concentration might have been materially different had services been included.

Finally, it is the intention of the study to draw conclusions applicable to the world as a whole, although it covers less than half of the world's countries and territories. Since, however, the trade of the countries investigated comprises some 80% of world trade, this procedure seems legitimate. Moreover, although these countries were not picked at random, they seem to include economies of almost all types and shades.[3] I believe, therefore, that inferences drawn from this study apply, with probably minor qualifications, to the world at large.

II

The coefficients of concentration of exports and of imports, and the ratio between the former and the latter, are presented in Table I in descending order of the exports' coefficient.

[1] Such as " wood, round or roughly squared," " wood, shaped or simply worked," " plywood, boards, etc.," " paper and paperboard," " pulp and waste paper."

[2] This is less frequent with regard to imports, partly because imports of goods are usually recorded on c.i.f. basis.

[3] Most conspicuous in their absence are countries in the Soviet orbit, whose trade structure may not be similar, on the average, to that of countries covered in this study.

TABLE I

Coefficients of Commodity Concentration of Exports and Imports

Country.	Exports.	Imports.	Exports / Imports
1. Mauritius	98·8	28·6	3·46
2. Netherlands Antilles	93·7	83·0	1·13
3. Egypt	84·2	18·6	4·54
4. Colombia	84·0	23·9	3·51
5. Gold Coast	83·5	21·4	3·89
6. Iceland	80·3	19·1	4·21
7. Burma	74·4	24·2	3·08
8. Trinidad and Tobago	72·7	30·5	2·39
9. Thailand	68·3	21·4	3·19
10. Honduras	65·0	19·7	3·30
11. Panama	62·8	16·8	3·74
12. Brazil	61·2	23·2	2·64
13. Costa Rica	60·5	18·8	3·21
14. Australia	50·8	27·0	1·88
15. Malaya and Singapore	49·8	25·4	1·96
16. Nigeria	49·3	24·3	2·03
17. Kenya–Uganda	49·0	22·9	2·14
18. Greece	46·2	19·3	2·40
19. Tanganyika	44·6	22·8	1·95
20. Indonesia	41·7	24·5	1·70
21. Turkey	39·7	23·5	1·69
22. Ireland	38·3	16·5	2·31
23. Finland	38·1	19·2	1·98
24. Mexico	35·0	26·8	1·30
25. Libya	34·1	18·9	1·80
26. Spain	33·9	24·5	1·39
27. Rhodesia and Nyasaland	32·5	20·2	1·61
28. Argentina	30·6	21·5	1·42
29. Sweden	28·1	18·5	1·52
30. Austria	27·7	19·7	1·41
31. Denmark	27·1	18·5	1·46
32. Belgium–Luxembourg	25·5	15·5	1·65
33. Norway	25·5	23·4	1·09
34. Canada	24·9	18·0	1·38
35. Japan	24·8	26·4	0·94
36. Portugal	24·7	19·1	1·30
37. Germany (Federal Republic)	22·3	15·6	1·43
38. Yugoslavia	21·4	26·1	0·82
39. Hong Kong	20·6	16·0	1·28
40. Italy	20·5	20·7	0·99
41. United Kingdom	19·2	16·1	1·19
42. United States	18·8	20·5	0·92
43. France	18·0	20·4	0·88
44. Netherlands	16·9	16·0	1·06

The findings of Table I are relevant to the lively—and yet unsettled—discussion of the probable effect of devaluation on the terms of trade of the devaluing country.[1] Let us recall Joan Robinson's well-known statement:

> " In general, each country is more specialised in respect to the goods which it produces than in respect to the goods which it consumes, so that any one country plays a more dominant role in the world supply

[1] For some of the positions taken in this controversy, see Fritz Machlup, " The Terms-of-Trade Effects of Devaluation upon Real Income and the Balance of Trade," *Kyklos*, Vol. IX (Fasc. 4, 1956), pp. 417–52.

of those goods which it exports than it plays in the world market for those goods which it imports. In general, therefore, the world demand for the exports of one country is less elastic than the world supply to it of those goods which it imports. So far as the foreign elasticities are concerned, there is thus a strong presumption that a fall in the exchange rate will turn the terms of trade in the unfavourable direction." [1]

The logic of this statement is that production of internationally traded goods is distributed among many countries, each of which specialises in a few industries to which it is best fitted. At the same time, it purchases a large variety of goods from abroad, in the market for each of which the country is one customer among many and thus not very significant.

This view has not gone completely unchallenged. Hinshaw [2] thought that " in the case of a large country, there is the presumption, in the absence of knowledge to the contrary, that the country is as important an influence in the world demand for the internationally traded goods that it buys as in the world supply of the goods that it sells." Specifically, Hinshaw thought that Joan Robinson's statement was not applicable to the United States and other major industrial countries, such as the United Kingdom and most of the Western European countries.

I do not intend to inquire here whether Joan Robinson's presumption about commodity concentration of exports and imports should lead to her conclusion about the effect of devaluation on the terms of trade; I rather intend to verify the presumption itself. From Table I we learn that in the large majority of countries exports are indeed more concentrated than imports. This is true for thirty-nine out of the forty-four countries under investigation. The (unweighted) arithmetical average of the ratio between the coefficients is approximately 2.

Joan Robinson's presumption seems, thus, to be valid. Yet, Hinshaw's position is not entirely refuted. In the United States, as Hinshaw suspected, exports are more diversified than imports (partly due to the large share of a

[1] Joan Robinson, " Beggar-My-Neighbour Remedies for Unemployment," *Essays in the Theory of Employment*, 2nd ed., reprinted in *Readings in the Theory of International Trade* (Philadelphia: The Blakiston Company, 1949), pp. 393–407. Quotation from p. 400.

Symbolically (using notation different from Joan Robinson's), the terms of trade of the devaluing country would deteriorate, under certain specified assumptions, if $\frac{\epsilon_I}{\eta_x} > \frac{\eta_I}{\epsilon_x}$, where

ϵ_I is the elasticity of foreign supply of imports;
η_x is the elasticity of foreign demand for exports;
η_I is the elasticity of domestic demand for imports;
ϵ_x is the elasticity of domestic supply of exports.

Joan Robinson submits that, owing to the difference in commodity concentration of exports and imports, the left-hand term of the inequality is high, or at least above unity; while the right-hand term is usually, particularly in slump conditions, below unity, and only in exceptional cases would it be so much above unity as to be greater than the left-hand term. Hence the probable outcome of a devaluation would be a deterioration of the terms of trade of the devaluing country.

[2] Randall Hinshaw, " Currency Appreciation as an Anti-inflationary Device," *Quarterly Journal of Economics*, Vol. LXV (November 1951), pp. 447–62.

single commodity, coffee, in the United States' imports). The same holds for two Western European countries, France and Italy, as well as for Japan and Yugoslavia. In the Netherlands imports are practically as concentrated as exports, and this applies to a lesser extent also to the United Kingdom and to Norway. Although these countries are, numerically, in the minority, it must be noted that their currencies include most of the world's major currencies, and that they occupy a large share of the international trade; their combined trade amounted, in 1954, to some 43% of world trade, and about 55% of total trade of the countries covered by this study.

One should be careful not to identify a high degree of concentration of exports with a low elasticity of foreign demand for exports. The degree of concentration is but one factor. Another is, of course, the nature of the goods in which the country specialises; and, it may be noted, countries whose exports are by and large highly concentrated export commodities the demand for which is believed to be inelastic—an added reason for inelasticity of foreign demand for the exports of these countries. Still another factor is the share of the country in world trade, and the degree to which the country's major export goods are produced abroad. Compare, for instance, Colombia with Brazil. The former's exports are much more concentrated than the latter's. Yet Colombia undoubtedly faces a more elastic demand for its major export good, coffee, than Brazil, whose share among the suppliers of coffee is dominant. On the other hand, consider a country like Turkey. It is about an average country, as far as the concentration of its exports is concerned, and its share in total world exports is rather small (some 0·5%). But Turkey is virtually the sole exporter of one of its major export goods, raisins, and is a very significant exporter of Oriental tobacco, another important export good, so that it is not at all clear whether the demand for Turkey's exports is indeed elastic.

It should be noted that the countries with the most predominant shares of world trade are also, by and large, the countries whose exports are least concentrated. Thus, two opposing factors work on the elasticity of demand for their exports.[1] It is important to know, in this context, not only the share of a country's exports in *world* trade; owing to transportation costs, artificial barriers and general imperfections of markets, the actual " market " whose demand concerns any country is usually considerably less than the whole

[1] These two factors together determine the " weight " of a country in world exports. Symbolically, the index of the country's " weight " is

$$\sum_i \left[\frac{x_{ij}}{x_i} \cdot \frac{x_{ij}}{x_j}\right]$$

where x_{ij} stands for exports of commodity i by country j, x_i stands for world exports of commodity i, and x_j for total exports of country j. This index would be higher the more concentrated the country's exports, and the larger the share of each of its export commodities in total world exports of that commodity. Our coefficient of concentration and the index of " weight " are, of course, different—though related—concepts. A separate study of the " weight " of countries in world trade will follow the present study.

world. The degree of geographic concentration of the country's exports (which will be examined in the next section) is thus also an important factor which affects the elasticity of demand for the country's exports.

A few other conclusions of interest may be deduced from Table I. We note that there is a much larger variation among countries with regard to the degree of commodity concentration of exports than with regard to the commodity concentration of imports. Coefficients of concentration of exports range all the way from 16·9 to 98·8 (the maximum possible range for both exports and imports, to be reminded, is from 8·2 to 100). The respective range for imports is, with one exception (the territory of the Netherlands Antilles), only from 15·6 to 30·5. Whether the ratio between the coefficients of commodity concentration of exports and imports is high or low is determined primarily by the former and not by the latter.

Let us now suggest some possible causes of variation with regard to commodity concentration of exports. What similarities can one find among countries whose exports are more (or less) concentrated? One answer that immediately suggests itself is that, by and large, the more developed the economy (that is, the higher its *per-capita* income), the more diversified are its exports. This could be expected, since a higher degree of economic development is usually associated with a more varied production.

Further, and this point is closely related to the former, although conceptually separate, it may be seen that the more industrialised the economy (that is, the lower the share of primary production in its national product), the more diversified are its exports. It may not be easy to distinguish between the "industrialised" and the "developed" economies, since the more industrialised countries are usually the more developed as well. Among the few exceptions that may be found, the most conspicuous are Australia, on the one hand, a country with an important agricultural sector whose exports are rather concentrated despite its very high level of *per-capita* income; and Japan, on the other hand, whose developed industry may explain the fact that her exports are highly diversified, although its *per-capita* income is low. The major export items in countries whose exports are highly concentrated are always primary goods (such as sugar in Mauritius, oil in the Netherlands Antilles, cotton in Egypt, coffee in Colombia or cocoa in the Gold Coast—to mention only five countries with the highest coefficients of commodity concentration). Where exports are highly diversified, they consist largely, in most cases, of manufactured goods.

Another suggestion, again related to the previous two, is the following: The greater is the geographical proximity of the country to centres of world trade, the more diversified are its exports. It is most striking, for instance, that almost all the countries whose exports are highly diversified are in Europe (that is, lie within the world's major trading area), while no European country has highly concentrated exports. It might be objected that this is no valid argument, since it so happens that the European countries are,

by and large, the more developed ones. Let us confine the comparison, then, to two groups of approximately the same level of development (*i.e.*, of *per-capita* income). The European group consists of six countries, whose (1954) *per-capita* annual incomes range from U.S.$200 to 410, and whose (unweighted) average *per-capita* income is about U.S.$300; the non-European group consists of seven countries, whose *per-capita* incomes are between U.S.$210 and 460, with an average income of about U.S.$275 for the group. We find that the average coefficients of commodity concentration of exports are 31·7 for the European group and 51·9 for the non-European group. That distance should be a factor could be expected, since the less important the transportation costs, the larger is the number of goods which the country is able to export.

It has sometimes been suggested that the *size* of the economy should also be considered. The larger is the country, the more varied should its production be, since the more varied, it may be presumed, are its climatic regions, its natural resources and, probably, its human resources. Moreover, a great number of industries cannot, owing to internal and external economies, be maintained in small countries. This is emphasised by Kuznets,[1] who suggests that economic activities would be more diversified in the larger country even if we compared two underdeveloped countries, but "the contrast in diversification would be particularly conspicuous for two economically advanced nations." And it is reasonable to assume that a larger variety in production would be reflected in higher diversification of exports.

TABLE II

Coefficients of Commodity Concentration of Exports, by Size and by Degree of Development

	Developed countries.	Underdeveloped countries.	Total.
Large countries	21·4	57·8	40·7
Small countries	39·1	46·2	41·5
Total	31·2	53·7	41·1

Our findings seem to support the main contention of this thesis. Table II presents the average coefficients of concentration of exports of those countries, thirty-four in number, for which estimates of *per-capita* income are available.[2]

[1] Simon Kuznets, "Economic Growth of Small Nations" in *The Challenge of Development*. (The Eliezer Kaplan School of Economics and Social Sciences, The Hebrew University, Jerusalem, 1958.)

[2] "Developed country" is defined arbitrarily as a country whose *per-capita* annual income exceeds U.S.$300 (according to the figures of the United Nations' *Per Capita National Product of Fifty-five Countries: 1952–1954*). "Small country" is defined, following Kuznets, as one whose population numbers less than 10 millions. This means, of course, that the country's area is not part of the definition, although there is certainly a close correlation between area and the size of population.

Table II shows that among the more developed countries, exports are indeed much more concentrated in the small than in the large countries. This is not true among underdeveloped countries; on the contrary, in this group exports are more concentrated in the large countries. It may be inferred that among underdeveloped countries the effect of size is relatively unimportant, and is overcome by other factors; one of these may be the fact that out of five countries in the group of " small countries," two (Greece and Portugal) are in Europe, while all seven large countries are non-European.

Is there, in general, any observable relation between the commodity concentration of exports and imports in any single country? It might be expected that the more concentrated the exports, the more diversified will imports be, since a high concentration of exports indicates a high degree of specialisation in production, which means, in turn, that a large variety of goods ought to be imported. We find, however, that as a rule the opposite is true; a positive correlation exists between concentration of exports and imports, though there are many exceptions to this rule. This is most evident if we average out groups of countries and if, in particular, we compare the group of (say) the ten countries whose exports are most concentrated with the group of ten countries whose exports are most diversified. The coefficient of correlation between the degree of commodity concentration of exports and imports for the forty-four countries is 0·43, and the coefficient of rank correlation between the two is also about 0·4. I can see primarily three reasons for this positive correlation.

The exports of a country may be the result of fabrication of imported raw materials, and a high commodity concentration of exports may be then the direct cause of a high commodity concentration of imports. One has in mind, for instance, the British export of textiles and its bearing upon the import of wool. Yet, in the case of the United Kingdom as well as in almost all other cases, a casual examination of the structure of trade suggests that this direct relation between concentration of exports and imports is not very important. Only in one case can it be said with assurance that this relation is a major factor: in the Netherlands Antilles exports consist almost entirely of petroleum products, while imports are overwhelmingly composed of crude and partly refined petroleum.

It is much more plausible that concentration of exports is not the cause of concentration of imports, but that there are certain common factors which affect both exports and imports. One is the aforementioned distance of the country from major trading areas. The heavier the transportation costs, in the country's international trade, the larger is the range of " domestic " commodities in its economy, and the smaller are the ranges of both export and import goods. A proper example for the operation of this factor may be the comparison of Australia and Canada, countries which are similar in many respects. In Australia, both exports and imports have high coefficients of commodity concentration. In Canada, on the other hand, whose centres of production and consumption lie close to the United States' major markets (and where, it should be added, certain other barriers to movements of goods, such as different languages, different trading customs, etc., are virtually non-existent), both exports and imports are diversified.[1]

Finally, the most important factor seems to be the level of economic development. It was seen that the less-developed countries tend to have concentrated exports, composed of one or very few staple or extractive goods. But the low level of development (*i.e.*, of *per-capita* income) implies not only a lower level of consumption *per capita*, but involves also a less varied consumption. Indeed, a generation or two ago one would have found, probably, a still higher degree of concentration of imports in underdeveloped countries. At present, imports of these countries are more diversified than they probably were, because the effort of economic development, particularly industrial development, requires the importation of a large variety of capital goods.

III

The investigation of the geographic concentration of trade, with which the present section will be concerned, is based on the 1954 data of the *Direction of International Trade*.[2] While for certain purposes one might be interested in the distribution of trade not among all countries and territories but rather among independent countries only, or even among monetary areas, for our purposes it seems best to treat each country and territory which is listed separately, whether independent or not, as a separate political unit.[3] The investigation is confined to the same countries whose commodity concentration of trade has been examined in the previous sections. For two of these countries, Kenya–Uganda and Libya, no information on the direction of trade is available, so that the study covers forty-two countries and territories. The coefficients of geographical con-

[1] Actually, one should consider not only convenience of transportation, in the narrow sense, but also other factors that hinder the mobility of goods, including man-made barriers such as customs duties, etc. It is reasonable to assume that the higher these obstacles to mobility, the more concentrated would exports and imports be. This point cannot be verified, however, without a wide research that is beyond the scope of the present study.

[2] A joint publication of the Statistical Office of the United Nations, the International Monetary Fund and the International Bank for Reconstruction and Development.

[3] One difficulty arises by the fact that not all the " units " consist of single countries or territories; some are groups such as " special categories," " other British countries," " other areas (in Asia, Africa, etc.) " and the like. Wherever such a group is of minor importance it is considered, indeed, as a separate single unit, with no justification but with very little harm done. Where, on the other hand, a group of this nature amounts to more than a small percentage of exports or imports, it is excluded from the calculations altogether.

centration of exports and imports are presented in Table III, in descending order of the former.

TABLE III

Coefficients of Geographic Concentration of Exports and Imports

Country.	Exports.	Imports.	Exports. / Imports
1. Panama	95·5	67·0	1·43
2. Ireland	89·7	56·7	1·58
3. Colombia	79·8	64·2	1·24
4. Honduras	78·0	69·4	1·12
5. Mauritius	77·6	46·5	1·67
6. Nigeria	74·0	51·3	1·44
7. Mexico	73·7	81·2	0·91
8. Canada	63·9	74·9	0·85
9. Costa Rica	62·4	60·4	1·03
10. Rhodesia and Nyasaland	58·4	55·5	1·05
11. Trinidad and Tobago	50·0	47·5	1·05
12. Gold Coast	47·9	50·5	0·95
13. Burma	47·6	39·6	1·20
14. Thailand	43·5	35·7	1·22
15. Denmark	41·8	37·0	1·13
16. Brazil	41·5	37·4	1·11
17. Australia	41·2	49·5	0·83
18. Tanganyika	39·5	47·2	0·84
19. Indonesia	38·3	31·4	1·22
20. Greece	34·1	31·1	1·10
21. Finland	34·0	26·8	1·27
22. Netherlands Antilles	33·6	79·7	0·42
23. Argentina	32·1	26·8	1·20
24. Austria	31·8	39·7	0·80
25. Yugoslavia	31·3	37·0	0·85
26. Spain	29·5	28·4	1·04
27. Belgium–Luxembourg	29·4	28·6	1·03
28. Turkey	29·3	28·4	1·03
29. Iceland	29·1	30·8	0·95
30. Sweden	28·4	30·4	0·93
31. Norway	28·0	25·9	1·08
32. Hong Kong	27·6	30·0	0·92
33. United States	27·5	27·6	0·99
34. Portugal	27·4	28·0	0·98
35. Netherlands	27·0	29·6	0·91
36. Malaya and Singapore	26·0	38·2	0·68
37. Egypt	26·0	26·0	1·00
38. Japan	24·0	38·1	0·63
39. France	21·8	20·4	1·07
40. Italy	21·1	24·2	0·87
41. Germany	21·0	20·8	1·01
42. United Kingdom	18·7	19·4	0·96

In interpreting the results of our examination, it is convenient to follow, in part, the pioneering work of Hirschman,[1] who calculated the coefficients of geographic concentration of trade of forty-five countries,[2] for several

[1] Albert O. Hirschman, *National Power and the Structure of Foreign Trade, op. cit.*

[2] Hirschman's calculations were confined to "small" countries; his definition of "small" countries is different, however, from the one used in the present study, and covers even countries such as Brazil or Poland. In addition to forty-four small countries the United Kingdom was studied by Hirschman, for the sake of comparison.

years for the period 1913–38. Two of Hirschman's conclusions may be of interest in the present context:

> (*a*) Exports tend to be more geographically concentrated than imports. In only six countries out of the forty-five did Hirschman find the opposite to be generally true, and in sixteen others the geographic concentration of exports and imports tended to be of approximately the same strength. The tendency of exports to be more geographically concentrated than imports was particularly recognisable in countries in which the geographic concentration of foreign trade was high.
>
> (*b*) The geographic concentration of exports is stronger the stronger the commodity concentration of exports. Although Hirschman did not study the latter concentration, he believed that our general knowledge of the structure of exports of the countries involved warranted this proposition.

Hirschman's first conclusion is barely reaffirmed by the present study. Of the forty-two countries examined, twenty-three have higher geographic concentration of exports than of imports, in eighteen the opposite is true, and in one country exports and imports are equally concentrated. Put differently: in twenty countries the ratio between the coefficients of geographic concentration of exports and imports is between 0·9 and 1·1, that is, the two coefficients are fairly similar; in nine others the ratio is below 0·9, while in thirteen countries it is above 1·1. The average ratio is about 1·04. It may thus be concluded that, although exports tend to be somewhat more geographically concentrated than imports, the difference is so slight that it is perhaps not meaningful.

It is still true that the tendency of exports to be more geographically concentrated than imports is stronger in countries with high geographic concentration of trade, but this, too, is less conspicuous in the present study than in Hirschman's. If we define a country in which either exports or imports have a coefficient of geographic concentration higher than 40 as a country whose trade is highly concentrated, we find that of nineteen such countries, in five the ratio between the coefficients of geographic concentration of exports and imports is between 0·9 and 1·1, in four it is below 0·9, and in ten it is above 1·1. The average ratio is 1·11.

The difference between the indications of the present study and those of Hirschman's may partly be due to the fact that the countries under investigation were not the same in the two studies. Yet, the difference persists if we confine our attention to those countries only that are common to both studies. For twenty-two of the countries examined in the present study information for the years 1937 and 1938 (as well as for several other

years) is provided by Hirschman's research. The average coefficients of geographic concentration of this group are as follows:

TABLE IV

Coefficients of Geographic Concentration of Twenty-two Countries, 1937–54

	1937.	1938.*	1954.
(1) Exports	43·4	46·9	41·3
(2) Imports	40·4	41·7	39·5
(3) Ratio (1)/(2)	1·09	1·12	1·04

* Twenty-one countries only.

It is clear that the difference between geographic concentration of exports and imports was narrower in 1954 than before the Second World War. This seems, from Table IV, to have been achieved by a considerable decline of concentration of exports.

Hirschman's second hypothesis—that the higher the commodity concentration of exports, the stronger is their geographic concentration—is borne out by the present study. The positive correlation between the two forms of concentration becomes clear if we average out large groups. If, for instance, the forty-two countries are divided into three groups of fourteen countries each, according to the strength of commodity concentration of their exports, the average coefficient of geographic concentration of exports would be 60·9 for the upper group, 44·2 for the next one and 29·3 for the last group. The coefficient of the rank correlation between the strength of the two forms of concentration of exports is, for the forty-two countries, approximately 0·6.

This positive correlation is somewhat bewildering. As Hirschman pointed out correctly, one might have expected the correlation to be negative; a country which exports but a few commodities would be forced, it may be presumed, to distribute her exports among many customers—and vice versa. Indeed, Table III provides several examples, such as Egypt, on the one hand, and Canada, on the other hand, where this reasoning seems to be justified. Yet, again, in general the opposite is true.

Hirschman explains this phenomenon by the suggestion that as a country becomes more industrialised (which, as we have seen, means as a rule that the commodity diversification of its exports becomes higher), it widens its trade connections; it acquires new customers while retaining her former ones. I suggest that an additional explanation lies in the geographic position of the countries involved. As may be remembered from Table I, almost all the countries the commodity diversification of whose exports is high are European countries. A large, sometimes overwhelming part of their exports, is marketed in Europe. But Europe, of course, consists of numerous countries, most of which are important traders. Where, on the other hand, a major trade area consists of a single country—namely, the United States—we find that the trade of countries located nearby is strongly concentrated, even if these countries are highly developed, such as Canada.

It is interesting to inquire, once again, what is the effect of *size* on the geographic concentration of exports. On the one hand, it could be expected, as Hirschman pointed out, that since exports of a small country form only a minor part of world exports, they may be absorbed by one or a very few countries. On the other hand, it has been seen earlier that among the developed countries, commodity concentration of exports of small nations tends to be higher, which may force a wider distribution of these exports among customers.

Our figures indicate that the former factor is dominant. Exports of small countries are more geographically concentrated than exports of large countries; this is true both for developed and underdeveloped countries, as may be seen from Table V.

TABLE V

Coefficients of Geographic Concentration of Exports, by Size and by Degree of Development

	Developed countries.*	Underdeveloped countries.	Total.
Large countries *	29·1	45·7	37·4
Small countries	37·9	58·7	44·9
Total	34·0	50·7	41·0

* For the definition of "developed" and "large," see Table II.

TABLE VI

Largest Customer and Largest Supplier of Countries with Highly Concentrated Trade *

Country.	Largest customer.	Largest supplier.
Panama	United States	United States
Ireland	United Kingdom	United Kingdom
Colombia	United States	United States
Honduras	United States	United States
Mauritius	United Kingdom	United Kingdom
Nigeria	United Kingdom	United Kingdom
Mexico	United States	United States
Canada	United States	United States
Costa Rica	United States	United States
Rhodesia and Nyasaland	United Kingdom	United Kingdom
Trinidad and Tobago	United Kingdom	United Kingdom
Gold Coast	United Kingdom	United Kingdom
Burma	India	United Kingdom
Thailand	Malaya	Japan
Denmark	United Kingdom	United Kingdom
Brazil	United States	United States
Australia	United Kingdom	United Kingdom
Tanganyika	United Kingdom	United Kingdom
Netherlands Antilles	United States	Venezuela

* Countries with "highly concentrated" trade have been defined, as before, as those countries whose coefficients of geographic concentration of exports and/or imports are above 40. Countries are arranged by decreasing order of their coefficient of geographic concentration of exports.

Finally, it is worthwhile to pay attention to the extraordinary position of the two largest trading nations, the United States and the United Kingdom. On the one hand, the latter has the least, and the former one of the least, geographically concentrated trade. On the other hand, one of these two countries is the major customer and supplier of almost all countries whose trade is highly concentrated. This is shown in Table VI.

It should be noted that trading ties of countries whose trade is highly concentrated with the United States or the United Kingdom are not of the one-way nature: for almost all these countries, one can see an identity of the major customer with the major supplier—an outstanding phenomenon particularly in view of the fact that both the U.S. dollar and, for most commercial transactions, sterling are convertible currencies.

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INFLATION, THE TERMS OF TRADE AND THE SHARE OF WAGES IN NATIONAL INCOME

IN a long section devoted to Income Distribution the recent U.N. Survey of Europe[1] draws attention to changes in the relative shares of different factors of production in the national incomes of selected European countries. It appears that the share of wages in most countries has risen very considerably since before the War, but this rise does not seem to have been at the expense of profits or even of income from self-employment. The almost universal use of some form of rent control seems to have been the important factor which "has ensured that rental incomes have kept pace neither with the rise in prices since before the War nor with the rise in other incomes."[2] In later post-war years rents have been partially derestricted, and in consequence the share of rent has somewhat recovered.

Taking the period from 1948 on, there has been little tendency in most countries for the share of wages to rise or fall, either with respect to national income or with respect to profits. But year-to-year comparisons show some interesting variations, which, as the Survey points out, are worth examining because of the light they might shed on the behaviour of factor incomes in a period of fluctuating activity and prices. Of course, any fluctuations in prices and activity during the post-war era have been purely relative, for, taking the period as a whole, business activity has been consistently high and inflationary pressure has been the order of the day. But both the pace and the nature of inflation have often varied, and it will be of interest to note what effect these changes have had on the behaviour of wages and profits.

The interesting period from this point of view covers the years 1950–53. The early part of the period, extending perhaps to the first quarter of 1952, was characterised by a rapid inflation of prices and wages which followed the outbreak of the Korean War. This was followed by a partial recession in business activity and by conditions of greater price stability. How did the share of wages behave as a consequence of these changing economic conditions? Did the share fall, as one might expect, when inflation was most rampant? And did it recover as business recession began to put pressure (if it did) on profit margins?

At first sight no generalisation seems possible. Table I sets out the data on the share of wages for eight European countries over the post-war years. The authors of the U.N. Survey point out the absence of any typical behaviour. Whereas the share of wages rose in four countries (the United Kingdom, Denmark, France and the Netherlands) during the rapid inflation of 1951, it fell in four others (Belgium, Germany, Norway and Sweden). In

[1] U.N., *Economic Survey of Europe in 1956*, Chapter VIII.
[2] *Ibid.*, Chapter VIII, p. 8.

TABLE I

A. *The Share of Wages and Salaries in Income Arising in the Private Sector* *

	Percentages.							
	1948.	1949.	1950.	1951.	1952.	1953.	1954.	1955.
Belgium	49·4	50·9	51·4	49·4	50·5	49·5	49·0	49·4
Denmark	43·8	42·8	41·4	41·7	42·0	41·9	43·3	43·3
France	—	50·1	48·7	51·4	52·0	52·7	53·7	53·3
Western Germany	—	—	56·3	54·3	55·9	58·3	58·1	59·2
Netherlands	50·4	49·0	48·8	50·8	50·0	49·0	50·2	52·6
Norway	51·4	52·4	52·1	48·0	51·0	54·0	52·8	52·6
Sweden †	60·6	59·8	59·3	57·2	61·3	63·0	62·7	—
United Kingdom	63·9	63·9	64·9	65·1	63·4	63·1	63·3	64·8

* The private sector is defined as all sectors of the economy other than public administration and defence. The data refer to *gross* income for Denmark, Sweden and the United Kingdom, and to *net* for all other countries. In principle, stock appreciation is excluded.

† Inclusive of public administration and defence.

Source: U.N., *Economic Survey of Europe in 1956*, Chapter VIII, Tables 1 and 5.

B. *The Terms of Trade* *

	1948.	1949.	1950.	1951.	1952.	1953.	1954.	1955.
Belgium	100	105	91	100	103	90	90	93
Denmark	100	105	93	82	89	93	95	95
France	—	100	112	88	100	123	117	118
Western Germany	—	—	100	96	108	116	114	113
Netherlands	100	97	90	86	88	88	94	93
Norway	100	100	93	108	104	95	97	100
Sweden	100	89	92	127	108	99	100	100
United Kingdom	100	101	94	82	89	99	98	97

* Export prices divided by import prices.

the following two years the labour share recovered in Germany, Norway and Sweden; fell towards former levels in the United Kingdom and the Netherlands; continued to rise in Denmark and France; and pursued a fluctuating course in Belgium, rising in 1952 and falling again in 1953 and 1954. The Survey concludes that if any generalisation were to be ventured from this mixed group of countries "it could only be that the shares of wages and profits in national income do not greatly fluctuate in relation to each other except in circumstances that can be regarded as, in many ways, exceptional, such as the eighteen months following the outbreak of the Korean War; and even in that period profits did not invariably gain the relative advantage." [1]

It is somewhat surprising, however, that in their analysis the U.N. authors failed to take into account the very different experience of these countries in the behaviour of their terms of trade. Comparison of the bottom half of Table I with the top shows that for many of these countries a clear inverse relationship seems to exist between changes in their terms of

[1] *Op. cit.*, Chapter VIII, p. 14.

trade and the share of wages in their national incomes. Countries in which the share of wages rose during 1951—the United Kingdom, Denmark, France and the Netherlands—suffered a considerable worsening in their terms of trade, whilst in Belgium, Norway and Sweden a fall in the share of wages was accompanied by an improvement in the terms of trade. In the following two years movements of the terms of trade were generally reversed, and in four countries the inverse relationship persists. The share of wages in Denmark, France and Germany, however, continued to rise, despite an improvement in their terms of trade.[1]

It is not surprising, of course, that fluctuations in the foreign-trade sector affect the internal development of costs, prices and outputs in these selected countries. Whilst none of them (except perhaps the United Kingdom) is large enough to induce substantial changes in world prices of manufactured goods or primary products by events internal to themselves, all are heavily dependent on foreign trade, and therefore tend to be seriously affected by events happening overseas. It hardly seems wise therefore to ignore autonomous fluctuations in their import and export prices when investigating the causes of short-run fluctuations in their factor shares.

In a *closed* economy, *i.e.*, one in which we can ignore the foreign-trade sector, relative changes in prices, wages and labour productivity provide the key to short-run fluctuations in the share of wages. If productivity is constant, the share of wages relative to profits remains constant, rises or falls depending on whether prices rise at the same, or a slower or a faster rate than wages.[2] If productivity is rising the share of wages will clearly fall when wages and prices are rising at the same rate; and even if wages are rising at a faster rate than prices, unless they are rising at a sufficiently faster rate than both prices and productivity, the share of wages will still fall. Conversely, a fall in productivity will tend to raise the share of wages relative to profits unless prices are rising at a sufficiently faster rate than wages. An inflation characterised by a tendency for prices to rise faster than wages requires a continual rise in one or more components of non-consumption-type expenditure (*i.e.*, investment or government expenditure) in real terms; otherwise the fall in real-consumption expenditure associated with the fall in real wages tends to slow down the rise in prices and activity. Similarly, a persistent rise in wages relatively to prices, greater than the rise in productivity would warrant (*i.e.*, a persistent rise in labour costs relative to prices) must eventually bring itself to an end, since falling profits will at some point result in a cut in production and employment and slow down the rise in wages. It is therefore not surprising that taking the post-war inflationary period as a whole, we find little change in the relative shares of wages and profits.

Fluctuations in foreign-trade prices tend to affect the share of wages *in the*

[1] Reasons for this "exceptional" behaviour will be suggested later.

[2] We shall concern ourselves only with conditions in which prices and wages are rising, since these are typical of the post-war period.

short run by the impact they have on the balance of trade, on labour costs and on final product prices. A rise in export prices, induced, say, by a spontaneous rise in overseas demand, tends to increase profits in the export sector and to improve the balance of trade, particularly of countries whose chief exports are primary products or whose exports have similar inelastic supply conditions. To some extent rising export prices may cause a sympathetic rise in the cost of living, for example, if export products enter directly into consumption at home or are used as raw materials in home production. Wages are therefore likely to rise, but they are unlikely to be tied closely to export prices and profits, so that the share of wages will tend to fall. The experience of Norway and Sweden during 1950–51 is an obvious instance of this sort of development.

Whilst the effect of a boom in export prices is obvious, the effect of rising import prices is more complex. If the rise is substantial the internal price level is inevitably affected as producers and merchants at home attempt to pass on their increased costs; wages follow and an inflationary spiral is set in train. What happens to the share of wages does not depend solely, as it does in a closed economy, on the changing relationship between product prices and labour costs; in an open economy product prices and profits are affected not only by demand and labour costs but also, of course, by the rise in the cost of imported materials and components. An equi-proportional rise in wages and prices, for example, would not necessarily imply that wages and profits had also risen in the same proportion. If the cost of imported materials (and therefore average prime costs) had risen in greater proportion than labour costs, profit margins and the share of profits would have fallen.[1]

But will prices fail to rise in proportion to costs? If so, what factors are likely to bring this situation about? Let us consider a simple model of the economy in which we assume: (*a*) that imports are solely or predominantly raw materials, the elasticity of demand for which is zero or at least very small; (*b*) that producers normally price their products by adding a constant-percentage gross profit margin to their prime costs (*i.e.*, labour plus imported material costs); (*c*) that labour productivity remains unchanged. Let us also distinguish between two sectors of the economy, one producing *consumption*-type goods, the other *non-consumption*-type goods, *i.e.*, investment, government and export goods; but let us make the further simplifying assumption that the import content (*i.e.*, the ratio of the value of imports to unit value of product) is the same for both sectors. Suppose that a given rise in import prices has occurred and that this has set in motion an inflationary spiral of prices and wages which, after a given interval of time, has run itself out. Suppose, further, that over the course of this interval wages have risen in less proportion than import prices—a reasonable supposition if the rise in import prices has been substantial. Then, on our assumptions of constant labour productivity and constant percentage profit margins, wages would have risen in less proportion than product prices; real wages would have fallen, and in all probability so would total real consumption.[1] Unless some other component of real expenditure—investment, government or export—had risen to offset the fall in real consumption, the volume of output would tend to be less than before the rise in import prices. There seems no reason to suppose that a rise in import prices would have induced a rise in either real government expenditure or real investment: indeed, if the money supply had been inelastic a fall in one or other or both is much more likely. On the other hand, it is not unreasonable to suppose that exports would have benefited from rising incomes overseas, so taking up resources released by the fall in consumption. If the increase in export demand has been sufficient to offset completely the fall in real consumption, then, owing to the fact that prices have risen in direct proportion to average prime costs, which have risen in greater proportion than wages, profits also would have risen in greater proportion than wages, and the share of the latter would have fallen. But failing a sufficient rise in exports, some decline in output must have taken place.[2]

[1] This can be shown as follows:

Let P = % change in final product prices, including export.
z = % change in import prices.
w = % change in wage-rates (and therefore in labour costs and wage income, if productivity and employment are assumed constant).
x = % change in gross profit income.
m = ratio of imports to total product.
l = ratio of labour costs (and income) to total product.
g = ratio of gross profit income to total product.

i.e.,
$$m + l + g = 1$$
$$\therefore \quad P = mz + lw + gx$$
and
$$x = \frac{P - mz - lw}{1 - m - l}$$

Dividing through by w, we have
$$\frac{x}{w} = \frac{\frac{P}{w} - m\frac{z}{w} - }{1 - m - l}$$

Thus if $P = w$, then:

(i) $x = w$ when $w = z$; (ii) $x > w$ when $w > z$; (iii) $x < w$ when $w < z$;

i.e., profits rise in the same, greater or less proportion than wages, depending on whether wages rise in the same, greater or less proportion than import prices.

[1] The effect on real consumption depends partly on the propensity to consume of wage-earners as well as on the change in their real wages; but given the conflicting pressures operating on the latter, *e.g.*, an upward pressure exerted by the fall in real income and a possible downward pressure exerted by the presence of money illusion, it seems safer and probably not far from the truth to assume that it remains constant.

If the import content of the non-consumption-good sector is greater than that of the consumption-good sector (which may be true of some countries, *e.g.*, Denmark and Norway) and if producers in the former sector have been successful in maintaining their percentage profit margins, then profits in this sector would have risen in greater proportion than consumption-good prices. This might have led to some increase in real consumption on the part of profit earners, thus offsetting to some extent the effect of a fall in real wages.

