THE

WEALTH OF INDIA

A Monthly Magazine of information and instruction on all matters of material interest.

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The Wealth of India.

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TOPICS OF THE MONTH.

Peace and Prosperity.

The twelfth of December 1911 marks an epoch in the history of the British administration in India. At 12 o'clock noon that day, all unrest and sedition were banished from India as if by a magic wand, and peace and progress were installed in their stead. The former were due to Lord Curzon and to Lord Hardinge we owe the latter. Lord Curzon thought that India was a great glory to Britain, and that, unlike Britain and her other oversea dominions, India must be ruled autocratically. He accordingly flouted Indian opinion and Indian sentiment. The result was unrest and unpopularity of the British rule in India. The mistake that Lord Curzon made was that he realised only half the truth. He forgot that English education had created new ideals and aspirations and that India was not only a great glory to Britain but also a great responsibility and a great danger. Fortunately for India and England, Lord Hardinge realised the whole truth. With the plainness and boldness characteristic of the Britisher, he represented his view to Lord Crewe who promptly agreed that an empire in discontent should be at once pacified. The manner in which it was done was most dramatic. The transfer of the capital from Calcutta to Delhi, the modification of the partition of Bengal and the grant of half a crore of rupees per annum for the spread of education were announced through the mouth of His Majesty the King Emperor at the great Durbar at Delhi and he was thus given the opportunity to show his *sympathy* for the

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people of India by deeds as well as by words. These boons indicate, in our opinion, a change in the principles of administration of this country. They are evidence that the Government admit their duty to educate the people of India, recognize Indian public opinion and will shape their measures in sympathy with them. Nay, the Despatches of Lord Hardinge and Lord Crewe open the glorious vista of a federated India under the hegemony of the British Crown and we have the Emperor's word, that we may *hope* for it. So far, the Government have nobly done their work. It is now our duty to deserve the promised place of honor in the Empire.

What we have written above is politics. We do not underrate the importance of politics in the advancement of this country. But we do hold strongly to the belief that improvement in the *material* condition is the foundation on which every national structure should be built up and it has preponderating claims to the best brains and the best energies of our people, over the demands of all other lines of work. It is in this view that we have decided to publish the "Wealth of India" with the inauguration of the new era of peace, progress and prosperity in India.

Protection for India.

The address delivered by the Hon'ble Mr. Dadabhoy as President of the Indian Industrial Conference held in Calcutta in December last, of which we give a summary elsewhere, was certainly up to the average of the speeches made by the previous Presidents of that useful assembly, with perhaps one or two notable exceptions. Mr. Dadabhoy appreciated the situation in India quite correctly when he placed the industrial regeneration of the country above all other pressing problems in importance. The pangs of hunger must be satisfied and all experience shows that commerce and industry are the most potent means of doing it. The "revival of Indian industries therefore offers the most productive and promising field for the labours of the Patriot and the Statesman." The address does not contain any original diagnosis why industrial progress in India is slow, nor does it contain any brilliant suggestion for the solution of the industrial problem in India. It is however noteworthy as a conspectus of the current ideas and notions that are prevalent about the lines of industrial development generally in this country. The programme sketched is costly, long, and laborious, and it is certainly desirable if it is practicable. If India could have fiscal freedom and if it could impose protective duties, her industries will get a certain amount of fillip no doubt; but as the bulk of the protective duties will fall on British manufactures, and as it is the British manufacturer that is the greatest competitor of India, what chance is there of his becoming an angel, giving up the selfish instincts of humanity, to nourish an industrial India? Assuming that protection is practicable, is it clear beyond doubt that that is the best form of fiscal policy for an agricultural country like India? The first effect of a protective tariff is to raise the price of the imported commodities. It is an indirect tax on the home consumer. In India, the chief consumers are the agriculturists. These pay already a tax of 50 per cent. on the net produce of the land, about another 6¼ per cent. as land cess and another small percentage, which it is not easy to determine, as an effect of the export duty on rice. It may be safely set down that with the payment of the customary, though not legal, perquisites to the village officers, the agriculturist already pays, on the average, about 60 per cent. of the net produce of the land as his contribution to the State. It is no wonder that the condition of the agriculturist who is so enormously handicapped is not as it should be. Indeed, it is the agriculturist more than the capitalist that requires protection in India at the present day. There are several reasons why industries are not advancing apace in this country. On the contrary, certain forces have begun to operate and arrest industrial development. We shall no doubt have occasion to explain what these are on a future occasion. Meanwhile, in the absence of adequate relief, a protective policy in India, would sacrifice the poor agriculturists for the sake of the fat capitalists; and as the agriculturists form the majority, protection of industries as a national policy will be an injustice to the bulk of the people of India.

SPECIAL ARTICLE.

THE RISE IN THE COST OF LIVING.

BY

THE EDITOR.

FOR some years past, the cry has become common in India that prices have risen high and that "living has become costly now-a-days." The ordinary man tries to explain away this fact by reference to the local causes which are most apparent in his neighbourhood. Experts on the other hand have their own theories and several of them set down the rise as due to the currency policy of the Indian Government. While every one in India knows that there has been a rise in prices of late years in this country, not many are aware of the fact that similar rises have taken place in other countries also. The phenomenon is not local but world wide. All the leading countries in the world, England, France, Germany, and the United States, have had the dear food problem pressed upon them and the experts in each are trying to solve it.

Another noteworthy fact is that the rise in prices has not been uniform in all countries and food and non-food articles exhibit different tendencies.

The question has been examined by Mr. R. H. Hooker in a paper on "The Course of Prices at Home and Abroad, 1890—1910." This paper will be found published in the December issue of the journal of the Royal Statistical Society. Comparing the prices in 1910 with those of the decade 1890-99, Mr. Hooker shows that wholesale prices have risen, in England by about 18 per cent., in Germany and the United States by about 30 per cent., and by intermediate amounts in France and Canada. Wholesale *food* prices in 1910 have risen by only about 6 or 8 per cent., in England, and scarcely at all in France, while a rise of between 20 and 60 per cent. is shown in the other countries. The raw materials of industry have risen much more, *viz.*, by 25 to 40 per cent. in all countries. A great contrast is shown between England and America, in the latter of which, food and materials have risen by practically the same amount; while in England, foodstuffs have risen very much less, although they have attracted much more public attention.