[2] If the assumption of constant labour productivity is relaxed, then there is no necessity for either real consumption or real output to have fallen. A rise in productivity, for example, would

In the event of such a downward pressure on output, however, it is unlikely that the assumptions of our model would continue to hold. In particular, it is unlikely that all producers would have insisted on, or have been able to insist on, maintaining constant percentage profit margins in the face of a decline in the volume of their sales; and clearly the greater the cut in their margins the less will have been the fall in their sales and the volume of output. In a limiting case where we can assume that no change had occurred in total output and the volume of imports, or in the real levels of investment, government or export expenditures, real consumption also would be unaffected. This would imply that wages must have risen in the same proportion as consumption-good prices, leaving real wages unchanged;[1] but since in our model we have assumed that wages have risen in less proportion than import prices, it follows that consumption-good prices must also have risen in less proportion than import prices and, therefore, in less proportion than average prime costs. Profit margins must therefore have been squeezed, and the share of profits relative to wages in the *consumption-goods* sector must have fallen. Even if profit margins on goods sold for investment, government or export use had been maintained—so that profit incomes in the non-consumption sector had risen relatively to wage incomes—owing to the greater weight of consumption output in total output, the share of profits in total income is also likely to have fallen.

Normally, however, a fall in sales is met, at least at first, by an enlargement of stocks rather than by a cutting of margins, but to the extent that stocks are valued at cost, *i.e.*, exclusive of the profit margin added on sale, a squeezing of profits as a percentage of the total value of output still takes place. Only a fall in output and employment will prevent the share of wages from rising. In practice, of course, a little of everything is likely to have happened: some cut in margins, some building up of stocks and some cut in output and employment; but to the extent that producers of consumption goods have resorted to one or other of the first two alternatives rather than the third, the greater is the likelihood that the share of wages will have risen.

Enough has been said to indicate that by virtue of its deflationary impact on demand, particularly for consumption goods, a substantial rise in import prices can have the effect of raising the share of wages in national income. But it must be stressed that a spontaneous or induced rise in export demand, whether this results in a rise in export volume or prices, can offset this effect.

permit money wages to rise in greater proportion than product prices, although still less than import prices; it would also permit a potential rise in total real output. It remains true, however, that if labour costs have risen in less proportion than import prices, money-wage incomes will have risen in less proportion than the potential money value of output (or to put it another way, the rise in real wages will not have kept pace with the rise in real output); and if the potential rise in real output is to be realised some rise in real investment, government or export expenditure must be forthcoming.

[1] This assumes a constant propensity to consume out of wage income. Cf. footnote 1, p. 741.

Indeed, if the rise in export prices is large enough to cause an improvement in the terms of trade (despite the rise in import prices), or if the rise in export volume is large enough to offset any deflationary effect on output the share of wages is more likely to fall than to rise. Further, any substantial changes in the shares of wages and profits relatively to each other are unlikely to be permanent. If the rise in foreign-trade prices has been the result of a temporary boom in commodities—as it was in 1950–51—the collapsing of the boom tends to reverse many of the effects we have analysed. On the other hand, if the rise in foreign-trade prices is once for all, wages and prices gradually adjust themselves to it, leaving the shares of wages and profits in their accustomed relationships to each other.

How far does the experience of the countries listed earlier bear out the substance of this theoretical reasoning? As Table I shows, all eight countries experienced large fluctuations in their terms of trade between 1949 and 1954. This was the result partly of currency devaluations in 1949, but mainly, as we have seen, of the outbreak of the Korean War in 1950. In general, predominantly industrial countries, whose imports are mainly raw materials and food, lost by the movements in their terms of trade between 1949 and 1951, whilst those exporting important raw materials gained. The gains and losses were reversed in the following two years, both because of the collapse of the commodity boom and because of the gradual rise in the price level of manufactured goods. We shall distinguish three phases: 1949–50, 1950–51 and 1951–53/4; and for each phase glance briefly at the movements of the terms of trade, the share of wages, the level of wages, labour productivity and the volume of exports in each of the countries with which we have been concerned.

Table II sets out the data for 1949–50. Five countries—the United Kingdom, Belgium, Denmark, the Netherlands and Norway—experienced a worsening in their terms of trade, and two—France and Sweden—an improvement. If we make the rough generalisation that the share of wages and the terms of trade are inversely related in their movements, then of the seven countries listed in Table II, four support the generalisation and three run counter to it. But it will be noted that in the case of the three counter-examples, Denmark, the Netherlands and Norway, an adverse shift in the terms of trade was accompanied by a very large increase in export volume, which, as we have argued earlier, would tend to offset and probably reverse any tendency for the share of wages to rise. In addition, labour productivity, particularly in Denmark and Norway, seems to have risen very markedly in relation to the rise in wages. Table III shows that the generalisation also holds very well in the period 1950–51, being borne out by the experience of seven of the eight countries. The exception, Germany, enjoyed a very large rise both in the volume of its exports and in their prices. Thus the share of wages fell instead of rising.

But between 1951 and 1953 the experience of our countries is more

diverse (Table IV). In the case of the United Kingdom, the Netherlands, Norway and Sweden, the generalisation continued to hold, but in four other countries the share of wages and the terms of trade were positively correlated. Possible explanations, however, do suggest themselves. In France, for example, wages seem to have risen very much faster than productivity, and although export prices also rose very considerably, prices at home were held down by deliberate government policy. Profits in the home market were therefore squeezed. Similarly, restrictive monetary policy in Germany and Denmark seems to have kept a tight pressure on profit margins whilst rising labour costs more than offset the fall in import prices. So far as Belgium is concerned, the change in the terms of trade between 1951 and 1952 was insignificant, and the share of wages was much more affected by an apparent decline in labour productivity and the continued rise in wages, which was not offset by a rise in the internal price level. But from 1952 to 1954, Belgium's terms of trade worsened, whilst the share of wages also fell; but this seems to be accounted for both by a considerable rise in export volume and by an almost complete stability of wages when productivity was rising fast.

There seems to be some empirical support, therefore, for the view that movements in the terms of trade and in the share of wages are related, although it must be remembered that the number of countries we have considered is limited and the period with which we have been concerned short. Also post-war fluctuations in the terms of trade have all been associated, very often as cause, with rising prices: favourable as well as unfavourable changes in the terms of trade have caused inflation in the countries experiencing them;

TABLE II

1949–1950

	Change in share of wages.	Percentage change in import prices (+ rise, − fall).	Percentage change in export prices (+ rise, − fall).	Percentage change in export volume (+ rise, − fall).	Percentage change in wages * (+ rise, − fall).	Percentage change in productivity † (+ rise, − fall).
Countries Whose Terms of Trade Worsened						
Belgium	Increase	+ 4	−10	+15	+ 6	+ 4
United Kingdom	Increase	+14	+ 6	+15	+ 4	+ 5
Denmark	Decrease	+10	− 2	+33	+ 5	+ 6
Netherlands	Decrease	+12	+ 4	+35	+ 7	+ 7
Norway	Decrease	+ 9	+ 2	+33	+ 4	+10
Countries Whose Terms of Trade Improved						
France	Decrease	+11	+23	+30	+ 8	0
Sweden	Decrease	+19	+23	+25	+ 4	+ 4

* Earnings.
† Manufacturing production divided by Employment in Manufacturing.

TABLE III

1950–51

	Change in share of wages.	Percentage change in import prices (+ rise, − fall).	Percentage change in export prices (+ rise, − fall).	Percentage change in export volume (+ rise, − fall).	Percentage change in wages (+ rise, − fall).	Percentage change in productivity (+ rise, − fall).
Countries Whose Terms of Trade Worsened						
Denmark	Increase	+27	+11	+12	+10	+ 2
France	Increase	+30	+ 2	+15	+28	+10
Netherlands	Increase	+23	+17	+18	+ 7	+ 2
United Kingdom	Increase	+33	+16	0	+11	+ 2
Western Germany	Decrease	+27	+22	+43	+14	+10
Countries Whose Terms of Trade Improved						
Belgium	Decrease	+20	+33	+21	+16	+ 7
Norway	Decrease	+20	+38	+11	+14	+ 4
Sweden	Decrease	+30	+79	+ 4	+24	+ 3

TABLE IV

1951–53

	Change in share of wages.	Percentage change in import prices (+ rise, − fall).	Percentage change in export prices (+ rise, − fall).	Percentage change in export volume (+ rise, − fall).	Percentage change in wages (+ rise, − fall).	Percentage change in productivity (+ rise − fall).
Countries Whose Terms of Trade Improved						
Netherlands	Decrease	−13	−10	+23	+ 4	+13
United Kingdom	Decrease	−14	+ 2	− 3	+15	+ 2
Belgium (1951–52)	Increase	− 3	0	− 6	+ 5	− 3
Denmark (1951–54)	Increase	−13	0	+13	+18	+ 9
France	Increase	−11	+26	− 5	+22	+ 4
Germany	Increase	−16	+ 1	+25	+14	+ 8
Countries Whose Terms of Trade Worsened						
Norway	Increase	− 2	−14	− 5	+20	+ 7
Sweden	Increase	−12	−33	− 4	+25	+ 2
Belgium (1952–54)	Decrease	−10	−21	+20	0	+ 7

and we need not expect the relationship to hold in a period of falling prices. What has differed, however, has been the nature of inflation itself. Thus, where inflation has followed a favourable swing in the terms of trade, as in primary countries benefiting from a boom in commodity prices, it has taken the classical form of a demand inflation. The autonomous improvement

in the balance of trade has been equivalent to a rise in investment over saving, prices have risen, wages have followed and an inflationary spiral set in train. In general, for some considerable time wages and labour costs have lagged behind the rise in aggregate monetary demand and the share of wages has fallen. In the industrial countries, however, inflation has usually followed worsening terms of trade brought about by a rise in import prices; but this is essentially cost inflation. The balance of trade worsens not, be it noted, because of a sudden increase in excessive demand at home, but purely because of the rise in import prices; and although monetary demand rises as wages follow prices upwards, very often it does so at a slower rate and in less proportion than monetary costs. In consequence, profit margins are squeezed, stocks enlarged, output restricted and the share of wages rises. Indeed, a better generalisation than the one with which we have been dealing in the body of this paper might well be that changes in the share of wages in a period of rising prices depend on the character of the inflationary process itself, the share falling when demand is playing the key role and rising when costs take the lead; and it may well be that where other indications are not clear as to the nature of a particular inflationary situation a change in the share of wages will provide the necessary clue.[1]

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[1] The questions whether a *cost* inflation exists and, if so, in what way it differs from a demand inflation, have been bothering economists in recent years. It is not sufficient to point to cost-raising forces, since it is often the case that these same forces increase demand as well. It is obvious, for example, that rising wages increase monetary demand as well as costs. Admittedly, rising wage costs tend to have a more immediate effect on prices than a purely demand-raising force, like an increase in investment or government expenditure, since business-men pay more immediate attention to their costs than to their sales when altering their prices. Nevertheless, it remains true that if rising wages are inflationary they are so because they raise both demand and costs.

What would happen if the extra wage income was taxed away as wages rose? Or, alternatively, if the Government reduced other forms of demand—investment or its own expenditure? Prices would probably still rise at first, but at the expense of some fall in sales and output. This suggests that a good way of distinguishing between demand and cost inflation is by reference to changing monetary demand and costs *relative* to each other. If the former is increasing at a faster rate than the latter, then we have demand inflation; if the reverse is true we have cost inflation, which is accompanied by a fall in sales and output. If monetary demand and costs are increasing at the same rate, then we have inflation, which is neither particularly demand nor cost, but which, however, is more genuinely inflation, since it is likely to persist over a longer period.

THE OPTIMUM RATE OF INVESTMENT[1]

INTRODUCTION

1. THE problem discussed in this paper is generally known as the problem of the " optimum rate of saving." The change in the terminology suggested in the title is not only a formal matter. It is intended to indicate the difference in the approach.

The discussion of the optimum rate of saving has hitherto been based on various considerations concerning utility maximisation. Essentially they involved comparisons between " present sacrifices " and " future gains." The first solution offered was that by F. Ramsey[2] as early as 1928. Ramsey's method consisted in comparisons between potential satisfactions in the state of " Bliss " (the maximum obtainable rate of utility) and the satisfactions of the current income. The most recent solution comes from Professor Tinbergen,[3] who derives it from particular assumptions about the shape of utility functions (logarithmic and hyperbolic) and the value of the " psychological discount " (the rate of time preference).

Both Ramsey's and Tinbergen's approach, as well as other attempts along similar lines, yield determinate solutions. But they are obviously not designed for being put to practical use: the concepts used exclude statistical measurement. Therefore in practical work another approach is often used. In planning economic development usually some constraints are postulated, *e.g.*, consumption must not fall below certain level; they are arbitrarily defined and then, considering these constraints as data, the saving decision is reached.

Thus so far we have been left with a choice of two alternative solutions: one determinate but impossible and the other practically possible but theoretically indeterminate. It is the scope of this paper to examine a possibility of a third solution, which would be both practicable and determinate.

2. For the start let us define a few basic concepts which will be used throughout the analysis.

(1) Gross social product and, consequently, the additions to gross social product will be conceived and computed net of services not intimately connected with material production (public administration, defence expenditures, etc.; transport and trade services are included). This definition of *GSP* is adopted partly with regard to available empirical data and partly because it simplifies the analysis.

[1] The basic ideas elaborated in this paper were first expounded in a talk given to the Staff Seminar in Economics at Manchester University in May 1957. I benefited from the discussion at the Seminar and afterwards. Professor Devons and Dr. Martin have been kind enough to read the manuscript and discuss it with me. But, of course, I am alone responsible for it.

[2] F. P. Ramsey, " A Mathematical Theory of Saving," ECONOMIC JOURNAL, 1928.

[3] J. Tinbergen, " The Optimum Rate of Saving," ECONOMIC JOURNAL, 1956.

(2) The phrase "productive investment" will mean investment producing an increment in *GSP* as defined in the preceding paragraph.

(3) In addition to the general distinction between investment and consumption, two further distinctions will be made. Thus social product will be considered to consist of four different parts. They are:

(*a*) Investment in the material factor of growth which causes the expansion of productive fixed and circulating assets. This part of *GSP* will be referred to as "investment."

(*b*) Investment in the human factor of growth (termed as *A*-factor) which increases the ability of the society to produce material goods. To distinguish (*b*) from (*a*) it may be called "productive expenditures."

(*c*) and (*d*) The remainder of social product is divided between personal and communal consumption. As a matter of fact, parts of (*c*) and (*d*) are physically identical with (*b*). The reason for putting certain consumption goods and services into (*b*) is that their consumption leads to an increase of *GSP*. If these consumption goods and services lose their positive productive effect, they will be classified only as (*c*) and (*d*). The (*c*) and (*d*) parts of *GSP* will be referred to as "consumption."

(4) It will be assumed that maximisation of consumption, as just defined, is the sole aim of the society's productive efforts. This will imply that if there is a choice between smaller and greater consumption, other things being equal, the society will choose the alternative with greater consumption. If other things are not equal, the society will face a choice—*e.g.*, maximum consumption as against maximum military strength—which falls outside this paper and, indeed, outside the scope of economics. However, society will normally not have to choose between greater consumption and greater production. One of the main purposes of this paper is to prove the identity of these two aims in the real world.

The Concept of the Absorptive Capacity of the Economy

3. Instead of maximisation of utility, it is proposed to consider the maximisation of production through time. Production is maximised with respect to a specified period, the length of which is determined by some physical properties of the economic process.

Maximisation involves not only the allocation of factors of production now, but also the adjustment of their various rates of expansion in the future. The potential effect of the optimum adjustment of the growth rates of factors is defined as the absorptive capacity of the economy. The easiest way to use this concept is to conceive the economy as a giant productive capacity capable of being expanded at a certain *maximum* rate, also at a lower rate, but ***not at a higher rate***. Any additional inputs (investment) would not produce ***additions*** to but ***reductions*** of output. Or, applying (with caution) the conventional terminology, marginal efficiency of investment will be zero or negative.

Zero marginal efficiency of investment does not necessarily mean zero

marginal efficiency of capital.[1] The latter is a static while the former is a dynamic concept. It means even less that the rate of interest is zero. In fact, the belief that the positive rate of interest is an evident proof that the marginal efficiency of investment is still positive—seems to have prevented a further exploration of the practicability of production maximisation. It has been observed that in normal circumstances the rate of interest has never vanished; it existed with investment expenditures however large. It was therefore believed that only an extraordinarily high rate of investment would drive the marginal efficiency of investment towards zero. And an extraordinarily high level of investment would imply an extraordinarily low level of consumption. One has therefore to weigh "present sacrifices" with "future gains," and this is the domain of the utility calculus.

However, the actual economic process is somewhat different. To show this in the simplest possible way let us consider its characteristics in a planned economy.

Investment–Production Function

4. Investment is made to increase production. There is therefore some relation between the addition to the output stream and the productive investment which has caused it. There is also a time lag between the cause and the effect known as the maturation period of investment (m). The ratio between additional output [2] in this year and the investment [2] made m years earlier we shall term "production coefficient" $\left(p = \frac{\Delta GP_t}{I_{t-m}}\right)$. The change of p as a function of investment will be called "investment–production function" (*IP*). This function may be diagrammatically represented in the following way:

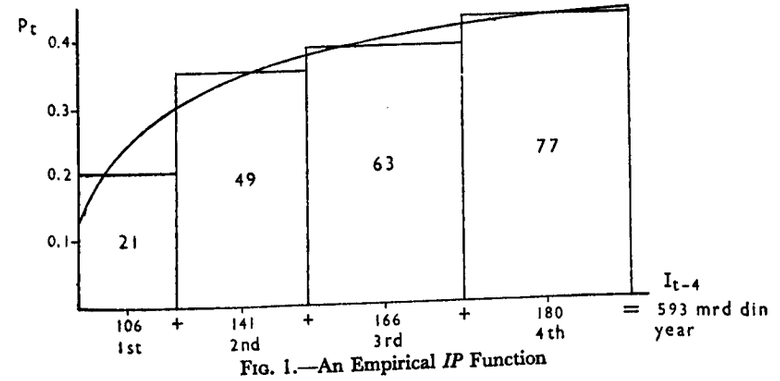


Fig. 1.—An Empirical *IP* Function

[1] This has been pointed out by A. Lerner, who coined his famous symbol *mei* (*Economics of Control* (New York, 1944), pp. 260 ff.).

[2] Output is defined as gross product and investment as the addition to the stock of productive capital, *i.e.*, statistically as gross investment net of replacement. However, in the following empirical illustrations gross investment figures will be used because of the lack of reliable data for net investment.

It is fortunate that here we are able to make use of an empirical diagram.[1] The need for representing three variables in a two-dimensional co-ordinate system has made for a little unusual construction of the diagram; it is, however, perfectly simple once the meaning of it is grasped. The ordinate shows the values of the production coefficient, which in four (adjusted) years has risen from 0·2 in the first year to 0·43 in the last one. The abscissa shows successive doses of investment expressed in milliards of dinars. The additions to social product are related to investments made four years earlier (maturation period). In each successive year the "dose" of investment has been increased, bringing the total for the whole period equal to 593 milliard dinars. If we multiply "investment doses," represented by the segments of the abscissa, by the respective production coefficients, we get increments in output which, in the diagram, are represented by the areas of the respective columns. The figures inside the columns indicate the size of these increments. The total increase in output in the period under consideration is equal to the sum of the areas of the four columns, $\Delta GP = \sum_{1}^{4} \Delta GP_t = 210$ milliard dinars. It is this last figure which will become our main object of analysis as we proceed. Finally, the free-hand drawn curve is intended to approximate continuous changes in the production coefficient. The area under the curve is, of course, equal to the sum of the increments in output, $\int_0^{593} p(I)dI = \sum_{1}^{4} \Delta GP_t$.

The main lesson this diagram teaches us consists in the demonstration of the possibility of great changes of production coefficients. In four years the value of p has increased by more than 100%. This is obviously not due to the technological changes only.[2] Thus we have to investigate the characteristics of our *IP*-function more carefully.

[1] The diagram refers to Yugoslav economy and is taken from an unpublished study by the author prepared for the Federal Planning Bureau. Investment (gross) and production (gross) figures (prices: 1952) are four-year averages (period 1947–57), because it was found that the maturation period for the Yugoslav economy is about four years. The data refer to industry (manufacturing and mining). The production coefficient for the whole economy increased in the same period from 0·18 to 0·37 (gross investment does not include investment into houses, schools, hospitals, etc., and gross product does not contain the value of services). Industrial rather than whole economy *IP*-function is shown because the period is too short to eliminate the influences of the agricultural weather cycle from the latter.

[2] The causes of this spectacular improvement may be tentatively described as follows:

(1) The most important impulse was given by the far-reaching economic reorganisation started in 1951–52. The managerial system with the rigid administrative central planning and control (more or less a copy of the Soviet economic organisation) has been gradually replaced by a combination of workers' management plus global planning through market instruments plus some central decisions concerning major investment projects.

(2) The tempo of investing has been slowed down and the know-how has been gradually improving.

(3) Changes in the structure of investment occurred: after the basic industrialisation programme had been accomplished by the first Five Year Plan (1947–52) relatively more was invested in extensions and relatively less into new factories. A survey made recently in Croatia showed that the capital productivity of extensions was about 50% higher.

5. The assumption from which we started was that the absorptive capacity of the economy was limited: additional investment beyond certain limits brought about negative increments in output. Thus we may say that *IP*-function depends on the quantity of investment (I) and on the absorptive capacity of the economy (A) and on the speed of their expansion $\left(\frac{dI}{dt}, \frac{dA}{dt}\right)$, or in symbols

$$p = f\left(I, \frac{dI}{dt};\ A, \frac{dA}{dt}\right)$$

Investment has to be absorbed by the economy. How well this will be done depends on the human factor A. The complex factor A may, perhaps, be made a function of four basic factors (policy variables) and of their changes: of personal consumption, health, knowledge, and of economic and political organisation. In addition, all other relevant characteristics of the economy may be conveniently lumped together as a single exogenous factor E.[1] Thus we get:

$$\left(A, \frac{dA}{dt}\right) = g\left(C, \frac{dC}{dt};\ H, \frac{dH}{dt};\ Kn, \frac{dKn}{dt};\ O, \frac{dO}{dt};\ E, \frac{dE}{dt}\right)$$

The factors (apart from E) are arranged according to the degree of their tangibility and physiological importance for human beings; their importance for the economic process (measured by changes which various factors may provoke) is roughly of the reverse order. The meaning of A-factors may be described very briefly in the following way.

Personal consumption has a great incentive value in a poor society. It may, therefore, influence the productivity appreciably. It may be added that in a growing economy the alternative to be chosen normally lies in the direction of an increase; the possibility of a decrease of consumption cannot normally arise in a rationally constructed scheme of economic development as will be shown presently. (The only two probable exceptions seem to appear in societies with an extreme inequality in the distribution of income or where mass enthusiasm had been created; in both cases total consumption may temporarily stagnate or even decline without causing a contraction of A.)

That the improvement in the *health* standard leads to an increase in the productivity of labour is notorious. A suitable generalisation will perhaps be provided by quoting the estimate of J. J. Spengler that the potential productivity of population of underdeveloped countries would rise 20–30%

[1] The exogenous factor E has been inserted to make the algebraic presentation formally correct. As, by definition, E is not a policy variable, we shall not be concerned with it, and we shall always assume that E is somehow given and known. In actual planning, of course, the analysis of E is of an extreme importance.

if the age composition and state of health of their people could be "Westernised." [1]

Factor *knowledge* comprises all degrees of skill, including scientific research. The experience of planning seems to suggest that knowledge (and certainly not investment resources [2]) is the most important scarce factor in underdeveloped countries with otherwise favourable social climate. Thus growth of "know-how" is likely to pose the limits to the general economic development.

The last policy factor, termed *economic and political organisation*, refers to the institutional set-up of the economy. Inadequate economic organisation and political discontent and instability are likely to upset the productive effect of all other factors and so to minimise the value of A. But factor O may also considerably increase the value of A, as may have happened, for instance, in India as a result of having achieved political independence or in China after social revolution. Factor O is usually taken as a datum in the economic analysis, and nothing prevents us from following this traditional line here too. Yet there is also some justification in assuming that in a rationally organised society the shaping of such an important productive factor will not be left to the haphazard play of blind social forces, but will be undertaken with at least some degree of rationality as it is the case with factors C, H and Kn. Planned economy may be assumed to experiment not only with micro- but with macro-organisation as well. And the effects are not as intangible and immeasurable as they may seem at first glance. It suffices to compare the economic results of various solutions applied in similar situations. For instance, the agricultural policy of Poland with that of Eastern Germany, or the economic results of the managerial system in Bulgaria and in Soviet Union with those of workers' management system in Yugoslavia, or underdeveloped countries with planned and unplanned economies. In any case, given or changeable, O is an important limitational factor.

6. The foregoing considerations show that A is in principle measurable and that in practice its value can be well approximated. The next step in the analysis consists in an examination of the relation between A and I. An image of a vessel (A) into which liquid (I) is poured from outside springs to mind. However, the picture is a little more complex than that. The

[1] J. J. Spengler, "The Population Obstacle to Economic Betterment," *American Economic Review, Proceedings*, May 1951, p. 344. Spengler also compares the estimate of D. Ghosh for India, where about 22½% of the national income is spent on maintaining those who die before they reach the age of 15, with that for England, where the corresponding figure is only 6½% (*ibid.*, p. 351).

[2] This is also obvious from the structure of *IP*-function. Investment is something relative, it is the share of investment in social product which is analytically meaningful. Given enough time, the share of investment may be increased as far as we like (short of 100%). The question is only whether the economy will absorb it. We are accustomed to think of investment as an independent factor of growth. However, in a rationally organised economy it would be more appropriate to treat it as a product of growth. Given A, the economy is able to produce any amount of I which can be productively applied.

vessel itself produces the liquid, which in turn causes the expansion of the vessel. This feedback operates with diminishing force, and the movement comes to an end when the vessel is filled up and additionally generated liquid is uselessly spilt. This is the point of optimum.

In other words, A and I are obviously interrelated. Investment makes possible the expansion of the community's absorptive capacity; A imposes the limits to the productive application of I. The absorptive capacity may now be redefined to mean the ability of individuals and of the society as a whole to manipulate the stream of output increments. This ability is limited because there is a given level and a limited speed of potential expansion of the will to work, of the state of health, of the number of skilled workers and scientists and of the institutional readjustments. Being limited, A may be taken as a datum (although a changing one) and I may be defined as its function, $I = f(A)$. So defined, investment is the *maximum investment which may be productively applied* in a given economy. Thus the *optimum* path of the investment–production function will be given by

$$p_{\text{opt}} = F[I(A)]$$

In this way the optimum rate of investment is determined.

Maximisation of Output Increment

7. For the purpose of application it will be necessary to reformulate slightly the last result using the inverse functional relationship of I and A. The problem will now be formulated as follows: try various quantities, collections and sequences of I, and for each of them adjust A in the optimum way. Then A becomes a function of I, $A = \phi(I)$, and various possible IP functions will be expressed by $p = \Phi[A(I)]$. Our task is now to integrate all these functions and to find the maximum integral

$$\text{Max. } \Delta GP = \text{Max.} \int_0^{I_m} \Phi(I)\, dI$$

Maximum integral represents the maximum possible increase of production in a specified period of the length m. As any other combination of investment would result in a smaller addition to output, this integral provides the formula for the optimum rate of investment.

There is also a third alternative method of finding the optimum rate of investment. Define capital coefficient as $k = \frac{1}{p}$. Increment of output in a specified period is derived from

$$I = k\Delta GP$$

where k is an average capital coefficient computed with respect of the period as a whole. Capital coefficient is functionally related to investment. After a certain point, further increase in investment will increase the value of k. Until the relative increase of k is less than the relative increase of I, the

change is worth while, because ΔGP will be expanding. The optimisation rule follows directly:

$$\eta_{kI} = 1$$

expand investment until the elasticity of the average capital coefficient with respect to investment becomes equal to one.

8. The choice we shall have to make may be clarified by recalling our *IP* diagram.

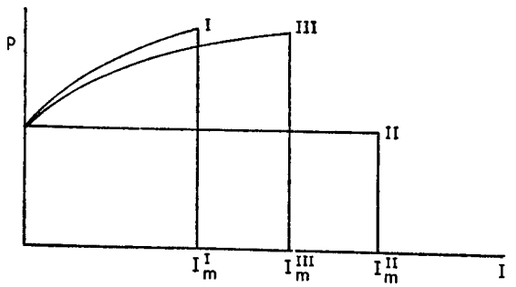


FIG. 2.—The Choice of an Optimum *IP* Function

Again, as in Fig. 1, the areas under the curves represent total additions to social product in a period of so many years. All alternatives are considered with respect to the same period of time. In this period various amounts of total investment may be undertaken and, given the total amount, various combinations of successive yearly investment doses are possible. In fact, the number of conceivable variations in both categories is unlimited. We shall not bother about the latter, and from the former we choose three representative cases. Before we proceed let us clearly realise that we are not analysing the curves themselves but the areas under the curves. Still, in drawing the curves one rule has to be observed: given the length m of the period under consideration and given the total amounts of alternative investments in this period, I^{I}_{m}, I^{II}_{m} and I^{III}_{m}, distribute investment over time in such a way as to maximise total potential output increment in every case. In other words, to be comparable with each other, curves should be optimum curves with respect to the chosen total amounts of investment. Now, suppose that our curves satisfy this condition. Then their shapes become irrelevant, and in searching for an optimum optimorum the relative areas have to be compared. The three representative areas in the diagram are chosen so as to represent the following relation between respective additions to social product: $\Delta GP^{I} < \Delta GP^{II} < \Delta GP^{III}$.

The first of the three *IP* curves may be conveniently termed the "underplanned solution" (historically the capitalist case); the second one the "overplanned solution" (historically, perhaps, the Soviet case); the third one represents optimum. The first solution shows the lowest rate of growth. The capital productivity (p) is higher than in either of the remaining two

solutions, but the total increment of output is the lowest due to the underinvestment. The second solution achieves much higher rates of growth than the first one, but due to overinvestment, negative outputs have been produced.[1] This becomes clear when the alternative II is compared with the alternative III where smaller total amount of investment creates larger addition to the social product than in II. The area under the curve III is the largest, and therefore this alternative should be chosen in formulating investment decision (granting that the sole aim of economic planning is production maximisation).

9. In paragraph 7 the term "specified period m" was used. The best practical approach to determine this period seems to be to identify it with the longest maturation period of the important productive factors. We may then tentatively proceed in the following way. The average maturation period of investment is about three to four years. It will take some four to ten years to achieve any appreciable change in the number of skilled and highly skilled workers. And the training of the university graduates and the development of the research institutions will require more than

[1] There are some reasons to believe that this was what actually happened in the pre-war years of Soviet industrialisation. Apart from the existing verbal descriptions of the economic conditions of that time, the following statistical comparisons may perhaps shed some light. According to the last Soviet statistical publication (*Narodnoe Khozjajstvo S.S.S.R., Moscow*, 1956, pp. 28 and 158–9) in the period 1928–40 the total productive capital and national income were expanding at approximately the same rate (indices: 1928 = 100, 1940 for capital 445 and for income 514). If these figures have any value as indicators, then they indicate that in the whole period of twelve years the production coefficient remained substantially unchanged (as it is assumed in the diagram above, curve II). It would seem plausible to assume that at the beginning of planning in the U.S.S.R. the production coefficient and the share of investment were not substantially higher than those at the beginning of the planning in Yugoslavia. Further, according to the same source, the cumulative annual rate of expansion of total (?) investment (*kapitalnye vloženija*) in the period 1929–40 (no figures for 1928) was 17%. The rate of growth of gross investment (housing, etc., excluded) in Yugoslavia in four adjusted years was 10% and production coefficient increased in the next four-year period from 0·2 to 0·4 (it will be recalled that p computed on the basis of new investment would be more correct). If on the basis of these data Soviet and Yugoslav *IP* curves are constructed, their shapes turn out to be very similar to those of curve II and curve III in the diagram. The whole comparison is obviously very hypothetical. But it seems to suggest a possibility of an, at least occasional, overinvestment practice in the U.S.S.R. in the first phase of industrialisation, and it also shows the possibility of achieving quite conclusive results on this matter if statistical series were more reliable and more comparable with each other.

It may also be noted that only in a situation of overinvestment, when the increments of output become negative, the popular belief that high level of investment is incompatible with the high level of consumption is a correct description of facts. Overinvestment cuts consumption at both ends: the total product is smaller than it otherwise would be, and in this smaller product the share of investment is greater than necessary. Does not this explain another well-known feature of the Soviet economic development, namely the relatively slow expansion of personal consumption, what hasty critics of the system identified with *every* planning for rapid growth? Particularly if one bears in mind that the already diminished total volume of consumption was further diminished by relatively heavy defence expenditures and large communal consumption in general, so that not much was left to personal consumption. Consider Yugoslav example again. Instead of doubling production coefficient, it would (hypothetically) have been kept constant and the amount of investment could have been doubled (increasing its share to more than 40% of *GSP*). In this hypothetical case all additional investment would have meant equal loss of consumption without any gain in the higher rate of growth.

ten years. Perhaps twelve years or three four-year plans will constitute the planners' horizon.[1] Then within this period the expansion of A and I will have to be adjusted in an optimum way.

The maximisation over the whole period may mean that there will be no maximum at any of the three sub-periods. Productive factors are always to a certain degree flexible. The students may be sent to factories instead of to universities and the output of this year will be increased. Or we may plan the development of an industry with the short maturation period but with a bad production coefficient; the output in the sub-period will again be increased. Therefore optimum and maximum in the sub-periods have to be carefully distinguished.

This also calls for a careful handling of the concept of marginal efficiency of investment (*mei*). To achieve maximum output *mei* has to be made zero. But in any sub-period and for any *individual* business *mei* may be greater than zero. This explains the secret of the positive rate of interest in a situation of a zero or negative *mei*. Interest rate is the price for the scarce factor of production called capital, when capital is being distributed among alternative uses. But interest rate has nothing to do with the marginal productivity of the *social* capital (entire capital treated as a whole). If investment is pushed beyond the frontier of A, the additional factory, being a modern one, may very well earn substantial profit. But at the same time the process described by the curve II in Fig. 2 will take place: external diseconomies *with respect to the economy as a whole* will outweigh the positive contribution of the *additional factory*. Additional investment simply reduces the general efficiency of the economy and, for that matter, of the capital employed. This is a reduction in total, not only in marginal product, by an absolute amount, not only of the last unit of investment relatively to the last but one. The distinction is similar—but not more than similar—to that between marginal product and marginal revenue in the theory of the firm: marginal value product may be greater than marginal cost, and still the firm will experience a decrease in profits because marginal revenue is less than marginal cost. Long before an additional factory is earning zero returns additional investment will cease to be productive. Thus one may conceivably speak of two *mei*: one with respect to the last unit only, and another one with respect to the economy as a whole. The latter determines the optimum rate of investment. In this respect the empirical p curves should also be handled with caution. Reconsider our diagrams.

[1] In fact, planners' horizon may be determined quite exactly (theoretically). The principle is essentially the same as in engineering design. Economic mechanism is not an absolutely precise machine; on the contrary, the adjustment tolerance of its cogs is quite considerable. On the other hand, additional gains in the precision of planning are rapidly decreasing with the extension of the horizon. The point where these "precision gains" become equal to the existing "tolerance margins" of the economy represents the limit of the desirable length of the planning period. It should be borne in mind that a long-period plan is not at all absolutely binding. Every year the horizon is extended for another year and the plan will be adjusted to new circumstances.

In every successive investment period the amount invested may increase, increasing at the same time the value of p (see Fig. 1). As p is rising throughout the period one is tempted to say that marginal efficiency of investment is rising (the shares of other factors being neglected for the moment). But taking the period as a whole, the optimum *IP* curve may lie below or above the actual curve (see Fig. 2). In the first case (curve I) *mei* is actually positive, and all potentialities of the system have not been exhausted. In the second case (curve II), although marginal $p = 0$, the true value of *mei* is negative: overinvestment has occurred. An analytically meaningful definition of *mei* will then read as follows: marginal efficiency of investment is the (positive or negative) change of (actual or potential) total increment of output caused by an additional unit of investment anywhere in the maximisation period. In other words, *mei* has meaning only with respect to the whole maximisation period.

It should also be noted that the concept of *mei* is used here in its gross formulation; rewards for factors other than capital have not been deducted. Thus $mei = \frac{d\Delta GP}{dI}$, it is a change of physical output per unit of additional investment. This is the consequence of our basic assumption of the absorptive capacity of an economy as being measurable by the volume of the total increment of physical output the economy is capable of achieving in a specified period. As a moment of reflection will show, in this conceptual framework there is no need for a net concept.

The Nature of Period Maximisation

10. There is a difficulty, not so far mentioned, in the procedure of period maximisation. Because of the interdependence of factors and the time lags the maximisation has to be carried out with respect to infinity. There is logically no possibility of confining it to a single period. We may, for instance, plan the output of university graduates to-day for the beginning of the twelfth year. But what about all the intervening years? If, say, in the eleventh year we again reduce the expenditures on the university training (and send students to factories [1]), the output of the first twelve years may be overmaximised, but it will certainly not be maximised in the period of next twelve years and in the whole of the two periods combined.

It must be possible to design a rule which will prevent overmaximisation of the kind just described. Proceed in the following way. Construct first *IP* curve on the strict maximisation principle. Estimate the difference of the potential future productivity of factors when expanded as compared with the state in the first *IP* curve. Then readjust A factors and redraw the

[1] This, naturally, does not imply regimentation, but refers to those marginal changes which may be achieved by material stimulation or destimulation or, in this case, by changing the standards of admission. Besides, these changes—being marginal—are probably practically not very important, and the whole problem is much more a problem of theoretical principles than of practical application.

IP curve. If the resulting loss of output in this maximisation period is less than the next period's increment due to the present readjustment, the change is worth while making. Now, it is obvious that the productivity in the next period cannot be estimated with precision. To achieve a precise estimation one would have to draw the *IP* curve for the next period as well, and to do this one more *IP* curve for another period ahead and so forth *ad infinitum*. As we cannot predict infinity, we have apparently encountered an insurmountable difficulty.

Yet, is this difficulty really different from that inherent in any prediction? Can we say we *know* what is going to happen to-morrow, or even next hour?—As soon as we leave the static world, we are in the world of approximations, all differences in precision are only differences in degree. We choose the length of our maximisation period not because we pretend to *know* the pertaining *IP* curve, but because this procedure is operationally simpler and yields better *approximations* than if we deal with a much shorter or with a much longer period. In the same way we do not *know* the *IP* curve of the next period, but we have some elements to estimate the *approximate* productivity of factors which are of interest for us. The further we go into the future the less certain our approximations are—but also the less relevant for our present position.

The difficulty encountered is, therefore, not peculiar to this particular approach. It is the " aporia " of the real world, and may be escaped only in a static world with no changes. And if we prefer not to follow the recipe of ancient Eleatic philosophers and eliminate movement as logically wrong—we are left to accept things as they are and to conceive planning as an infinite process of gradual approximation. The task of the economist is to design methods which will increase the degree of approximation in a dynamic world—not to remove change from it.

The Evaluation of Present Sacrifices

11. So far, well and good. The examination has in fact been predominantly theoretical. But—as it is often said, and may well be said once again—it is hardly a practicable proposition to push investment so far as to make $mei = 0$. This would imply an exceptionally great increase of investment, which then involves considerations of present sacrifices of consumption. If it were for only 1 or 2% of social product to be added annually to already existing investment funds, the whole thing might have practical value. Otherwise, who can make consumers agree to refrain from consumption for the sake of future generations?

Here we may pause for a moment. It is exactly those 1 or 2% which are needed. To demonstrate this a simple model will be constructed. The model will be as crude as it is simple, but it will give us an idea of the order of values, and this is all we need.

Suppose there is a regularly growing economy with the share of investment in social product $s = 15\%$, capital coefficient $k = 3$ and, therefore, with the rate of growth $r = 5\%$. Suppose next that each year respectively 1 and 2% are added to investment fund causing the following year an additional increase in output and increasing thus continuously the rate of growth of output; k is supposed to remain unaffected by these changes. On these assumptions output and consumption will be changing in the following way:

Year.	Pattern I.			Pattern II.			Pattern III.		
	Output.	*s*, %	Consumption.	Output.	*s*, %.	Consumption.	Output.	*s*, %.	Consumption.
0	100	15	85	100	15	85	100	15	85
1	105	15	89	105	16	88	105	17	87
2	110	15	94	111	17	92	111	19	90
3	116	15	98	117	18	96	118	21	93
4	122	15	103	124	19	100	126	23	97
5	128	15	108	132	20	105	136	25	102
6	134	15	114	140	21	111	147	27	108
7	141	15	120	150	22	117	161	29	114
8	148	15	126	161	23	124	176	31	121
9	155	15	132	173	24	132	194	33	130
10	162	15	138	187	25	140	216	35	140

In the first year the change in investment policy *relatively* reduces consumption; since then the rate of growth of consumption is constantly increasing. It will take respectively nine and ten years to surpass the level of consumption of the original pattern of growth. The result is not substantially altered if the share of investment or the capital coefficient is changed (see Appendix I).

The differences in the consumption during the whole period are relatively small; the greatest, in the middle of the period, is of the rank of 6% which indicates the lag of only one year. The crop fluctuations in underdeveloped countries, the industrial fluctuations in developed countries and, in both of them, the unproductive expenditures of government such as defence, not to speak of war expenditures, are all far in excess of this difference. Bearing this in mind, it is realistic to expect that if a nation is asked to accept a programme which envisages that a certain level of consumption will be achieved in the fifth instead of the fourth year, with all the good consequences [1] afterwards—it will wholeheartedly accept this programme,

[1] One of the good consequences may appear as a considerable " free gift of nature " caused by relativity properties of the economic system in motion. Namely, capital *costs*, *ceteris paribus*, are not fixed, but are conditioned by the speed of growth. The greater the speed of growth the smaller capital costs per unit of output will be. Or, alternatively, the same piece of equipment will, *ceteris paribus*, produce about $3\frac{1}{4}$ times larger total output in an economy growing at the rate of 10% than in the one growing at the rate of only 3% (if productive life of equipment is 30 years and the productive capacity of it remains approximately constant); for the rigorous demonstration see my " Depreciation Multiplier " in the forthcoming issue of the *Manchester School*.

and by accepting the programme it will push its economy on the path of the maximum rate of growth, for this programme implies an annual increase of the investment at the rate between 12% (pattern II) and 18% (pattern III). And exactly in this range the maximum rate of expansion of *A* is likely to lie, as it has been demonstrated by Soviet and Yugoslav economies which occasionally even overshot the mark of productive investment.[1]

The general result of the analysis so far consists, then, in the conclusion that the production maximisation is not only a theoretically determined but also a practicable proposition. The final question which remains to be answered is: where is maximisation of production likely to lead? This brings us to the fascinating subject of the limits of the economic science, to which the last few paragraphs are dedicated.

"Underdeveloped" and "Developed" Economies

12. The maximisation discussion has hitherto implied the case of an underdeveloped economy. This assumption has now to be stated explicitly by defining the underdeveloped economy as one where the share of investment is less than optimum and/or the level of *A* factors is low (as compared with already achieved standards in other countries). In this sense all existing economies are underdeveloped. And this will not be surprising if one takes into account the transitional state of to-day's world economy.

As the economy expands, the level of *A* factors will rise, and this will change their productive functions. Once poverty economics is left behind, and people are well fed, have reasonable leisure time and enjoy a healthy life, factors *G* and *H* lose their place in *IP* function. They are no longer productive agents but only ends in themselves.

Further, it seems reasonable to assume that after a while every socio-economic system in its development reaches a stage of relative stability and that this applies to the planned economy as well. At this stage economic

[1] The Soviet case was already discussed in an earlier note. The Yugoslav case refers to the period of the first Five Year Plan, when, with the then given state of *A*-factors, as some case studies tend to suggest, too large an investment programme has been carried out to be productively absorbed. Gross investment (housing, etc., excluded) in the period 1947–52 was expanding at the rate of 15% per annum. The share of gross investment in gross product surpassed already in 1951 the mark of 30%, and since then not only the share but even not the absolute amount of annual investment has been achieved again. The labour and capital productivity were low, even declining. Since the end of the first F.Y.P. (1952) the tempo of investing has been gradually slowed down, *A* factors have undergone continual readjustment and the rate of growth of output has, if anything, increased. It may be added that in spite of the restricted expansion of investment since 1952, even to-day, as the annual conference of the Federal Chamber of Industry established in May 1957, manufacturing and mining have less than 80% of the necessary number of skilled workers and only 50% of highly skilled workers, the training of new skilled workers is still lagging behind the *current* needs, and the university output of graduate technicians is only slightly more than one-half of the necessary number (*Borba*, May 7, 1957), although—to illustrate the last statement with two comparisons—in relation to the population there are already twice as many university students in Yugoslavia than, *e.g.*, in Great Britain, and by 1955 the number of technology students had been increased five times as compared with 1939.

and political organisation will be more or less stabilised, all major potential innovations in this sphere exhausted, and the system will perpetuate itself almost automatically. This the factor *O* may be dropped out too.

In this way *A* will be reduced to *Kn*, which remains the only limitational factor of growth. The "intellectual capacity" of a community will provide unsurpassable limits for the productive application of investment and so for the speed of expansion of its economy.

13. The last statement may cause some difficulties. For it is obvious that potential knowledge is unlimited and that, therefore, expenditures on research, however large, must be productive. Therefore *Kn* expenditures would absorb the whole social product, and thus the criterion for the distribution breaks down.

However, there is a fallacy in this reasoning, and it is of exactly the same nature as the apparent contradiction of simultaneously positive and negative *mei* analysed in paragraph 9. It resulted here from the confusion of the ultimate result with the speed of change Skill and knowledge will always be increasing, but the physiological substratum and social habits impose quite definite limits to the *speed* of the change. The increase of production requires continual readaptation of the whole social structure. This may not be evident in a slowly expanding economy. Yet, suppose that the rate of growth is 10%. Then in a generation of two twelve-year periods output would increase 10 times. Our children would have to manipulate an output 100 times as great, and our grandchildren an output 1,000 times as great. An underdeveloped and poor country of to-day would after only seventy years manipulate an annual social income of some $100,000 *per head of population*—do not these figures sound startling? Obviously, there is a physical limit to the rate of expansion to which society is able to adapt itself.

14. The process of development or transition may be advantageously described diagrammatically in the following way:

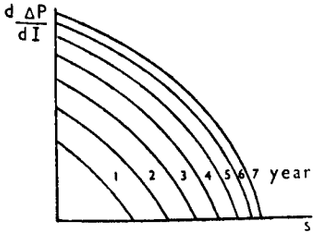


Fig. 3

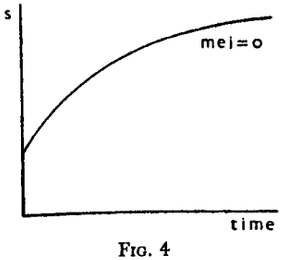


Fig. 4

The Transition from a Low- to a High-investment Economy

The left-hand diagram indicates the increase of the share of productive investment in every successive year (denoted as years 1 to 7). The continual increase of *s* pushes *mei* curve every year to the right. These im-

pulses tend to decrease. If then all *mei* = 0 points are plotted on an *s*–time diagram the resulting curve will increase at a diminishing rate (the right-hand diagram). The rapidly growing first section of the curve (which may have also an S-shaped beginning) shows the transition from the low-investment and unplanned to the high-investment and planned economy. After all economies of adjustment of *I* and various *A* factors are exhausted and *Kn* is left as the only source of the further expansion of *A* the slope of *s* curve will tend to flatten. And as *s* can never reach 100%, the further rise of *s* curve may proceed only at a decreasing rate, *i.e.*, the curve will approach asymptotically a fixed limit in the infinity. In this second stage, after the new level of a high-investment economy has been reached, the share of investment may for all practical purposes be taken as constant.

Here we reach the point where welfare considerations may be profitably introduced into the discussion.

A New Welfare Theory

15. The problem of economic welfare may be approached in basically two different ways: either starting from the assumption of an isolated individual maximising his economic welfare in a static world or from the assumption of the society (or, if this is a better term, the social individual, *economic zoon politikon*) maximising economic welfare in a dynamic world. Theoretical identity of these pairs of concepts, individualist-static and socialist-dynamic, should have been made clear by the implications of the discussion so far. Here it will be derived explicitly with the purpose of showing that the theoretical apparatus developed in this paper makes it possible to construct an ethically neutral criterion for judging the economic desirability of various types of economic systems.

16. The first approach is sometimes stated in the following categorical form: the absolute limit of maximisation of economic welfare of present generation will be reached when the whole social capital is used during this generation's life-time and nothing is left to the next generation; there exists no economic criterion for judging whether and how much of social capital to leave to the next generation. Instead of "generation" the term "individual" may apparently be used without altering the sense of the contention.

Let us examine briefly the implications of this approach.

Suppose the whole social capital inherited from past generations has been used up during the life-time of the present generation. This would mean an immediate increase of consumption equal to previous share of investment in social product, say by 20% of *GSP*. Yet in a rapidly growing economy this increase of consumption will be reached in four or five years anyway, and afterwards it will be greatly surpassed. Thus, from

the point of view of every individual who expects to live longer than five years it would be very foolish indeed to stop investing.

Further, what does the term "generation" mean? Five years of a child who dies in his fifth year or hundred years of a Methuselah? Presumably everybody is expected to maximise his own welfare. But this is possible only within the consumption possibilities provided by the social productive effort manifesting itself as a single integrated force. At the back of the confusion of the relative with the absolute sovereignty of the *homo economicus* lies the naïve preconception of an individual independent of his social environment. In the modern American as well as in the modern Indian society individuals are free to save or to spend their incomes and shape their consumption functions throughout their life-times in whichever way they find fit. The only choice they *cannot* make as independent individual is in fact the *much more basic choice of smaller or larger total income in their life-times*; whatever the Indian does, the income of his American twin is ten or more times higher. In this respect their choice is determined by the society in which they live: by the level and the speed of development of the social productive forces.

Thus individualist approach breaks down completely and we are left to try the second alternative.

17. Granting that individuals are free to choose their occupations and to shape their consumption functions in time, everything outside this decision sphere depends upon social decisions. In the first decision sphere the individual decision-maker may be absolutely independent, in the second he cannot be; this is simply one of the natural properties of the economic system as such, and no amount of economic theorising can alter it. Production and distribution are social processes irreducible to independent individual economic decisions either in the privately or in the socially owned economy. In the former the production function (and thereby the volume of available consumption) depends on more or less haphazard market forces which are likely to lead to boom as well as to slump regardless of our individual intentions. In the latter it is more or less planned with the purpose of achieving certain socially determined aims. The maximum rate of growth of output depends on the expansion of the production capacity of the economy as a whole. Now, if the share of investment is constant and production is always maximised, consumption will be maximised also. And exactly this was the result we wanted to achieve.

In fact, the restrictive assumption of the constant *s* is not necessary. If the unmanageable concept of "generation" is eliminated, a meaningful basis for welfare maximisation will be provided by the following proposition: Maximisation of welfare of *every* individual means maximisation of the total volume of consumption in the life-time of *any* individual consistent with the similar maximisation of *any other* individual. And this requirement is automatically satisfied once the economy has been pushed on to the path

of maximum growth. For any other policy would be equivalent to the diminution of welfare for some individuals without any increase in welfare for anybody else (see Appendix II).

Conclusions

18. The findings of the analysis may now be summed up. The principle of output maximisation has provided a key for a determinate and practicable solution of the problem of optimum investment and has also provided a basis for an operationally meaningful welfare maximisation in a rationally planned economy. As the economy expands the basic investment decision will soon be reduced to the adjustment of investment to the human capacity to produce inventions and innovations. This will determine the physical upper limit for the rate of growth and will probably cause a relative stabilisation of the share of investment. Judging from the experience so far, this stabilisation for the foreseeable future may be expected to occur at around 30% (possibly more) of productive investment in social product, which will sustain a rate of growth of output of 10% or more per annum.[1] This doubling or trebling of the rate of increase of the population's well-being is what we may expect from the planned economy as compared with economies we used to know. This will mean the exhaustion of the purely economic possibilities of growth, and as such represents the limit to what the economist has to say on this subject.

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Appendix I

Characteristics of the Model

All important characteristics of the model may easily be derived from the rates of growth of investment and consumption once they are expressed as algebraic functions.

Denote capital coefficient, *i.e.*, the ratio between investment in this year and the resulting increment in output next year as k, investment as I, consumption as C, output as P, rate of growth of investment as r, rate of growth of consumption as ρ and the share of investment in product as s. Investment in two successive years is given by

$$I_{t-1} = s_{t-1}P_{t-1}$$

$$I_t = s_tP_{t-1}\left(1 + \frac{s_{t-1}}{k}\right)$$

and the rate of growth in any one year t by

$$r_t = \frac{I_t}{I_{t-1}} - 1 = \frac{s_t}{s_{t-1}} + \frac{s_t}{k} - 1 \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

If every year, 1 and 2% respectively are added to s (1) may be expressed in two alternative ways:

$$r_t = \frac{0{\cdot}01}{s_{t-1}} + \frac{s_t}{k} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.1)$$

$$r_t = \frac{0{\cdot}02}{s_{t-1}} + \frac{s_t}{k} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1.2)$$

It is evident that the rate of growth of investment changes through time. It will be declining when the following inequality holds good

$$\frac{1}{s_{t-1}} - \frac{1}{s_t} > \frac{1}{k} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

The inequality holds good up to $s = 17\%$ for 1% additions and up to $s = 24\%$ for 2% additions ($k = 3$). The deviations from an average rate of growth are relatively small.

Similarly, consumption in two successive years will be given by

$$C_{t-1} = P_{t-1}(1 - s_{t-1})$$

$$C_t = P_{t-1}\left(1 + \frac{s_{t-1}}{k}\right) - s_tP_{t-1}\left(1 + \frac{s_{t-1}}{k}\right)$$

Therefore

$$\rho_t = \frac{C_t}{C_{t-1}} - 1 = \frac{(1 - s_t)\,(k + s_{t-1})}{k(1 - s_{t-1})} - 1 \quad . \quad . \quad . \quad (3)$$

The *volume* of consumption will be normally increasing. The condition for this is that the increment of product is not exhausted by the increment of investment

$$\Delta P_t > \Delta I_t$$

$$\Delta P_t = \frac{s_{t-1}}{k}P_{t-1}$$

$$\Delta I_t = s_tP_{t-1}\left(1 + \frac{s_{t-1}}{k}\right) - s_{t-1}P_{t-1}$$

$$s_{t-1}(1 - s_t + k) > s_tk \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$

If annual addition to s is respectively 1 and 2% (4) may be expressed as

$$s_{t-1}(0{\cdot}99 - s_{t-1}) > 0{\cdot}01k \quad . \quad . \quad . \quad . \quad . \quad (4.1)$$

$$s_{t-1}(0{\cdot}98 - s_{t-1}) > 0{\cdot}02k \quad . \quad . \quad . \quad . \quad . \quad (4.2)$$

or, as an approximation

$$100\,s_{t-1} > k \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4.1.1)$$

$$100\,s_{t-1} > 2k \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4.2.2)$$

[1] It may be worth noting how the naïve though widespread belief, that the rate of growth is bound to decline in a mature economy, proved to be wrong, as the economic history of at least one country, the U.S.S.R., has demonstrated. In the period of the last eighty-five years Soviet economy has experienced the following sequence of the rates of growth of national income: 1870–1900, 3½%; 1885–1913, 4½%; 1928–37, 7%; 1948–55, 9% (M. C. Kaser, "Estimating the Soviet National Income," Economic Journal, 1957, p. 101). The post-war Japanese and German economies have displayed similarly high rates of growth. And in the last eighteen years American economy is expanding at a rate far higher than the past eighty-year average. If the reasoning in the text is correct, the decreasing *rise* of the rate of growth, and not the diminution of the rate of growth itself, is what one may expect in a developed economy. All this obviously on the assumption of no obstacles on the part of the institutional set-up. A separate problem arises from the use of "borrowed technology" in the early stage of the economic development. Once foreign credit in technological knowledge is basically exhausted, this may depressively influence the rate of growth. However, no such phenomenon seems observable in the Soviet case.

This means that, if $k = 3$, starting share of investment must be greater than 3% in the first case and more than 6% in the second case to prevent consumption falling absolutely in the next year.

The *rate of growth* of consumption is constantly increasing for all feasible values of s and k as may easily be found by putting $\varrho_{t+1} > \varrho_t$.

Realistic changes in the assumptions of the model will only slightly change the results described in the text. Thus the smaller the value of capital coefficient k, the greater, *ceteris paribus*, both rates of growth will be. Further, the smaller the k, the smaller the original share of investment—and the smaller annual additions to it—the sooner the level of consumption of the steady growth pattern I will be reached. If k decreases from 3 to 2, or if the starting share of investment is $s = 9\%$ instead of $s = 15\%$, or if annual additions to investment are 1% instead of 2%, the level of the consumption of the pattern I will generally be reached one to two years earlier.

Appendix II

Equivalence Theorem

In paragraph 17 it was contended that any movement off the path of maximum growth is equivalent to the diminution of welfare for some individuals without any increase in welfare for anybody else. Here a formal (logical) proof for the contention will be supplied.

The decision to push the economy on to the path of maximum growth is a once-for-all decision. Therefore generalisations about it, in the traditional manner, do not seem to have much sense. Probably nearest to common sense would be to ask the referendum-question as it was formulated in paragraph 11. But even such a question is still much too formal to have a real value for the economic theory and policy. This is so because the affirmative answer implies not simply a choice with respect to economic welfare but also a choice with respect to different socio-economic institutions; to achieve maximum growth the economy has to be planned. However, once this basic decision has been made and the economy starts moving along the path of maximum growth—and this has been the assumption of this paper—formal generalisations about economic choices have sense and, moreover, they lead to some interesting new results as compared with the traditional welfare theory.

The choice we face in such an economy is formally the same as before: either to invest more or to invest less as compared with the original investment pattern. The first alternative is dismissed at once because it leads to negative increments in product, with a consequence that everybody loses and nobody gains. The second alternative implies that *IP* has been shifted to maximise consumption in a particular sub-period. In this case some individuals would gain at the expense of others and at the expense of their own future consumption. In physical terms this gain is always incomparably smaller than the resulting loss, because the gain, being temporary, is finite, and the loss, being permanent and, moreover, expanding, is infinite. The problem is a little more complex in utility terms.

Traditional approach would imply that saving has to be pushed to the point where marginal disutility of saving becomes equal to the marginal utility of investment. In the economy on the maximum growth path marginal productivity of investment (*mei*) is zero. With $mei = 0$ marginal utility of investment (*mu*) is zero too. If this is so, marginal disutility of saving (*md*) must also be zero at this point. If it were positive, it would be necessary to reduce investment to make $mei > 0$ and $mu = md$. This conclusion applies to every moment of time. Therefore it would never be possible to achieve maximum rate of growth. But this would contradict our starting assumption.

Thus the first choice of maximum growth implies that marginal disutility of saving is zero. If in a growing economy $md = 0$ at one time it has to be zero for ever, because increasing consumption implies decreasing marginal disutility of saving and, by definition, *md* cannot diminish below zero (and even if it could, this would not change the final conclusion). Therefore, if maximum growth alternative is once chosen, it will continue to be chosen. Every other policy—the restriction or the expansion of investment as compared with the optimum rate—brings about losses for some individuals without any gain for anyone else.

If the foregoing reasoning is correct, the theorem will have two important implications. First, in a situation of maximum growth traditional utility considerations become irrelevant. And, second, once the first choice of optimum *IP* is made, traditional utility logic becomes invalid: disutility of saving does not change (continuously) with the welfare of the community and therefore $md = 0$, and cannot decrease with increasing consumption. These results, being mere logic, are perfectly general. If in some countries—for some *historical* reasons or others—the decisive first choice has not yet been made, this cannot change the *logical* structure of the set of concepts used. It suffices to accept that the initial decisive choice is feasible and all consequences follow at once as generally valid. Contrary to traditional assumptions, marginal disutility of saving is *not always* positive and is *not always* decreasing with increasing consumption. If there is no regularity, no *a priori* theory can be developed and all statements become tautologies: the choice has been made because it has been preferred. If there is a regularity, then $md = 0$ is a universal characteristic of utility function, and as such renders utility considerations irrelevant. In fact, what appears to be wrong is not the concept of utility as such but the mode of its marginalist application in the field of macroeconomic investment choices.

Finally, it is worth noting how, as a by-product of this analysis, the well known von Mises–von Hayek proposition about rational economic choice in two alternative economic systems will have to be reversed: consistent investment choices appear now to be impossible in the unplanned economy. If it is chosen to achieve maximum growth of consumption, planning is indispensable by definition. If the choice is formulated in the traditional manner a certain regularity in investment will have to be observed; in fact, the share of investment will have to be continuously increasing. The reasons are the following ones. Increasing consumption implies decreasing marginal disutility of saving, this is reinforced if there is an egalitarian tendency in the distribution of income, and decreasing capital coefficient implies increasing marginal utility of investment (*ceteris paribus*). Now, increasing consumption, egalitarian tendencies and decreasing capital coefficient have been observed, but no appropriate regularity in investment. On the contrary, it fluctuated widely and irregularly. Thus if we reject the obviously absurd assumption that investment fluctuations reflect changes in tastes, we are left to conclude that *rational* choice with respect to the amount of investment is possible only in a planned economy. And this choice is the basic economic choice because it determines the rate of increase of consumption.

AN ECONOMIC ANALYSIS OF FIXED INVESTMENT

IT would be a coincidence if, in investigations into such problems as the causes of economic growth, the existing classifications, as such, of fixed investment could serve anything more than a limited purpose. For the most part, they consist of concrete divisions (such as machinery and buildings, and using industries) which were primarily designed to satisfy statistical requirements; and it is the statistical data collated in accordance with these concrete divisions, rather than any analytical concepts underlying their structure, which give them practical value.

Concrete characteristics, however, are not the only bases of classifying fixed investment. There are two abstract basic characteristics which would provide categories of some theoretical independence and therefore of relevance to economic analysis, viz., the various ways in which new investment creates, or is intended to create, yield, and the various ways in which it affects the total stock of fixed capital.

I

Potentially, a new capital work creates yield in one of two broad ways: (*a*) by expanding capacity, and (*b*) by reducing costs. We thus have a primary division of new capital works, and therefore of fixed investment, into two main groups, which we may conveniently call the broad yield-categories.[1] Every new capital work also affects the existing stock of the firm's fixed capital in one of three ways: (*a*) by addition or development, (*b*) by replacement or renewal, and (*c*) by transferring or displacing some of it by reorganisation. Each of the two broad yield-categories may be subdivided by reference to these three capital-stock categories; and so we have a basic analytical classification of new fixed capital consisting of six categories, viz.:

Expansion-development	Saving-development
Expansion-renewal	Saving-renewal
Expansion-reorganisation	Saving-reorganisation

There is a seventh category: the renewal of like for like involving neither expansion nor saving; but in practice it is not of much consequence, since the renewal of fixed assets is nearly always an occasion for improvement of some sort.

[1] Not all capital works are designed to create yield; apart from government-sponsored works, such as roads and ordnance factories, there are a few whose purpose is to improve the conditions of safety, hygiene and the like. These are left out of account.

Renewal needs to be interpreted broadly. For our purpose, the term can be conveniently extended to include the provision of new assets which displace, as well as those which replace, old assets, such, for instance, as a plastics-moulding machine for producing car-body parts in place of a press for producing functionally the same parts from steel sheet. Function, however broadly we interpret it, is the criterion of renewal, and not—for instance—physical position. New assets designed to produce goods or services functionally different from the products of any assets to be displaced to make room for them constitute development.

Reorganisation works consist of the rearranging of existing machinery, plant, stores and offices designed to improve the flow of raw materials, components, partly finished goods and packing materials through the factory. They include such schemes as " the streamlining of group production and amalgamation of smaller units to achieve the benefits of volume production and bulk distribution," [1] and those physical reorganisations which result from the application of such methods of investigation as Work Study.[2] Expenditure on schemes of this kind is fixed investment, whether it is charged to capital account or not.

Expansion is defined as the growth of productive capacity; and *development* as capital formation. There can be expansion without development, and development without expansion, as the classification shows. Expansion-development and expansion-reorganisation are the only kinds of work which are always deliberately designed to increase productive capacity. The purpose of renewal works is primarily to maintain capacity. However, it does happen that a firm needing to expand somewhat may be able to do so by replacing some existing assets with new assets of a greater capacity at a price no higher than the current replacement cost of the assets to be displaced. This may take place at the end of the book life. But premature renewal with the main object of increasing productive capacity is not uncommon; and then we have pure expansion-renewals. The category also embraces the renewal in similar circumstances of assets which have reached the end of their book life, provided it is the firm's intention to employ the increment of capacity in order to increase its gross revenue.

The categories are not mutually exclusive, unless we employ some such device as *major effect*, in the same way as the *Standard Industrial Classification* defines industrial establishments by reference to major product or major activity. For our purpose this is not very important, and less so since probably most new works fall into one or another of the six categories without overlap.

For technical accounting reasons, we can scarcely hope to have accurate statistics of investment expenditure under each category; but a notional

[1] *Financial Times*, May 29, 1957.

[2] See " Work Study To-day," by Sir Ewart Smith, *Financial Times*, July 22, 1957; and an article by John Davy in *The Observer* of January 26, 1958.

estimate of the normal percentage distribution may not be without value. According to the National Income blue book, rather more than 50% of gross capital formation in recent years has gone to the maintenance of the stock of capital goods in the country. In the long run, there is a displacement of assets which remain unreplaced, so that of the actual total expenditure on the provision of fixed assets, not more than 50% may be on renewal account, the remainder being defined as development for our purpose. Apparently, the blue-book figures do not take account of reorganisation expenditure, even that which takes place in association with renewal or development works. We can therefore only guess the relative value. Furthermore, we have no statistical information which would give us a clue to the relative values of expansion and saving works. The following is based partly on blue-book data and partly on personal experience and observation:

Estimated Percentage Distribution of Fixed-investment Expenditure

	Total.	Expansion.	Saving.
Total	100	45	55
Development works . . .	35	20	15
Renewal works	35	10	25
Reorganisation works . . .	30	15	15

It should be emphasised that these estimates are very general averages; to apply them to any particular year would in any event beg one of the main questions of this paper.

II

The six categories can be expanded into a more useful analytical classification by an analysis or breakdown of the two broad yield-categories into a number of narrower ones. Where appropriate, the subdivision of each into the three capital-stock categories can be retained.

In assessing the anticipated yield of new works, we can take it that annual costs are a primary consideration in all cases. For any given size of plant, they can be regarded for convenience as falling into two main classes, viz., (*a*) time-elements, which are incurred largely in the provision and maintenance of new fixed assets, or in the transfer or reorganisation of old assets, or which are saved in the displacement of old assets, such items of cost being, for instance, interest, depreciation, local rates, and the rent of land and buildings; and (*b*) operating elements, which are incurred in the running of new assets or saved in ceasing to run old assets, such items of cost being, for instance, materials, fuel, power, and direct and some indirect labour.

This division of annual costs should not be confused with the division into overhead and direct costs; all time costs are overheads, but not all

operating costs are direct costs. Nor should it be confused in any way with a division into variable and non-variable costs as applied to the effect on annual costs of changes in the arrangement or stock of fixed capital. In assessing the anticipated yield of new works, it is sometimes the practice to take account of the variable annual costs only, the object being to avoid inflating or deflating the yield of new works by some cost-accounting fiction which may assume that the work will result in a change in, for instance, the general manager's salary. Sometimes we shall need to take account of the total cost.

Annual costs are not necessarily the costs incurred in any one year. They are the costs of reproducing the quantity sold or to be sold in a year under present or prospective extraneous conditions, extraneous conditions being those which exist independently of the new work, such as wage-rates and material prices. Whisky is usually matured in bond for three years or longer. The costs with which we would be concerned are not the actual costs of producing and storing the whisky which is to be produced, or expected to be produced, say, next year. They are the estimated annual costs, including warehousing and the cost of financing the stocking in bond, under the extraneous conditions which are expected to prevail next year, of the quantity to be sold. Where an anticipated change in sales has to be taken into account in assessing the yield of a new work, we are thus able to make a direct comparison between the annual costs and the receipts from sales under old and new conditions.

The total annual cost, T, and the annual gross revenue from sales, G, are taken as being dependent on the quantity, q, sold or expected to be sold in a year. It is safe to assume, in most cases at any rate, that the elasticity of demand, e, for the product, and—within the normal capacity of the plant—the marginal cost, a, are constants over any range of sales or output up to about 2 : 3. The normal annual cost function may therefore be written:

$$T = aq + b \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

where aq represents the annual operating costs and b the time element.[1] The form of the gross-revenue function is derived from the constant-elasticity demand function, $q = kp^{-e}$, where p is the price, and k a constant, that is:

$$G = pq = Kq^{1-1/e} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

[1] Of the new capital works whose financial results I have been concerned in assessing, the cost functions for output rates within the normal capacity of the plant have always been linear, though admittedly, this may have been apparent rather than real owing to the practical difficulties of obtaining a measure of any systematic departure from linearity. It is known that in some industries the marginal unit labour cost at the firm tends to decrease, *cet. par.*, as the rates of output increase, and vice versa; but these are generally over very wide ranges of output in which the plant itself expands and contracts. See, for example, my "Productivity in the Wartime Aircraft Industry," *Aircraft Engineering*, June 1957.

K being equal to $k^{1/e}$. The vertical distance between the annual cost and annual gross revenue curves for any given value of q is the measure of the net revenue, which may be defined as that part of the annual profit, distributed and undistributed, which accrues gross of tax to the proprietors or the holders of Preference and Ordinary Stock and Shares in the company. The maximum net revenue is equal to the vertical distance between the two curves where they are parallel, that is, where—

$$p = \frac{ae}{e-1} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$

which is the optimum price.[1] Corresponding to the maximum net revenue, the gross revenue may therefore be written—

$$G = \frac{qae}{e-1} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$

and the quantity sold—

$$q = k\left(\frac{ae}{e-1}\right)^{-e} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (5)$$

which may be substituted for q in equation (4) to give the optimum gross revenue as a function of the marginal cost and the elasticity of demand. Writing M for the maximum net revenue, we have—

$$M = \frac{aq}{e-1} - b \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (6)$$

that is, after substituting for q—

$$M = ke^{-e}\left(\frac{a}{e-1}\right)^{1-e} - b \quad . \quad . \quad . \quad . \quad . \quad (7)$$

Subscripts 1 and 2 will be used to denote present and prospective, or old and new, conditions respectively.

Expansion works generally result in an increase in the time costs, that is, $b_2 > b_1$. Exceptions are largely confined to expansion-renewal works. Three practical grounds exist for expansion works: (*a*) where the firm anticipates an increase in the level of demand for its products, and the capacity of the existing plant is inadequate to meet it; (*b*) where the demand at the optimum price already exceeds the normal capacity of the existing plant; and (*c*) where it is possible to introduce a technical development which would so reduce the marginal cost that the demand at the lower

[1] An analytical proof of the optimum-price formula, equation (3), is given in my *Cost, Demand and Net Revenue Analysis* (London, 1938). A geometric, more general and more satisfactory proof appears in *The Economics of Imperfect Competition*, by Joan Robinson.

optimum price would exceed the normal capacity of the unexpanded plant. Every expansion scheme, however, must justify any increase in the time costs which it may incur.

Where the new work does not involve a change in the marginal cost, its net financial result is—

$$M_2 - M_1 = \frac{a(q_2 - q_1)}{e-1} + b_1 - b_2 \quad . \quad . \quad . \quad (8)$$

that is, if the proposed expansion work is to prove justified, the time cost under the new conditions, b_2, would not exceed—

$$\frac{a(q_2 - q_1)}{e-1} + b_1$$

Where there is an anticipated change in the marginal cost, the net financial result is equal to—

$$M_2 - M_1 = \frac{a_2q_2 - a_1q_1}{e-1} + b_1 - b_2 \quad . \quad . \quad . \quad (9)$$

These two equations hold good whether the cost curves are linear or not, but where they are not, b_1 and b_2 are not the values of the time costs, but serve to show the elevation of the curves at a_1 and a_2 by indicating where the tangents to the cost curves at these two points cut the y-axis. In practice, the firm may, in the circumstances of a rise in the level of demand, increase its net revenue to a new maximum without expanding the plant merely by increasing output beyond the normal capacity of the plant until the cost curve has curled upward to a point corresponding to the economic capacity of the plant, which is the output corresponding to the vertical which passes through the upward-curling cost curve and the new gross-revenue curve where they are parallel. The rise in the level of demand would thus be met partly by an increase in the supply and partly by a rise in the price. In theory, a level of demand tending to rise beyond the normal capacity of the plant would best be exploited by a series of small expansion works contrived in such a way as to cause the normal capacity of the plant to expand at a rate just sufficient to keep pace with the increasing demand.

Expansion works in general nearly always embody new technological improvements, with the result that for the plant as a whole the marginal cost under the new conditions is lower than that under the old, and therefore the optimum price is also lower. In reality, then, equation (9) is more generally applicable than equation (8).

It is also equation (9) which is the ultimate criterion applicable to the third ground of justification for expansion works. This ground consists of a decline in the marginal cost of the final product resulting from improve-

ments of the existing plant. A small saving-renewal work may initiate an expansion work of this kind; but I would say it is more likely to be a large-scale renewal scheme or renewal and saving-development scheme, combined perhaps into a single major new work under a general reorganisation. But an expansion-reorganisation work alone, with possibly a small-scale renewal programme, can sometimes be effective enough to lead to a significant reduction in the marginal cost.

As equations (3) and (5) show, the optimum price and the corresponding quantity in demand can both be expressed as functions of a and e. Since a is now fairly widely recognised in industry as a valuable product of the costing system, the main practical difficulty in determining the maximum obtainable additional net revenue from expansion schemes is the evaluation of e. Probably many firms tend to strike a reasonable approximation to the optimum price and the corresponding demand more by trial and error than by using a mathematical formula. The value in price-fixing policy of a knowledge of the elasticity of demand is little appreciated, and where the concept is understood, it is quite likely regarded as rather academic. That the optimum price increases and decreases in the same proportion as the marginal cost may not only be appreciated at some firms, but also applied in practice.

All saving works designed to reduce the marginal cost of the final product of the firm potentially affect the firm's gross revenue by decreasing the optimum price. Purely saving works of this kind are necessarily confined to those where the demand at the new or prospective optimum price can be met by the existing plant without expansion. The criterion of efficiency is equation (9), but b_2 may be greater or less than, or equal to b_1; although where it is not greater, the work is bound to yield an additional net revenue provided a rational pricing-policy is pursued.

The only other types of saving work of any importance which affect the gross revenue are best described as loss-cutting. They consist of reorganisation schemes designed to reap the maximum benefit from a curtailment of output of a line which has become unprofitable in general or in a particular market. Perhaps *reorganisation* is not quite apt: strictly, such schemes are capital-displacement or contraction works—negative development. But the investment expenditure on them is largely devoted to the physical transfer of fixed assets, that is, to the recovery of usable assets from the abandoned plant either to sell of for displacing similar but life-expired or less-modern assets in a profitable part of the plant.

The purest forms of saving works are those which reduce the time costs without causing a change in the marginal cost. In these cases pricing policy is not affected, and there is therefore no consequential change in the gross revenue. The reduction in the annual time cost is the measure of the additional net revenue resulting from such works, and it applies to all rates of output.

III

A more detailed classification of fixed investment can now be constructed:

Expansion-	Saving-
Development—	Development—
$a_2 = a_1$	$a_2 < a_1$
$a_2 < a_1$	$b_2 < b_1$
Renewal—	Renewal—
$a_2 < a_1$	$a_2 < a_1$
Reorganisation—	$b_2 < b_1$
$a_2 = a_1$	Reorganisation—
$a_2 < a_1$	$a_2 < a_1$
	$b_2 < b_1$

The marginal cost, a, and the time cost, b, may apply to the firm's intermediate products quite independently of the final products. It is true that in manufacturing industry the marginal cost of an intermediate product usually forms part of the marginal cost of the final product; but it is not invariably so. Paper-work in the office, for instance, is often an exception; and in the service industries it is not uncommon to find an intermediate product whose operating cost relative to itself is an appreciable proportion of its total annual cost, which, relative to the final product, may be almost entirely a time element. In assessing the financial results of new works, the distinction is important. Generally, for our broader purpose, the analysis of annual costs into marginal and time elements need be considered in respect of the final product only.

IV

Throughout all phases of a boom, fixed investment tends to become concentrated upon expansion-development. Expansion-renewals and expansion-reorganisation are not in themselves effective enough to interest business-men when expectations are high, and for the most part, they are ultimately taken care of in major schemes of expansion in which development plays the principal role.

In the initial phase of a boom, expansion-development may be formed almost entirely from assets originally ordered under renewal programmes; that is, actual expansion is achieved less by increasing the acquisition of new assets than by reducing the rate of displacement of old assets. Most assets ordered under saving-development projects—and especially those (such as office machinery) intended for ancillary activities—could scarcely be used for any purpose other than the one they were originally intended for. In the early phases of a boom, however, the stimulus to expand creates a situation

in which little time and money can be spared for promoting saving works of any kind.

During the second phase, the earlier increase in the demand for new fixed assets would by now be resulting in an increase in the supply. The accumulation of arrears of renewals has become appreciable, and the pressure of rising material prices brings about a fresh interest in expansion-renewals, and also to some extent in saving-renewals for activities whose expansion is not essential to the growth of the business. Efforts to clear the accumulation of arrears of renewals may provide additional stimulus to the boom; and although an ever-changing pool of arrears may remain, like a pool in a river, the renewal demand for new assets ultimately tends to become a fairly stable addition to the increased expansion-development demand.