As to retail prices, the data were scanty, and not very reliable. It appears that, on the whole, since 1895 they have risen by about as much as wholesale prices, though in the United States, they seem to have lagged behind.

Now, as to the causes of the rise in prices, there is a fair volume of authoritative opinion that one cause of the general rise is undoubtedly the enormous increase in the production of gold. The following schedule, taken from the Economist, summarises the approximate aggregate production of gold during the last fifty years by five-year periods :—

Years.	Fine ounces.
1856—1860	32,431,000
1861—1865	29,747,000
1866—1870	31,350,000
1871—1875	27,955,000
1876—1880	27,715,000
1881—1885	39,973,000
1886—1890	27,306,000
1891—1895	39,410,000
1896—1900	62,233,000
1901—1905	76,732,000
1906—1910	105,701,000

During the last five years, the yield of gold, according to the best available estimates, for the first time exceeded 100,000,000 fine ounces. A large part of the augmented output must be ascribed to the discovery of the cyanide process. Early in the nineties, MacArthur and the Forests brought the modern perfected cyanide process under the notice of all interested in mining enterprise. During the two decades which have elapsed, the aggregate output has been 284,076,000 fine ounces. That the spread of the cyanide process is largely responsible for this output is proved by the fact that, during this period, with one notable exception, very little new ground has been discovered or opened out. Klondike is the only new area which has recently been added to those from which the main yield of gold is obtained. It

has been pointed out that the "cream of the world's gold fields have already been skimmed in previous years in California, Australia, South Africa, and India; it is mainly in the lower-grade areas of the old fields that the cyanide process has achieved the remarkable production" shown in the figures given above. The low grade deposits were formerly passed over; now it is the innumerable, widely dispersed, low-grade reefs which have sent the output to a level which is a record, and it is these low-grade accumulations which now provide the main portion of the world's supply of gold. In default of the discovery of other virgin areas, the world will have to depend for its future requirements mainly on these low-grade deposits, which the cyanide process has brought within the limits of profitable working. There is every indication, says the Economist, from which we are quoting, that the increase will be maintained for sometime. Taking the world's output of gold at 100, the sources of supply are as follows:—

	Per cent.
From Russia, Mexico, India, South America, and China ...	15
The Transvaal	35
Other British Dominions ...	25
United States	25
TOTAL	100

The predominant position of the Transvaal is clearly shown by the fact that more than a third of the whole output comes from there, and the proportion is 10 per cent above the production of the United States or of the rest of the British dominions.

Mr. Hooker considers that the effect of the gold output shown above would probably persist for some time and prices would oscillate round an average that is not likely to decrease for the present.

A second cause for the rise in prices in England is stated to be that it is "now near the crest of one of those waves, due to increased demand for materials, especially minerals, which periodically recurred in prices, and which were generally associated with industrial prosperity."

"Thirdly, the price of food had risen very greatly during the past three months owing to the droughty summer in north-western Europe. The two former influences, superimposed, had resulted in very high cost of materials. The two latter were temporary, and when they had passed away, prices would again be lower." So far, as regards England.

In France, the Government recently ordered an official inquiry for the purpose of discovering the causes of the growing high cost of provisions in the country. No communication has been made as yet in regard to the results of this inquiry, but a recent number of the *Bulletin of Social and Economic Intelligence* issued by the International Institute of Agriculture, Rome, contains an article based on an important publication which has been issued by the French General Statistical Office and on numerous studies made by authorised experts. It deals with the gravity of the increase in the price of food and the causes of the increase, as to which there seems to be a general agreement. It also makes known the measures taken by the Government to put a stop to the rise in prices.

It is generally agreed that the present rise in prices is not special to the year 1911. A careful examination of the variations in prices for a certain number of ordinary commodities is said to reveal the fact that there has been a general tendency to increase since 1887, and that since 1904 in particular, the increase has been continuous and so rapid that a large Parisian Administration, the "Assistance Publique", has had its expenditure increased by more than 18 per cent. in four years.

The causes of this disquieting phenomenon are not all of equal import; some are temporary, such as the influence of the disasters which have been affecting agriculture for two years past: floods, poor crops of wine and wheat, unprecedented droughts, and epidemics raging amongst all the herds of cattle. On the other hand, the prices of some of the commodities have increased in proportion to the fluctuation of the law of supply and demand. Thus, milk, butter and eggs are consumed to a much greater extent than formerly in consequence of the improvement in the condition of the working classes, and also in consequence of the new medicine and the new hygiene, under which many persons are submitted to a regimen of milk and eggs.

The article, for a summary of which we are indebted to the Indian Trade Journal, also points out, as other causes of the rise in prices, a certain falling off in the stock of French cattle, and the rapid increase in the wages of agricultural labourers and reduction of their hours of labour; and lastly, whilst showing how the question is still under discussion, it indicates the part played in the rise in prices, according to eminent economists, by the depreciation in the precious metals, due to the abundance of gold.

In Germany, there is no doubt that the pinch of high prices is being felt, but the Government is not prepared to sift the causes on politico-economic grounds. It will be remembered that, recently the German Imperial Chancellor, in replying to a series of interpellations in the Reichstag on the high prices of food, denounced such questions as designed to destroy Germany's protective system. The dearness of food is accounted for by the Chancellor simply as the effect of drought; and any plea that high prices are made higher still by shutting the door against imported produce is scouted as a sacrilegious attempt to discredit the protective system.