The third and last phase begins when the boom has reached a state of true inflation. Then additional labour becomes difficult to obtain; and further expansion largely depends upon the success of labour-saving schemes in the existing plant, schemes which the firm may justify, not on a direct saving in the annual costs of production, but on the quantity of labour they release for operating expansion works as they are brought into use. Labour saving by the firm thus tends to become an end in itself without reference to the economic tests normally applied to new capital works. Labour-saving works and expansion-development works come to depend for their success upon each other; and if the latter fail, or if business expectations turn so much less optimistic that the expansion schemes fall through, the firm will have made its cost structure more inflexible to no purpose by increasing the time costs by an annual amount in excess of the annual saving in operating costs. Labour-saving works of this kind can rarely have a long-period economic justification, any more than expansion-development works whose success depends upon a prolonged period of inflation.

In the first phase of the ensuing slump the cancellations of orders for fixed capital assets would not at first be confined to those intended for expansion, but would tend to embrace those ordered for saving schemes as well. Capital expenditure might be almost entirely limited to saving-reorganisations designed as far as possible to cut the time costs, and to clear the pool of arrears of renewals with existing assets which would otherwise have been declared redundant.

After this first phase, unit-cost reduction becomes the paramount need, and orders for assets under the headings of saving-development and saving-renewal would begin to flow again, probably reaching a rate in excess of that of the boom period. The promotion of saving-reorganisation schemes would continue, but they would be now less concerned with reducing time costs and more with reducing operating costs than in the initial phase.

These, briefly stated, are the changes which one may expect to take place in the several categories of fixed investment—other things being equal—

during the progress of a boom and a slump. Investment in expansion works is a function of business expectations, and it is usual to explain the change from slump to boom and boom to slump in those terms. Investment in saving works is also to some extent a function of business expectations, but probably in the inverse way except in true inflation.

In saving-development and saving-renewals the principal factor is technological progress; and in saving-reorganisation it is the progress made in mechanical-handling plant and in the physical aids to industrial control (both of which are technological), and in those sets of principles of works organisation the application of which came to be generally known in the nineteen-thirties as " rationalisation."

An increase in the rate of technological progress will always tend in any economic conditions to stimulate expansion in the rate of investment in saving works. During a boom, the adoption of the newest technology in expansion works is the common practice. In some cases it has to be applied to the whole of the productive unit or not at all.[1] A revolutionary improvement in production processes will always have attractions for business-men, even when rapid expansion is the order of the day.

But it is during periods of slump that rapid technical progress is most welcomed by industry, and especially by those firms which have internal sources of finance, or which remain otherwise credit-worthy. At such times, when cost-reduction is the paramount consideration, a proved revolutionary advance in production processes and equipment could very well lead to a rate of investment in saving works great enough to bring about an upward turn of the trade cycle.

V

The economic analysis of fixed investment has a relevance to long-term trends, and may suggest a gradual change, perhaps for the worse, in the character of short-term movements.

Saving works which effect a reduction in the marginal cost of the firm's final product at the expense of an increase in the annual time cost set to the rate of output an economic minimum. This minimum, below which it would be more profitable to retain the original plant, is determined by the point of intersection of the new total-annual-cost curve and the old one. The opposite is true of saving works which effect a reduction in the annual time cost at the expense of an increase in the marginal cost: they set to the rate of output an economic maximum. Most saving works fall into the former category; and many expansion works also result in a fall in the marginal

[1] An example is the pre-war electrification of machine shops, that is, the fitting of electric motors to individual machine-tools, looms, etc., in place of belt drives from a shaft propelled by a steam-engine. The application during the present decade of electronic control in factories probably falls into the same category. Such new works are saving-renewals or saving-development rather than expansion-development.

cost and a rise in the time cost. It follows that the cost structure of industry is becoming more insensitive to changes in the rate of output.

As the marginal cost declines with the introduction of successive new-works schemes and approaches the bare unit cost of materials, the former type of saving work will have less scope, and the latter will grow in importance. And pricing-policy will then be less affected by falling marginal costs than by rising demand elasticities.

Technology has been encroaching on some items of time cost for many years. But probably by far the most important time-cost savers are new capital works which result in an increase in the rate of output per unit of fixed capital. For works of this kind, there seems to be unlimited scope.

VI

One matter remains to be dealt with. If we accept investment control as an instrument of national economic policy, how, if at all, could the control authority exploit this analysis of fixed investment?

Of the several categories of new capital works, expansion-development is the one which responds most to changes in business confidence. It does not follow, however, that the investment-control authority should concentrate entirely on curtailing expansion-development in times of boom, and on encouraging it (by subsidy, for instance) in times of slump. In general, it may be considered to be in the common interest to do so; but there may sometimes be good reason for exercising a measure of control over renewal and reorganisation schemes and saving-development schemes, as well as over expansion-development. May there not be, for instance, in a time of boom some expansion-development proposals in excess of the equilibrium requirement more worthy than some of the proposals under other categories, and in a time of slump, some expansion-development proposals less worthy of official encouragement than some proposals under the other categories? To some extent, the answer turns on the official attitude to labour productivity.

During the phases of a boom, the rate of increase in productivity as a whole tends to decline as a result of the retention in service of assets due for renewal, of business-men's preoccupation with expansion to the neglect of saving schemes, and, when true inflation is reached, of the introduction of labour-saving schemes which in themselves are uneconomic, and which merely serve to transfer the onus of finding additional labour to the capital-goods manufacturers. There seems to be a dilemma here; for the more the control authority restricts expansion-development, the more likely will business-men retain obsolete and outworn assets.

On the whole, it seems that the authority should take the long view, and give its full support at all times to genuine saving-works and to expansion-renewal works, and withhold its licence from the promoters of uneconomic

labour-saving schemes where it can detect them. Only expansion-development and expansion-reorganisation are left for the authority to control by restrictive licensing in times of boom.

There is, however, still some choice within the categories. When the control authority is weighing schemes which involve reductions in marginal costs against those which involve reductions in time costs, it may work to the principle that industrial costs should be made and kept as flexible as possible, and so support the latter at the expense of the former. On the other hand, it may work to the principle that prices to consumers should be kept to a minimum at all times, and so support the former at the expense of the latter. It may, of course, combine the two principles, and support schemes which involve reductions in both the marginal and the time costs at the expense of all others.

But the over-riding principle governing control policy may be to obtain the maximum results for the minimum effort. This would mean that the larger new capital works would receive more attention than the smaller ones—undoubtedly a good policy provided it were not carried so far that the smaller works passed through the control net unnoticed. In my experience, integrated renewal programmes are sometimes large, and so also are a few reorganisation schemes. But in times of boom, by far the greatest number of large capital works falls into the expansion-development category.

Other criteria of control under a central authority, such as locality, types of product and the additional labour required, have been recognised for a long time. It is not suggested that the yield and capital-stock categories should take their place. There seems to be good reason, however, for taking them into account as supplementary criteria.

E. J. Broster

London.

REVIEWS

Frank H. Knight on the History and Method of Economics. Essays selected by WILLIAM L. LETWIN and ALEXANDER J. MORIN. (Chicago: University of Chicago Press (London: Cambridge University Press), 1956. Pp. vii + 309. 45*s*.)

RICHES here indeed—but how does one review them in a little room? Economy says select and order. And this guide has been followed by those who chose these essays as a proper seventieth birthday gift; for who could be more worthy of Professor Knight than Frank H. Knight himself? The editors have chosen by their author's main interests—economic theory and its history (Parts I and II), theory of method in the social sciences (Part III) and the reasons which justify a liberal society (Part IV). I shall follow these divisions; but start with two general reflections.

First, we have here to do with the supreme all-rounder of our day. Not only can he play all the parts, and conduct his own orchestra, but he can also play any one part as well as any of the specialists—economics, epistemology, science, mathematics, history, sociology, philosophy. I had recently to read in sequence the major works of John Stuart Mill. This gave the impression of a mind of higher power than the accustomed run, in ability to absorb all the disciplines and play on all the organ stops together. This impression these essays also constantly give—and the tunes are livelier. Then, we should here also recognise perhaps the most dedicated rationalist of our day. In him the glorious Enlightenment lives again, but with policies more positive than in its eighteenth-century masters. " In a sense, truth includes all other values . . . All truth . . . is arrived at by co-operation among individuals acting freely and in a spirit of ethical, even religious, integrity." This is Knight's religion.

The economic theme shines resplendent in " The Ricardian Theory of Production and Distribution " (II), to which should be added the review of Wicksteed's *Commonsense of Political Economy* (IV), and in " The Business Cycle, Interest and Money " (IX). The first is too little known, possibly because its title underplays its amplitude. Knight no doubt wishes to expose the error so obvious in Ricardo—his failure to push the economic principle from production costs through to distribution theory. But this article does much more. It offers a constructive estimate of the classics (doing most sensitive justice to Adam Smith), and through them traces the line of growth in the theory of substitution till, in Knight's own hands, it reaches maturity. Here indeed Knight's rationalism is revealed; he pushes the economic principle to its marginal limits. At this level, Knight sees all prices as mutually self-determining, in space, time and in psychology as choice

between alternatives. The subjects of all prices are reduced to a common denominator as and because they are all in fact *services*, and that in the immediate moment of consciousness or continuous present. This is the raw material of our economic traffic, and on it the economic principle works. " Streams of services . . . are the things valued and exchanged in the market," and each factor is so valued so far as it yields this stream. At each moment we value the support from " land," the immediate produce of capital goods or the services of our fellows. Capital and wealth are secondary derived (or expected) money aggregates of these services. Rent can be translated into capital yield by converting the original cost into the present cost of an equal stream (through allowing for maintenance cost). On labour services Knight seems to your reviewer not to show quite his usual rigour:

> " All this does not mean that the human being as a source of economic services can be treated in theory as wealth or capital, or additions to human productive capacity treated as product, or the act of making them as production, as in the case of material wealth. There is a fundamental difference, in the form of a somewhat paradoxical limitation to the individual's ownership of himself. The principle of inalienable rights, recognised in all free societies means not merely that one cannot sell himself outright, but that one cannot so much as give a valid lien on his services or make an enforceable contract to deliver them for any considerable time in the future. In other words, he cannot capitalise his earning capacity. Having no economic value to anyone but himself, he has in effect none at all " (p. 52).

Distrust paradox! The following may be a personal view, it is not indeed orthodox. But do we not all make contracts over time for our " flows of services," for which we accept responsibility? And have we not wage and salary rates, and life tables, by which to estimate their capital value? Are such estimates different in economic kind (especially as to invested skills and rents) from machinery? And do they not remove the anomalies of plumbers who have no capital and surgeons devoid of wealth? Knight in other passages shows sympathy with this further application of the economic principle. " In free society, economic agencies, or resources, include human beings . . ." (p. 44, cf. p. 100, footnote).

However this may be, Knight's " flow of services " formula shows its power especially in an unusually concise and stimulating statement of the determination of interest rates. The source of value being the flow of all the services, the value of capital springs from the greater produce it affords; and the rate of interest simply reflects this growing produce in the moving present. This is, of course, a measure of long-period trends (Knight's work on uncertainty needs no comment here). " Capital is the productive capacity of [concrete] things, except that it is measured by salable value at a moment of time, while the product of capital is a perpetual flow or stream of

value" (p. 77). Knight indeed regards capital as of indefinite life: as long as progress continues, capital is continuously replaced or improved, indeed the yield of any capital item cannot be defined until maintenance cost has been deducted.

Ignoring uncertainty, then (" there is no clear meaning of rational behaviour in the face of uncertainty ") investment proceeds up to the point where its accumulated costs equal the discounted value of its expected yields, both accumulations and discounts being estimated at the present rate of interest, as it is the present alternatives we are measuring. In this way supply and demand for capital are fixed. And, just because capital is productive, the demand for capital exceeds its supply, and the rate of interest is always positive. The scope for the productive use of capital is in fact unlimited (barring uncertainty), whereas the preference for saving over consumption clearly is not.

From this it will appear that Knight's and Keynes' theories of interest are more complements than antagonists, the first dealing with the long-period trend and source of interest, the latter with its short-period market determination. These essays being selected, there is inevitably some risk of distortion, and reviewers have inevitably seized on some rather highly coloured remarks on Keynes (and especially Keynesians) (*e.g.*, pp. 220, 252). Yet it is easy to find fully argued passages in which Knight shows agreement with Keynes' hoarding and interest theory, so far as this deals with conditions of " disturbance," as Keynes certainly did. One recalls passages in the second preface to *Risk, Uncertainty and Profit*, and in " Capital, Time and the Interest Rate " in *Economica* 1934. Article IX of the present collection—" The Business Cycle, Interest and Money "—is a fine and welcome example. Thus, dealing with the cycle's falling trend, Knight says, " the motive for holding money idle . . . is speculation for a rise in its future value " (p. 210, cf. pp. 213, 215). He adds (footnote to p. 215) that " a relative stabilisation with a considerable amount of unemployed labour . . . and a great plethora of idle funds " can in fact obtain. But in Knight's theory monetary and other derangements are treated as distorting forces, whereas to Keynes between the wars they seemed endemic and permanent. The further cleavage, such as it was, sprang from temperament and difference in political views. Knight has always distrusted " powers " —" I am reluctant to believe in doing good with power. With William James, I incline to the side of ' the slow and silent forces,' slow as in all conscience they are—and though time is fleeting " (p. 281). To Keynes in the 'twenties and 'thirties it was indeed fleeting. The " powers " seemed the only hope, if they could be advised. We can see the rightness of each, in due place, each a liberal of genius.

Knight's business cycles appear as disturbances within his long-period model. In one sense they approach reality nearer than most models. Knight's first training was in science, and often in these papers one hears

the scientist speaking in a way at once strange and compelling to British ears. So, here, he sees equilibrium not as static, but as the regularity of oscillation (or regular lags), for it is oscillation we always find in reality; whereas a disturbed oscillation reflects the cycles of business uncertainty. So what we have to explain is not oscillation, but these excessive movements away from regular oscillation, and how to control them. Indeed, Knight's scientific realism leads him, as it seems to me, to the right criticism of the rather loose category " Statics and Dynamics " (Art. VIII), as applied to economic processes. Thus " phenomena of growth or change " are described as dynamic in contrast with the " static " state in which they are absent. Knight says—

> " this is misleading, because entirely different from the meaning of the terms ' statics ' and ' dynamics ' in the field of theoretical mechanics, from which they are taken. Dynamics deals with motion, and the working of a stationary economic system involves the analogue of motion. The process of establishing a moving equilibrium under stationary conditions might more reasonably be called economic dynamics. Changes in these given conditions (wants, resources and technology), are analogous with nothing dealt with in the science of mechanics and should be designated by some other term, such as ' historical ' or ' evolutionary ' economics " (p. 55 note).

Here we note Knight's sense of the uniqueness of human experience. That reflects his ethical and social theory, to which we next turn.

Knight's insistence on the uniqueness of human experience is the core of the five essays in Part III. It is usual in science to separate the animate from the inanimate, but then one treats man as a social animal. Here, Knight reacts. He agrees about the social. But we are social in a unique way—not by instinct and invariable reaction, but by our unique ability to adapt through learning, through handing on our learning and through knowing we so know. This creates a new gulf. *We* are faced with uncertainty, we can make errors, and we can choose to act wickedly; rocks and plants, tigers and termites cannot. If so, human sciences must differ radically from those about animals or natural forces.

From this it follows that, except hypothetically, the human sciences cannot consist of mere fact or theory, as in physics. For error and sin are excluded by pure logic. The heart of the matter for Knight is that the sciences themselves are social creations, built by human experience. And the differential of human behaviour is action from motives, not merely impulsion by forces. We *want* experiences; and unfortunately our wishes are not consistent, with one another's or with society's. If it were not so, as Knight dryly remarks, the problem would be much simpler. Because of these facts, some methods, open to the inanimate, do not apply to the human sciences. Especially, prediction is just not possible. For we can anticipate the motives of others, and of social " experiments," and so we can always

" beat the gun." As Knight is fond of saying, if both A and B predict each other's conduct, both will be wrong. For each will beat the other's gun. The sequel is important. For success between persons or between governments and persons among such conflicting motives, deceit and coercion are inevitable. Also, what is " right " will at least be matter of opinion, not an inevitability. Conflict will be positive, not just failure to understand.

From this, Knight's view of what he considers the dangers of " scientism " will be apparent. For it, " ends, motives, etc., are *data* merely; . . . Scientific knowledge alone is required for the prediction of social events; and the prediction and control of social events is all that is required for the solution of practical social problems " (p. 235). " A proper scientific education," which makes this known, will bring contentment with what is possible. In sum, all we need is an efficient Gallup poll. Especially, for economics, it is assumed that adequate knowledge will give the solution where many want the same things the means to create which are limited, a problem which includes " who is to bear the costs,and in what proportion." Knight is careful not to underestimate these views. He insists that the major part of our behaviour *is* induced just as the " scientist " position assumes. In view of science's present vogue, this gives force to its acceptance. Yet Knight also insists that this just misses the differential in human experience —choice with some rational basis. For it is just this element that makes human experience creative, and (possibly) progressive.

More positively, however, Knight's view of economics follows from his conception of the different types of knowledge derived from the different kind of force or agent which controls change in each field of knowledge. These fields he places in three tiers: knowledge of the external world; the truths of logic and mathematics; and knowledge of human conduct. To each field corresponds a different level of inducement to human action: force applies with us as in physical science; ends and means relationships can be taken in abstraction, as given. On such assumptions economics, for example, can become " a highly abstract ' concrete deductive ' science similar to . . . mathematical mechanics." In any human society, so treated (for instance economic statics), the assumptions rule out uncertainty and error. On the third level, however, any science of human behaviour must include all these (and evil also). At this level the motive to behaviour springs from what individuals-in-society *value*. But about our values there is no final agreement. Here, we are reduced to history, and guess-work. " Evolutionary " or historical economics is our utmost aspiration. At this level economics would aim not merely at logic but at understanding.

The " ends–means " assumption may seem here to receive scant justice. However, as Knight constantly says, ends-and-means is an infinite regression. Each end can in turn be a means to a higher end, relative to our efforts to improve our situation. Hence, it is reasonable to take any arbitrary " ends " (*e.g.*, economy) as given, and use them as the assumptions of abstract

sciences deducing the best " means." When we come to *values*, this arbitrary element in " means and ends " falls away, for value experiences have some *intrinsic* worth. They also have objective compelling power, simply because they are held in respect by individuals-in-society. They are in some sense "right," right for everyone, right as sanctioned in law and in moral and religious codes, which have rational compelling power. It is, then, at this level that what individuals want clashes with what is right or valuable. Here, " utility " does not reduce to any definable common denominator. What suffices for hypothetical science fails us when applied finally to specific human behaviour.

The conclusion is an all-out trust, with all the diffidence in the world, in the one weapon we have which offers any hope at all—the slow working of the free, impartial human reason. Negatively, this for Knight involves a deep distrust of all human principalities, of all merely emotional powers, so far as they operate to restrict reason's free play. Among such powers he at present rates high the dogmatism of mere science; partly because of its vogue to-day, but mainly because it commits the solecism of precisely missing the unique *human* problem—the problem of error and our choice of evil, and the concomitant blasphemy of putting mere authority—specifically authoritarian science—in its place.

> " Co-operation [for truth] in its ideal form is equalitarian or democratic in the ideal sense of that concept; it excludes any exercise of power or wish to exercise power over other participants in the quest, on the part of any individual. The pursuit of truth or of value in any form is the ideal type of ethical association, which is to say of all true society " (p. 132).

In this difficult pursuit Knight continually advises us " not to go too fast, not to over-simplify, not to grasp at easy solutions for hard problems." Here he thinks " the greatest danger is . . . a moralistic approach, attributing social evil to sin, with the implication of cure by liquidating someone. . . . People are not bad in the main, but they are ignorant, and do not understand." This reflects the eternal rationalist, though " in the main," plus ignorance, leaves room for an awful lot of sin. And it is not so much sin in the sense of evil willing that Knight is here denying as the convenient definition of sins by those in power, with their consequent measures to " liquidate " them. Those who still believe in sin (especially north of the border) could accept this.

The last two papers—including the champagne from this cellar, his presidential address to the American Economic Association—deal especially with liberty. Freedom he regards as the precious gift of the Enlightenment. " The establishment of freedom, rooted in the liberation of the mind from traditional dogma and mythology, enforced by ecclesiastical and political authority, is the greatest revolution of all time or since the dawn of conscious

life." Yet the advance has turned to retreat. "The liberal movement went wrong, partly because of the failure to think out its problems. . . , but especially because it generated expectations and implied promises impossible of fulfilment." More bluntly, it asserted rights which could be exercised only if the concomitant obligations were undertaken. The results of selfishness create the need for force to maintain essential order. But force in turn organises itself in self-seeking ways. And this is fatal for liberal society, because force permits of no argument, no discussion. But for Knight the highest level of discussion (and so government) is that which debates the higher human values. "Objective norms belong to a third level of reality, distinct from and above individual desire or end and means, as the category of the instrumental is different from and 'above' mechanical sequence or cause and effect" (p. 266). For Knight, such discussion hinges especially at present on the conflicting claims of freedom and justice (pp. 269–74). This is beyond our scope. I quote his main conclusions. "The first test of a free society is that it teaches its youth to question and criticise and form opinions only by weighing evidence . . . instead of implanting eternal and immutable truth, with abject submission to the inevitable by some prescriptive right" (p. 274). "The balance will always be hard to strike, and entirely a matter of judgment, not of formula, a balance between principles that conflict, while each claims to be absolute" (p. 277). "The object of devotion and pursuit is not ends but ideals, progressively redefined as they are progressively realised" (p. 278). And in the end "the prime necessity is simply the critical intelligence."

For this supreme rationalist, then, truth ascends in tiers from the abstract to the more concrete. On such a view all truths are relative. Only the truth is for us absolute. As "problem-solving animals," we pursue it endlessly. Frank Knight's many British friends rejoice in his continued zest. They will wish to add their tribute to this fitting birthday present. Many happy returns!

The University of Glasgow. A. L. MACFIE

The Measurement of Utility. By TAPAS MAJUMDAR. (London: Macmillan, 1958. Pp. xiv + 149. 13*s.* 6*d.*)

THE theory of consumer's choice is a subject which lends itself readily to intellectual refinement, and in consequence has attracted to itself some of the most agile minds among theoreticians. Since empirical checks are slight, controversy flows freely notwithstanding the general belief, voiced by Professor Robbins in his foreword to this book, that the direction of its current is unlikely to have the slightest impact on business decisions or economic policy.

The sanguine expectations awakened by Jevonian utility, by Marshall's consumer's surplus, even by the more modest aspirations of Pigou's welfare economics, are now largely a matter of history. The reaction against the influence of Marshall, Pigou and other members of the Cambridge School gathered force and found expression in the thirties, notably in the work of Professor Robbins, who attacked all propositions building on interpersonal utility comparisons, and later, in the famous paper by Hicks and Allen demonstrating the sufficiency of ordinal measurement as a foundation for the theory of consumer's choice and, in effect, relegating cardinal utility to the role of a metaphysical poor relation. There were the diehards, of course, but for at least a decade following this development, the ordinal school was well in the ascendant, and if one spoke of marginal utility still, it was rather with an air of conscious catholicity emanating from a cultivated deference to tradition.

With the appearance of Von Neumann and Morgenstern's *Theory of Games* in 1943, this attitude began to change. A utility thermometer had apparently been invented, and the method used in its construction had prompted others to think up hypotheses claiming to shed light on behaviour in risk situations. Nor was the indifference curve analysis left unmolested and in possession of the field of riskless choices. Parallel with the rehabilitation of cardinal utility, a theory of revealed preference, associated strongly with the name of Professor Samuelson, began to gain ground. It boasted a more exacting methodology and its disdain of the indifference curve, as a sort of unnecessary crutch, was perhaps reminiscent of the way in which cardinal utility was, earlier, brushed aside by the ordinalists. And though a couple of years ago Professor Hicks sought to meet this new attack, in part by revising his previous hypothesis, the present position is still something of an interregnum, with no hypothesis widely held to the exclusion of the others.

Inasmuch as the literature on consumer's choice is extensive and often specialised, a short and popular survey with the aims of disentangling the chief issues and of appraising the contending claims with skill and detachment would indeed be a boon to the general reader. If Dr. Majumdar has not entirely succeeded in providing us with all we could legitimately hope for, he has made a worthy attempt. Certainly the author's controversial, though generally lucid, style makes for lively reading. And if his answers do not always satisfy us, we can agree that he has raised some important issues and provided a framework about which discussion might profitably be organised.

Following a short dissertation on the meaning of welfare in Part I, of somewhat uneven interest and relevance, Dr. Majumdar prepares the logical groundwork for Part II, where we are furnished with a suggestive frame on which to append the various utility hypotheses to be scrutinised: introspective cardinalist, introspective ordinalist, behaviourist ordinalist and

behaviourist cardinalist. It is not to be imagined that the hypotheses corresponding to these categories—respectively, those of Marshall (and, more recently, of Armstrong), of Hicks, of Samuelson, and of Von Neumann and Morgenstern (and Friedman and Savage)—are all alternatives. For riskless choices, the first three may be regarded as rival theories. But the fourth is quite consistent with the indifference–preference analysis: it could invest the indifference surfaces, for instance, with a set of values determined up to a linear transform.

Though a sharp methodological hatchet is at all times in evidence, and though the author wields it to some advantage within territory already made familiar to us by Marshall and Hicks, one has the feeling that in the newer terrain he is occasionally felling the wrong tree. For instance, while at all times grudging in his appraisal of the Von Neumann–Morgenstern " hypothesis," the weight of his attack is to be found in statements about the difficulty of estimating risks, the unlikelihood of their being known to the individual, and the irrelevance in any case of such information to the individual unless he is expected to make the same choice a sufficiently large number of times. Now any objection to this method of discovering the shape of a particular individual's utility function with respect to income, in an experiment which attaches probabilities to the alternative prizes, would be at least as pertinent to any endeavour to infer by experimentation the contours of some individual's indifference map. On the other hand, if Dr. Majumdar's remarks are to be interpreted as an objection to the hypothesis put forward in the Friedman–Savage paper of 1948, such remarks were anticipated by the authors at that time and shown to be quite beside the point. Indeed, on Dr. Majumdar's declared methodological maxim of testing the implications of a hypothesis, this sort of protest is inadmissible. If it were, Dr. Majumdar's favourite hypothesis, the indifference–preference hypothesis, would fare very badly. It does not seem to me that Friedman and Savage were exaggerating when they spoke of the richer empiric content of their hypothesis. If Dr. Majumdar wishes to make a dent in their theory, it is to this empiric content that he must address himself, as others have already done.

His case against Samuelson has a surface plausibility, but is hardly conclusive. No use is made of a substitution effect in Samuelson's revealed preference theorem, but, argues Dr. Majumdar, a substitution effect may be inferred if we happened to observe a price elasticity greater than unity in a situation in which all goods had a positive income elasticity. The distinction between the two effects, clearly defined in the Hicksian analysis, has value for Dr. Majumdar owing to the possibility of formulating demand theorems, first, when the income elasticity of demand is zero or negative but the income effect is smaller than the substitution effect, and second, when the income elasticity is negative and larger than the substitution effect. But surely the possibility that the demand curve can either slope upward or

downward when the income effect is negative adds nothing to the limited prediction of the hypothesis. True, if we could measure these two effects separately and in advance of a price movement there would be no need for a theory of demand: the need would be only for skilled econometricians whose job it would be to add these two effects, algebraically, for any anticipated price change and announce the result. But if they are not measurable in advance, it were better, surely, if we could depend upon the downward-sloping demand curve. And if not in all circumstances, at least under the simple condition ascertainable in advance, that the income effect is not negative. Whenever this simple condition is not met—when we observe in advance that the income effect is negative—we can but wait to see how the wind blows. The direction being observed, we must keep a straight face and calmly inform the interested public that the substitution effect must have been in fact quite a bit stronger, or weaker as the case may be, than the income effect. This is all that Dr. Majumdar's additional " theorems " boil down to.

Furthermore, his statement that there is no behaviourist theorem equivalent to the negative price–quantity relationship yielded by the indifference–preference hypothesis when the good in question has a zero income elasticity cannot be allowed. The most that might be made of this is the argument that, owing to its strong ordering, we derive a " weaker " theorem from the revealed preference hypothesis: if the price of X falls, X having a zero income elasticity, its quantity does not diminish.

Beyond these specific strictures, Dr. Majumdar's treatment seems vulnerable to a rather fundamental criticism; that of not carrying the scientific method far enough. For the best we can hope for from either of the rival hypotheses is, under certain restrictions, a downward-sloping demand curve for the individual. But, in economics, individual behaviour interests us only in so far as it is an index of market behaviour. Downward-sloping individual demand curves lose significance if, with their aid, we cannot infer a downward slope for the market demand curve. And, in fact, we cannot without violating the *ceteris paribus* clause; for one thing, a fall in the market price of the good under consideration, in principle, alters the distribution of income, leaving uncertain the resultant quantity taken by the market. Of course, we may choose to believe that if each individual has a downward-sloping curve, the chances of the market curve sloping upward over any range are remote. But even if we are right are we not guilty of a premature infusion of empiricism to jolt the theory along? After all, it is not the theory which tells us this; rather, it is we who tell the theory.

If, then, we cling on to any of these hypotheses, in disregard of our announced methodological purism, it is surely because the techniques associated with them have come to permeate our way of thinking. Despite appeals to Occam's razor, the indifference–preference hypothesis, for example, might well be preferred to the Marshallian, or revealed-preference, hypothesis

simply because it organises our thoughts so as to enable us quickly to grasp essential distinctions. In a society subject to transient fashion and spasmodic development the conditions necessary for close predictions may not exist, and the economist therefore, in examining any practical problem or policy, must have recourse to some degree of taxonomy. A technique which provides the right kind of insights at least helps the practising economist to make the right kind of conditional statement. We could do with more of such techniques.

There are, finally, some minor points which might be attended to in a future edition. The author's view of Professor Hicks as a stalwart of the hypothetico-deductive school will raise many an eyebrow. Other than the passage—in itself not unambiguous—quoted from the *Revision*, there is little in Professor Hicks' writings which can be cited in favour of this notion. Indeed, the remarks in Chapter 3 of the *Revision* on the range of alternatives facing the consumer, on continuity, and on the concept of indifference, manifest only a concern with the intuitive plausibility of these things. No less perplexing is it to find the "as if" Friedman of *Positive Economics* paraded before us as an "operationalist," notwithstanding his permanent-income hypothesis in his recent *Theory of the Consumption Function*.

In his chapter on the introspective ordinalist Dr. Majumdar states that the convexity of the indifference curve is equivalent to assuming diminishing marginal utility. Hardly! For the convexity of these curves is quite consistent with diminishing, constant or increasing marginal utility. Rather it might be said, then, that the chief ingredient of the negative sloping demand curve, from being diminishing marginal utility in Marshall has become, in the Hicksian system, diminishing marginal substitutibility.

The merits of the book stand up in spite of these and possibly other criticisms, which are perhaps unavoidable in the serious review of any absorbing and thought-provoking book. The exposition is non-mathematical and the book of a size that it may be read without undue effort in a couple of days. Provided it is read in the critical spirit in which it is written, time could hardly be put to better use.

London School of Economics. E. J. MISHAN

The Control of Inflation. An Inaugural Lecture. By J. E. MEADE. (London: Cambridge University Press, 1958. Pp. 52. 5*s*.)

THIS pamphlet gives the text of Professor Meade's inaugural lecture as Professor of Political Economy in the University of Cambridge. It deals with the control of inflation, but it aims in both directions. The target was changing in the very weeks when the lecture was being prepared. Professor Meade was aware of this. "A more serious American recession than anything which we have experienced since the end of the Second World War is always a possibility." He claims that one of the main virtues of his proposals for the control of inflation is that they are equally well designed to stimulate expenditure and to keep selling prices up in a period of deflationary pressure as they are to prevent price rises in an inflationary situation. And he adds, significantly and self-revealingly, "it is even more important to be in a position to offset any future deflation than to stop the present inflation."

What are those proposals? Professor Meade elaborates a ten-point scheme, of which the basic and very precise item is that the Government "should accept a precise commitment to keep a precisely defined price index below a precisely defined ceiling." The index should be composed of home-produced goods and services and insulated from all import content of these goods and services (a challenge to the statistician—what proportion of the price of a haircut is attributable to the hair-dresser's intake of imported food?).

The stabilisation of the index would be entrusted to a Stabilisation Commission, subject to the ultimate control of the Chancellor of the Exchequer. Its measures of control should include variations of a levy on personal incomes such as the National Insurance contribution. Professor Meade's proposals would involve a break with free wage negotiations. He suggests that a body like the Council on Prices, Productivity and Incomes should publish estimates of the rise in earnings that would be compatible with stable prices, and it would be left to arbitral bodies to decide whether workers in particular industries should obtain wage increases above or below the average. There should be public scrutiny and control of restrictive practices in the labour market. Finally, Professor Meade does not disappoint his faithful followers by failing to bring up the variable rate of exchange. If, he says, financial policies are concentrated on domestic stability, variations in exchange rates should be made much more freely as a means of preserving equilibrium in the balance of payments.

There is in Professor Meade's argument the unwavering logic that we have come to expect from him—but a logic so inexorable as to verge at times on the unrealistic. Economic policy is the art of the possible. The trade unions could, admittedly, abandon the principle of free wage negotiations. Many people believe that they should. But to assume that they will is to fly in the face of all the evidence that has accumulated on this subject.

Professor Meade's proposals should, however, be criticised on other than these grounds of practicability. The main weight of his balancing measures would be applied to consumer purchasing power. How does this fit into the pattern of the world recession of 1957/58 which has offered the paradox of a decline in economic activity and a growth of unemployment coinciding with a continued rise in national price levels at the very time when there has been a substantial fall in primary commodity prices? In accordance with the Meade formula, the holding of the index below the precise ceiling would

have called for an increase in taxation or in National Insurance contributions.

Does Professor Meade believe that, even though the British and the United States indices of retail prices have risen over the past year, each of these countries should have raised taxation or otherwise encroached on the purchasing power in the hands of its consumers? Since the indices would have risen even more had they been insulated from the impact of lower import prices, the required deflationary dose would have had to be severe—a strange corrective to the industrial stagnation that has gripped these countries.

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La Fin de l'Inflation. By J. GABILLARD. Observations Economiques, No. 5. (Paris: Société d'Edition d'Enseignement Superieur, 1952. Pp. vii + 359.)

L'Inflation Française d'Après Guerre 1945–1949. By J. LE BOURVA. (Paris: Armand Colin for the Centre d'Etudes Economiques, 1953. Pp. 381.)

IN the study of inflation (as in that of the trade cycle) there are many mansions, and the two books under review are excellent examples of different lines of specialisation along which the analysis of this complex and heterogeneous phenomenon can be attacked. Dr. Le Bourva has made an intensive study of inflation in the French economy during a relatively short period; Dr. Gabillard attemps a comparative analysis of the forces and sequences by which inflation has been brought to an end in a number of economies.

A feature which they share is the combination of an attempt to apply modern theory to their data wherever possible with a determination to avoid over-generalisation; to look at the different markets and sectors of the economy separately. Thus, Dr. Le Bourva makes, or draws on, a number of statistical studies of the ways in which prices were fixed in the French economy. For agricultural products, which were mostly free of control from quite early in the period, there is a very close general relation with the wage-bill, while for particular products (especially meat and wine) the supply is shown to have had a powerful effect on price. The econometrics of these investigations may be somewhat over-simple in view of the shortness of the period in question and the predominance of simple trends through it—in fact, the causal mechanism of price-formation is largely assumed rather than proved—but a convincing general picture is presented.

In discussing the prices of manufactured goods, the author deduces, partly from a small but interesting sample inquiry made from Rennes, that entrepreneurs followed a policy, predominantly, of full-cost pricing. Wage-rates are shown to be explicable on the assumption that they follow the cost of living with a short lag. These are the elements of what is now a familiar model of inflation in western countries, but the author must rank as one of the pioneers of it, and his assumptions are very carefully checked—though, as with most models, the equal plausibility of some rival system is not excluded.

Dr. Le Bourva develops his model more systematically than these brief remarks might indicate. The rise of import prices (including that due to the devaluations of the franc) is shown to have played a considerable, though apparently not a commanding, part; the functions of public finance and state-controlled investment are taken into account; the course of events in the economy as a whole is finally reconstructed from the main variables which have been mentioned and the simple regression relations between them. Monetary conditions have no place in this reconstruction; after a careful discussion of monetary policy, the author concludes that it was not carried so far in any direction as to prevent money from playing a passive part in the French inflation, the great decrease in liquidity during this period notwithstanding.

Dr. Gabillard's scepticism of broad generalisations leads him to the thesis that the end (and presumably much else in the course) of an inflation can be explained only by looking at a number of different forces in a number of different markets, which, of course, have repercussions upon one another. During inflation, the degree of dispersion of different prices, measured as percentages of the median price, is shown to be increased, so that heavy distortion of the price-structure takes place; the downturns of different prices are also shown to be widely separated in time. Such facts certainly discourage reliance upon simple, macro-economic explanations of the downturn in the price-level as a whole.

When it comes to identifying particular kinds of force, the author distinguished three broad classes; the relaxation of inflationary factors in inflationary markets, the appearance of deflationary factors and the appearance of rigidities which block the spread of inflation from its points of origin. It is not entirely clear that this classification assists greatly in the understanding of the events analysed, though it does, perhaps, serve to emphasise the variety of sources, within or without the economy, from which anti-inflationary (or, for that matter, inflationary) impulses may come.

The most valuable part of the book is, perhaps, the analysis of a number of conclusions of inflationary episodes—in the United States in 1920, in Germany in 1923, in France in 1926 and the United States in 1948. In the first of these instances, improvement of agricultural supplies, a weakening of labour's bargaining-power, monetary stringency and the overtaking of consumption by stock-accumulation are given the chief credit. For the German hyper-inflation the analysis is less convincing, except where, like other writers, the author emphasises the extreme sensitivity of the expectations entertained by holders of goods or of foreign exchange to events such as

the introduction of the Rentenmark. Indeed, hyper-inflation is the type of episode in which broad, macroeconomic explanations are at their strongest; the differences between markets and sectors of the economy sink into quantitative insignificance in comparison with the vast common movements of prices. For France in 1926, again, the author seems to be driven to stress the paramount importance of the single factor of confidence—the confidence, as he emphasises, of a restricted class of asset-holders to whom Poincaré was politically acceptable, as opposed to the broad mass of the community whose expectations (reflected in wage-settlements particularly) have been of importance in more recent inflations. The 1948 downturn in the United States again gives Dr. Gabillard scope for displaying a wide variety of forces of more nearly equal importance. The variety of inflationary episodes extends to their being sometimes very complex, sometimes very simple.

This brief and belated review may perhaps serve to indicate the admirably empirical spirit of these two useful French studies. That justice cannot be done to them in so short a space is a consequence of their virtues.

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International Economic Papers, No. 7. Translations prepared for the International Economic Association. (London: Macmillan; New York: The Macmillan Company, 1957. Pp. 184. 15*s*.)