In the United States, the senate nominated a Commission about the beginning of last year, to make an inquiry into the high cost of living, and especially into the high price of food. The Commission collected a great quantity of evidence and recently presented a report which has received the sanction of the majority of its members. The following summary of the Report is taken from the *Kansas Farmer*. Among the different causes which have helped to make prices rise, the following are the most noticeable: (1) Increase in the cost of the production of farm products, in consequence of the higher value of land and the increase in wages; (2) increase in the demand for farm products and food; (3) passing of a part of the population from the role of food producers to occupations; (4) decrease in the fertility of the soil with the result either of an inferior average production or an increase in the expenditure for manures; (5) greater facilities in the bank transactions in agricultural districts, which allows farmers to hold back their crop until they can sell them under the best conditions. It has been found that this fact, not only makes the prices steadier, but has a tendency even to increase them; (6) preservation of products by cold storage, which prevents great fluctuations in the price of certain products according to the season, but which, by permitting the wholesale merchant to buy and sell under the best conditions for himself, tends to make prices rise; (7) increase in the cost of the distribution of products; (8) industrial combinations; (9) organisation of producers and merchants; (10) increase of money resources; (11) over capitalisation; and (12) more luxurious ways of living.

These deductions have been made, it appears, from a study of the prices of 257 products set forth in tables showing the increase which has taken place from 1900 to 1909 inclusive. The general level of wholesale prices in the United States is said to have increased 14·5 per cent. during that period. "These tables show that the largest increase was verified in the produce of the soil. The Report states that, since the increase in prices has been much greater on products coming directly or indirectly from the farm than on any other product with the exception of forest products, it seems obvious that the main cause of the present high price of food will be found by a study of agricultural conditions."

Referring to the relatively great advance of food prices in the United States as compared with England, Mr. Hooker considers that American agriculture has been unable to keep pace with the expansion of population; in England, on the other hand, the diminished supplies from the United States have been fully

covered by supplies drawn from other countries, notably Argentina: hence the rise in food prices was relatively small in England. Changes in tariffs are also responsible for some of the differences noted between prices in England and elsewhere.

Coming next to the effect of the rise in prices on wages, it is obvious that the rise in prices must necessarily press on those who are in receipt of fixed incomes. If salaries and wages rise in equal proportions, the hardship is not likely to be felt by the people; but wages do not always readily rise or fall with prices. It appears that the comparisons made by Mr. Hooker of the course of prices with wages, for which a few data were available for England, France and the United States, indicate that wages had not fallen behind prices except in the last year or two. "The curve of wages was, however, always the smoother; and if it did not rise so abruptly during times of high prices, like the present, on the other hand, it fell very little during times of low prices. In France, in particular, wages appeared to have risen most, relatively to prices, but the data were very far from conclusive."

How far it is possible for the people or the Government to control prices is not very clear. It is believed that in France, so far as the people are concerned, the agricultural syndicates and co-operative societies, which have already centralised the forces that were formerly dispersed, might undoubtedly one day impose a regulating influence on commerce.

So far as the Government is concerned, we gather that it first took measures for the purpose of facilitating the importation of Colonial, Argentine or Canadian cattle, and rendering the transit of agricultural produce and fresh fish to the inland markets easier. It also arranged for the application of a special regulation to the maize imported for feeding cattle, the institution of a system of rebates in the octroi laws, and the study of the regulation of markets and slaughter-houses.

Lastly, the French Government have introduced a provision into the Finance Bill authorising the Communes to open Municipal or co-operative bakeries, butchers' shops, etc., for the purpose of regulating prices. In order to prevent any competition which would be disastrous to existing commerce, the Bill arranges that each Communal or inter-Communal group of 5,000 inhabitants may have only one Municipal or co-operative institution of this kind.

This institution will not enjoy any fiscal or other privilege so as to alter the conditions of natural competition, and whenever a Municipal Council decides to start an enterprise, in the profits of which the Municipality itself shares, or to encourage the institution of a co-operative society by granting it a loan, the shopkeepers of the locality will have the right to bring their complaints before the Council of the State, upon whose decision will depend the approval or non-approval of the rules of the projected institution.

Having thus far summarised the position of the high prices question abroad, we may now consider the case of India.

On the 14th May 1909, Mr. Hart-Davies asked the Under Secretary of State for India in Parliament whether the attention of the Government had been called to the high price of foodstuffs prevailing in India; whether it was attributed to the Government's currency policy and excessive coinage of rupees; and what steps the Government proposed to take in the matter. Mr. Hobhouse replied that the Secretary of State was aware that the matter had attracted attention in India and that he was in communication with the Government of India on the subject. He was not of course prepared to make any definite statement as to the conclusions at which the Secretary of State might arrive.

In the month following, however, the announcement was made that the Secretary of State had sanctioned the deputation of an officer on special duty for the purpose of inquiring into the rise of prices in India. Mr. K. L. Datta of the Finance Department of the Government of India was accordingly appointed with Mr. G. F. Shirras, Professor of Economics at the Dacca College as his assistant. These gentlemen are now touring through out India gathering evidence and examining witnesses. How long it will take to complete the enquiry and what may be their conclusions, it is impossible to say. But so far as we know, very few witnesses are forthcoming to give evidence and stand the cross-examination on the subject. Of facts and figures, there is very little, but of opinion, there is plenty. One gentleman would explain the rise in the price of wheat as due to the fact that educated Indians are giving up rice and taking to wheat, either to avoid or mitigate the rigors of that gentlemanly disease known as diabetes. The country folk will ascribe the rise in the price of rice as due to want of seasonable rainfall and exhaustion of the soil. One explanation for the rise in the price of dairy products is stated to be that country women now-a-days affect genteel manners and decline to look after the cow as the women of olden days did. Another would explain that coffee drinking has increased enormously of late years and nearly all the milk is exhausted and very little comes to the churn. The explanations furnished will be various and may not occasionally be amusing also. All these only show the difficulties of the problem. The complexity of the subject may be gathered from some of the questions addressed by the Datta Committee to intending witnesses:—

"1. What are the classes of articles in which there has been an appreciable increase in price during the last 21 years and what are the classes of articles in which there has been an appreciable fall? Are these variations specially marked in the case of any particular class of articles.