SINCE 1951, we have all looked forward with pleasure to the annual appearance of *International Economic Papers* with its miscellany of articles, some of which may be old chronologically, but all of which are new to the overwhelming majority of English-speaking economists. Who can tell, except those few whose suggestions, translations or editorial work go to build each volume, what particular mixture is to be brought forth in each succeeding year? Few would surely wish to know what was to come, for it is the lucky-dip quality of this publication which is responsible for its unique charm—if charm is a word suitable to describe an academic journal. The fascination of the unpredictable is not among the virtues of many of the otherwise virtuous regular journals. For these, if each new issue is not exactly predictable, one is scarcely surprised to find yet another article on subject X in journal A, to gain the impression from journal B that economists are highly skilled mathematicians and from journal C that they find simple algebra quite a handful, or to find long tables of figures prominent in most of the articles in journal D.

A high degree of auto-correlation among different issues of the same journal is not necessarily a vice, and may well be a virtue to impecunious academics making out their subscription lists. Nevertheless, as a liberalising exercise, nothing could be better than to read every article in each issue of *International Economic Papers* as it appears for, in that journal, no topics or

styles (save only the very mathematical, for which translation is less essential) are excluded.

The latest issued, Number 7, keeps up the tradition of variety. From the classical period we have two articles by Sismondi on effective demand, from the Swedish macroeconomic school two recent papers (by Lindahl and Kragh) on national accounting and budgeting, there are two contemporary Marxist papers by Lange and Brus concerned essentially with the problems of allocation, especially of consumer goods, in a Communist country, and three other articles, two pre-war, by Einaudi on tax capitalisation and Gibrat on economic inequalities, and a contemporary article by Giersch on welfare and international trade. Not only is there variety in subject, in time (Sismondi's first article was written in 1820, the most recent contribution is dated 1956) and in country of origin (five countries are represented), but, perhaps most noticeably, in style. We have the drawing-room polemics of Sismondi, the algebraic style of the Scandinavians, the uncomfortable style of the Marxists, the soothing modern welfare style (all essential points italicised) of Giersch.

All the articles are well worth reading, if none is a masterpiece. Perhaps the best is Lindahl's critical examination of national accounting concepts and methods—certainly a field not lacking in literature—although Giersch's vest pocket *Trade and Welfare* (written before Meade's book appeared) is very elegant. The two papers written in the inter-war period (those by Einaudi and Gibrat) remain quite contemporary, since they are contributions to two slow debates of which the end is not nearly in sight. To many readers, the two most interesting articles will be those by Lange and Brus, providing, as they do, a clear picture of the Marxist economist attempting to come to grips with the problems of allocation, especially allocation of consumer goods, without falling into "capitalist" terminology.

To contrast two articles, those by Giersch and Brus, throws a great deal of light on the respective methodological problems of economists west and east of the so-called iron curtain. Both writers are concerned with the same fundamental problems, those of welfare and allocation. Brus discusses many things with which we are familiar, but avoids the familiar names, while Giersch uses all the familiar names, but one wonders to what things these names refer. Here, for example, is a sentence from Giersch:

> "This equilibrium is optimal only if the social marginal cost of production of A in a and the social marginal cost of shipment (including all cost of transfer) from a to b are together exactly equal to the social marginal cost of B in b, which includes the social marginal cost of transport to b if the good is not produced in B itself."

Compare with this Brus attempting not to call a spade what we would call a spade:

> "... the transfer of means of production from the supplier to the recipient (both State undertakings) is a movement of goods which is

> strictly planned and purposeful . . . But although this is a sale in form only, it does not follow that the money check loses its importance. Payment in money should be an act of definite acknowledgement that the labour which has gone into the product is indeed *social labour*" (my italics).

If Brus is inhibited by being quite unable to speak of the holy "means of production" being bought and sold, or having a market, Giersch suffers from the prevalent Western disease of being carried along by the sweep of logical connection between a series of familiar names, even if these do not represent identifiable things.

Revealing juxtapositions like this are among the greatest benefits to be obtained from *International Economic Papers*, and it is to be hoped that the editors continue the tradition of variety, even if it sometimes involves selection on grounds other than quality alone.

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Quality and Competition: an Essay in Economic Theory. By LAWRENCE ABBOTT. (New York: Columbia University Press (London: Oxford University Press), 1956. Pp. 229. 30*s*.)

IN this book Professor Abbott has made an intelligent and useful contribution to the theory of monopolistic competition. Taking as his starting-point the fact that product or quality competition has received far less attention in the literature than price competition, Professor Abbott has set out to develop a comprehensive analytical treatment of quality competition. The result is a stimulating work: less original and startling than Professor Abbott would have us believe, but nevertheless a brave attempt to tackle a difficult and elusive subject.

Professor Abbott begins by attacking the notion that pure or perfect competition in the sale of a standardised product should be regarded as the ideal competitive standard. He argues that product differentiation is not only an integral part of the modern world but also a desirable feature of it, because it yields benefits that would be lost if competing products were homogeneous. It cannot be assumed without further examination that product differentiation is a monopoly element and therefore undesirable. Indeed, one of Professor Abbott's main contentions is that competition is more active when there is quality as well as price competition. In his view, an analysis which concentrates on price competition among the producers of a given set of products leads to a seriously distorted picture of the economic world. What is needed is a truly general theory that explains not only the structure of outputs and prices but also the structure of goods and services.

Professor Abbott follows other writers in drawing a distinction between the ends of economic activity and the means to those ends. What people

really desire, he asserts, are not products but "satisfying experiences." The desire for such experiences he calls "basic wants." The desire for products which enable basic wants to be satisfied he calls "derived wants." Basic wants are largely determined by one's culture, and can be modified only slowly. Derived wants, on the other hand, are for products which are not wanted for their own sake but to satisfy basic wants, and they therefore indicate only a provisional choice. Old products may readily be displaced by new products if these are felt by consumers to satisfy their basic wants more adequately. Consumers try to obtain the optimum variety of any product, that is that which would, if produced, provide the maximum satisfaction of wants. When price is a consideration they try to obtain the "optimum bargain." Producers alter the quality of their products whenever they believe that new qualities will satisfy consumers' basic wants better than the old. Small innovations are therefore continually being sought, even in conservative industries. Professor Abbott regards innovational changes in consumers' goods not as occasional interruptions of the routine of maximising conduct but as an integral part of it. In his view, the dynamic elements in quality competition are of great importance, and he stresses the fact that one of the most striking characteristics of competitive markets is their evolutionary character. This type of quality competition, he argues, leads to an increase in the welfare of consumers because their individual wants are catered for more precisely than by homogeneous products. Professor Abbott refers at one point to the possibility that variety may involve an increase in costs so great that this more than offsets the higher satisfaction given by a variety of products, but this is only a passing comment.

Professor Abbott's next step is to consider some distinctions that he believes have been made possible by his analysis, and it is at this point that one feels most vividly that Professor Abbott is overrating the importance of his own contribution. He considers here, for example, the well-known problem of defining an industry under conditions of monopolistic competition. He attempts a definition in terms of wants—an industry, he suggests, "consists of all those products any one of which is capable of making a particular type of contribution towards the attainment of some experience or activity"; for example, safety razors and electric razors both make a particular type of contribution to a man's desire to be well groomed, and are therefore produced by the same industry. Professor Abbott claims that his definition is superior to one based on cross-elasticities of demand, but it is difficult to see how. It would appear to solve none of the problems associated with the cross-elasticity definition and to be a good deal less precise. Nor is much new illumination gained when Professor Abbott uses his definition of an industry to illustrate the distinction between an industry-wide monopoly and an individual firm's monopoly of a single variety of a product.

The rest of Professor Abbott's book is concerned in effect with the problem

of equilibrium under conditions of both price and quality competition. Although, as has been said, the author is very much aware of the dynamic nature of quality competition, he is forced to concentrate on equilibrium situations in order to make the analysis manageable. He first defines competition in terms of a contest between independent sellers, and then makes a useful distinction between quality competition that is horizontal (different types of product at much the same price), vertical (better quality at a higher price) and innovational. On the basis of a large number of assumptions, he develops an elegant geometrical analysis of quality competition, holding price constant, which enables him to investigate both horizontal and vertical equilibrium. Using what he calls a " cost of options " curve, he is able to determine the number of varieties that will be produced in an industry and to specify the level of quality of these varieties. The next step is to consider equilibrium when both price and quality can be varied. The equilibrium position here depends on the strength of consumer attachments to particular varieties and the steepness with which the average cost curve falls. Professor Abbott comments that " the difference between actual unit cost and minimum unit cost of the typical products of our economy is a measure of the price we pay for the diversity, richness and refinement of our advanced civilisation and our high material standard of living." Diversity and variety, however, cannot be afforded by an impoverished society. The proposition that " the minimum point on the average cost curve is the proper criterion of maximisation of welfare " is a generalisation " valid only for the economics of underdeveloped countries."

Although it is to be doubted whether many economists will think Professor Abbott's conclusions to be as revolutionary as he clearly believes them to be, much of what he has to say will be readily accepted by them. However, there are a number of provisos that need to be made. The first is that in his eagerness to tilt against " traditional " price theory, Professor Abbott has gone too far in the other direction, and his description of price theory is to some extent a caricature. What is more important, Professor Abbott dismisses far too easily the arguments of those who stress the monopoly elements in product differentiation. We are given no empirical justification for the view that quality differences and changes are not in general a monopolistic imperfection but a competitive element. Professor Abbott refers to possible imperfections in quality competition, such as ignorance and lack of decision on the part of consumers and deliberate attempts to deceive on the part of producers, and he admits that his arguments apply more to some types of market than to others, but he plays down the importance of factors such as these. He also says little about the influence of oligopolistic situations on the nature of quality competition. At one stage, when referring to yearly changes in automobile designs, Professor Abbott does suggest that these are perhaps " undesirably frequent," but this is a line of argument on which he does not elaborate, at least in so far as it relates to countries such as the United States. One can accept his view that competitive changes of product are a very important dynamic element in western economies, but one cannot ignore the possibility that many such changes may lead to no increase in economic welfare and may even lead to a decrease. Professor Abbott has, in short, gone too far and claimed too much. There is, however, a great deal of hard thought in his book, and it will repay reading and thinking about even by those who will want to take its conclusions with a grain of salt.

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Common Sense about the Common Market. Germany and Britain in post-war Europe. By E. STRAUSS. (London: Allen & Unwin, 1958. Pp. 169. 15*s*.)

THE Common Market, inaugurated in March 1957 by the Treaty of Rome, is seen by Mr. Strauss as the latest manifestation of an idea which had been alive in Europe for over a hundred years before the Second World War: first as the Zollverein of 1834, then as Friedrich Naumann's *Mitteleuropa* (1915), and finally as the *Anschluss* of the 1930s. " The idea of a common market initiated by a customs union thus played a significant part on three occasions during the last century. In every case it was advocated by the liberal elements amongst Germany's business classes . . . ," mainly because it would facilitate German industrial expansion.

For the same reason German business interests more recently accepted the European Coal and Steel Community, which was in so many ways the forerunner of the Common Market. " So far from keeping the growth of German heavy industry under control and preventing the re-establishment of its old preponderance, the Community has proved a first-rate framework for Germany's industrial re-expansion " (p. 68). Then, in the subsequent negotiation of the Treaty of Rome, " the basic fact is Germany's success in securing the acceptance of the common market scheme on terms which ensure Germany's eventual predominance in Western Europe " (p. 91).

What are these terms? They amount to a brand of *laissez faire* which " may be expected to make Western Europe safe for capitalism," including (very probably) monopolistic capitalism (p. 98). " Throughout the treaty the workers are only considered, if at all, as the poor relations of the dominant economic interests " (p. 101); moreover, little attempt is made to safeguard the interests of backward areas such as southern Italy (p. 112) or to facilitate measures to combat any future general economic depression (p. 113).

Admittedly, in the course of negotiations substantial concessions had to be made on points of secondary importance in order to secure compromise solutions acceptable to all members, and particularly to France, and examples of such compromises are to be found " in such matters as the community tariff, as far as it has been finally settled, the functions of the European

Investment Bank and the European Social Fund, the association of overseas territories with the community and the regulation of agriculture" (p. 136). Most of these compromises are viewed with distaste by leading German spokesmen, but "the German negotiators did not cry for the moon and were willing to pay for the very valuable concessions to German interests which the treaty contains" (p. 137).

How should the British Government react to the establishment of the Common Market? Mr. Strauss thinks that we should try to do a deal with the Six roughly on the lines of France's deal with her five fellow members: we should try to achieve for the rest of the Commonwealth the privileged status enjoyed by France's overseas territories.

> "Such a policy would bring obvious gains to the participating Commonwealth countries in the shape of partially protected markets throughout the Community: the corresponding drawbacks would not be suffered by these countries but by the United Kingdom whose preferences in the Commonwealth markets concerned would be reduced in favour of the other members of the scheme" (p. 144).

But unless we are prepared to make sacrifices such as this we cannot expect to interest the Six in a wider area of freer trade.

Hitherto the British Government has failed to realise that it must needs make concessions if it is to conclude a deal with the Six (p. 137). Moreover, it has been remiss in favouring, instead of challenging, the extreme *laissez faire* philosophy which pervades the Common Market agreement (p. 138). Only if we profess an interest in economic planning and in particular for continued protection for backward areas (p. 145) can we hope to find supporters (either inside or outside the present Common Market) for any scheme for a wider area of freer trade.

The implications of the Treaty of Rome, a highly complex and on many points very obscure document, are anything but easy to assess, and I expect I shall not be alone among Mr. Strauss' readers in my unwillingness to swallow outright the whole of his interpretation. I would, for instance, have been grateful for a better presentation of his case that a Free Trade Area is incompatible with a full-employment policy on a national scale (p. 141), that the gospel of Cobden and Bright is irrelevant or dangerous in the case of agriculture (p. 146) and that "free trade is incompatible with the interests of the more backward countries" (p. 145). But a great deal of what Mr. Strauss has to say is very persuasive indeed, and in addition there will be few readers who are so expert in this field that they will not profit from Mr. Strauss' remarkably lucid guide to a formidable complex of tortuous negotiations and indigestible documents.

University of Nottingham. BRIAN TEW

Productivity and Economic Incentives. By J. P. DAVISON, P. SARGANT FLORENCE, BARBARA GRAY and N. S. ROSS. (London: Allen & Unwin, 1958. Pp. 306. 35*s*.)

THIS book examines the effect of economic (mainly monetary) incentives, with particular reference to productivity and earnings. The difficulty, of course, of estimating the effect of any change in working conditions is, first, that of isolating the change. This is particularly so in the case of incentive payments, which are often introduced as part of a comprehensive reorganisation of equipment, methods and working conditions. The second difficulty is that of finding adequate and comparable records relating to the periods before and after the change.

As a first line the authors were able to investigate fifteen different operations in five factories where output and earnings had been recorded before and after the introduction of incentive payments and where there had been no other major changes. The total number of workers involved was 130, of whom, in order to assess the impact of incentives on the workers, 118 were interviewed. The usual change was from time-rate to a straight piece-work bonus payable on output in excess of standard. Increase in output per man-hour varied from 7½ to 291%, about half the cases showing increases between 43 and 76%. Increase in earnings per man-hour varied from 12 to 49%, about half being between 18 and 38%. The account of the interviewing procedure adopted and of the evaluation of its results is complicated, particularly the attempt to arrive at percentages of satisfaction. It is, however, reassuring to learn that there was found to be a significant positive relationship between satisfaction with incentive schemes and increase in earnings.

The scope of these particular investigations, covering only some 130 workers, was admittedly narrow, but the results are in line with other less-detailed inquiries conducted by the authors covering factories, laundries and retail distribution. There is also an interesting discussion of the possibility of extending incentive payments into fields hitherto regarded as unsuitable, such as services and house and factory maintenance. Instances are given of substantial increases in output and savings in labour cost achieved in such fields.

In many of the cases examined in this book the increased output obtained, the less than proportionate increase in earnings and the consequent reduction in labour costs per unit of output are clearly the result of the setting of standard outputs, on the basis of work study, considerably higher than the outputs previously being obtained on time-wages. In other words, to obtain the same earnings as previously the workers would have had to work harder; to obtain the higher earnings which they did in fact achieve they had to work considerably harder. There appears to have been some evidence, particularly at the level of trade-union officialdom, of dissatisfaction with a system under which earnings increased less than output and a feeling that, on the

contrary, in view of savings on overheads, there would have been a case for earnings increasing more than proportionately to output. On the other hand, it is stated that the workers themselves were prepared to accept an increase in earnings less than proportionate to the required increase in output when both were " believed to be fair." It would therefore seem to follow that workers' acceptance must have been based on a realisation that their previous output was " unfair."

This brings us back to the fundamental question of whether there are not other, simpler and possibly even more effective means than incentive methods of payments of inducing such an attitude of mind among workers. There is a short discussion in the book of the alternative of the high time-wage system, more common in the United States than here, but sometimes used here also (as, for example, in the construction of the Fawley refinery) by companies with American associations. Such a system, however, it is pointed out, usually involves setting output standards, detailed recording of output, strict supervision and the threat of dismissal for failure to achieve the standard. This, too, would therefore appear to be a system of incentive payment with the penalty of loss of employment and its accompanying high wage as a means of achieving standards of output. Whatever may be the advantages of a high degree of supervision, there is evidence, in the interviews recorded in this book, of worker satisfaction when, under incentive payments, they feel they are no longer being physically driven by supervisors and the latter can devote themselves to other aspects of efficient management, such as supply of work and reduction of delays.

A further point brought out in the book is the considerable transfer of trade-union power from the centre to the workshop which is involved in the successful application of incentive payments. A complete chapter is devoted to a case study of the negotiations at a factory over a period of years for the introduction and application of an incentive payment system. The sympathy and cordiality existing between the management and the higher levels of the trade union proved no remedy for suspicion and hostility in the factory itself.

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Human Relations and Modern Management. Edited by E. M. HUGH-JONES. (Amsterdam: North-Holland Publishing Company, 1958. Pp. x + 256. 20 guilders.)

THE editor explains the plan of this book as being that of exploring human relations and their implications for management in three situations—among workers on the shop floor, when labour is organised and at the highest level of management itself. He states that, no attempt having been made to impose any particular point of view on the various authors, it may well be that the careful reader will find some overlaps and repetitions. An even greater difficulty, however, lies in finding the unifying link, other than the tenuous one implied in the title, between the very varied contributions which make up this volume.

Chapter 1, by Professor Meij of the State University of Groningen, outlines a theory of management based on the span-of-control concept. Chapter 2, by Dr. W. H. Scott of the University of Liverpool, deals with the various elements in the factory structure and suggests that the main need to-day is for a further development of the role of union representatives at plant level and a division of authority between national and local officials on the lines prevalent in American trade unions. Chapter 3, by Professor Kahn of the University of Michigan, criticises the non-psychological approach of classical scientific management and describes a series of studies conducted by his University which concentrated on the ability of business and industrial organisations to achieve their formal goals and also to offer high psychological return to their members. Chapter 4, by Professor Young, of the University of Wisconsin, gives a concise history of the development of organisation among workers and employers and of collective bargaining in the United States and criticises the attitude of managements which regard human-relations programmes as a substitute for collective bargaining.

Chapter 5, by Dr. N. S. Ross of the University of Birmingham, dealing with organised labour and management in the United Kingdom, is perhaps the most interesting of the book. His main theme is a condemnation of the common tendency for management theorists to regard the firm as an isolated unit and as a self-contained and self-sufficient social system, and to regard the function of management as being to weld a mass of individuals into a single viable organisation and to unify, integrate or liquidate sectional groups and special interests. Rather, he suggests, the firm should be recognised as a plural society and the function of management should be regarded as that of controlling and balancing the activities of constituent groups. He frankly recognises the difficulties of government of such a plural society, but suggests there are other and greater dangers to human relations and managerial efficiency in policies based on an authoritarian concept of organic unity of the firm.

Chapter 6, by Mr. E. F. L. Brech, senior partner of a British firm of management consultants, deals with the responsibility which should be assumed by boards of directors for company policy in regard to human relations and with the inhibiting effects on management of disharmony and inefficiency within the board room itself. His suggested Schedule of Responsibilities of boards of directors is a clear statement of what the uninitiated might imagine boards of directors are already doing or attempting to do. If they are not, it is questionable whether setting the points out in print would provide any guarantee of their observance in practice, particularly in boards

where personal relations exist such as those depicted by Mr. Brech from his own observations. Chapter 7, by Professor Revans of the University of Manchester, based largely, but not entirely, on his own well-known research into the coal-mining industry, deals with the problems of management associated with the size of undertakings. He emphasises the need for further study of organisation and for clearer definition of abstractions which figure so commonly in management literature. The conclusion, he suggests, may be as simple as this: when managers and supervisors are either overloaded or caught up in a snare of functional complexity, they will not know the men's troubles, and morale will suffer most readily in the biggest unit. Chapter 8, by Professor Wight Bakke of Yale, propounds the view that the first and most important function of management is to think. He suggests, too, that, whatever management may think it is doing, it cannot be the sole planner; every single participant in the flow of productive work in fact participates in the planning. The decisions are not in fact made by management; management can only propose, and the decisions are made by everyone whose activity and work are involved in carrying out the proposals.

It will be seen that there is variety in this book. The approach varies from theory to factual description and the conclusions from practical programmes of action to somewhat platitudinous exhortations. The clearest lesson which, taking the contributions as a whole, one could draw is that which in fact is the main theme put forward by Dr. Ross—the tendency in the theoretical treatment of management blandly to ignore the institutional structure of workers in industry or impatiently to try to brush it aside as an irrelevancy.

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Technical Education and Social Change. By STEPHEN F. COTGROVE. (London: Allen & Unwin, 1958. Pp. 220. 25*s*.)

Internationale Tendenzen in der Entwicklung der Ausgaben für Schulen und Hochschulen. By FRIEDRICH EDDING. (Kiel: Institut für Weltwirtschaft, 1958. Pp. 164 + 166. DM 20.)

THE relationship between expenditure on education, social change and economic growth is only beginning to be explored, and these two books are important landmarks. Dr. Cotgrove has taken as his subject the changing social and industrial pattern as it is mirrored in the education system. After a somewhat thin start in the nineteenth century, when for social reasons technical education was second-class and second-rate, he develops an argument that the relative stagnation in British industry led to an undervaluing of the skilled and educated man, and that this was connected with the constant proportion of arts and science graduates from universities and the slow rate of expansion of higher education. The social system led to a

division between graduates and non-graduates, for whom on the whole technical education was designed, and this pattern ceased to have meaning when the forces of expansion and change seized the economy in the Second World War. In the modern economy there is seen to be a conflict of aims and intentions in education, arising from the rigidities of an outmoded class structure which tries to constrain the forces of growth. This occurs at all points of the education system—the grammar schools have a social role which conflicts with the educational needs of a changing society; the universities try to maintain the gap between them and the technical and teacher-training colleges—one could continue the catalogue indefinitely.

In technical education Dr. Cotgrove throws remarkable light on the distortions produced by the demand of the students at technical colleges for degree courses (one-quarter of the nation's science graduates come from technical colleges); the determination of the universities to keep the colleges down; the pressure of professions on the colleges and on their students (accountants are almost forced to take correspondence courses); the retention of local-authority control, although it means that academic growth is prevented; and, above all, a complete misunderstanding until recently of where Britain's lack of education really hurts most. The nation is not so much short of an *élite* as of a mass of educated scientists, technologists and business-men, and the universities have been so obsessed with maintaining "standards" that the appearance on the international scene of nations which could have both an *élite and* a mass of educated persons was at first not noticed. As Dr. Cotgrove says, until recently there was no pressure-group for change; this book is one in itself.

So, too, is Dr. Edding's book. He has taken a number of countries (over twenty in some cases, but Germany, the United Kingdom, the United States, the U.S.S.R. and Japan in detail) and discussed the relation of education expenditure to economic growth. He finds that there is a close correlation between economic growth and rising education expenditure as a proportion of the national income; this assertion conflicts with the results of other studies, and may spring from an improvement in statistics as national incomes increase, as he himself admits. The richer a country is, however, the more education expenditure is likely to begin to fall off, and this is certainly true; the U.S.S.R., spending possibly nearly 8% of its national income, and Japan, with 6% are exceptions to this rule—the explanation lies in attempts to pull themselves up by their own boot-straps.

As education expands, so the length of time pupils stay at school grows and the size of their classes fall. In the United States average school and college life is well over thirteen years; in the U.S.S.R. the pupil–teacher ratio is 17 : 1 (about half the British). In the U.S.S.R. teachers are paid very well, and the quality of education is high; in the United States the contrary is the case, but in neither country is there any serious opposition to the idea of as much education investment being made in each pupil as he is

prepared to stomach. These two countries have passed a barrier which other countries, still wedded to an *élite* education, are approaching. Dr. Edding finds that despite differences over the form and content of educational provision, in general the economic problems are the same in all countries. Growth is closely dependent upon education, and the tendency is always towards more education being given to more people, rather than towards an unlimited expenditure on a very few.

His work points the way to rich rewards in international comparisons of these economic matters, and is a triumph over the limitations of national-income and education statistics. With some more heroic efforts the rewards will be attained. Even the Ministry of Education might see its way to more than one table in its annual report on the expenditure of the hundreds of millions it supervises.

JOHN VAIZEY

Oxford.

Managers, A Study of their Careers in Industry. By R. V. CLEMENTS. (London: Allen & Unwin, 1958. Pp. 200. 20*s*.)

THIS book is a useful and stimulating addition to the growing literature about industrial managers. It is based on interviews with 646 managers in twenty-eight firms in Lancashire and north-eastern Cheshire. The firms range in size from thirty-two employees to between 3,000 and 10,000. Most were either textile manufacturers or engineers, but about a dozen other types of light industry were represented. The men to be studied in each firm were determined by " rule of thumb methods in consultation with each firm." They usually include working directors, sales managers, works managers, the head draughtsman or designer, the chief engineer, the secretary, the accountant and the chief of research. The study is limited neither to directors, as was G. H. Copeman's, nor to very large firms, as was that by the Acton Society Trust.

Mr. Clements has exploited his statistical data very fully to present pictures of these managers according to their career patterns, social origins, mobility, type of departmental work, chances of reaching top management, as well as to assess historical trends in appointments since the 1920s. Of particular interest is his description of the attitudes of the men he interviewed, why they entered industry, their reasons for changing firms or remaining where they were, their assessments of their own training and experience, and their views of top management.

After warning the reader of the dangers of generalising from his data, the author presents his conclusions in a clear, concise, balanced and thoroughly readable manner—something which can be said of few studies of this type. This readability is achieved in part by discarding some of the usual scholarly apparatus. There is no bibliography, and footnote citations are almost all

cross-references. Non-academic readers are likely to be attracted by the absence of statistical tables in the text. They can skip the figures if they want and accept Mr. Clements' deductions from his careful study of them. Some of the supporting statistics are to be found in the Appendices, and the author is willing to supply others on request. Most of these figures are given in absolute numbers; the interested reader or fellow-researcher is invited to use the raw data to make his own calculations. Certain difficulties arise, the most serious being the failure to make any tests of significance. Because of this the author is led to report on one page that " rather fewer science than arts graduates or accountants are in top management or become directors " (p. 147), while a few pages later he gives rather a different impression of the same figures in stating that the " chances of science graduate managers becoming top managers appear to have been nearly but not quite equal to those of arts graduates " (p. 150).

The main conclusions are less equivocal, though the reader is occasionally left in doubt as to which are based on evidence and which on opinion. Mr. Clements finds that the types of manager who are gaining in importance are the specialist trained before he entered industry and the man with a secondary education who enters industry at the bottom, in manual or clerical work. He finds no reason to think that family recruits will decline in importance or that the number of arts graduates taken as management trainees will expand. Supply, he thinks, will be the limiting factor in both instances. The groups likely to lose ground are those designated as special entrants, men without qualifications who have started their careers in industry with certain social advantages, and the largest group in the sample, those who began in manual work after an elementary school education.

These possible trends reflect very largely changes in the educational world before 1944. But Mr. Clements does not think the 1944 Act will bring a change in the social origins of managers. Sons of working-class parents who attain management positions are tending to be better educated than formerly but not to increase their representation. Industry is leaving the selection of ability to the schools, where the writer feels the greatest wastage of potential talent takes place in the secondary modern school. Industry itself is making no contribution of its own to social mobility.

This conclusion is particularly disturbing in view of the high degree of immobility—both inter-firm and inter-departmental—which prevails among the managers studied. Many factors make for imperfections in the managerial market. The consequence is that this group of firms tends to recruit its managers internally but to pay little attention to discovering potential talent and systematically training and encouraging promising men. The *élite*, those with the greatest chance of attaining high salaries, top positions and directorates, tend to be pre-selected by their education and social advantages. They are accountants and science and arts graduates.

Finally, the author finds little evidence of the emergence of a profession

of management. Managers tend to be divided into discreet groups, each of which has specialist knowledge, distinct methods of recruitment and, to a great extent, different social and educational origins. His empirical evidence does not support a theory of a particular management function; until this is clarified Mr. Clements sees no point in experiments in education for management as such.

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London School of Economics.

Womanpower. A Statement by the National Manpower Council with Chapters by the Council Staff. (New York: Columbia University Press (London: Oxford University Press), 1957. Pp. xxxi + 371. 40*s*.)

Womanpower is a report by the National Manpower Council of Columbia University on the position of women in employment in the United States and the problems created by recent changes in this field. The report, which contains a considerable amount of detailed statistical material, traces the historical changes in the position of women in the labour market; examines the opportunities available to women in different types and grades of work and analyses the alterations which have taken place in the age and marital status of women at work. Considerable space is given to an examination of the educational opportunities available for girls and women, and to the relationship between the type of education a girl receives and her subsequent career. The social questions involved in the increased employment of married women are also discussed.

To British readers the most remarkable feature of this report is the close parallel between the development described and the changes which have been going on in the United Kingdom. In both cases a high level of employment coupled with a fall in the average age of marriage and in the age at which child bearing ceases has drastically altered the attitude of women towards employment at different stages of their lives. In both countries the most marked feature is the return of the older married woman to work, after her children have gone to school. According to the report:

> "Of mothers living with their husbands with children aged 6–17 (but not under 6) 35% were working in 1955. Since the majority of women marry before they are 21 and have their first child soon afterwards, a great many mothers no longer have children of pre-school age by the time they are 30. Today it has been estimated, the average mother is only 32 when her last child reaches school age."

In the United States, as in this country, the return of married women to employment is not caused solely by the need to work for the bare necessities of life, since the demand for employment opportunities is found in all income groups. In these circumstances it is not surprising to find in the United States the familiar emphasis on the need for schemes for retraining older women and for increased opportunities for part-time work.

In the detailed examination of the jobs which women obtain and the obstacles they encounter, the same resemblance between the two countries persists. In manual grades women have tended to be employed predominately in jobs regarded as "women's work," and have found great difficulty in gaining acceptance in employment traditionally established as "men's work." In the professional and executive groups two-thirds of all professional women are teachers or nurses, while less than 5% of all employed women are working as managers, officials, proprietors, and less than 15% of all managerial workers are women.

The volume contains a summary of recommendations by the Manpower Council which include improvements in vocational guidance for girls at school and also for older women through statutory and voluntary bodies; increased opportunities for education and training, both before marriage and for married women who wish to return to work; the removal of sex discrimination in employment and the need for employers to review their employment practices in the light of the type of woman now available for employment. The report emphasises the need to experiment more widely with the development of part-time work and flexible work arrangement and the necessity for greater research into the whole field of women's employment and its wider social implications. In the light of the changes taking place, it suggests that a comprehensive review should be undertaken by the Secretary of Labour into the potential use of the country's resources of woman power and the existing laws relating to the employment of women.

NANCY SEEAR

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The Costs of Education. By JOHN VAIZEY. (London: Allen & Unwin, 1958. Pp. 256. 30*s*.)

MR. VAIZEY has applied to education in the United Kingdom techniques similar to those used by Professor Titmuss and Dr. Brian Abel-Smith in *The Cost of the National Health Service in England and Wales*. A great deal of labour has gone into the collection and examination of data, and the author acknowledges help from a number of individuals, institutions and authorities; but it is evident that he himself is responsible for the remarkably clear and orderly exposition of the nature of the sources, the method of working and the conclusions which can be drawn. At every appropriate point he warns the reader when he must be cautious in accepting figures and estimates. The result is an excellent study, not by any means difficult to read despite the mass of detail handled in some chapters, which should be of great value to government and local authorities in formulating policy and carrying out administration.

In terms of 1948 prices expenditure on public education rose from £128 million in 1921 to £300 million in 1955. The greatest part of this increase was undertaken after 1946, when the numbers of young people undergoing education were increased, first by raising the school-leaving age and later by the entry into school of "the bulge." Mr. Vaizey is convinced, however, that—

> "population . . . was not the main factor in encouraging the growth of education expenditure. The immediate post-war years in the early twenties, the second Labour Government, the Chamberlain Government and the post-1945 years have in fact marked the fastest rates of growth. These years have been associated with high levels of economic activity . . . it is this which is the probable explanation."

It may indeed be true that a favourable economic climate, with its accompanying painless rise in government revenue, makes public and government more willing and better able to spend more money on education; but if prices—including the prices of educational requirements—are rising rapidly the increase in expenditure may not be matched by an equivalent flow of resources into education. Similarly, when economic activity declines and cuts in expenditure are made—as in the days of Geddes and May—their effects are not so severe as intended or feared. Thus it comes about that (if "social" expenditure on meals, milk and health services be excluded though capital is included) "Expenditure in 1955 was a lower proportion of the national income than in the pre-war years from 1931 to 1935. Expenditure until 1950 was a lower proportion than in almost any pre-war year."

To Mr. Vaizey "this is a striking and melancholy conclusion." In his foreword to the book Professor Titmuss says that an even "plainer comment" would be justified. Yet those who feel this way (as I do) must meet the criticism of others who will point out that it is inevitable that in bad times we should spend a larger proportion of our income upon necessities, and natural that in good times we should want to spend most of the additional income now available to us upon pleasure or upon newly discovered necessities such as motor cars or television sets. The average elector is perhaps inclined to think that present educational provision is reasonably good, if indeed it is not rather extravagant in parts. If we want him to demand something better we shall have to convince him not merely that he can afford it but that his children really need it and that a continuation of expansion in the economy requires a higher output of well-educated people, trained in the use of special skills, than we are yet producing. He must spend enough on buildings and equipment to provide for smaller classes and enough on teachers' training and teachers' salaries to ensure that those classes are adequately taught. Above all, he must be persuaded to "sacrifice" somehow the earnings which his more gifted children can make between fifteen and eighteen, or even between fifteen and twenty-two in order that they can secure the qualitatively different education which can be obtained only at those ages.

Mr. Vaizey is not a special pleader: at every stage he presents his facts objectively; but again and again the facts lend force to the arguments which the educators must put before the electors. For instance,

> "the parents earning less than £500 a year in 1951 derived £54 m. net benefit from the system, while those earning from £500 to £1,999 derived £30·4 m. benefit and those earning over £2,000 a year lost £84·7 m. . . . Since there are more children in the lower than in the middle income ranges, the benefit per child is two-thirds greater for the child in the middle class than for the working-class. This greater benefit is related to better opportunities available to the middle-class child in the more expensive parts of education, notable at grammar schools, direct grant schools and universities."

Making all reasonable allowances for the possibility (far too conjectural to have entered into Mr. Vaizey's calculations) that children of the professional classes may have some hereditary as well as social advantage over others, these facts indicate clearly that there is still a foolish, not to say shocking, waste of ability in our educational system. The remedy lies not merely in building additionally at the top of the pyramid, but in greatly strengthening its base and its middle storeys.

H. A. MARQUAND

London.

The Chemical Industry During the Nineteenth Century: A Study of the Economic Aspects of Applied Chemistry in Europe and North America. By L. F. HABER. (London: Oxford University Press, 1958. Pp. x + 292. 45*s.*)

"THERE are many histories of chemistry, few of the chemical industry," writes Dr. Haber; and in spite of Dr. and Mrs. Clow's study of the chemical revolution, a few more specific studies like Barker and Harris's study of St. Helens and biographical studies like Mr. Cohen's life of Ludwig Mond, the charge that economic historians have generally neglected the complex process of change in the chemical industry is broadly justified. Dr. Haber, the son of the inventor of the Haber process for the fixation of atmospheric nitrogen, is admirably qualified to fill the gap, and he has done it in this excellent survey. It is not, as he says, a complete account. He is principally concerned, on the inorganic side of the industry, with sulphuric acid, soda ash, caustic soda and bleaching powder—the four products which determined the rate of expansion in the industry as a whole. On the organic side, the emphasis again is on a few products and a single branch of manufacture—dyestuffs.

From the start, Dr. Haber relates his survey to economic conditions.

The rising output of cotton, linen, glass and soap increased the demand for vegetable alkali, while war obstructed the movement of this and other primary commodities. Better methods and materials were made possible by three discoveries: the lead-chamber process for manufacturing sulphuric acid, the Leblanc soda process and Tennant's bleaching process. (It seems to have been the milk shortage, for example, that drove Scottish bleachers to export cotton and linen to Holland for final bleaching.) The early improvements in sulphuric acid and soda manufacture were nearly all associated with French scientists; their introduction into manufacture more often took place in Scotland—a kind of scientific auld alliance. The English came into their own in the 1840s with men like Gossage and Muspratt, though the largest chemical works in Europe was still in Scotland—Tennant's business at Glasgow, which grew round the Scottish textile industry. Tyneside, though lacking salt deposits, throve on its cheap communications with the markets at Hull and London and in Europe. The famous "chemical triangle," bounded by St. Helens, Warrington and Widnes, was still a long way behind in the mid-century.

Once again, in the 1830s, as during the Napoleonic wars, the cutting off of imported supplies of traditional materials stimulated the search for substitutes. The disappearance of Sicilian sulphur, for example, led to processes for recovering sulphur from alkali waste, and for extracting it from gypsum and pyrites. The sulphuric acid process and the soda process gradually became closer together. This was the period when chemistry became fashionable in England and even the S.P.C.K. enlivened their publications with chemical information. University College, much under the influence of Scots and Utilitarians, was already teaching chemistry and added a chair of applied chemistry in 1845.

In America, meanwhile, Scottish principles as expounded by Black's pupils, predominated. By 1820 over twenty colleges were offering chemical instruction. Here, as in France and England, the necessities and deprivations of war proved a powerful stimulus to chemical inquiry and growth. Nowhere was scientific education pursued so systematically or successfully as in Germany; when the spectacular growth of British industry in the 1850s and 1860s slowed down, and even the powerful combination of Eugénie's fashions and the French dyehouses was proved to be economically limited in its effects, it was Germany that was forging ahead with the new dyestuff processes. A large part of the story of the relative decline of the British chemical industry at this period can be summarised in the decline of the Leblanc soda process and the "arrest" of the British dyestuffs industry. Against this must be placed the rise of Brunner Mond and the Solvay process.