2. To what causes do you attribute the increase in prices?

3. Do you consider that the rise of prices of agricultural produce is due—and if so, to what extent—to a decrease in production? To what causes do you attribute this decrease in production? Besides shortage of rainfall, floods and injuries by insects, do you think there are any other causes which have led to a decrease in production?

4. Can you say whether the cultivation of non food products (jute, cotton, etc.), has been substituted for that of rice or other food crops, and if so, to what extent?

5. Is there any truth in the statement that there has been a decrease in the productive power of the soil?

6. Has the growth of production kept pace with the growth of population?

7. How far is the rise in prices of foodgrains due to excessive export? Do you think that, if exports were stopped, prices would return to their old level of 21 years ago? Would it be desirable to stop or curtail exports?

8. Has there been any increase in the cost of production, and if so, what are the causes which have led to it? Has there been any enhancement in the rent of land; has the standard of living of agriculturists and labourers been raised and has there been a rise in the wages of the agricultural classes; and do you think these have led to an increase in the cost of production and a consequent rise in prices also?

9. Have there been any variations in the wages of skilled and unskilled labour during the last 21 years and to what extent? Are these variations proportionate to the variations in the prices of the necessaries of life for that class of people?

10. Do you think the cultivating classes are on the whole better or worse off now than 21 years ago?

11. What are the new communications which have been opened in the last 21 years? Has there been any change in the cost of transport from the interior to the centres of trade? What has been its exact effect upon prices during the same period?

12. Has there, to your knowledge, been any reduction in ocean freights during the last 21 years and what has been its effect on the prices of articles of export?

13. Does any part of the rise in prices of wheat, cotton, and other commodities, which are exported from India but are not the monopoly of it, reflect a corresponding rise in

prices in the countries to which they are exported ? Is the rise in prices in this country singular in any, and if so, in what case ?

14. Does the rise in price of articles of ordinary consumption, namely, fish, milk, meat, vegetables, etc., reflect a rise in the prices of food-grains, or are there any distinct causes ?

15. Do you think that the rise has anything to do with possible "corners" by merchants ?

16. Are there now more middlemen in any business than there used to be 21 years ago, and if so, do you think this has anything to do with the rise in prices ?

17. In the case of imported goods, what are the classes of articles in which there has been a rise in prices and those in which there has been a fall ?

18. To what extent may this rise and fall be attributed to similar variations in the countries of origin and in the cost of their transport to India ?

19. Has any change in the tariff, either here or in any other country, contributed to the rise in prices ?

20. Do you think that any part of the rise in prices is due to a depreciation of the value of the rupee, and if so, how and why has the value of the rupee been depreciated ?

21. Do you think that there has been a redundancy of coinage in this country; if so from what year do you think this redundancy has commenced ? What are the indications from which you would judge there is a redundancy of coinage. How and to what extent has this redundancy affected prices ?

22. To what extent has the system of credit or other similar means of economising the use of the precious metals for currency been developed in the last 21 years ? What effect has any such development had on prices ?

23. Has the present system of rupee coinage any effect on prices, and if so, how and to what extent has the coinage affected prices ?

24. Do you think that the adoption of a gold standard in India had anything to do with the recent variations in prices ? Has the total output of gold in the world had any effect on such variations ?

25. Has there been any large influx of capital from abroad during the last 21 years ? If so, what has been its effect on prices and wages ? How would you best gauge this influx.

26. Have barter transactions been substituted by cash during the last 21 years to any appreciable extent ? If so, what has been its effect on prices ?

27. How far are the variations in prices due to what may be called "world-factors" ?

28. What have been the probable effects of these variations on the different sections of the community ?

29. Do you think that the demand for Council Bills in excess of the Secretary of State's requirements should necessarily be regarded as a demand for an increase in the circulating medium of the country ?

30. Can you account for the fact that the total imports into India of foreign goods during the last famine has been greater at any previous period, however prosperous ? The value of imports in 1907-08 was Rs. 1,29,89,51,000, in 1906-07 Rs. 1,08,30,76,000 and in 1908-09 Rs. 1,26,57,000.

The rupee prices of imported articles, as represented by their index numbers, were also the highest in 1907 and very high in 1906 and 1908, being 116, 105 and 107 respectively, and in all these years the exchange has been steady and almost the same as fixed by the Government. How would you reconcile this?"

We have given these questions here to show the lines in which the student of Indian Economics is expected to approach the question and gather data for his investigation. In this connection, it is well to remember that India is in the transition stage of economic progress. While several parts of rural India will still be found to be essentially what they were fifty years ago, the establishment of British rule and the rapid growth of communication, through the shipping, railway, post and the telegraph, have drawn India as a whole into the vortex of international exchange. As a necessary consequence, her prices must be levelled with the prices in the great markets of the world.

From the results of the enquiries in other countries which we have summarised above, it will be seen that there are *local* factors which will account for the rise in prices and there are also *world* factors. The opinions of observant old people, though not supported by figures, will be valuable evidence of *local* factors, and it will be a mistake to neglect them. The *world* factors will of course have to be worked out by experts in economics. We trust that the reports and evidence of the Datta Committee will be published by the Government of India in due course, for, they will form a valuable record of the material progress of India in recent years.

VIEWS AND REVIEWS.

India and the World's Cotton Supply.

The following is an abstract of a paper read by Mr. J. Howard Reed, F.R.G.S., before the Section of Economic Science and Statistics of the British Association at Portsmouth, 1911.

Shortage of raw cotton has become an almost chronic condition with which the cotton manufacturer has to contend. It has produced abnormally inflated prices, given an opportunity to cotton gamblers, caused loss and embarrassment to manufacturers, and produced distress among cotton operatives. 'Shortage' has not been produced by a falling off of the world's output of raw fibre, nor by an increased demand by Lancashire for cotton, but by an enormous growth in the manufacture of cotton goods on the Continent of Europe, and in the United States of America. In eighteen years prior to 1910, Britain's demand for raw cotton has fallen 4 per cent., while, during the same period, Europe's requirements have increased 70 per cent., and this, on a figure much larger than ours. America, during the same time, has increased her demand 90 per cent, and her total consumption of fibre now exceeds that of Britain by no less than 54 per cent. Thirty years ago, the total American crop of cotton was less than 7 million bales, but supplemented by the small crops of other countries, was sufficient to supply the world's demands and leave a surplus each season, keeping the price reasonable and fairly regular. Now, with an American crop nearly double the figure just quoted, and with increased supply from other fields, and with the demand of Lancashire stationary, the price of raw fibre has doubled, and 'shortage' has become rampant, notwithstanding the restricted time worked in the mills. The difficulty apparently gets worse month by month, and unless measures of amelioration are successfully pressed, the cotton industry of Lancashire must decline, and ultimately be starved out of existence. India at present produces almost half the weight of cotton grown in the American fields, and has, roughly, 20,000,000 acres under cotton crops. Indian fibre is, however, of short staple and, therefore, very little used in Lancashire. Britain consumed only 87,592 bales during the year ending August 31, 1910. Many experts believe that, with properly directed effort, the crop of Indian cotton may be doubled in the course of a few years. If this can be done, even if the staple is not improved, it will take the place of much long-fibred cotton now used throughout the world, and set free for Lancashire a proportionate amount of better material. The cultivation of cotton in India is very primitive. The lands are poorly tilled, inadequately manured, and meagrely watered; while the native farmer is not only very unprogressive, but is harried by unscrupulous money-lenders, crippled by poor seed, and handicapped by insect pests. With selected seed, longer stapled cotton can be grown, but the native ryot finds it gives a lighter crop, and as he can, under present conditions, only obtain the same price as for the shorter stapled cotton, he naturally soon reverts to the cultivation of short stapled fibre.

The Customer's Point of View.

It can't be said that Indian businessmen are experts in salesmanship and every help intended to improve them in this useful art is welcome. One of the best magazines which supplies hints and wrinkles in this line is 'The System'. In the December number of this Journal, there is an excellent article entitled "From your customers viewpoint" by John Bismer.

The merchant may impress upon the prospective purchaser all the good points in favor of his article but after all, they may not be the points which induce the buyer. Here is an anecdote which is worth consideration by advertisers.

"At his club, one evening, a motor car manufacturer overheard two men discussing the various makes of cars. One of the men, it appeared, already owned a car. The other had made up his mind to buy one, and was

trying to decide on the make which was best suited for his needs. The car owner overwhelmed the prospective purchaser with technical information. He talked cylinder boxes and strokes, the advantages of various types of transmission, the use of alloy steels, the size of tyres and other details bewildering in their mass,

" That all sounds very nice," interposed the prospective purchaser, when the car owner paused to take breath, " but how much will it cost me to run that car? Can my wife manipulate it ? How often will it break down ?"

The customer wanted to know three things: (1) cost of upkeep ;(2) simplicity of operation ; (3) durability. From which the manufacturer went away a wiser man. At his office, next morning, he called his assistants to him.

" We are talking a language the customer doesn't understand," was his opening remark. " We must learn *his* language and talk it to him hereafter." Then, the manufacturer told three of his car-owning department managers to devote one day of each week mixing with the users of automobiles. The purpose was to learn their viewpoint, to get *their* ideas of what a motor car should be and what service it ought to be able to perform.

As a result of this investigation the manufacturer changed his entire selling plan. Thereafter mechanical details were omitted from his advertisements and from the arguments of his salesmen ; " for," he insists to-day, " that belongs to a language *foreign to your customer.*"

The principle point in selling is to get at your customer's point of view. " To do this, get in with your customer. Study his wants, listen to his demands; cater to notions and caprices ; in other words, make his point of view a vital factor in your business. It may seem almost a paradox, but there is only one viewpoint—and that is your customer's. If he is to see things from *your* standpoint, you must first see your goods from *his* point of view."

Indian Finance.

In the Coronation number of the *Indian Review*, Mr. D. E. Wacha raises a warning against the dangers of the financial situation of India in the near future. The cessation of opium consignments to China commences from 1914-15, that is, opium receipts will disappear as an item of revenue from the Indian budget, from and after that year. What will be the effect of the disappearance of the opium revenue ? Mr. Wacha constructs a hypothetical budget for 1912-13 basing the estimates, both of receipts and expenditure, more or less, on those of Sir Guy Fleetwood Wilson's last budget. Now, the total net estimated revenue of the budget for 1911-12 was £52·14 millions, including £3·09 millions from opium; and the net expenditure was £51 32 millions. Eliminating £3·09 millions of the opium receipts for the purpose of the hypothetical budget for next year, the net expenditure will be £51·32 and the net revenue £49·05 millions, leaving a deficit of £2·27 millions (or Rs 3·40 crores).

But the opium revenue only disappears from 1914-15 ; and the question is what improvement there is likely to be in the short intervening period. Mr. Wacha makes a careful calculation and provides for an improvement in the existing sources of revenue of Rs. 1·30 crores; but as against this, provision will have to be made for increased expenditure to the tune of Rs 2 crores ; so that the position in 1914-15 will be that the deficit will be Rs. 3·40 crores minus Rs. 1·30 crores (growth of revenue) plus Rs. 2 (growth of expenditure) or a deficit of Rs. 4·10 crores. It is perfectly possible that railways will yield their present surpluses ; but on the other hand, the revenue depends on a gamble in rain. But taking the most hopeful view of the situation and assuming there are no seasonal failures or trade depressions and no undue increase in working expenses, it is safe to provide for an additional Rs. 2 crores from railway receipts. That reduces the deficit of the hypothetical budget to Rs. 4·10 minus Rs. 2 or Rs. 2·10 crores,

The question is how the Government is preparing itself to meet this deficit : ? Mr. Wacha sees no hope in retrenchment of existing expenditure or avoidance of necessary expenditure on education and sanitation in the immediate future. Only additional taxation can save Indian finance. " Let us wait and see," says Mr. Wacha, "what hares that authority (Sir Guy Fleetwood Wilson) may start on the next budget occasion."

The Fish Supply of Calcutta.