Dr. Haber has produced a close-knit survey of world development in a vital industry. To say that it has a kind of massive competence is by no means to imply that it is dull, for its construction reflects all along the organic character of the growth and the dynamics that underlay it. The relationship between demand, fashion, war, social changes and the growth and changing technology of the chemical industry is never forgotten. The relative fortunes of the dye industry in England and Germany are analysed convincingly. So are the effects of technology on the size and structure of individual firms, on law, policy, labour relations and regulations. Nor does the author forget the contribution of individual entrepreneurs. Dr. Haber's book is not easy reading, but it repays the attention it demands; and it is indispensable for a balanced knowledge of industrial development in the nineteenth century.

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The Economics of Man-made Fibres. By DOUGLAS HAGUE. (London: Duckworth, 1957. Pp. 315. 30*s*.)

PROFESSOR HAGUE's book is one of those in the Industrial Innovations Series: a series of works by members of the Department of Political Economy, University College, London, in which an attempt has been made to investigate "the circumstances which predispose an industry either to welcome innovations or to obstruct them." Professor Hague has interpreted his brief widely. His discussion covers not only the problems involved in the manufacture of man-made fibres but also the impact of man-made fibres on the traditional textile trades. Indeed, well over half the book is devoted to this latter topic. The author points out that much of the information he gives about the man-made-fibres industry was already available in published form, but that a good deal of field study was necessary before the chapters on the use of man-made fibres in the traditional textile industries could be written. These chapters embody much interesting new material, but even the earlier chapters on the man-made fibres industry contain a fuller and more complete study of their subject than has previously been available.

The longest of the chapters on man-made fibres is naturally that which is devoted to rayon. Most of this chapter is taken up with a chronological account of the development of the rayon industry in this country. Attention is paid to innovations, but this is only one subject among many: price policy, cartels, international trade and the structure of the industry are among the other topics discussed. As an historical account this is well done, and Professor Hague has many interesting things to say on such matters as Courtaulds' price policy in the 1930s and on the historical reasons for the difference in character between Courtaulds and British Celanese before their merger. He also makes some shrewd judgments about what rayon producers were thinking about future markets in the immediate post-war period. The structure of the chapter, however, precludes a full discussion

of such questions as costs of production in the industry and the relationship between costs, scale of output and price policy. Professor Hague's remarks on this subject are not entirely clear, and could have been amplified with advantage. Another question that is dealt with rather cursorily is that of the strength of the British rayon industry in relation to its competitors overseas.

Professor Hague devotes a good deal of space to man-made fibres other than rayon, principally nylon and terylene, and tells the fascinating story of the invention and development of these fibres in some detail. He contrasts the amount of research devoted to the discovery of nylon and terylene, and points out that although terylene was discovered comparatively cheaply because of the pioneer work that had already been done on nylon, the expense required to bring terylene to commercial production was on the same prodigious scale as that for nylon. He concludes that "whilst the inventor of a man-made fibre need not always spend a fortune on doing so, the commercial innovator has to be on the scale of a Courtaulds or an I.C.I."

The second part of the book, on the impact of man-made fibres on the traditional textile trades, contains chapters on the hosiery trades (written in conjunction with D. Berry), the cotton industry, the wool textile industry, and textile finishing. There is a final chapter of general conclusions. In these chapters Professor Hague sets out very fully all the relevant statistics and provides new figures of his own on some topics. He has based these chapters on wide reading, much of it in the technical journals, as well as on interviews, and one admires his grasp of technical detail in the textile and engineering fields. Sometimes it is a little difficult, especially when faced with a large number of statistical tables, to see the wood for the trees in these chapters; nor are they always easy reading, but it is well worth the effort for the considerable amount of valuable detail that they contain. Among many other subjects, Professor Hague has much of interest to say on the conditions under which rayon is substituted for cotton, on geographical specialisation in rayon in Lancashire and on the relationship between size of firm and willingness to introduce man-made fibres. He reaches the conclusion that the enthusiasm of the textile industries for new man-made fibres seems to have varied in proportion to the suitability and desirability of the fibre in question, and that there is no evidence that the traditional textile industries have failed to interpret and meet the demands of consumers for fabrics containing man-made fibres. Where the traditional textile industries have been least successful, in his view, is in the machinery field, but Professor Hague suggests that this is only one aspect of a malaise that appears to affect the textile-machinery industry as a whole.

Professor Hague's general conclusion on the subject of the man-made-fibres industry itself is that monopolistic and competitive forces are present in the industry in more or less the right proportions. He was writing before the merger of Courtaulds and British Celanese, but it seems unlikely that he would want to modify his conclusions greatly in the light of that event. As he points out, rayon faces so much competition from natural fibres, as well as from other man-made fibres, that rayon producers have every incentive to manufacture as efficiently as possible and to seek actively to improve their product.

In his introduction Professor Hague says that he has written, in effect, an economic history of the man-made-fibres industry. This is indeed a better description of the contents of the book than that implied by its title, which suggests a more extended economic analysis of the industry than we are in fact given. In the field he has chosen to write about, however, Professor Hague has covered a very wide canvas and has presented a great deal of new information in a clear and interesting manner. All students of the textile industries must certainly read his book.

AUBREY SILBERSTON

St. John's College,
Cambridge.

The Economic Development of Radio. By S. G. STURMEY. (London: Duckworth, 1958. Pp. 284. 30*s.*)

THIS is one of a series of case studies on industrial innovation presented by economists at University College, London. Dr. Sturmey has chosen the radio industry for his consideration and more specifically three major innovations in its development—marine navigation, point-to-point communications and broadcasting. He seeks to answer two main questions—What have been the main conditioning forces of technical progress in these fields? Which is the industrial structure most conducive to the rapid invention and application of new processes and techniques?

It is not long before we learn that, of the various determinants of innovation in the radio industry, two stand out as being of especial significance—Government policy and the conditions surrounding the entry of new firms. Concerning the former, following its early established control over coastal wireless stations and internal telegraphic communications, the State has influenced the application and development of radio in three main directions: first, by its interest in the organisation of overseas radio services; secondly, by its monopoly of domestic broadcasting; and thirdly, by its large-scale purchase of wireless equipment. Dr. Sturmey believes that such a participation has both retarded and accelerated technological growth. For example, on the one hand, he cites the Post Office as frustrating the speedy introduction of an Imperial radio network by its refusal to grant an operating licence to the Marconi Company (which was prepared to undertake the necessary installation work) at a time when it had neither the facilities nor the desire to offer any alternative system; on the other, he suggests that the decision of the British Broadcasting Corporation to experiment with the Baird system of television transmission in 1929 was a risk which, at that time, competitive systems in other countries were not prepared to take.

Economic theory rightly acknowledges the importance of entry conditions as a factor influencing market situations and pricing policy, but Dr. Sturmey has provided us with some very valuable empirical evidence of its effects on the rate of technical progress. As regards the radio industry, it appears that while structural factors largely control the *ability* of a firm to innovate, it is the conditions surrounding entry which will determine its *desire* to do so. In general, Dr. Sturmey argues that progress is most likely to be rapid where entry is unimpeded and where the existing competitive structure is oligopolistic. Naturally, of course, the exact nature and significance of the external stimuli will vary over time and according to the section of the industry being discussed. Thus the early conditions of entry in the domestic radio industry were such that a prospective entrepreneur needed to possess only the minimum of capital and technical knowledge to supply broadcast receiving sets. But to-day in some of the more complex branches of the industry, where research is an important determinant of progress, large initial capital requirements preclude any such Marshallian influx of firms. Instead the main source of potential competition originates from established firms on the fringe of the radio industry whose productive capacity is sufficiently flexible to produce radio apparatus should the need arise.

Any attempt to label a particular type of industrial structure or condition of entry as being that most conducive to innovation is further complicated for two other reasons. First, even within a particular industrial structure the competitive relationship which exists between firms producing the same products is rarely a symmetrical one. For example, the electronics industry consists of three types of firms—the branchers, specialisers and assemblers. By definition, however, the first group of firms (which are amongst the largest in size) compete in other fields, and in consequence are less likely to be affected by than to affect their competitors' policy. Secondly, Dr. Sturmey's conclusions apply primarily to what he terms the *evolutionary* innovations or those consisting of " the use of a greatly improved technique, or a new technique which is related to existing techniques, to do something which is already being done " (p. 258). As for the *revolutionary* innovations, which arise on the introduction of a completely new technique or product likely to affect profoundly the course of development, for instance, radio for point-to-point communications, television, wire relays and the like, these, it would seem, rarely originate from within the industry itself whatever its structure.

There is much to attract the economist in Dr. Sturmey's book. In spite of a not very propitious start with a highly technical account of the development of the valve, the author soon shows where his main interests lie. Chapters VIII and IX, which trace the origin and development of domestic broadcasting, perhaps contain the best case material for the applied economist, and it is here too that we are given a brief description of the present-day structure of the radio industry. However, this is very much an *obiter dicta*, and it is a pity that Dr. Sturmey did not feel able to extend his researches a little further in this respect, and also provide us with more statistical data about this fascinating but little studied industry. Nevertheless, the book, as a whole, shows evidence of a very thorough and competent piece of research, presented in a way which makes absorbing reading. The author has also produced a number of interesting by-products. Teachers of elementary economics have cause to be grateful for a very good practical illustration of the significance of demand elasticity to add to their repertory (pp. 75–6); students of monopoly will find much to intrigue them in Chapter XI, which is devoted to the subject of patents; and those who wish to be reminded of ways in which foreign capital and enterprise may affect an industry's technological growth are given a number of illuminating glimpses (pp. 171 and 264 among others) into the role played by American affiliated firms in the British radio industry's development.

J. H. DUNNING

University of Southampton.

Inland Transport. By C. I. SAVAGE. *History of the Second World War, United Kingdom Civil Series.* (London: H.M. Stationery Office and Longmans, 1957. Pp. xvii + 678. 47*s.* 6*d.*)

MR. CHRISTOPHER SAVAGE writes in detail of inland transport in the United Kingdom during the Second World War. He begins with an account, necessarily sketchy since so little is known, of the trade from 1920 to 1939. We are told of the preparations made before September 1939 in expectation of the outbreak of war, most of which were misconceived, principally it appears because Government—or at least, the departments of Government chiefly concerned—over-estimated both the efficiency of aerial attack and the latent capacity of the railways to handle an increased traffic. The railway companies, moving less freight and passengers in the third decade of the twentieth century than in the first, argued that their equipment was therefore under-utilised. Government, fearful of attack from the air, foresaw the closing of the east coast ports and the need for a wholesale diversion of imports to the west. Air attack on the east was more severe and the losses of landed cargo might certainly have been less had it been possible to divert more. But road transport was deliberately confined to conserve fuel and the railways just could not handle the load. The number of passengers was rising and journeys were lengthening. There was no rationing of travel by train, and passenger services could not be cut by the 70% which had been assumed. The Ministry of Transport finally came to realise that freight in unaccustomed places and consigned over unusual routes could not be handled with the expedition demanded by war unless traffic were transferred from the railways and not to them. The unpleasant fact was not fully recognised until the winter of 1940/41. The

initial mishandling of transport must by then have been aggravating the direction of the war economy at large.

Mr. Savage's exposition is dictated by the circumstances of the times of which he writes. His period falls into four—prelude, comprising the months of the " phony " war in 1939 and 1940; twelve critical months in 1940 and 1941 when the battle was joined; austerity from 1941 to 1944; victory and preparation for reconstruction in 1944 and 1945. The course of events for each of the agencies of inland transport—railways, road passenger, road goods, canals and inland waterways and coastwise shipping—is recounted separately in these chronological divisions and we are provided with a discussion of the administrative problems calling for resolution. This reader, at least, did not realise (though no doubt he should have) that the Ministry of Transport had already anticipated in the war-time Road Haulage Organisation the fabric on which the British Transport Commission were able to build so unexpectedly rapidly the nationalised services of the Road Haulage Executive.

The reviewer was impressed by the machinery which had to be elaborated " to ensure that diversions of Government traffic from one form of inland transport to another were made with the object of using all available capacity to the best advantage and *not because of the difference in charges* " (p. 565, reviewer's italics). He knows the good reasons there are for not interfering with prices during war. But resources might have been allocated so much more effectively if the prices of the competing services had been used to work with the machinery of direction instead of against it. This is surely simple enough. But it is a truth the relevance of which does not seem to have been grasped by those responsible for transport policy until at least 1953. That was ten years after the railways had first been run as one by the Railways Executive Committee and as long after an official Road Haulage Organisation had had to be brought into being by the Ministry of Transport specifically to resolve the problems created by the attempt to supersede, in handling the large block of traffic consigned on Government account, " the normal economic criterion of cost in determining by what means a particular traffic should move " (p. 586).

Transport, considering the value of its contribution to the gross national product, is most inadequately recorded in the statistics. Passengers carried by public-service vehicles (buses) have been returned since licensing began in 1930. The deficiency, so marked in the statistics of freight, has now been made good, in part at least, by the survey of the work done by a sample of lorries and trucks undertaken by the Ministry of Transport in 1952 and repeated again this year. But there was not even this much during the War. Mr. Savage on no less than eighteen occasions has to observe how the lack of adequate statistics added to the burdens of administrators.

Mr. Savage has written a book which, though undoubtedly long, is both interesting and informative. Official memoranda are reproduced in

appendices to the relevant chapters, together with statistics and notes. Twelve tables are collected at the end and there is an index of seventeen pages. This contribution to the History of the Second World War should be as useful to the historian of democracies wrestling with the problems of total war as it was to one student at least of the economics and organisation of transport.

GILBERT WALKER

University of Birmingham.

The Regulation of Rail–Motor Rate Competition. By ERNEST W. WILLIAMS, Jr. (New York: Harper, 1958. Pp. ix + 247. $4.50.)

THE Interstate Commerce Commission is the body authorised by the Congress of the United States of America to administer the Transportation Act of 1940. That Act declares the recognition and preservation of the inherent advantages of carriers by rail, water and road motor to be a part of the national transportation policy; but the Act and the Commission between them have, so we are told, tended instead to confirm the competitors " in whatever areas they may have been able to carve out for themselves " (p. 15). Professor Williams describes, with a wealth of citation, how the Commission have decided the rates which should be charged for the services of competing carriers. With an appreciation of change which the British Railways never gave the appropriate authority (wasn't it the Railway and Canal Commission?) an opportunity of showing, the I.C.C. have been prepared to allow competition to justify the creation of a preference which might otherwise have been undue and therefore illegal; and they have on occasion accepted a reduction which brought rates for the longer distance below the shorter in apparent disregard of the long- and short-haul clause. But they have been careful not to allow reduction by more than the amount demanded by the competition of which complaint was laid and they have at all times sought to ensure rates which would offer a reasonable compensation to the carrier.

The rates published by the motor-rate bureaux and filed with the Commission may not be the charges actually made by the individual and often highly independent motor carriers and the amount with which the trader debits himself as the cost of doing his own carrying is not brought within the jurisdiction of the regulating authority. The first is a possibility not really considered by Professor Williams—it is not in any case subsumed under his title—but he refers on many occasions to the impact of competition, realised or potential, from traders who do, or who might, carry their own goods. The private carrier is a nettle which neither Congressmen nor Members of Parliament have so far grasped. They may have to before long.

Regulation in the United States, as in the United Kingdom, far from co-ordinating has helped to dis-ordinate transport. Motor carriers " are retained and encouraged further to develop in a service for which they have an apparent cost disadvantage " (p. 214), a situation which " maintains an excessive number of carrier services all operating at unit costs above the attainable optimum " (p. 215). To insist that rates by rail and road be the same and to eliminate differences otherwise justified by cost deprives the trader of effective choice. Uncontrolled competition shows " *no* tendency to reach an equilibrium position " (p. 225). Competition between railways supplying a heterogenous output from a common equipment with carriers by road able, or so it is believed, to arrive at a significant figure for their fully allocated costs is still the problem. The Cost Finding Section of the I.C.C. have been elaborating their inquiries but these awkward questions are as little resolved now as they were twelve years ago when the reviewer was writing about the territorial (motor) class rate investigations first opened in 1937 and 1938. Professor Williams, on his final page, remarks that the Commission " thus far have not faced the issue " of one carrier able to cover all his costs at a rate which leaves another something over his out-of-pocket expenses but not enough, may be, to avoid the imposition of " an undue burden on the aggregate of transport costs."

Professor Williams assumes a greater knowledge of the powers and practice of the I.C.C. than most English students are likely to possess. He makes use, too often to one reader's mind, of those ellipses which trans-atlantic authors (mistakenly) consider an aid to brevity. The clarity of his many references and footnotes suffers from *ibid.* and *loc. cit.* On p. 82, three pronouns in lines 8 and 9, all in the third person plural refer to two distinct subjects. The meaning can be guessed but the expression is needlessly ambiguous. Cases cited occupy nineteen pages—a useful list but one which would have been so much more valuable had the cases been arranged under the precedents to which each leads. There is no index, as there certainly should be in a book of this kind. But these defects must not be allowed to obscure the value of Professor Williams' considerable contribution to the practice of price fixing in a controlled but a competitive market.

GILBERT WALKER

Birmingham University.

Pre-famine Ireland, a Study in Historical Geography. By T. W. FREEMAN. (Manchester: The University Press, 1957. Pp. viii + 352. 35*s.*)

BEFORE the famine Ireland had two economies, one a primitive subsistence economy in which three-quarters of the people lived and the other a commercial-exchange economy linked with Great Britain. The famine represented the final catastrophe of the primitive economy, and the outflow

of people and the inflow of cash merged the whole of Ireland into the economic system of the British Isles. After so great an emigration for so long, the detritus of the old order survives; the visitor to Ireland is shocked by the dereliction and decay, some of it dating from the withdrawal of the active commercial classes at the time of the troubles, but much of it showing the wide extent of the old order and the failure of the new economy to make use of its marginal land and its unsophisticated labour. A subsistence economy uses all resources with equal intensity, because specialisation is limited; when the market arrives, the least rewarding parts of the soil are abandoned.

Professor Freeman's book draws a picture of the two economies just before they coalesced. He has made wide use of contemporary and secondary sources, as well as his more intimate topographical knowledge, to reconstruct the economic life of Ireland before the famine. The book has useful maps, and (apart from an inadequate index and the infuriating practice of putting references at the back) it will serve as a valuable aid to the historian of the Irish economy. It would have been strengthened had it made use of modern economic analysis, because in its pages the basic economic explanation of the famine is not touched on; the monetary history of Ireland is neglected and the significance of the absence of money in the subsistence economy is not grasped. Within these limitations, however, the book raises many interesting questions and confirms much that is known about the pre-monetary economies.

The basic Irish paradox is how so primitive an economy endured for so long alongside the most advanced economy in the world. The major explanation has to do with deflation after 1815, when the Irish currency was drastically revalued, but there are other factors—the different language, the persistence of Roman Catholicism and the continual threats of treason which frighten away venture capital. The usual explanations are, in a sense, all subsidiary to these, because the dependence on the potato, the overcrowded land, the primitive techniques, the lack of town life and the rate of saving were all manifestations of the subsistence economy and not reasons for its existence. A second problem is the lack of growth in the exchange economy. This is mainly explained by the area's monetary history and especially the severe deflation, but the lack of raw materials, poor communications and lack of an effective entrepreneurial class played their part. As Professor Freeman points out, however, all these difficulties have been exaggerated; Ireland's sea and canal communications were good, and the railways when they came were adequate—and little used; there were some raw materials; and there were some entrepreneurs. Possibly the country was in a sense swamped by the great army of under-employed which made any attempts to improve the country seem puny beside the problem they were designed to solve.

Out of an employed population of 3½ millions in 1841, 52% were engaged in agriculture, 25% in textiles and clothing and 20% in domestic service.

This is a division of labour which yielded an adequate but unexciting standard of living; the potentialities of development seemed to be too difficult to discover. Professor Freeman's study is valuable because it emphasises the immense amount of change that was already taking place before the famine; the old order was already breaking down and would have passed even if the potato had not failed for five years in succession. The local variety of a subsistence economy provides the points of growth whether or not a tide of disaster sweeps away the economy in which they stand.

JOHN VAIZEY

Oxford.

Harold Adams Innis. Portrait of a Scholar. By DONALD CREIGHTON. (Toronto: Toronto University Press (London: Oxford University Press), 1957. Pp. 146. 24*s*.)

" IN the first pale fine days of early March, he foraged about for bits of firewood, while the maple sap bubbled lusciously in the great iron kettle " (p. 9). It conjures up for me a memorable Easter week-end at the Innis' home in Oxford County, Ontario. The night before we had fixed the tins on the trees: early next morning lighted our shallow fire, fed it with sticks hour after hour, scooping away the froth and talking the while of Veblen, " tie-ins," Canadian Wheat Pool and the amiable weaknesses of our friends. That evening his mother cleared the syrup by stirring it with a linen bag of egg-shells and next morning we had it for breakfast. Mr. Innis, senior, told us of the days when they worked with their iron kettle along a concession, and Harold's brother, Sam, showed me over his new tobacco-curing plant.

In this delightful study of Harold Adams Innis (his mother was an Adams) Dr. Creighton tells the story of a scholar and a school, the scholar a great economic historian, the school a distinctive school of Canadian economic history, of which he was the leader. In a fruitful life, hard but not harsh, there was but one deep shadow, the cancer that killed him at fifty-eight, aggravated, perhaps, by the multiple activities that forced themselves on him in his last years. We follow him from Section School, High School, Collegiate Institute, Woodstock (where he met Hubert Kemp), to McMaster University, housed then beside the University of Toronto: its building (since the removal to Hamilton) the *ultima domus* of Innis and the Department of Political Economy, of which he became the head in July 1937. He took his Ph.D. at Chicago (subject " The History of the Canadian Pacific Railway "), meeting there his future wife, Mary Quayle, herself later a writer in his field and now Dean of Women in Toronto. In July 1920 he accepted a lectureship in economics in the University of Toronto. A year later I joined the Department, and was his colleague for ten years. His History, with its long

geographical introduction, furnished the motif of his future thought; for it taught him that the C.P.R. had, through the new medium of rail transport, recaptured an older economic unity, based on the St. Lawrence and Great Lakes. " The present Dominion emerged not in spite of geography, but because of it "—in his own words: and he applied this leading idea to a survey of the staples of Canadian history, produced on one continent and sold to another by direct east–west contacts of French and English provenance.

In *Trek* (*Economic History Review*, 2nd series, Vol. X, No. 3), Sir Keith Hancock speaks of " a man like Harold Innis who found the dynamic of Canadian growth in a procession of markets—for fish, furs, timber, wheat, metals." But he was very far from indifferent to personality. Indeed, it was in the scope for individual initiative that he found the connecting thread of his commodity studies. He was, of course, greedy for documents, but he belived in boots as much as books, and that took him in a canoe to the mouth of the Mackenzie River in 1924. In a chapter on the Canadian Maritimes for the *Cambridge History of the British Empire*, under our joint names, I supplied the frills of style and he the governing idea and supporting facts for a maritime economy, rugged, like its coast-line, and facing the sea, which had brought its prosperity, but compelled now to turn landwards, losing thereby some of its institutions and ablest men to the continental mainland north and south of the border—a theme which he developed later in his collateral Report of 1934 to the Royal Commission on Nova Scotia. I read, I think, all he wrote in book form down to his magnum opus of 1940, *The Cod Fisheries, the History of an International Economy*. This last I made my bible during my two summers in Newfoundland, 1952 and 1953; and it never failed me.

From 1938 onwards, honours (and duties) crowded on him: 1938, President of Canadian Political Science Association; 1945, air trip by invitation to Moscow and Leningrad, from which he returned with strong views upon the need for co-operation between Russia and the Anglo-Saxon world; 1946, President of Royal Society, Canada; 1947, Dean of Graduate School; 1948, Beit Lecturer, Oxford (Empire and Communications); 1948–49, Royal Commission on Transportation, involving an exhausting programme of mid-weeks at Ottawa and busy week-ends at Toronto; 1951, President Elect of American Economic Association. Chicago sought to get him back on his own terms towards the close of the Second World War, but he was too devoted to Canada and its problems to leave his native country, especially at a time when he was holding the academic fort for the youth who would be shortly returning, as he had returned, a wounded gunner, from Vimy Ridge in July 1917. Strangely enough, with my Machine Gun Company at Lens, I must have been close to him that spring! When we met at Toronto in 1921, he found me, I know, rather " imperialistic," but it did not take me long to find that his was the sort of imperialism after which I was feeling.

Alfred Marshall, Maynard Keynes, General Lindsay of the Machine Gun Corps, Harold Innis—truly in my friendships I have been blessed above the ordinary.

C. R. FAY

Belfast.

Stability and Progress in the World Economy. The Record of the First Congress of the International Economic Association, with Addresses by DENNIS ROBERTSON, JACOB VINER, FRANCOIS PERROUX, GOTTFRIED HABERLER and ERIK LUNDBERG. Edited by D. C. HAGUE. (London: Macmillan, 1958. Pp. xv + 267. 25*s*.)

THE first Congress of the International Economic Association held in September 1956 was a very memorable occasion for all who attended it. First, there was the delight of being in Rome, which in the new Italy has now more than ever become an attractive city to visit. Then there was the opportunity of an audience with the Pope (of which I am afraid I was one of the few not to take advantage). Above all, there was the kindness and hospitality of Professor Papi, both an economist of international reputation and the Rector of the University. Secondly, the Congress provided a unique opportunity of meeting colleagues from other nations. For the young there was the satisfaction of being face to face with the owners of famous names; there was Sir Dennis Robertson dissecting the problems of the advanced countries with his usual charm, and there was François Perroux, bubbling with ideas; for the more experienced there was an almost equal interest of meeting the rising generation of economists of other countries, perhaps specially the West Germans, who were almost unknown to us. Finally, there was the pleasure of welcoming for the first time at an I.E.A. meeting economists from the iron curtain countries: Russia, Czecho-Slovakia, Hungary and Poland.

This volume of the proceedings, ably edited by Professor Hague, is a worthy memorial of the Congress. Those who now read the contributions for the first time must, however, not be surprised that the originality of the thought as it emerges in the record is rather less than might have been expected from such an august assembly. In a meeting of this sort it is always in the off-stage discussions, in little groups in cafés (aided no doubt by cassatti and vermouth), that the most progress is made, and these cannot be recorded. Further, there was a real difficulty in getting ideas of any complication across to such a large and heterogeneous audience.

The procedure laid down was in most cases fruitful and appropriate. The main contribution was followed by two set criticisms by equally experienced economists, who had had the opportunity of a preview of the paper; the subject was then thrown open for general discussion. The technical arrangements were as good as could be; microphone for the speakers, earphones (with most useful amplification) and simultaneous translation (which, however, obscured the meaning as often as it clarified the words), these ought to have enabled everyone to follow. But in fact it was extremely hard to grasp the whole of a close-knit argument, including the qualifications, and this led to a good many misunderstandings. (Professor Viner's paper suffered especially.) Speakers thus faced an awkward dilemma between being too subtle to be followed and too obvious to be interesting.

Perhaps the most successful contribution in this respect was that of Professor Lindahl, speaking second to Professor Haberler. The question at issue was whether full employment could be maintained indefinitely without an intolerable degree of inflation, a very burning problem in 1956 when it was still uncertain whether monetary authorities would face up to a tough credit squeeze, and if they did whether it would be effective in modern conditions. Professor Haberler had put his faith in the growth of productivity in the United States, and presumably in its ability to carry other nations with free institutions along with it. Professor Lindahl, with a faith that has already largely been justified, stoutly argued, first, that a profit inflation *could* be brought under control by monetary means, and secondly, that a cost (wages) inflation could be treated in a number of ways, especially since countries with strong trade unions tend to be countries with a sufficiently high standard of general education for workers to be able to understand the economics of the situation. Professor Lindahl stressed particularly a point which has since received a great deal of attention: the importance of being able to assure workers of a reasonably steady price level.

Perhaps the most distinguished paper was that of Professor Viner. It also gave rise to the liveliest (and most acrimonious) discussion, as will be apparent from the Proceedings. Professor Viner was (no doubt deliberately) provocative, in particular in his condemnation of the use of the concept of Disguised Unemployment in underdeveloped countries. He went so far as virtually to deny the existence of the phenomenon, although with an important qualification which was almost universally missed. Professor Viner assumed that it was claimed by the protagonists of the concept that *long-run* zero or even negative productivity could exist among peasant farmers. In discussion it became evident that Professor Vakil and his friends had in mind a much less restrictive definition, and indeed were putting a lot of faith in the possibility of raising agricultural productivity by small improvements in practices, many of which would require only minimal investment.

Other important contentions of Professor Viner were that while the evils of inflation may well be less in underdeveloped countries where long-run bonds and long-term contracts are relatively unimportant, the possible benefits, providing incentive for investment and scope for forced saving, are not likely to be substantial. It was also very usefully emphasised that in respect of external economies it is the economies *net* of diseconomies that matter, a point that is frequently overlooked by planners. In respect of population problems

Professor Viner pointed out that these may be serious, quite apart from the rate of increase, if there is an excessive ratio of present population to natural and other resources, a high ratio of present population to labour force, or a high ratio of dependants to total population. Of all resources, only human scarcity is desirable, and a complicating factor is the extreme cheapness of medical aid in improving health and expectation of life, far cheaper than any other " aid " which developed countries can bestow.

A final warning: notwithstanding the title of the book, readers will find very little about stability and progress in the world economy. Everyone argued in terms of the country or countries which were known to him. The approach was in this sense more micro than macro. Professor Lundberg alone (International Stability and the National Economy) could not escape from the world economy, and consequently found that he had far too many things to talk about for the time allotted to him. However, in the long run, the most important thing about the Congress was the personal give and take which it promoted. Professor Dyachenko put this nicely when he expressed the wish that " our contact that has been started at this Congress, be constant and fruitful, in the interest of the development of economic science and in the interest of the economic progress of all peoples." I hope that he would agree that in the two years which have elapsed since that time we have made some definite progress along the right path.

URSULA K. HICKS

Oxford.

NOTES AND MEMORANDA

CONSISTENCY BETWEEN SAY'S IDENTITY AND THE CAMBRIDGE EQUATION

THE impression is sometimes given that the introduction of a quantity-theory equation to determine absolute prices in a Say's Identity economy is an inconsistent procedure, *i.e.*, that a system of equations consisting of: (*a*) a set which satisfies Say's Identity, and (*b*) the Cambridge equation, for example, is necessarily self-contradictory. The purpose of this note is to show that two standard proofs which have been advanced to demonstrate this proposition do not support it.

Consider an exchange economy with $(n-1)$ commodities and paper money. We have

$$D_j \equiv f_j(p) \tag{1}$$

$$S_j \equiv g_j(p) \tag{2}$$

$$D_j = S_j \ (j = 1, \ldots n) \tag{3}$$

(1) and (2) are the demand and supply equations, (p) is shorthand for $(p_1, \ldots p_{n-1})$ ignoring p_n (assuming $p_n \equiv 1$ for paper money), and (3) are the equilibrium conditions. The above may be simplified by

$$D_j - S_j \equiv X_j(p) \tag{4}$$

to

$$X_j(p) = 0 \quad (j = 1, \ldots n) \tag{5}$$

Accepting Walras' Law, a tautology, we have

$$X_n(p) + \sum_{i=1}^{n-1} p_i X_i(p) \equiv 0 \tag{6}$$

where $X_n(p)$ is the excess demand for money. It follows from (6) that equations (5) are not independent.

Consider now the $(n-1)$ equations

$$X_i(p) = 0 \quad (i = 1, \ldots n-1) \tag{7}$$

which involve $(n-1)$ variables. It is assumed that the D_i and S_i, and hence the $X_i(p)$ $(i = 1, \ldots n-1)$, are homogeneous of degree zero in (p). That is,

$$X_i(p) \equiv X_i(\lambda p) \quad (i = 1, \ldots n-1) \tag{8}$$

We can deduce from (6) the identities

$$\lambda X_n(p) + \lambda \sum_{i=1}^{n-1} p_i X_i(p) \equiv 0 \tag{9}$$

and

$$X_n(\lambda p) + \sum_{1}^{n-1} \lambda\, p_i X_i(\lambda p) \equiv 0 \tag{10}$$

and from (8) we can get

$$\lambda \sum_{i=1}^{n-1} p_i X_i(p) \equiv \lambda \sum_{i=1}^{n-1} p_i X_i(\lambda p) \tag{11}$$

Hence, from (9), (10) and (11),

$$\lambda X_n(p) \equiv X_n(\lambda p) \tag{12}$$

i.e., $X_n(p)$ is homogeneous of degree one in (p).

Now Say's Identity is

$$-\sum_{i=1}^{n-1} p_i X_i(p) \equiv 0 \tag{13}$$

This and Walras' Law (6) give

$$X_n(p) \equiv 0 \tag{14}$$

i.e., excess demand for money is identically zero. More pointedly, (12) and (14) give

$$X_n(\lambda p) \equiv 0 \tag{15}$$

so that, since λ is arbitrary, (p) is indeterminate in the system.

However, it is possible that relative prices $z_i \equiv p_i/p_{n-1}$, $p_{n-1} \neq 0$, are determinate. Referring to (8), we set $\lambda = 1/p_{n-1}$ and get

$$\begin{aligned} X_i(p_1, \ldots p_{n-1}) &\equiv X_i(z_1, \ldots z_{n-2}, 1) \\ &\equiv Z_i(z_1, \ldots z_{n-2}) \quad (i = 1, \ldots n-1) \end{aligned} \tag{16}$$

Then (7) and (16) give

$$Z_i(z_1, \ldots z_{n-2}) = 0 \quad (i = 1, \ldots n-1) \tag{17}$$

We see that (17) is $(n-1)$ equations involving $(n-2)$ variables. This fact, however, is not sufficient ground for the inference that the system is therefore inconsistent. When a system of m equations involves $r < m$ variables the *a priori* conclusion is that the system is either: (a) not consistent, or (b) not independent. (See W. B. Hickman, "The Determinacy of Absolute Prices in Classical Economic Theory," *Econometrica*, XVIII (1950), pp. 9–20. This presentation essentially follows Hickman's.) Hence, if it is assumed that the system is consistent it can be concluded that it is not independent, *i.e.*, any solution of $(n-2)$ equations in the system is a solution of the $(n-1)$th equation. But also, we cannot say without more information that there is a unique solution for the z_i.

Include now the Cambridge equation in the form

$$k \sum_{i=1}^{n-1} p_i S_i = M \tag{18}$$

Since $p_i \equiv z_i \cdot p_{n-1}$, this is the same as

$$k p_{n-1} \sum_{i=1}^{n-1} z_i S_i = M \tag{19}$$

If equations (17) have a unique solution, absolute prices can then be determined by observing that the S_i $(i = 1, \ldots n-1)$ are homogeneous of degree zero,

$$S_i \equiv g_i(\lambda p_1, \ldots \lambda p_{n-1}) \quad (i = 1, \ldots n-1) \tag{20}$$

so that putting $\lambda = 1/p_{n-1}$ and $z_i \equiv p_i/p_{n-1}$, (20) is

$$S_i \equiv g_i(z_i, \ldots z_{n-2}, 1) \quad (i = 1, \ldots n-1) \tag{21}$$

Consequently, with the z_i known from (17) the S_i are determined. Substituting them into (19), the value of p_{n-1} is determined, since M and k are given constants. Then $p_1, \ldots p_{n-2}$ are also known from $p_i \equiv z_i \cdot p_{n-1}$.

This procedure was claimed by Lange to be self-contradictory (O. Lange, "Say's Law: A Restatement and Criticism," in *Studies in Mathematical Economics and Econometrics*, ed. O. Lange *et al.* (Chicago, 1942), pp. 49–68). According to Lange, (19) is not compatible with Say's Identity. His argument is as follows: The equation

$$k p_{n-1} \sum_{i=1}^{n-1} z_i S_i - M = X_n(p) \tag{22}$$

is true. But (14), deduced from Say's Identity, is

$$X_n(p) \equiv 0 \tag{23}$$

Hence, Lange says, we obtain

$$k p_{n-1} \sum_{i=1}^{n-1} z_i S_i \equiv M \tag{24}$$

"*i.e.*, an identity, which holds for *any* value of p_{n-1} and, therefore, cannot serve to determine p_{n-1}. But k cannot be constant and must be indeterminate to adjust itself to any value of p_{n-1} so that the identity be satisfied" (*op. cit.*, p. 65).

It is sufficient to point out here, what seems to have escaped notice, that the inference from (22) and (23) to (24) is not valid. The last is a relation stronger than that contained in (22). The form

$$\begin{aligned} A - B &= C \\ C &\equiv 0 \\ \therefore A - B &\equiv 0 \end{aligned}$$

is invalid.

Patinkin's proof in his *Money, Interest, and Prices* (Evanston, Ill., 1956, pp. 334–5) is based on the proposition that the excess demand function for money in the Say's Identity system has a formal property which that function as contained in the Cambridge equation does not possess. *I.e.*,

$$-\sum_{i=1}^{n-1} p_i X_i(p) \tag{25}$$

which is the excess demand function for money (see equation (6)), is homogeneous of degree one in (p), while

$$k\sum_{i=1}^{n-1} p_i S_i - M \tag{26}$$

expresses the excess demand function for money in the Cambridge equation and this expression is non-homogeneous. Thus, Patinkin concludes, the system is "internally inconsistent." Presumably, inconsistency is shown when a solution (p) of the whole system (the Cambridge equation included) is arbitrarily changed to (λp), which, though still satisfying that part of the system excluding the Cambridge equation, will no longer satisfy the Cambridge equation.

This argument makes odd use of the term "inconsistent." If such a (λp) did not satisfy the Cambridge equation the obvious thing to say is that (λp) is not a solution of the *whole* system. Precisely, since Say's Identity is satisfied by an infinite number of price vectors (p), it is that one which also satisfies the Cambridge equation that would be the solution of the system. (That is, assuming it has a solution, and assuming the Cambridge equation is tantamount to such an assumption. *Cf.* Hickman, *loc. cit.*, p. 16, on this point.)

It seems that discussion of this matter has sometimes lost sight of the necessary distinction between the independent and dependent variables in the system. Here k and M are independently given and the Cambridge equation determines the solution (p) of the system. However, if we preselect (p) we would be dealing with a different system wherein (p) are the independent variables and either k or M are dependent. In the latter case, if M is given, k cannot, of course, be interpreted as a given constant.

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A NOTE ON MR. GOULD'S DISCUSSION OF POTENTIAL SURPRISE [1]

PROFESSOR SHACKLE'S fundamental criticisms of the type of decision theory which would be indicated by the orthodox theory of probability are two. Firstly, in unique actions the numerical probabilities of success or failure are irrelevant to the decision taken, and secondly, in any case there are many circumstances when these numerical probabilities are undiscoverable. No meaning is attached to any such concept as "subjective *a priori* probability." A large number of economic acts, particularly investment decisions, fall into the class covered by this second condition. However, in a strict interpretation of Professor Shackle's view a situation in

[1] My thanks are due to Mr. A. K. Sen, of Trinity College, Cambridge, for his helpful comments.

which the first condition alone held would be adequate to render the theory of probability inapplicable. If the probability of success of an act is irrelevant in the decision taker's mind, then it follows that increasing the probability of success does not affect the decision taker—that is, the compounding of probabilities is an irrelevant procedure in considering decision problems. Professor Shackle lays considerable emphasis on this point.