Mr. J. Travis Jenkins, D.Sc., Ph D., Superintendent of the Lancashire and Western Sea fisheries read a paper on the fisheries of Bengal, which is published in a recent issue of that most useful repository of valuable information, namely, the Journal of the Society of Arts. From this lecture it appears that the chief problem to be solved in the development of the fisheries of Bengal is the question of transport. There can be no doubt, said the lecturer, that the supply of fresh fish in Calcutta and up-country markets within a day's journey is quite inadequate to meet the demand ; and there is a large quantity of edible sea and estuarine fish of the highest quality available within easy reach of Calcutta.

Since this fish can be purchased from the local fishermen far cheaper than it could be caught by any other means, there seems to be no reason for introducing European or any other methods of fishing, except in places like Fraserganj in the Sunderbans, where there is no community of indigenous fisher men and an abundant supply of fish.

Fresh fish always commands a quicker sale and a better price than any cured fish, and consequently any company which might be formed to develop what is only done now spasmodically—a trade in fresh fish preserved in ice for the Calcutta market—ought to be very successful, if at all reasonably managed. In Mr. Jenkin's opinion, the development of the estuarine fisheries should pay, and the lines along which such development should proceed should be borne in mind.

An estuarine fishery would possess several advantages over any other :—

1. "A much smaller capital would be required than in the case of a steam trawling company. To equip and maintain a small fleet of motor launches would cost far less than a corresponding number of steam trawlers. These launches would be mainly used for transport, which is the chief difficulty in the way of development of the fisheries.

2. The risk of casualties and delays in the supply to the Calcutta market consequent on the weather would be much less than in the case of deep-sea trawlers.

3. The development of the estuarine fisheries would be independent of the importation of European labour, and would consequently cost much less than steam trawling, where, it may not be possible to dispense with Europeans. In an estuarine fishery, it is rather by improving and modifying the local methods of fishing than by introducing foreign methods which may prove unsuitable to local conditions, that success is to be anticipated.

4. The taste and good qualities of the estuarine fish are already well-known to the population of Bengal, whereas sea fish are not so well known, and are certainly less appreciated. In the estuaries, there are fish suited to the tastes and means of all classes of the population. The bummalohds, bhektis, cuja bhektis, mullets, shrimps, and prawns compare favourably with the best of fish anywhere, while the siluroids, gobies, and others would suit persons of moderate means. When one considers the class of fish found on the tables of well-to-do up-country residents at present, it seems almost incredible that no attempt has been made to develop on a large scale the possibilities of the Sunderbans and other coastal fisheries of Bengal."

Here is a chance for Swadesi Bengal.

Common Sense in Business.

In the current number of the *Modern Review* Mr. J. C. Sen puts in a plea for common sense in business. He draws attention to the facts that, although we have been during the last five or six years busy devoting attention

to the resuscitation of old and the starting of new industries, we have not met with success. It has not been due to want of capital or enthusiasm. Our public-spirited Zamindars and men high in the confidence of the public not only endorsed the schemes but also subscribed liberally for the capital of the new companies.

"But somehow or other, the Aladin's lamp which was expected to revolutionise the industrial condition of India in a half-a-dozen years failed to do its duty. We have found that in our happy optimism, we have counted only on smooth sailing. That there might be foul weather and storm did not enter into our calculation at all. So when it came, we began to blame the weather and thought that we have done all that could be done under the circumstances."

Mr. Sen ridicules the idea that in the initial stages, we must be prepared for failures. What is required for success is to use sound commen sense, to dispassionately analyse the past, present and the future. That is the secret of success in America and in Europe.

"Let us see how a company is promoted in Europe and in America. A small promoter has perhaps discovered a rich deposit of iron ore in an out of the way place; he thinks that the deposit is enormous and that there is a good chance of making money. But he has not the capital or the experience to start it himself. So he naturally goes to a local banker and tries to interest him in the enterprise. The local banker has perhaps only a limited capital too small for such an undertaking. But he has close business relation with large banking houses, say, in New York or London. He puts the proposition in the hands of the banking house in New York, which perhaps does a considerable amount of promoting and underwriting new ventures. Proposals like this are continually coming to the banking house in New York; if, after some investigation, they find it worth considering, then, they will employ one of the best mining engineers to investigate and report on the property. This engineer has no personal interest in the promotion; he was selected mainly for his well-known professional knowledge. His reputation and his future business depend on his good judgment. If his report is favourable, then financial experts will be set to figure out the probable cost of mining the oar and its cost of transportation. Above all, it will be carefully figured out whether profit can be made or not. This is the final test. If everything is satisfactory then the organisation of the business begins."

And now to India. Here is Mr. Sen's graphic description of how the thing has been managed.

"Now compare how our businesses are promoted. We argue that manufacture of pencils is successful in Japan. It is a profitable business, and certainly must be so in India. A meeting is called, half-a-dozen of the leading men sign their names in a manifesto, shares are called, and the capital is subscribed. A factory is equipped, and a young man who has learned something about pencils in Japan, along with certain other industries such as soap, matches, artificial flowers, umbrella, etc., is put in charge of it. The men who sign the manifesto, though elected directors, do not expect to direct at all. They have neither experience nor time to do any active directing. The result is that our "expert" young man is left altogether to his own resources. He is expected to manufacture, and sell, and also manage the whole factory. But here his trouble begins. He finds that he has not got the proper wood for his pencil, or that the graphite has to be imported from a long distance. Then the supply of skilled labor is limited. To cap the climax, he finds that though he knows the technical part of the business, he knows nothing about the methods of industrial organization. The result is that the business drags on for a little while, and then stops through sheer inertia."

Mr. Sen puts in a plea for developing such of the industries as have already taken root before beginning to start new enterprises without knowing whether they are suited to the county are not.

Business and Personal Investments.

Mr. Franklin Escher, the Financial Editor of the Bankers' Magazine of New York and of Harper's Weekly, has a very informing article on this subject, in the December issue of the Financial Review of Reviews. The article is of special interest to us as by a reading of it, we may easily guess why people in India are slow to invest their money in industrial concerns.