The discussion between Mr. Gould and Professor Shackle [1] consists of two parts. In the first part Mr. Gould produces an example where there seem strong reasons for rejecting the Shackle model. In the second part he discusses a formal description of the concept of potential surprise, which he holds to be a valid conception in certain circumstances—for instance, economic situations. After a preliminary discussion of Mr. Gould's example, the purpose of this note will be to point out one or two weaknesses in his formal discussion of the concept, and to emphasise that he only *discusses* the situation where the non-additivity of the measure of uncertainty prevails, but that this in itself does not give reasons for thinking that a system built on such a postulate is an applicable model.

Mr. Gould's counter-example, where he considers the Shackle model inapplicable, consists of a choice between two gambles A and B, which, described in orthodox probability terms, have outcomes as in the table:

Probability	1/36.	17/36.	17/36.	1/36.
A	−10	−1	9	20
B	− 9	−8	1	22

Units in £1,000.

A strict interpretation of Professor Shackle's system would indicate the choice of gamble B, as the highest possible gain is higher than that of A, while the lowest possible loss is not so great, and the outcomes as grouped in the table have equal potential surprise. It seems implausible that this choice would be made; the middle values, the occurrence of one of which carries a very high degree of probability as opposed to potential surprise, are substantially in favour of gamble A. This extreme situation is one in which the Shackle model begins to look very weak, and Mr. Gould is led to conclude that in gambling situations, where compounding of probabilities gives a large difference in the aggregate probability of success or failure, then the Shackle system breaks down. The problem becomes one of deciding how much the probability has to alter before it becomes significant in the decision taker's mind. Professor Shackle, in his comments, appears to agree that in some extreme cases his model must be abandoned.

Mr. Gould proceeds to give his more formal account of what the potential surprise concept with its characteristic of non-additivity entails in those

[1] "Odds, Possibility and Plausibility in Shackle's Theory of Decision: A Discussion," G. Gould and G. L. S. Shackle, ECONOMIC JOURNAL, December 1957.

situations where the second as well as the first condition holds; that is, where the probabilities are vague and undefined. The discussion reveals some of the difficulties which the strong assumption of the non-additivity of the measure of uncertainty raises, which render it at times intuitively difficult to accept.

Let us use the notation A s B to mean " The hypothesis A is more possible than the hypothesis B ", and A t B to mean " The hypothesis A is as possible as the hypothesis B." The system of four hypotheses A, B, C and D which Mr. Gould depicts can be represented by the relationships A s B, A s C, with D a " loose " hypothesis in that it cannot be placed in either an " s " or a " t " relationship with any of the other hypotheses. Mr. Gould brings in the further hypothesis E which is the composite hypothesis " B or C or D." No ordering relationship exists between the possibility of this hypothesis and that of the hypothesis A: that is, from the above conditions it cannot be deduced which of A s E, E s A and A t E obtains. However, Mr. Gould does specify the relationship E s D. In discussing the model he then goes on to assert the Shackle hypothesis: " In some situations . . . composite hypotheses (such as E) may carry no further weight than their individual components." Now this assertion does not follow at all from the previous argument. It is in fact contradicted earlier in the argument by the statement " E is more plausible than D." The contention that E carries no more weight than any of its constituent hypotheses taken individually implies the following three relationships: E t B, E t C and E t D, the last contradicting the previous assertion of E s D. However, even if the assertion of E s D is abandoned (and it can be, as no subsequent argument depends on it), then all that has been shown is that in this model the assertion of the equi-possibility of a composite hypothesis with a single one of its constituent hypotheses can be made without further contradiction, but no positive reason for its assertion is made. On these grounds, therefore, it can be claimed that this argument is a *non sequitur*.

I now wish to show that the introduction of the hypothesis D with unknown possibility is superfluous to the argument. In the model, A s B and A s C are specified. As these are simple ordering relationships, nothing can be said of the relationship of A with the composite hypothesis " B or C." Thus the incomparability of the composite hypothesis with the hypothesis A can be established without bringing D into the composite hypothesis. The second point at which D enters into the argument is when it appears as a constituent of the hypothesis E in the relations E t B, E t C and E t D. Now, however large or small is the possibility of the hypothesis D on its own, the composite hypothesis " B or C or D " cannot be *less* possible than the hypothesis " B or C". Thus, as " B or C or D " t B (*i.e.*, E t B), then " B or C " t B without the intervention of hypothesis D (unless the composite hypothesis is regarded as being less likely than one of constituent members, which is hardly tenable). Thus the hypothesis D, the possibility of whose

occurrence is not placed in the ordering of possibilities, is irrelevant to the argument in that the points made with its assistance can equally well be made without.

Thus Mr. Gould's model does no more than assert that the composite hypothesis " B or C " may be no more possible than either of the individual hypotheses alone in situations where the probabilities of events happening are vague and unknown. It is tempting at this point to return to the firmer ground of probability theory and assert that this is only the case when the possibility of either A by itself or C by itself is so small as to be negligible. However, by firmly remembering our psychological rather than mathematical intent we might be induced to admit that sometimes " B or C " t B when the possibility of C alone is not negligible. The question becomes, " How great has the possibility of C to be before 'B or C' s B replaces 'B or C' t B? " Professor Shackle would hold that only in extreme cases would this happen (and I gather he regards Mr. Gould's first example as being such a case).

The question which is relevant in the discussion of models of decision taking (or in any economic models) is whether a model is applicable or not in the sense of its behaviour postulates being correct accounts of behaviour in the world. Hence the question to be asked of the Shackle model and the Gould interpretation of it is, " Is the assumption of the non-additivity of a measure of uncertainty a correct assumption about people's thought processes in the face of uncertainty? " The model holds as a logical system irrespective of its applicability but its interest is small if the range of problems where it is applicable is small. The postulate may be unacceptable in one situation but not in another. Mr. Gould gives an instance where the Shackle postulate does not seem to hold, but, as he himself makes quite clear, this does not necessarily mean that it does not hold in other and interesting situations. However, the non-additivity of the measure of uncertainty is a very strong assumption in all situations and contradicts what one is inclined to think intuitively about reactions to uncertain situations. Possibly it is applicable at times, but hesitation in accepting it without strong evidence is justified.

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COMMENT ON ARROW AND THE "NEW WELFARE ECONOMICS" [1]

A RECENT paper in this JOURNAL by E. J. Mishan [2] defends the "new welfare economics" against what the author regards as criticism, and unjustified criticism, at the hands of Kenneth Arrow in his *Social Choice and Individual Values*.[3] His point is essentially that Arrow arrives at contradictions in the construction of social-welfare functions only be starting with propositions which have been denied, or at least not affirmed, by now standard welfare theory. In the light of this point the author seems to say:

(1) that Arrow has falsely criticised the new welfare economics;

(2) that it is impossible to construct a social-welfare function only if propositions unacceptable to the new welfare economics are admitted;

(3) that a social-welfare function can in fact be constructed on the basis of the new welfare economics.

I am persuaded that his points are not well taken, since he seems to misunderstand the concept of the "social welfare function" as it has generally been used by Bergson, Samuelson and others, and because he confuses the problem of constructing such a function with the other problems treated by welfare theory.

His criticisms, more specifically, rest on the point that Arrow has defined social alternatives as "indifferent" in two types of situation where they would not be so defined by the new welfare economics:

(1) two points on two Scitovsky community indifference curves each lying above the indifference curve passing through the other, the two curves intersecting at some point; and

(2) a choice between two situations x and y where xP_1y, but yP_2x, (where subscripts indicate different individuals).

The new welfare economics, the author says, would assert that two situations or alternatives were indifferent if, and only if, they were indifferent to all members of the community.[4] No attempt would be made to evaluate alternatives where genuine oppositions of interest between members of the community existed. But the type of analysis that must be here referred to is the analysis of the so-called "Paretian" conditions of optimality—the necessary (but not necessarily sufficient) conditions for a social maximum. It is true that in the context of this part of the welfare problem situations

[2] The Editors apologise for the omission of this note from the September issue. A rejoinder to it by Mr. Mishan was printed in that issue.

[3] E. J. Mishan, "An Investigation into some Alleged Contradictions in Welfare Economics," ECONOMIC JOURNAL, September 1957.

[3] London; Chapman & Hall, 1951.

[4] Mishan, *op. cit.*, p. 452.

defined by Arrow as "indifferent" are to be regarded, indeed, not as "indifferent" but as "incomparable." However, I find nothing in Arrow indicating disagreement with, or criticism of, this part of the new welfare economics.

The problem confronting the constructor of social-welfare functions is that, given tastes, technology and resources, there are an infinite number of optimal positions (depending upon income distribution) open to a society. The social-welfare function is an ordering of these optima, and the difficulty is precisely that a choice between optima involves conflicts of interest of a kind with which the new welfare economics does not and cannot deal. This point is made quite explicitly in Arrow's book.[1] Alternatives such as x and y, where xP_1y, but yP_2x cannot be regarded as "incomparable" in this part of the welfare problem because this part of the problem is just exactly the making of such comparisons.

The kind of social welfare function which can be constructed from the new welfare economics is defined only for alternatives on the ordering of which there is unanimity within the community, as Mishan states.[2] For this relatively simple problem the compensation principle is useful, since it rules out alternatives which can be improved upon from the point of view of every member of the community. This principle is of no use, however, in deciding between true alternatives, that is, between two or more maximal states. This is the problem with which Arrow is concerned, and it would seem quite proper for him to prove that the compensation principle is of no help to him.

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A FURTHER NOTE ON FINANCE AND TAXATION IN JAMAICA

I

THE significance of economic and financial problems and the difficulties involved in making detailed analyses of social and economic conditions in underdeveloped economies have been indicated by Mr. D. J. Morgan in his appraisals of two official documents relating to the special problems of economic development in Jamaica and which were prepared by Professor and Mrs. Hicks and by Messrs. Towers and Fisher.[3] It is the principal

[1] Arrow, *op. cit.*, p. 37.

[2] Mishan, *op. cit.*, p. 454.

[3] The ECONOMIC JOURNAL, June 1957, pp. 347–53. In his further note on "West Indian Finances," which appeared in the December 1957 issue of the JOURNAL, Mr. Morgan mentioned the limits to policy in the British Caribbean which are set by factors such as "the relative poverty of the area, the almost total lack of interest in Government finance, the area's economic vulnerability and the dependent nature of the currency."

purpose of the present writing to review the broad issues involved in the formulation and administration of subsequent financial and taxation policy in the island economy.

Mr. Morgan stated that the long-awaited reform of the system of land valuation, taxation and rating in Jamaica had been deferred largely because of indecision as to the basis to be adopted. The recommendation of the Bloomberg Commission in 1943 that unimproved value should—instead of capital value—be the basis of land taxation and rating was accepted without comment in 1952 by the Mission of the International Bank for Reconstruction and Development.[1] Mr. Morgan suggested that the case for unimproved-value taxation had not been closely argued and that, in their 1955 Report, Professor and Mrs. Hicks effectively addressed themselves to the issue of its practicability in detail; he also noted, with regret, that their stated case against unimproved values had no great impact on public policy. The 1956 " Report on Jamaica " [2] stated that the Hickses " advised against the system of unimproved value taxation, and proposed a compromise solution which it was felt would allow the work of revaluation to proceed on the accustomed lines, using improved values as the basis for land taxation, but attempting to secure the benefits of unimproved values by a system of temporary deductions to be applied selectively in accordance with the Government's policy towards various types of improvements." The official reasons given for the rejection of those taxation proposals were that it was felt " that, subject to certain modifications, the application of the principles of unimproved land value taxation to Jamaica was feasible and desirable " and " that there was no real substance in the point made by Professor and Mrs. Hicks that a revaluation properly carried out on the improved value or any other basis would involve any less effort than a revaluation on the unimproved value basis." [3]

[1] In England much interest has centred around the problems of taxation and rating on unimproved or land values—a form of taxation which has been levied by Australasian Governments since 1884. (See, for example, A. C. Pigou, *A Study in Public Finance*, Chapter XIV (London: Macmillan, 1928). The 1952 Report of the Land Enquiry Committee provides a recent appraisal of special problems associated with the imposition of such a levy in a highly developed economy subject to comprehensive planning controls. (*The Rating of Site Values* (London: Her Majesty Stationery Office, 1952).)

[2] *Jamaica: Report for the Year 1956*, pp. 186–90. (London: Her Majesty's Stationery Office, 1957.)

[3] *Op. cit.* Mr. Morgan has subsequently indicated the completeness of the official acceptance in Jamaica of the principle of unimproved value and stated that the critique by Professor and Mrs. Hicks of the suitability and applicability of the principle to Jamaican conditions was the only one of which he had knowledge. Although he conceded that a general revaluation was necessary because of what he described as a complete change since the last revaluations in 1929 and 1937 in the economic situation in Jamaica " from depression to boom, from forced sales to speculative land deals," Mr. Morgan still thought that the implications of the changeover to unimproved value had not been understood in official circles. (See D. J. Morgan, " Land Valuation and Land Taxation in Jamaica," *Public Finance* (*Finances Publique*), Vol. XII, No. 3, pp. 232–9. Haarlem, Netherlands, 1957.)

II

In 1956 and 1957 the Government of Jamaica—with the co-operation of the United Nations Technical Assistance Administration—obtained the advice of Dr. J. F. N. Murray on the practicability of effecting the proposed changeover from capital to unimproved-value taxation and on the organisation and direction of the current programme of revaluation. Dr. Murray clarified the major issues and complexities of land valuation, taxation and rating in the Jamaican setting and formulated the working basis of the system, the principles of which are now being implemented under the administrative direction of Mr. J. M. Copes as Commissioner of Valuations to provide for land taxation and general rating to be levied upon unimproved values and, if so desired, for special or services rating to be based upon capital values.[1] The results of the current revaluation of Jamaica have confirmed the general appropriateness of unimproved value as the basis of taxation and rating, and the following summary of the analysis given in the Murray Report of the central points at issue in the Hicksian proposals may serve to illustrate the basic difficulties which underlie policy formulation involving complex problems in land economics unless such problems have come directly within the ambit of personal professional experience.[2]

The statement by Professor and Mrs. Hicks that, in unimproved-value rating, valuers would be forced to work on new and unfamiliar lines, is not correct in the case of rural lands because the data available are normally insufficient to enable capital values to be ascertained by capitalisation of net

[1] *Report to the Government of Jamaica on Valuation, Land Taxation and Rating*, by J. F. N. Murray (Kingston, Jamaica: The Government Printer, 1957. Pp. 55. 5*s*.). In the third edition of his *Principles and Practice of Valuation*, Dr. Murray demonstrated that the dissociation of valuation theory and general economics since the days of Sir William Petty, whom Karl Marx described as " the father of political economy and to some extent the founder of statistics," retarded the general development of these related disciplines. An inevitable consequence has been that the problems of land taxation have not been, in practice, one of the economist's most successful fields of research and of professional advising. See, for example, Herman Finer, *Road to Reaction*, p. 81 (London: Dennis Dobson Ltd., 1945) and *A Survey of Contemporary Economics*, Vol. II (ed. Bernard F. Haley), Essay on " Public Finance " by C. Lowell Harriss, pp. 294–5 (American Economic Association, 1952). Professor Finer referred to the " great errors " made by economists in respect of—*inter alia*—land-tax laws which have had " practical application in government and business policy "; Professor Harriss noted a further decline in academic interest in property taxation and observed that " no one draws on our wealth of sad experience with the administration of property (and death) taxes," although he considered the contribution of Professor and Mrs. Hicks and Dr. Rostas in *The Taxation of War Wealth* (Oxford, 1941) was probably the best discussion.

[2] During the last two decades, the processes of indirect induction or of abstract reasoning in economics without empirical verification have been subject to challenge, but I sometimes wonder if the distinguished economists and econometricians, including Professor Schumpeter, who have attempted some reappraisal of the relative position of Petty and political arithmetic and that of Smith and Ricardo, have realised that it can be shown that political arithmetic was, in essence, little more than contemporary valuation theory and practice applied to the solution of national problems. In Chapter 23 of his *General Theory*, Lord Keynes also acknowledged the contribution to statecraft made by the methods adopted by the early pioneers of economic thinking in the sixteenth and seventeenth centuries, but, surprisingly, made only incidental references to Petty's contributions.

rentals or profits; in such cases, the process of valuation must obviously consist of the summation of the values of land, qua land, and the improvements upon it. It is also standard valuation practice to check the values of urban areas obtained by capitalisation against both the land value and the value of the improvements. Professor and Mrs. Hicks further stated, although they did not support their argument, that the separation of land and building values is very much easier in a country where buildings are frequently pulled down and rebuilt. That state of affairs is realistic only when the buildings are new and develop sites to the optimum extent and the values of buildings equal their current costs of construction. In any event, it is not necessary to demolish improvements to ascertain site values.

It is also of interest to consider the Hickses' discussions of the development element in capital value which, they stated, was " hard to catch," and the de-rating of certain types of improvements for a period of years. The valuation process does not, however, involve forecasting market trends and is directed objectively towards the interpretation of evidence drawn only from sales of comparable properties. In the absence of such sales, an official marking up of values in the vicinity of a new cinema or grocery store in the Hicksian sense would merely be simple prophecy. It is further suggested that their proposals for de-rating concessions would, if effective in certain circumstances, simply create " unfair " competition between similar types of businesses and that their probable effects would include a rise in values and prices of vacant or poorly developed sites.

The incidence of capital value taxation, *cet. par.*, falls mainly upon large and highly improved properties because poundages are fixed in relation to revenue requirements and to the *aggregate assessed* capital value of all subject properties. It is, nevertheless, assumed by Professor and Mrs. Hicks that, because assessments on the basis of capital values include the speculative element in land value, a rate or tax on capital value brings in its train development similar to that engendered by a levy upon unimproved value. Australian—as well as Jamaican—experience, on the other hand, has shown that the impact and incidence of capital-value taxation—*per se*—tend generally to inhibit the development of real estate, to encourage speculation in land and to benefit those who, for speculative reasons, withhold it from its highest and best use. In the history of England there are actual instances, as in the case of the 1656 " Act for preventing the Multiplicity of Buildings in and about the suburbs of London," when levies were imposed " disproportionately " on improved properties with the express intention of discouraging new building and of restricting city growth.

III

It has become clear that an immediate and vital effect of the adoption of unimproved values for rating and taxation purposes would be to shift the incidence of rates and land taxes in Jamaica from small and impoverished

rural holdings with habitations to vacant urban allotments and suburban lands which are becoming ripe for development.[1] From this it follows that, as enterprising owners will not be taxed on the results of their personal labours, improvements to all classes of holdings would not be discouraged even by higher levels of taxation in specific instances. In other circumstances—such as when the value of improvements is much greater than the unimproved value, including those of luxury hotels and residences—it is important, when sufficient sales data are not immediately available, to ascertain whether the incidence of levies based solely upon unimproved values is entirely equitable, as such properties could become virtually de-rated. Sales analyses made during the progress of the current revaluation of Jamaica have now revealed that the prices paid for sites for hotels and luxury homes ensure that their unimproved values will constitute an equitable basis for taxation and rating.

Mr. Morgan, however, referred to the recent Land Valuation Law and the partial combination of unimproved and capital values as the basis of rating and taxation as a " regrettable compromise greatly inferior to the alternative " suggested in the Hicks Report. The combination of land taxation and general rating levied upon unimproved values and of special or services rating based upon capital values is being introduced to ensure —*inter alia*—that highly improved properties in service areas make a contribution to public revenues in proportion to services received. In other words, the objects of the dual system in Jamaica are to provide the advantages of reducing existing anomalies in the cases of special buildings and of introducing flexibility of administration during the transitional period when the island is being valued parish by parish and also after the completion of the valuation of the whole island. That revaluation, which is tantamount to a national stocktaking, is now proceeding in accordance with the policy recommendations of the Murray Report and is directed towards ascertaining capital values in service areas and the unimproved value of every parcel of land in Jamaica.

D. F. MURRAY

Canberra,
Australia.

[1] Taxable capacity in Jamaica, of course, is limited, and the capital-value system caused general dissatisfaction; the assessed values, admittedly, were low, but, as an expedient, land tax was imposed at progressive rates, with increases in tax liability extending back over the whole of each range of taxable values. It is essential to any appreciation of the valuation problem in the island to note that a great part of its terrain is extremely steep and that the demand for land under existing conditions of population growth and economic absorptive capacity led, over the years, to the cultivation and utilisation of slopes which, elsewhere, would be regarded as precipitous and too liable to erosion for effective and continued development. The general level of poverty in the Jamaican economy is also illustrated by the classification of farms according to area given in the 1952 *Report of Mission of the I.B.R.D.*; only 68,000 out of the total of 319,000 separate holdings exceeded one acre in area. Standards of living and of building construction in the hills are such that it has been authoritatively suggested to me that it is possible for a Jamaican peasant or smallholder to live on his " garden truck " and a very small cash income. An attempt to elucidate the interplay of causes and effects of emigration from Jamaica is, however, beyond the scope of present writing.

CURRENT TOPICS

MAY we offer our most sincere congratulations and good wishes to Lady Wootton as one of the first four women to be given the honour of a Life-Peerage? While much of Lady Wootton's recent work has lain within the kindred discipline of sociology, we are proud to remember that she was by earlier training an economist and that she has made distinguished contributions to our own discipline as well as to that of social theory.

WE are pleased to be able to announce that the economic library of the late Professor Hollander has been acquired by the University of Illinois and that, as Professor J. F. Bell informs us, it will at long last be open to scholars. This is most welcome news, for since the death of its owner in 1940 the library had been stored away in boxes and completely inaccessible. Its contents, however, are known from the excellent catalogue that was issed in a limited edition in 1937. Although Hollander may not have had the means of Seligman or the flair of Foxwell, yet he was an early gatherer in the field at a time of unlimited opportunities. Among the manuscripts in the library are letters of Adam Smith, which were published by W. R. Scott, and a few of Ricardo, which Hollander intended to use himself in the *opus* which he has left unfinished; these it is hoped to include among the addenda in the Index volume of the Works of Ricardo.

Houblon-Norman Awards. The Trustees of the Houblon-Norman Fund invite applications for Fellowships or Grants in Aid of Research into the working industry and finance in Great Britain and elsewhere and the economic conditions affecting them. Fellowships are intended primarily for established scholars who require leave from teaching or other duties to complete work on which they are engaged, or for other senior research workers with similar qualifications. Fellowships are therefore awarded only for full-time work; but this does not necessarily preclude some extraneous work, subject to the consent of the Trustees. Fellowships are normally granted for one year, which may be renewed for a second year. They may be supplemented by an allowance for travelling and other incidental expenses. In addition Grants are made to others who are not eligible for Fellowships to assist approved research, whether part-time or full-time. While such grants will normally be limited to expenses, the grant of a subsistence allowance will also in exceptional cases be considered. The amount of the award, which will take effect from October 1, 1959, will be such as may appear necessary to the Trustees to enable the candidate to undertake the 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 International Economic Association held its Annual Conference during September 1958 on the island of Corfu. The subject chosen for it was Capital Theory. Among those who contributed papers were F. Lutz (Switzerland); J. Hicks, D. Champernowne, N. Kaldor, T. Barna (United Kingdom); P. Samuelson, W. Fellner, R. Goldsmith, E. Domar, R. Solow (United States); W. Hoffmann (W. Germany); J. Marchal, A. Barrère (France); B. Thalberg (Norway). Among some dozen other participants were E. Lindahl (President), G. Haberler (Hon. President), A. Robinson (Treasurer) and P. Sraffa and I. Little (United Kingdom). The papers and a summary of the vigorous and hard-hitting discussions will be published for the International Economic Association by Messrs Macmillan.

THE following have been admitted to Life Fellowship of the Society:

Baerncopf, Prof. D. A.
Cooper, G. A.
El Serafy, Dr. S. E. D.
Gupta, K. L.
Hoare, D. T.
Khan, M. I.
Pasinetti, L. L.
Schloss, Prof. H. H.
Sen, Amartya Kumar
Shah, Anil C.
Von Boventer, Dr. E.

THE following have been admitted to Fellowship of the Society:

Adepeju, A. A.
Awopeju, J. O.
Baksh, H.
Bateman, D. I.
Batten, H. A.
Bhalsod, D. K.
Blair, A. J.
Bober, S.
Bradley, J. J.
Brookes, G. M.
Chaudhuri, S. K.
Christodoulou, E. N.
Clement, Prof. M. O.
Conde, R.
Connolly, J. G. P.
Crawford, S.
Crickmore, J. B.
Croll, J. R.
Crossley, J. R.
Cruikshank, R. J.
Dalal, Miss U.
Dayapara Murthy, P. C.
Dowling, J.
Duncan, W. J.
Echevarria, Prof. O. A.
Edmondson, G. R.
Evans, R. A.
Ewelukwa, D. I. O.
Fahm, L. A.
Falkingham, R. P.
Ferguson, Prof. C. E.
Fisher, R. G.
Gaebler, F. S.
Gandy, A. V. H.
Garg, M. L.
Gibb, M. M.
Glenn Campbell, W.
Goh, Sieow Wah.
Gonsalves, C.
Gould, J. R.
Haddad, L.
Hall, F. L.
Harcourt, G. C.
Herrick, W. P.
Hoegh-Guldberg, H.
Howard, L. M.
Iro, M. I.
Jacobson, I. J.
Johnson, S. K.
Johnston, Prof. J.
Jucker-Fleetwood, E. E.
Karkaria, D. D.
Knox, J. R.
Langley, L. A.

Lawrie, J. W.	McNamara, B.	Riley, J. F.
Lee Man Yuk	Mitchell, W.	Salama, E.
Lessing, H. W.	Moore, C. H.	Saridja, O.
Levine, N.	Morrin, F. D.	de Silva, D. P. N.
Liebowitz, H. A.	Mukherjee, N.	Singh, R. P.
Long, P. M.	Nair, S. A. B.	Sirisena, U. D. I.
Mago, R. C.	Neeves, L. D.	Sly, D. F.
Malet, Dr. D.	Okere, L. V. N.	Thakkar, L. V.
Mansfield, L. C. S.	Osanyinjobi, F.	Townsend, P. A. R.
Markwell, P.	Pai, K. J.	Vanden Berghe, R.
Massell, B. F.	Parikh, Dr. G. M.	Wallich, Prof. H. C.
McCasker, A. W.	Parker, D. L.	West, Miss T.
McGuinnes, P.	Patel, C. A.	Yentumi-Mensah, J.
McLaughlin, J.	Ramanathan, K. C.	Zaracostas, C.

THE following have been admitted to Library Membership of the Society:

Economic Institute of Africa, Bulawayo.
Faculdade de Ciencas Economicas, University of Bahai, Brazil.
Forest Hill Research Station, Farnham, Surrey.
Gobardanga Hindu College, West Bengal, India.
Institut des Hautes Etudes Arabes, Cairo, Egypt.
Long Island University, Brooklyn, New York.
National Planning Board, Government of Pakistan, Karachi.
National Research Council, Ottawa, Canada.
Santa Monica State College, California, U.S.A.
State Finance Committee, Hobart, Tasmania.
University of Nevada, Reno, U.S.A.

THE Annual Meeting of the Royal Economic Society will be held on Thursday, July 9th, at 5.0 p.m., at the London School of Economics.

RECENT PERIODICALS AND NEW BOOKS

Journal of the Royal Statistical Society

VOL. 121, PART 2, 1958. *Classification of the Population by Social and Economic Characteristics: The French Experience and International Recommendations:* M. BRICHLER. *Research in Statistics:* M. G. KENDALL. *Differential Prices for the Services of Ships Belonging to the Same General Class: A Case of Oligopoly:* D. E. KOPANITSAS. *The Efficiency of Randomization by Card Shuffling:* D. D. KOSAMBI and U. V. R. RAO.

VOL. 121, PART 3, 1958. *Industrial Production and Steel Consumption:* SIR R. SHONE and H. R. FISHER. *Some Problems in the Measurement of Price Changes with Special Reference to the Cost of Living:* S. J. PRAIS. *The Design of a Long-term Sampling Programme to Measure the Hazard Associated with an Industrial Environment:* J. R. ASHFORD. *Wholesale Prices in 1957.*

Applied Statistics

VOL. VII, NO. 2, JUNE 1958. *The Economist and his Statistics:* E. SHANKLEMAN. *Simple Mortality Rates:* S. BROADBENT. *Marginal Cost:* A. MUIR. *A Simple Approach to the Minimisation of Store-size:* N. T. J. BAILEY. *Factor Analysis:* G. H. JOWETT.

Economica

VOL. XXV, NO. 99, AUGUST 1958. *On the Theory of Oligopoly:* W. J. BAUMOL. *Productivity-geared Wage Policies:* K. LANCASTER. *Wages Policy in Sweden:* T. L. JOHNSON. *Bank of England Branch Discounting, 1826–59:* R. O. ROBERTS. *Uncertainty, Probability and Potential Surprise:* L. FOLDES.

The Review of Economic Studies

VOL. XXV, NO. 68, JUNE 1958. *Tariffs, Retaliation and the Elasticity of Demand for Imports:* W. M. GORMAN. *The Wicksell Effect:* E. OSBORN. *Utility and the "Ordinalist Fallacy":* W. E. ARMSTRONG. *The Predictive Accuracy of the Marginal Productivity of Wages:* J. L. STEIN. *The Relation between the Accelerator and the Capital Output Ratio:* A. E. OTT. *Demand Theory without a Utility Index: A Comment:* P. K. NEWMAN and R. C. READ; *Further Comments:* L. MCKENZIE. *Immiserizing Growth: A Geometrical Note:* J. BHAGWATI. *Risk Bearing and Income Taxation:* N. KALDOR.

Yorkshire Bulletin of Economic and Social Research

VOL. 10, NO. 1, JUNE 1958. *On Measuring Utility:* A. GABOR and S. F. JAMES. *Matrix Multiplier Analysis: An Exposition:* A. HAGGER. *Mrs. Robinson's Warranted Rate of Growth:* J. D. SARGAN. *The Savings–Investment Equations in Post-war Britain:* H. BURTON. *Index Numbers on Liner Freight Rates in United Kingdom Trades 1946–57:* D. L. MCLACHLAN.

International Affairs

VOL. 34, NO. 4, OCTOBER 1958. *Nuclear Weapons and Defence: Comments on Kissenger, Kennan, and King-Hall:* P. M. S. BLACKETT. *Storm Clouds over the Horn of Africa:* B. BRAINE. *World Recession and the United States:* R. F. HARROD. *Indonesia and the Commonwealth in South-East Asia: A Re-Appraisal:* C. D. COWAN. *Disengagement and Western Security:* M. HOWARD. *The German Resistance in its International Aspects:* H. ROTHFELS.

The British Journal of Sociology

VOL. IX, NO. 3, SEPTEMBER 1958. *Social Change:* M. GINSBERG. *Kinship in Anglo-Saxon Society: I:* L. LANCASTER. *Some Present Trends of Social Anthropology in France:* E. M. MENDELSON. *Employment of Sociology and Anthropology Graduates: Final Report:* J. A. BANKS.

Soviet Studies

VOL. X, NO. 1, JULY 1958. *The Origin and Status of the Cheka:* E. H. CARR. *The Soviet Union as a Neutral, 1939–41:* G. GINSBURGS. *Soviet Economic Relations with the Underdeveloped Countries:* N. B. SCOTT.

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VOL. XIII, No. 1, JUNE 1958. *Rigidities in Milk Production:* I. G. REID. *The Small Farmer:* E. M. CARPENTER. *My Impressions of Russian Agriculture:* W. E. CAVE. *The Relevance of the Theory of Tariffs to Agricultural Production:* G. MCCRONE. *Planting Density and the Economics of Late Flowering Chrysanthemum Production:* A. B. WEBSTER. *Estimating a Supply Curve:* F. HOLME. *Economies of Scale in Farming:* J. R. RAEBURN.

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VOL. VI, PART II, 1958. *Agriculture in Roman Britain:* S. APPLEBAUM. *The East Anglian Foldcourse: Some Queries:* A. SIMPSON. *The Lost Village and the Landscape of the Yorkshire Wolds:* A. HARRIS.

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VOL. 108, No. 391, AUGUST 1958. *Middle East and Reflation. The New Monetary Weapon. Capacity for Re-Expansion:* J. E. HARTSHORN. *Company Finances after the Boom:* S. J. PRAIS. *Ulster's Unemployment Problem:* P. ROBSON.

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VOL. 108, No. 393, OCTOBER 1958. *From Montreal to New Delhi. Consumer Banking. Galbraith Rides Again:* J. E. HARTSHORN. *Lending Germany's Surplus:* R. E. LUKE. *India's Breathing Space:* G. TYSON. *Deflation Through Wool:* H. W. ARNDT. *Brazil's "Fifty Years in Five."*

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VOL. CLXXXVI, No. 1373, AUGUST 1958. *The End or Suspension of the Credit Squeeze? New Credit Measures and the Balance of Payments:* SIR R. HAWTREY. *Background to Expansion:* T. C. MAYNARD. *The Banking Half-year. Survey of Economic Conditions in the U.S.A.: Consolidation of Recent Gains. Central Banking in Nigeria:* A. HAZLEWOOD.

VOL. CLXXXVI, No. 1374, SEPTEMBER 1958. *Bank Rate and the Recession. Banking Links with H.P. Finance. Banking Systems of the Future:* R. HINDLE. *Some Comparisons between Banking in the U.S.A. and the U.K.:* H. W. AUBURN. *Banking Comparisons in the U.S. and U.K.:* SIR R. HAWTREY. *American Imports, 1956–58:* F. G. DAVIDSON. *Survey of Economic Conditions in the U.S.A.: The Dow–Jones Average Breaks Through 500.*

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No. 50, OCTOBER 1958. *The Fund and the Future:* M. STAMP. *The Changing Oil Situation:* D. BURN. *Forward Exchange: The Case for Intervention:* A. E. JASAY.

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VOL. 4, No. 3, JULY 1958. *Draft Agenda for Montreal. India's Mounting Foreign Exchange Difficulties. Trade in Two Territories: Short Reports on Uganda and Zanzibar.*

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No. 39, SEPTEMBER 1958. *The Economic Gains from Freer Trade with Europe:* H. G. JOHNSON. *Local Unemployment:* J. SYKES. *The Bank of England—Agent of the Royal Bank of Scotland.*

Planning

VOL. XXIV, No. 426, SEPTEMBER 1958. *Problems of World Liquidity.*

Town and Country Planning

VOL. XXVI, No. 9, SEPTEMBER 1958. *Chaos of London Markets:* G. ALLEN. *Housing in Hungary:* R. P. HELLER. *The Example of Zurich:* R. ELVIN.

Which?

VOL. 1, No. 4, SUMMER 1958. *Reports on Washing Machines, Cut Price Groceries, Sunburn and Suntan Preparations, Skin Tonics, Ball Point Pens.*

Progress (Lever Bros.)

VOL. 46, No. 259, SUMMER 1958. *Fifty Years of Change:* LORD ATTLEE. *Europort—The Gateway of Europe:* K. P. van der MANDELE. *The Colonial Development Corporation:* SIR H. BEAVER. *The British Association:* P. M. S. BLACKETT. *Village Community Development in India:* R. TOULMIN. *A Display of Character:* M. BLACK. *Technical Education in East and Central Africa:* A. ALBU.

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VOL. 27, No. 11, JULY 1958. *The Operation of Tramp Shipping:* C. F. B. ARTHUR. *The Change-over to Diesel Traction on Irish Railways:* T. C. COURTNEY. *The Organisation of Transport:* SIR B. ROBERTSON. *Railway Management:* E. W. ARKLE. *Southern Africa Visit:* SIR R. WILSON.

VOL. 27, No. 12, SEPTEMBER 1958. *Road Haulage in North America:* G. W. QUICK SMITH. *Air Ferry Integration with Surface Transport for the Carriage of Passengers:* J. R. HAWKES. *Traffic Inspection in Road Passenger Transport:* M. ROURKE.

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No. 30, SEPTEMBER 1958. *World Situation. Output Trends 1958. The Problem of Prices.*

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VOL. XXXIV, No. 68, AUGUST 1958. *The Australian Economy, July 1958:* D. COCHRANE. *Australia and European Free Trade:* W. M. CORDEN. *Trade and Redistribution of Income—Is There Still an Australian Case?:* A. J. RIETSMA. *Economic Experiments in New Zealand and Their Political Background:* K. A. BLAKEY. *The Growth of the Cement Industry in the 1920s: A Study in Competition:* C. FORSTER. *The Pattern of Australian Demand:* C. E. V. LESER. *Capital, Income and Output in New Zealand Agriculture, 1922–1956:* B. D. PHILPOTT and J. D. STEWART. *Another Look at the Acceleration Relationship and Equilibrium Growth:* R. HIESER.

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VOL. VI, No. 1, JULY 1958. *A Re-evaluation of the Scarcity Postulate in the Light of Recent Theoretical Developments in the Social Sciences:* M. E. POLAKOFF. *Taxation in a Developing Economy with Special Reference to the Indian Plans:* M. H. GOPAL. *Contemporary Trends in European Co-operative Banking:* K. V. SRI RAM. *On the Relevance of the Sectoral Concept in the Theory of Economic Development:* J. K. SENGUPTA. *Professor Gadgil on Rephasing the Plan: A Reply:* B. R. SHENOY. *Plurality as Underdevelopment:* R. K. HAZARI. *Locational Industrial Matrix in Economic Planning:* S. S. WAGLE.

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VOL. IV, No. 1, FEBRUARY 1958. *A Growth Equation Analysis of the Ricardian and Marxian Theories of Growth:* W. O. THWEATT. *Léon Walras:* H. K. MANMOHAN SINGH. *Investment and Efficiency in Indian Railways during the Second Five Year Plan:* S. J. PATEL. *The Indian Labour Market and its Impact on the Pattern of Regional Wage Differentials:* H. LAXMI NARAYAN. *A Method for Estimating Decade Internal Migration in Cities from Indian Census Data:* S. N. AGARWALA.

Sankhyā

VOL. 19, PARTS 3–4, JUNE 1958. *Bengal Anthropometric Survey, 1945: A Statistical Study:* D. N. MAJUMDAR and C. R. RAO.

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VOL. 2, No. 2, JULY 1958. *Population and Human Fulfilment:* SIR J. HUXLEY. *China's Population:* I. B. TAEUBER. *Population Trends and Labour Force in India, 1951–66:* T. CHELLASWAMI. *Population Planning in China:* S. CHANDRA SARKER. *The Composition of India's Population: II:* S. CHANDRASEKHAR.

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VOL. VII, No. 2, DECEMBER 1957. *The Optimum Choice of Technology:* J. TINBERGEN. *Criteria for Investment in Industrial Development:* C. WILCOX. *National Accounting Technique and Input–Output Analysis:* R. K. KHANDKER. *A Note on Secular Stagnation and Income Redistribution in Developed Economies:* Q. H. QURAISHI. *Principles of Central Banking:* M. RASHID. *Inflation and Capital Formation:* M. AKHLAQUR RAHMAN. *Policy Implications of the Measurement of International Trade Elasticities:* ZUBAIDA AZIZ.

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VOL. 4, No. 2, JANUARY 1958. *Interest Rates in Conditions of Inflation and High Taxation:* P. J. GILL. *Africans and Income Tax in Uganda:* D. WALKER. *The Future of the Timber Industry in Kenya:* F. T. HENSON. *Some Comments on the Report of the Social Security Committee:* G. ST. L. D'ADHEMAR. *Power in Uganda:* D. WALKER.

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MARCH 1958. *The Sterling Area and Ireland. The Agricultural Institute. The Psychological Elements in Federal Reserve Policies: Problems of Application:* C. R. WHITTLESEY.

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VOL. XI, No. 9, SEPTEMBER 1958. Usual statistical material.

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VOL. 25, No. 1/3, 1957. *La Trentième Session de l'Institut International de Statistique:* G. DARMOIS and R. C. GEARY. *"Inductive Behaviour" as a Basic Concept of Philosophy of Science:* J. NEYMAN. *Les tableaux de corrélation et les programmes linéaires:* M. FRÉCHET. *Maximum Specification Errors and the Estimation of Economic Relationship:* H. THEIL. *Maximum Likelihood Estimators with Heteroscedastic Errors:* G. R. FISHER.

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No. 12, FEBRUARY 1958. *A Case History in Financial and Operating Ratio Analysis:* C. B. TAYLOR. *Productivity Increases in European Firms—Two Case Studies. Machine Interference:* W. KNÖDEL. *Productivity and Size of Firm:* K. BORCH. *Wages and Labour Productivity:* O. D. K. NORBYE.

No. 13, MAY 1958. *Productivity Studies and Comparisons in Arc Welding:* A. G. THOMPSON. *German Studies of Productivity in Wholesale and Retail Trade:* F. KLEIN. *Interchange of Information between Business Enterprises:* W. MITCHELL. *Comparison for Comparison's Sake:* H. G. C. NANNINGA. *Productivity Measurement in the Nationalised Industries in Austria. Productivity and Size of Establishment in New Zealand Manufacturing:* J. W. ROWE.

Kyklos

VOL. XI, No. 3, 1958. *William E. Rappard (1883–1958):* L. BAUDIN. *Auf der Suche nach dem Standort der Zeit: Alfred Weber zum Gedächtnis:* E. SALIN. *Professor Shackle on Economic Methodology:* J. ÅKERMAN. *Toward Comparative Historiography: Background and Problems:* F. REDLICH. *The Theory of Social Classes:* F. ZWEIG. *The Dollar and International Liquidity Problem Reconsidered:* R. TRIFFIN. *Price, Cost and Output:* H. R. EDWARDS. *Die Dogmengeschichte der Volkswirtschaftslehre im Lichte des Pragmatismus:* W. STARK.

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Probleme Economice (Rumanian text, English, French and Russian Summaries)

No. 5, 1958. *Karl Marx and the Fight Against Contemporary Revisionism. The Beginnings of the Activity Laid by the Founders of Scientific Communism, K. Marx and F. Engels:* Z. BRÎNCU. *Proletarian Internationalism—Basis of the Economic Relations between Socialist Countries:* I. ANGHEL. *Against the Bourgeois and Revisionist Adulteration of the Economic Role of the State in Contemporary Capitalism:* P. DAN. *Schumpeter and the Reformist Current in France:* H. CLAUDE. *Progress and Forms of Present-day Socialist Agricultural Co-operation:* N. BELLI. *Changes in the Foreign Trade Structure of Some European Socialist Countries:* I. BURȘTEIN. *The Causes and Evolution of the Financial Crisis in France:* S. FIRU. *The Use of the National Income in the Appréciation of the Economic Efficiency of Industrial Investments:* P. JICA.

No. 6, 1958. *The Preparation and Execution of the Revolutionary Act of Nationalising the Main Means of Production:* S. ZEIGHER. *The Agrarian Problem in G. Plekhanov's Work:* V. MALINSCHI. *The Post-war Industrial Cycle and the New Over-production Crisis:* E. VARGA. *The Bourgeois Theory of Mass Welfare and West German Realities:* GH. NISIPEANU. *Criticism of Some Bourgeois and Revisionist Theories on West European Economic Integration:* I. ANGHEL. *The Problem of Economic Efficiency in the Territorial Distribution and Specialisation of Socialist Agriculture:* O. PARPALĂ. *The Distribution of Production in Collective Farms:* B. NICOLAE. *The Main Problems of Cost Price in the Consumer-goods Industry:* S. COSMA and M. IAROVICI.

NEW BOOKS

British

BULL (G.) and VICE (A.). Bid for Power. London: Elek Books (14 Great James Street, W.C.1), 1958. 9″. Pp. 238. 25*s*.

[This is a study, written by two financial journalists, of the take-over bid as it has been practised in this country in recent years. The exploits of Mr. Clore, Mr. Fraser, Mr. Wolfson and other less well-known practitioners are recounted with a wealth of detail, financial and personal. The authors' purpose is partly to tell a story of interest in itself, and partly to give guidance to small shareholders in companies that become subject to bids. Their reflections on the broader economic significance of the take-over bid are brief but to the point.]

BULLARD (SIR R.). The Middle East. A political and economic survey. 3rd Edition. London: Oxford University Press for the Royal Institute of International Affairs, 1958. 8½″. Pp. xviii + 569. 45*s*.

[The third edition of this comprehensive country-by-country survey, which is mainly factual in scope, has been completely rewritten. The revision is the work of many hands under the editorship of Sir Reader Bullard, formerly British Ambassador in Persia. It has been brought up to date to autumn 1957.]

BURN (D.) (Ed.). The Structure of British Industry. A symposium. In two volumes. National Institute of Economic and Social Research, Economic and Social Studies, No. XV. Vol. I: pp. xvii + 403; 45*s*. Vol. II: pp. xiii + 499; 50*s*. London: Cambridge University Press, 1958. 9½″.

[To be reviewed.]

CARR-SAUNDERS (A. M.), CARADOG JONES (D.) and MOSER (C. A.). A Survey of Social Conditions in England and Wales, as illustrated by statistics. London: Oxford University Press, 1958. 9″. Pp. xxi + 302. 25*s*.

[To be reviewed.]

CARTER (C. F.) and WILLIAMS (B. R.). Investment in Innovation. London: Oxford University Press, 1958. 9″. Pp. ix + 167. 15*s*.

[To be reviewed.]

COOK (P. LESLEY) with the collaboration of COHEN (RUTH). Effects of Mergers. Six studies. Cambridge Studies in Industry. London: Allen & Unwin, 1958. 9″. Pp. 458. 42*s*.

[To be reviewed.]

CORLETT (W. J.). The Economic Development of Detergents. Industrial Innovation Series. London: Duckworth, 1958. 9″. Pp. 208. 25*s*.

[To be reviewed.]

COTGROVE (S. F.). Technical Education and Social Change. London: Allen & Unwin, 1958. 9″. Pp. 220. 25*s*.

[Reviewed in this issue.]

DEPARTMENT OF AGRICULTURAL ECONOMICS, UNIVERSITY OF BRISTOL. Grassland in England and Wales, by V. H. BENYON; Report No. 106; 9″; Pp. 59; 5*s*. Self-feeding of Silage in Devon, 1957/58, an Interim Report by V. H. BENYON and J. A. LANGLEY; Report No. 107; 10½″; Pp. 33; 2*s*. 6*d*. Farm Organisation and Incomes in South West England, 1956; Report No. 108; 9″; Pp. 61; 5*s*. An Economic Study of the Broccoli Crop in West Cornwall, 5-year investigation 1952/53 to 1956/57; Report No. 109; 9″; Pp. 50; 5*s*. Newton Abbot: Department of Agricultural Economics, University of Bristol, 1958.

DEPARTMENT OF AGRICULTURAL ECONOMICS, UNIVERSITY OF MANCHESTER. Farm Management Survey, Financial Results, 1955–56, and 1956–57; Pp. 40; 3*s*. 6*d*. Milk Production in North-West England, an economic survey of 53 herds, 1955–57, by T. W. GARDNER and J. E. HOLT; Pp. 49; 3*s*. Manchester: Department of Agricultural Economics, Faculty of Economic and Social Studies, University of Manchester, 1958. 10″.

DEPARTMENT OF AGRICULTURAL ECONOMICS, UNIVERSITY OF READING. Financial Results on Farms in the Southern Province in 1954–55, 1955–56 and 1956–57, by G. B. BISSET and C. H. BLAGBURN; Farm Management Survey Report No. 7; 9½″; Pp. 51; 5*s*. Some Economic Aspects of Pig Production 1956/57, by D. S. THORNTON; Miscellaneous Cost Studies No. 35; 10″; Pp. 20; 2*s*. 6*d*. Reading: Department of Agricultural Economics, University of Reading, 1958.

DEPARTMENT OF AGRICULTURE, STATES OF JERSEY. Work Study; Farm Management Report No. 3; 10½″; Pp. 20. Silage, 1957; Farm Management Report No. 4; 10½″; Pp. 31. Milk Production Costs in Jersey, 1957–58; Report No. 11; 13″; Pp. 79. St. Helier; Department of Agriculture (Agricultural Economics, Victoria Chambers, Conway Street, St. Helier), 1958.

EDWARDS (R. S.) and TOWNSEND (H.). Business Enterprise, its Growth and Organisation. London: Macmillan, 1958. 9″. Pp. xvii + 607. 60*s*.

[To be reviewed.]

ENKE (S.) and SALERA (V.). International Economics. Third edition. London: Dennis[redacted]n, 1958. 9″. Pp. xviii + 606. 42*s*.

[This book, one of the most successful American texts on international economics, has been substantially altered in its third edition. The emphasis has been shifted away from pure theory towards problems of policy, and many topics are covered which were not included at all before, such as Western European Regionalism. In view of the difference in scope, the publishers are continuing to make available the previous edition, which deals more rigorously with theoretical problems.]

FIRESTONE (O. J.). Canada's Economic Development, 1867–1953, with special reference to changes in the country's national product and national wealth. International Association for Research in Income and Wealth, Income and Wealth Series VII. London: Bowes & Bowes, 1958. 8½″. Pp. xxvi + 384. 45*s*.

[To be reviewed.]

HAAS (E. B.). The Uniting of Europe. Political, social and economical forces 1950–1957. Published under the auspices of the London Institute of World Affairs. London: Stevens, 1958. 8½″. Pp. xx + 552. 50*s*.

[To be reviewed.]

HANSEN (B.). The Economic Theory of Fiscal Policy. Translated from the Swedish by P. E. Burke. London: Allen & Unwin, 1958. 9″. Pp. xv + 450. 45*s*.

[This is a translation of a book originally published in Swedish in 1955. The Swedish edition was reviewed in the ECONOMIC JOURNAL of June 1956 by A. Williams.]

HARROD (R. F.). Policy Against Inflation. London: Macmillan, 1958. 9″. Pp. xiii + 257. 24*s*.

[To be reviewed.]

HOWARD (M.). Disengagement in Europe. A Penguin Special. Harmondsworth: Penguin Books, 1958. 7″. Pp. 92. 2*s*. 6*d*.

[This clear and well-reasoned essay is based on the deliberations of a study group of experts on military affairs. Its subject is "the military and political aspects of a military withdrawal in Central and Eastern Europe and the setting up of a neutral and demilitarised zone." This policy is considered is relation to the various alternatives that offer themselves.]

JENKS (C. W.). The Common Law of Mankind. Published under the auspices of the London Institute of World Affairs. London: Stevens, 1958. 10″. Pp. xxvi + 456. 63*s*.

[This contains a number of papers on international law. The theme running through them is that "contemporary international law can no longer be reasonably presented within the framework of the classical exposition of international law as the law governing the relations between States but must be regarded as the common law of mankind in an early stage of its development."]

MAJUMDAR (T.). The Measurement of Utility. London: Macmillan, 1958. 7½″. Pp. xiv + 149. 13*s*. 6*d*.

[Reviewed in this issue.]

MARRIS (R. L.). Economic Arithmetic. London: Macmillan, 1958. 9″. Pp. xvii + 349. 28*s*.

[To be reviewed.]

MUSGRAVE (R. A.) and PEACOCK (A. T.) for the International Economic Association. Classics in the Theory of Public Finance. London: Macmillan; New York: The Macmillan Company, 1958. 10½″. Pp. xix + 244. 30*s*.

[To be reviewed.]

NICULESCU (B.). Colonial Planning. A comparative study. London: Allen & Unwin, 1958. 9″. Pp. 208. 18*s*.

[To be reviewed.]

REDLICH (J.) and HIRST (F. W.). The History of Local Government in England. Edited by B. KEITH-LUCAS. London: Macmillan, 1958. 8½″. Pp. xv + 261. 30*s*.

[This is a reprint of the historical section of Redlich and Hirst's classic *Local Government in England*, originally published in 1903, and now out of print. The editor has added an introduction describing the context of German thinking within which Redlich's views must be judged, and he has also contributed a concluding chapter briefly setting forth the main developments in English local government since 1903.]

RYAN (W. J. L.). Price Theory. London: Macmillan, 1958. 9″. Pp. ix + 396. 31*s*. 6*d*.

[To be reviewed.]

SCITOVSKY (T.). Economic Theory and Western European Integration. London: Allen & Unwin, 1958. 9″. Pp. 154. 16*s*.

[To be reviewed.]

SHACKLE (G. L. S.) (Ed.). A New Prospect of Economics. An introductory textbook by members of the staff of the Department of Economics in the University of Liverpool, under the chairmanship of F. E. HYDE. Liverpool: Liverpool University Press, 1958. 9″. Pp. xiv + 498. 30*s*.

[To be reviewed.]

STAPLETON (G. B.). The Wealth of Nigeria. London: Oxford University Press, 1958. 7½″. Pp. ix + 228. 16*s*.

[To be reviewed.]

STEPHENS (W. B.). Seventeenth-Century Exeter. A study in industrial and commercial development, 1625–1688. A publication of the History of Exeter and South West Research Group. Exeter: University of Exeter, 1958. 9″. Pp. xxvi + 203. 30*s*.

[This elaborately documented monograph analyses the industry, trade and economic and social structure of Exeter between 1625 and 1688. A major theme is the transformation of Exeter's trade brought about by the Civil War and Interregnum, as a result of which it came to be focused mainly on Holland, Germany and Italy, instead of on France, as it had been before.]

TAWNEY (R. H.). Business and Politics under James I. Lionel Cranfield as Merchant and Minister. London: Cambridge University Press, 1958. 9½″. Pp. 325. 40*s*.

[To be reviewed.]

TITMUSS (R. M.). Essays on "The Welfare State." London: Allen & Unwin, 1958. 9″. Pp. 232. 20*s*.

[To be reviewed.]

WILLIAMS (W. M.). The Country Craftsman. A study of some rural crafts and the rural industries organisation in England. Dartington Hall Studies in Rural Sociology. London: Routledge & Kegan Paul, 1958. 9″. Pp. xviii + 214. 25*s*.

[The author's main purpose is to examine critically the policy of the complex of bodies which he describes as the rural industries organisation, financed by the Treasury, through which assistance of various sorts is given to country craftsmen. To cast light on this, he undertook field-study of the state of rural crafts in Devon and in the West Midlands. These crafts suffer not only from declining demand due to technical changes (such as the fall in the number of horses) but also from a social dilemma: they serve rural customers who are usually accustomed to long credit and a friendly personal basis of dealing, while having to obtain their supplies from urban firms which require prompt payment on strictly business terms. While not denying that certain crafts provide necessary services to agriculture, the author is inclined to scoff at some of the more romantic claims put forward about their social usefulness. He believes that crafts (as distinct from larger-scale industry) are a very small source of rural employment. Mr. Williams suggests that the rural industries organisation should now give more emphasis to improving the craftsman's efficiency in the business side of his work and less to raising technical standards. Better access to loan capital is also important. Some of the resources that the rural industries organisation has hitherto devoted to the encouragement of crafts should also in future be diverted to other rural industries.]

Australian

COOMBS (H. C.). Conditions of Monetary Policy in Australia. The R. C. Mills Memorial Lecture. Sydney: Department of Economics, University of Sydney, 1958. 8½″. Pp. 40. 5*s*. (Aust.)

[The author is Governor of the Commonwealth Bank of Australia. He describes the successes and failures of monetary policy in Australia in recent years. As in other countries, the record has been a mixed one, and one of the chief difficulties has been the time needed for monetary measures to take effect. A number of interesting technical suggestions are made as to how the task of the authorities might be made easier. Dr. Coombs' lecture is preceded by a memoir of R. C. Mills by Professor S. J. Butlin.]

MATHEWS (R.) and GRANT (J. McB.). Inflation and Company Finance. Sydney: The Law Book Company of Australasia (London: Sweet & Maxwell), 1958. 8½″. Pp. xii + 179. 42*s*.

[This is partly a general theoretical study and partly an analysis of Australian statistics. The authors state the case for calculating current company income after deduction of depreciation at replacement stock and stock appreciation. They analyse what difference such a procedure would have made to the figures of Australian company profits since the War. In considering the effects of current accounting practices on the position and policy of companies, they have regard not only to tax liability and investment decisions—the two most familiar aspects of the matter—but also to pricing policy and policy relating to dividend distribution.]

Canadian

CREIGHTON (D.). Harold Adams Innis. Portrait of a scholar. Toronto: University of Toronto Press, 1957 (London: Oxford University Press, 1958). 9″. Pp. 146. 24*s*.

[Reviewed in this issue.]

American

BACH (G. L.). Inflation. A study in economics, ethics and politics. The Colver Lectures in Brown University, 1957. Providence, R.I.: Brown University Press, 1958. 8½″. Pp. vii + 103. $2.50.

[This is a group of four lectures on the problem of inflation in the United States economy today. The first lecture contains a very compressed and useful survey of the economic effects of inflation. The author suggests that the effects of a rising price level have been a good deal less drastic either for good or evil than is commonly supposed. He enumerates next a series of reasons which lead him to believe that there will be a strong pressure towards inflation during the foreseeable future. He then turns to questions of policy. Although inflation has not caused large distributional shifts between major categories of income receivers, some groups, notably the elderly and those employed directly or indirectly by government, have undoubtedly suffered severely. Such "non-fulfilment of reasonable expectations" strikes the author as the gravest objection in equity to even a slow process of inflation. He therefore believes that, despite all the difficulties involved, the best policy is really to take the strongest possible line against inflation. Success in such a policy depends, however, on the willing participation of all major economic groups; it cannot be imposed by force. And since it would be unrealistic in present circumstances to expect complete success, an attempt should be made at the same time to lessen the evils of inflation by supporting the position of those most vulnerable to it. In particular, the Government itself should have clean hands in the matter. It is highly inequitable that government employees should suffer from the Government's attempt to "give a good example" in their case by holding down their wages, while failing to prevent a rise in wages in other sectors of the economy. Hence "governments should put all prices which they determine unilaterally on something like a cost-of-living-adjusted basis." Likewise it is wrong to perpetuate laws which oblige trustees to hold the bulk of their assets in fixed-income securities. The author is aware of the objection that such attempts to mitigate the evils of inflation might hasten its pace; but he believes that they are not inconsistent with an attempt to stop inflation by general consent. While Professor Bach is speaking all the time of the American economy, his moderate and balanced views are of much interest in the context of British problems as well.]

BOULDING (K. E.). The Skills of the Economist. Cleveland, Ohio: Howard Allen, 1957. (London: Hamish Hamilton, 1958). 8″. Pp. 193. 16*s*.

[To be reviewed.]

BOWMAN (M. J.) (Ed.). Expectations, Uncertainty, and Business Behaviour. A conference held at the Carnegie Institute of Technology in October 1955 under the auspices of the Committee on Business Enterprise Research. New York: Social Science Research Council (230 Park Avenue, New York 17), 1958. 11″. Pp. 202. $2.00.

[To be reviewed.]

COCHRANE (W. W.). Farm Prices—Myth and Reality. Minneapolis, Minnesota: University of Minnesota Press (London: Oxford University Press), 1958. 9½″. Pp. vii + 189. 32*s*.

[The author is Professor of Agricultural Economics at the University of Minnesota. His purpose is to analyse the problems of agriculture within a framework of an evolving, developing American economy. He analyses the way in which the combination of inelastic demand and expanding supply creates a chronic price problem for agriculture. On the basis of this analysis and of certain value judgments which he is at pains to formulate with unusual explicitness, he considers the relative merits of the alternative ways in which output can be kept down to the level of demand. The author does not claim to introduce any basically new concepts, though much of his statistical and descriptive material is new, but he suggests that some novelty resides in his general synthesis and his view of agriculture in the context of the economy as a whole.]

A Comprehensive Bibliography on Operations Research, through 1956, with Supplement for 1957. Publications in Operations Research, No. 4. New York: John Wiley (London: Chapman & Hall), 1958. 11″. Pp. xi + 188. 52*s*.

[This contains about 3,000 titles, arranged alphabetically by authors. A system of serial numbers helps the reader to find items on particular subjects and indicates the scope of each item. Separate listing is given of the entries relevant to each of some forty special sub-topics.]

A Critique of the United States Income and Product Accounts. Studies in Income and Wealth, Volume XXII, by the Conference on Research in Income and Wealth. Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Oxford University Press), 1958. 9½″. Pp. 589. 92*s*.

[This contains papers delivered at a conference held in November 1955. The volume opens with a long paper on the conceptual basis of the United States national income accounts by George Jaszi, who is head of the National Income Division of the Office of Business Economics in the Department of Commerce. There follow papers on different aspects of the accounts by economists and business users.]

EHRMANN (H. W.). Organized Business in France. Princeton, New Jersey: Princeton University Press (London: Oxford University Press), 1958. 9½″. Pp. xx + 514. 60*s*.

[To be reviewed.]

FERBER (R.). Employers' Forecasts of Manpower Requirements: A Case Study. Urbana, Illinois: Bureau of Economic and Business Research, University of Illinois, 1958. 9″. Pp. 88. $1.50.

[This is one of an interesting series of monographs on expectations emanating from the Bureau of Economic and Business Research of the University of Illinois. Data are supplied by employers in Illinois to the Illinois Department of Labour on the anticipated size of their labour force two months in advance and four months in advance. The author analyses the accuracy of these projections and considers the factors influencing them. Broadly speaking, the forecasts turned out quite well, though it has to be borne in mind that they related to the quite near future and that the period covered by the study happened to be relatively free from major fluctuations. As in a former study (on railroad shippers' forecasts), it was found that forecasts in general were of an upward movement, so that errors were larger when contractions actually eventuated than when expansion continued.]

FURNISS (E. S.). The Position of the Laborer in a System of Nationalism. A study in the labor theories of the later English Mercantilists. Reprints of Economic Classics. New York: Kelley & Millman, 1957. 8½″. Pp. 260. $6.00.

[This is a reprint of a work by Professor E. S. Furniss of Yale that was first published some forty years ago. It won high praise from Professor Heckscher as a study of a particular aspect of mercantilist thinking.]

HENDERSON (J. M.). The Efficiency of the Coal Industry. An application of linear programming. Cambridge, *Mass.*: Harvard University Press (London: Oxford University Press), 1958. 8½″. Pp. xii + 146. 36*s*.

[To be reviewed.]

HOUSER (T. V.). The Cruelest Tax. New York: Committee for Economic Development (711 Fifth Avenue, New York 22), 1958. 9″. Pp. 23. 50c.

[This is a summary of a report on inflation issued by the Research and Policy Committee of the Committee for Economic Development.]

JONES (R.). An Essay on the Distribution of Wealth and on the Sources of Taxation. Reprints of Economic Classics. New York: Kelley & Millman, 1956. 8½″. Pp. xlix + 329. $8.50.

[The Rev. Richard Jones (1790–1855) was an economist who asserted the importance of historical and institutional study in opposition to the deductive method of the Ricardian school. The present work is a treatment of the problem of rent along these lines. As with several of Messrs. Kelley and Millman's otherwise valuable series of reprints, the original date of publication is not indicated.]

KINDLEBERGER (C. P.). International Economics. Revised Edition. Homewood, Illinois: Irwin, 1958. 9½″. Pp. xxii + 636. $7.00.

[The first edition of this well-known text-book was reviewed by Sir Donald MacDougall in the ECONOMIC JOURNAL of September 1954, p. 559. The present edition has been considerably revised, new material has been added, and some of the more difficult analysis relegated to appendices.]

LEVIN (H. J.) (Ed.). Business Organization and Public Policy. A book of readings. New York: Rinehart, 1958. 9½″. Pp. xxi + 550.

[This is a systematically organised collection of readings in the field of industrial concentration, anti-trust policy and government intervention in industry, almost all of them taken from American sources. Each section is introduced by a few pages by the editor, in which he outlines the issues involved and reviews the literature. While the strongly American orientation limits the book's usefulness to English students, the skill with which it is put together demonstrates that such a collection of readings can cover the ground no less successfully than a pre-digested text-book and with considerably greater educational value.]

MEIER (G. M.) and BALDWIN (R. E.). Economic Development. Theory, history, policy. New York: John Wiley (London: Chapman & Hall), 1957. 9½″. Pp. xix + 588. 68*s*.

[To be reviewed.]

MYERS (C. A.). Labor Problems in the Industrialization of India. Cambridge, Mass.: Harvard University Press (London: Oxford University Press), 1958. 9½″. Pp. xvii + 297. 52*s*.

[To be reviewed.]

NATIONAL BUREAU OF ECONOMIC RESEARCH. Investing in Economic Knowledge, by S. FABRICANT. 38th Annual Report. New York: National Bureau of Economic Research, 1958. 10⅛″. Pp. 108.

[This report becomes a more substantial and valuable document every year. On this occasion Professor Fabricant, instead of choosing a particular topic for his introductory paper, devotes it to a general survey of the past, present and future work of the National Bureau, looked at in relation to the broad aims of economic research in furthering the national interest. The second part of the Report contains full accounts by staff members of research currently in progress, with summaries of results to date. Some of these summaries are of the dimension of short articles.]

PAPANDREOU (A. G.). Economics as a Science. Chicago, Illinois: J. B. Lippincott Company, 1958. 8½″. Pp. xi + 148.

[To be reviewed.]

ROBERTSON (H. M.). South Africa. Economic and political aspects. Durham, North Carolina: Duke University Press for the Duke University Commonwealth Studies Center (London: Cambridge University Press), 1957. 8″. Pp. x + 192. $3.50.

[The racial problem is the central theme of these informative, liberal-minded and well-reasoned lectures. Professor Robertson first describes the way in which relationships between Black and

White have developed in the course of South African history, especially in the economic sphere. He then considers the doctrine of *apartheid*, viewed in relation to past and present realities and future possibilities. He devotes much attention to the system of migrant labour, which is what makes *apartheid* at least a theoretically conceivable solution. He shows, however, that the possibility of providing for all or the bulk of the Native population in the Reserves is likely to be rendered increasingly remote by demographic trends, quite apart from the many other difficulties involved. Hence arises the danger that any potentially constructive elements in the concept of *apartheid* will be lost sight of, and it will come to be merely synonymous with repression. Professor Robertson's final lecture is concerned with recent constitutional struggles. Appended to the lectures are a glossary and an extensive annotated bibliography.]

SAULNIER (R. J.), HALCROW (H. G.) and JACOBY (N. H.). Federal Lending and Loan Insurance. Princeton, New Jersey: Princeton University Press for the National Bureau of Economic Research (London: Oxford University Press), 1958. 9½". Pp. xxx + 566. 96*s*.

[This is a fully documented statistical survey of the Federal Government's programme of lending and loan insurance which began in 1932 and of its consequences. This has now become a major feature of the American financial scene, especially in agriculture and housing. The authors reckon that its importance in determining the level of demand has been not less than that of Federal fiscal policy, but the two have in general not been well co-ordinated. In addition to its effects on the level of aggregate activity, lending by the Federal Government has had effects on the allocation of resources and on the distribution of income. It has had the general effect of cheapening the terms of credit required by private lenders.]

SMITH (ADAM). Lectures on Justice, Police, Revenue and Arms, delivered in the University of Glasgow. Edited by E. CANNAN. Reprints of Economic Classics. New York: Kelley & Millman, 1956. 8½". Pp. xxxix + 293. $7.50.

[The publication of these lectures in 1896 was an important event in the history of economic thought. They are now made available in this photographic reprint.]

TANNENBAUM (A. S.) and KAHN (R. L.). Participation in Union Locals. Evanston, Illinois: Row, Peterson, 1958. 8½". Pp. xii + 275.

[This is a sociological study of the sort of people who are active in unions and their motivations, and of the characteristics with respect to control and other aspects of organisation that go to make a union an active one. It is based on four case-studies. In three of the unions studied, the most active members were found to be in general those with more skilled jobs than the average, and their interest in union activities arose largely from desire to protect their job interests. They were not as a rule particularly ambitious to raise their personal status, nor were they animated by special hostility to management. In the fourth union, however, things were rather different. This was a more aggressive union, and its most active members were *not* those with the most valuable job interests to protect.]

DE LA VEGA (J.). Confusion de Confusiones. Portions descriptive of the Amsterdam Stock Exchange, selected and translated by H. KELLENBENZ. Boston, Mass.: The Baker Library, Harvard University Graduate School of Business Administration, 1957. 10½". Pp. 42.

[The curious work which is the subject of this latest publication in the Baker Library series of reprints was written in Spanish in 1688 by a Portuguese Jew resident in Amsterdam. Its subject is the organisation of the Amsterdam Stock Exchange and the practices in stock dealing there at that time. It is cast in the form of a dialogue, and the original was written in an extravagant style, with extensive rhetorical and literary digressions and moralisings. The translation is therefore of selected passages only and is designed to make conveniently available the remarkable amount of information that the work contains. The introduction by Professor Kellenbenz discusses de la Vega's personal history and analyses the financial institutions which his book describes.]

German

GUNSTON (C. A.) and CORNER (C. M.). Deutsch-Englisches Glossarium finanzieller und wirtschaftlicher Fachausdrücke. Dritte stark erweiterte Auflage. Frankfurt: Fritz Knapp (London: Patria Translations, 22 Cheyne Walk, Hendon Central, N.W.4), 1958. 7½". Pp. 814. 68*s*.

[This is the third edition, much enlarged, of a glossary designed principally for the use of translators employed by banks and similar institutions. It seeks to give the exact English equivalent of technical terms in use in economic and financial literature, with explanatory notes where necessary.]

Norwegian

Bedriftsskatter i Danmark, Norge og Sverige. (Corporate Taxes in Denmark, Norway and Sweden). Samfunnsøkonomiske Studier No. 6. Oslo: Statistisk Sentralbyrå, 1958. 9½". Pp. 100.

[This is in Norwegian, with an English summary. The methods of assessing corporate tax liability in the three countries are described in detail and illustrated with reference to hypothetical examples. For the purpose of giving an overall evaluation, the concept is used of an "equilibrium tax rate," namely the rate of tax that would be payable by a company if the various factors affecting its liability had been following a smooth path for a number of years.]

Israel

The Challenge of Development. A symposium held in Jerusalem in June 1957. Jerusalem: The Eliezer Kaplan School of Economics and Social Sciences, the Hebrew University, 1958. 9½". Pp. 233. 7*s*.

[To be reviewed.]

KLINOV-MALUL (RUTH). Productivity of Labor and Machines in Israel's Cotton Spinning Mills. Jerusalem: Falk Project for Economic Research in Israel (24 Hillel Street), 1958. 9½". Pp. 48.

[The upshot of this piece of research is that productivity per man and per machine in cotton-spinning mills in Israel does not compare too unfavourably with productivity in most countries in Western Europe and South America, though falling well short of the standard in North America. Most of the equipment used in the mills in Israel is relatively modern, but as against this advantage are the disadvantages imposed by unduly small-scale production and inadequate specialisation. The higher cost of the output of Israeli mills at current exchange rates compared with the cost of European yarn is due more to differences in factor prices than to differences in productivity.]

LUBELL (H.) and others. Israel's National Expenditure 1950–54. Jerusalem: Falk Project for Economic Research in Israel and the Central Bureau of Statistics, 1958. 9½". Pp. 93. $2.00.

[This completes a series of national accounts studies for Israel undertaken by the Falk Project and the Central Bureau of Statistics for the period 1950–54. It contains the commodity flow data which add up to totals of expenditure, and it also contains a system of tables drawing together the results of the previous studies. Output and consumption per head in real terms are shown to have risen sharply in 1954, after being nearly stationary for the previous three years. Gross domestic capital formation, on the other hand, fell markedly between 1950 and 1954, mainly because of the decline in residential construction associated with the decline in the rate of immigration.]

Turkish

HABAKKUK (H. J.), SAUVY (A.), SARACENO (P.), LARY (H. B.) and NURKSE (R.). Lectures on Economic Development. Ankara: Faculty of Political Sciences, University of Ankara; Istanbul: Faculty of Economics, University of Istanbul, 1958. 9½". Pp. 200. £7.20 Turkish.

[This contains a series of lectures delivered in Istanbul and Ankara by visiting economists in Spring 1957. The contents are: "The Entrepreneur and Economic Development" and "Population Growth and Economic Development," by H. J. Habakkuk; "Progrès technique, emploi et chômage" and "La population des pays sous-développés," by A. Sauvy; "Initiative privée et action publique dans les plans d'industrialisation des régions sous-développées," by P. Saraceno; "Economic Development and the Capacity to Import: National Policies" and "Economic Development and the Capacity to Import: International Policies," by H. B. Lary; "The Conflict between 'Balanced Growth' and International Specialization" and "Some Reflections on the International Financing of Public Overhead Investments," by R. Nurkse.]

Sudanese

The Population of Sudan. Report of the Sixth Annual Conference of the Philosophical Society of Sudan in conjunction with the Department of Statistics, Government of the Republic of Sudan. Khartoum: Philosophical Society of Sudan, 1958. 11½″. Pp. 97 + maps.

[The first Census of the Sudan was recently undertaken and its results are currently in the course of preparation. The proceedings of this conference contain lectures, written contributions and maps, many of which are based on the preliminary results of the Census.]

Japanese

Kimura (M.). Conditions for Direct Taxation and Other Essays. Science Council of Japan, Economic Series No. 17. Tokyo: Science Council of Japan, 1958. 8½″. Pp. 130.

[This is published in a series sponsored by the Social Science Council of Japan with the purpose of making the writings of Japanese economists more readily accessible to western readers. It contains six essays by Professor Kimura, most of which have been previously printed. They bear mainly on the problems of taxation that arise at different stages of economic development with especial reference to the experience of Japan.]

Official

British

Peacock (A. T.) and Dosser (D. G. M.). The National Income of Tanganyika, 1952–54. Colonial Research Study, No. 26. London: H.M. Stationery Office, 1958. 9½″. Pp. 78. 7*s.* 6*d.*

[To be reviewed.]

Woodward (Joan). Management and Technology. Problems of Progress in Industry, No. 3. London: H.M. Stationery Office, 1958. 8½″. Pp. 40. 2*s.* 6*d.*

[This is a summary of a research project which will be described in full in a forthcoming book. It is based on a survey of management organisation in a hundred firms in South Essex. Its main subject is the relation between technical conditions of production and organisational requirements within management. One of the conclusions reached is that the impact of technical change on organisational patterns need not be very great unless a change is involved either in aims or in the production system.]

Canadian

Restrictive Trade Practices Commission, Department of Justice, Ottawa. Report Concerning the Manufacture, Distribution and Sale of Yeast; Pp. 80. Report Concerning the Production, Distribution and Sale of Zinc Oxide; Pp. 193. Report Concerning the Purchase of Pulpwood in Certain Districts of East Canada; Pp. 229. Ottawa: Department of Justice, 1958. 10″. 50c. each.

[These three latest reports of the Canadian Restrictive Trade Practices Commission contain the conclusions arrived at, together, as usual, with extensive verbatim extracts from the oral evidence and exhibits received.]

Royal Commission on Canada's Economic Prospects. Final Report. Ottawa: The Queen's Printer, 1957. 10″. Pp. 509.

[To be reviewed.]

American

Statistical Review of East-West Trade 1956–57. Eleventh Report to Congress under the Mutual Defense Assistance Control Act of 1951. Washington, D.C.: U.S. Government Printing Office, 1958. 9″. Pp. 34.

[This contains statistics for 1956 and 1957, together with an account of the controls affecting trade with the communist bloc in each of the principal Western countries. The report is one of a series that appears twice a year.]

International

Council of Europe. The Development of Africa. Report of the group of experts presented to the Consultative Assembly of the Council. Strasbourg: Council of Europe, 1957. 10″. Pp. 69.

[This is the report of a study group concerned with the economic development of Africa, with special reference to the contribution that may be made by the co-operation of European countries. Attention is given in particular to external finance for development, technical assistance, and the organisation of trade relations and markets, and to the institutional framework required for these purposes.]

Tinbergen (J.). The Design of Development. Baltimore: The Johns Hopkins Press for the Economic Development Institute (International Bank for Reconstruction and Development) (London: Oxford University Press), 1958. 8½″. Pp. 99. 20*s.*

[To be reviewed.]

United Nations. Structure and Growth of Selected African Economies. New York: United Nations, 1958. 11″. Pp. 201. 14*s.*

[The three economies considered are the Federation of Rhodesia and Nyasaland, Morocco and the Sudan. The central theme of the study is the process by which resources are transferred from unspecialised traditional subsistence agriculture to the growing exchange sector of the economy. The exchange sector may be dominated by foreign capital and enterprise, as in Rhodesia, or it may come into existence by commercialisation of parts of the traditional economy, as in the Sudan. Morocco presents a case intermediate between these two. The report analyses the structure of the three economies, and the ways in which it has been and is likely to be affected by growth. It contains extensive statistical tables, based mainly on published data but including also a certain number of new estimates.]

International Monetary Fund. Annual Report of the Executive Directors for the Fiscal Year ended April 30, 1958. Washington, D.C.: International Monetary Fund, 1958. 9″. Pp. 218.

[This year's issue of the Fund's Annual Report follows its now established lines. It contains a general review of the world economic position, followed by a more detailed survey of developments affecting finance and balances of payments. The general introductory chapter is mainly concerned with the problems involved by recent deflationary tendencies. Its conclusion foreshadows recent moves towards increasing the Fund's resources.]

United Nations Food and Agriculture Organisation. Governmental Services to the Sea-fish Industry of Great Britain. Rome: F.A.O., 1958. 9″. Pp. viii + 127. 6*s.* 3*d.*

[This report was prepared under the auspices of the Royal Institute of Public Administration for the F.A.O. by F. M. G. Wilson, Research Fellow of Nuffield College. Part I contains a useful general survey of the present structure of the fishing industry in Great Britain and an analysis of the factors—depression, war, changes in demand, conservation problems—that have led to the present extensive government interest in it. Part II describes in more detail the various services rendered by the Government to the industry.]

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