Investors may be broadly divided into two classes: There are the laymen and the business men. The former fall into two classes again, those who are dependent on their income from the investment and others who are independent. The requisites of a good investment are safety, marketability, stability of price, prospects of price-appreciation and a high rate of income. Each investor has thus to choose the security most suited to his circumstances. One security has a very high factor of safety; that commends it to a certain class of buyer. Another security can always be readily converted into cash; that commends it to another class of investor. A third security has the virtue of price-stability; a fourth, a good chance of appreciation in price; a fifth, reasonably safe, can be bought to yield a high rate of interest. These are attributes which attract, and rightly, different classes of purchasers. In investment, as in anything else, what may be wholly unsuited to the needs of one buyer may be exactly suited to the needs of another.

In choosing an investment, therefore, the very first thing for the prospective buyer to do is to carefully consider his own particular needs. Is the money being invested with the idea of leaving it undisturbed for a number of years, or is it important that at any time the investor should quickly be able to convert his securities into cash? Is the money that is being invested "surplus" money, or is absolute security of principal and interest the prime consideration?—in the one case, a high income-yield can be tried for, while, in the other, only the very best and safest of fixed-interest-bearing bonds can be considered. What is the investor's principal need—absolute security, marketability, stability of price, or income? It will pay him well to consider these points. According as an investment possesses these attributes, its price is fixed.

In all investments, to be called investment, safety of capital is the prime consideration but it is possible to pay too much price for this attribute, even when it is considered that the investment should be absolutely safe. *In the case of the investor who is dependent upon income, the question of safety is of the greatest importance.* In investments of this kind, no chance whatever can rightly be taken—the security of the bond must be absolute. Marketability is not of much importance as the bonds are purchased with a view to be kept and not sold. It must of course be possible to convert the security into cash at any time, at some sacrifice, it may be. But as bonds which are easily convertible are always sold at a high price, the investor dependent on income need not put his money into this class of securities. Stability of price is also a consideration which the investor dependent on income should bear in mind. The securities should not be depreciated largely in their quoted value. Appreciation of value and high income yield should not be looked for by investors of this class.

The layman independent of income looks of course for the safety of his capital but he has more regard for the increase in the price of his securities. This may be said to be speculation, not investment, but much depends on the resources and knowledge of the investor. What may be said to a speculation in the case of an inexperienced man may be considered to be a very proper investment by one who has knowledge of the securities dealt with. To the business man, safety of his capital is no doubt a consideration but convertibility into cash and stability of price are of supreme importance.

"The business firm which puts a part of its idle capital into bonds is most interested in knowing that when it wants its money, the money will be there. A little less income is not of so much account. The real purpose of such an investment is rather to keep working a fund which would otherwise be idle than to attempt to get a large income. And where the money which is to be invested represents the accumulated profits of the concern and is to be allowed to remain invested for some length of time, it is all the more important that the security of the principal should be absolute. The idle capital of a business having been temporarily invested in bonds, it is important not only that the bonds be at any time readily saleable but also that the amount realized be substantially as great as the amount put in. For this reason, short-term notes and bonds, having a maturity not more than a few years away, are particularly suitable. Of the very great amounts of business-money which are at the present time being put into bonds, a substantial proportion is going into securities of this class. Almost equally suitable, however, it may be said, are securities whose investment value is so well recognised that fluctuations in price are comparatively limited."

To sum up, in the investment of the business surplus, the three great investment attributes which count are safety of principal, stability of price, and ready convertibility into cash. In the case of investment where the buyer is dependent upon income, safety of principal and as high an income yield as is compatible therewith are the considerations of primary importance.

Industrial Success.

According to Mr. Dadabhoy, who presided at the last Industrial Conference held at Calcutta, four conditions are absolutely essential for industrial success, namely, sufficiency of fluid capital, skill, labour and market.

Capital is the crying need of Indian industries. There is very little of hoarded wealth in the country. Indeed, the periodical revision of the assessment on the land, the law of succession obtaining among the Hindus and Mahomedans and the joint family system, all these act against accumulation of capital which is essential for the development of industries in a country. We should therefore not hesitate to borrow English capital in abundance; but then, observes Mr. Dadabhoy, they should not be employed by foreign miners, merchants and manufacturers for their profit and for the enrichment of their own countries. The capital should be advanced by them as *loans* to be applied to the various industries by the Indian themselves. Mr. Dadabhoy would even go further and request the Government to provide that the Indians should have the option and the right to buy up the industrial concerns owned and managed by European capitalists on terms and conditions that may be settled by the Government.

Meanwhile, the little capital that is available in the country and held by the great land-owners and Zamindars should be drawn-out to be invested by them in industrial enterprises. For this purpose, Government should distribute honors and titles judiciously to those engaged in commerce and industry, give a guarantee to Indian concerns, periodically audit their accounts, and also advance loans to promising enterprises.

Coming next to skill, the second requisite of industrial progress, Mr. Dadabhoy states that we should have free and gradual compulsory primary education and a system of technical education devised to "utilise and improve the inherited skill of the Indian artisan, to stimulate increased production by the introduction of improved labour-saving appliances, to train the people in mechanics and mill management, and to disseminate such industrial knowledge as would divert the trained activity of the nation into new and profitable industrial channels." To attain these ends, schools of design, technical institutes, and industrial schools should be started all over the country. Technological colleges and research

institutes should also be established at suitable centres for imparting thorough training in the higher branches of industrial science. The technical scholarships initiated by Government for training in Europe and America should be multiplied. Added to these, there should be organized, exhibitions, demonstration farms and factories, demonstration lectures by peripatetic instructors, and distribution of leaflets in the vernaculars explaining the uses, advantages and methods of working heavy plants. The public should also endow charities for the support of education.

Turning to labor, it is a mistake to suppose that India is a land of cheap and plentiful labor. Wages are low, but judged by efficiency and productive capacity, it is really very dear. "The Indian laborer has a weak physique, is incapable, from habit as much as from want of stamina, of sustained effort and is devoid of a sense of duty and responsibility. He takes but a languid interest in the work and is indifferent to the interests of his employer." To improve the inadequate labor supply of the country, over-sea emigration should be stopped and inland emigration encouraged; and labor-saving appliances should be freely introduced for working the various industries, agriculture included.

Mr. Dadabhoy then examines the conditions favorable for the sale of Indian manufactures. The first and foremost requisite is a protective tariff, next comes 'honest Swadesi,' on the part of the people. The Government should also make its purchases out of Indian manufactures, give facilities for the manufacture of salt and industrial alcohol, remove the excise duty on Indian cotton goods, reduce Railway freights, develop water ways, standardize the weights and measures in the country and supply expert advice to those who want it through commercial and industrial bureaus organised for the purpose.

The manufacturers on their part should send out travelling agents to canvass orders, reorganise cottage industries on co-operative principles and establish national chambers of commerce. So far regarding the development of the Inland market.

As regards the sale of Indian manufactures abroad, the Government must arrange for the maintenance of museum of Indian art work at convenient centres, and vigorously strive for the repeal of the import duties on Indian goods in foreign countries

Having thus examined the requisites of industrial regeneration, Mr. Dadabhoy pleads, in the last portion of his address, for sympathy from Government, fiscal autonomy for India, state pioneeringof industries,applica ion of the factory system to the cottage industries, the encouragement of agriculture and the prevention of the indiscriminate slaughter of cattle, the main stay of the farmer.

Mr. Edison on European Industries.

If Indians are to progress rapidly in industrial and commercial matters, they ought not to hesitate to assimilate all that is good in the West. In this view, the experience of businessmen and the methods of work of the leading commercial nations of the world should prove profitable studies. The following impressions of European industries were recently given by Edison, the well-known inventor, to a representative of the *Scientific American*. We give them here for the benefit of our readers. "Germany made the deepest impression upon me" said Mr. Edison. "She is making enormous strides in manufacturing and in extension of foreign trade. The secrets of Germany's success are her intelligence, patience, industry, and appreciation of the value of co-operation. In industry and commerce, the Germans are a united people They are following a well-laid plan to capture the major part of the world's commerce, with the help of the Government. The inventor has a better chance than with us, because if he has a good thing, experts employed by a promoting bank, examine it, and, if their opinion is favourable, then the bank will furnish money to some manufacturer to develop the invention. We have no such banks in this country. There are no trusts in

Germany, as we use the word, but they have pools, or cartels, which settle price that all the people, or a part, as the case may be, engaged in any industry, shall ask for their goods. This eliminates destructive competition, either wholly or partly. These cartels do not strangle the small man. They take him in, or, if not, do not close the door of equal opportunity. American machinery is widely and increasingly used; sometimes made in the United States, and again copied from our designs. As a rule, they do not undertake to improve our designs, knowing that with our higher labour costs, we have ample incentive to work along such lines. Germany has benefited enormously through American tools and methods, but the debt is not all on one side. She repays us in scientific discoveries, which we apply in our industries and in chemicals. The German is well equipped for the task of working out tedious and involved processes—something which the average American takes to, very unkindly. Germany is threatening our supremacy in lines outside of chemistry. With us, interference with business through the Government and politics is one of the heaviest burdens that industry and commerce have to carry. The German is not thus handicapped. He has a mercantile marine, banking facilities in foreign countries to assist sales, and a corps of young men specially educated to go out to foreign countries and hustle for business. The foreign commerce of Germany is large and growing rapidly. I do not believe, however, that Germany will attain pre-eminence in the commerce of the world as rapidly as some people think. To-day Great Britain is the leading nation in manufacture, engineering, and ship-building, with all that this implies. She has the advantage of the leading position in finance. Germany is giving England a great run, and may pass her in time—but not just yet. The English nation is not decadent, but I do consider that certain conditions, unless changed, will lead to commercial decadence. I refer to the very serious question of her labour troubles. In Germany, I saw a man running three lathes, a thing which would not be permitted in England. Hence the Germans can manufacture goods much more cheaply than the English, export them in their own ships, and finance the sale of them over a long period—and I can see but one ending to a competition of this character. The German business man, too, works longer hours than his British rival. I don't think that the increase in the German navy means war with England. Emperor William is a pretty good business man. He will not care to jeopardise his mercantile fleet on every sea. The navy is needed, however, to insure the safety of these ships. I wish to pay tribute to the high state of perfection to which the Germans have carried their system of Municipal Government. They appoint a very high-class man for mayor, and he holds this position for life, or until he is retired. Ugly, unsightly, or freak buildings are not allowed to go up. I noted that the lighting of the leading European cities does not compare with that of New York. Berlin will soon surpass Paris. Night life in that City is increasing very rapidly. There seems to be a relation between the night life and the industrial activity of the people. In towns where the people have cheap and plentiful light, they keep later hours, and this seems to have the effect of mitigating the phlegmatic character of their temperament. Many people sleep too long, and over-sleeping, contrary to commonly accepted ideas, so far from being refreshing, renders one sluggish and slothful. Hard work, work in which you are thoroughly interested, is more stimulating and refreshing than sleep for sleep's sake."

The Future of Interest.

Discussing the future of interest in the *Economic Review* for October, the Rev. T. R. Phelps considers that the increase of capital, which is great in England, greater in America, and will soon be greater still in what are now new countries, makes it almost inevitable that interest will fall. He asks, will this not mean that production is cheaper and life easier for those who work, and more difficult for those who do not? Leisurely lives will be fewer, but a greater number will enjoy more leisure.

AGRICULTURE.

Indian Grown Cotton.

At a recent meeting of the Council of the British Cotton-Growing Association at Manchester, a sample of Indian cotton grown from American seed in Tinnevelly was submitted. It was stated that three thousand bales of this cotton had been used at Oldham. It was thought most desirable that a letter should be sent to the Indian authorities, congratulating them, and asking them if steps could be taken to increase its production. The opinion was expressed that the amount expended on the Agricultural Departments in India was altogether inadequate, and it was resolved to make representations to Lord Crewe, urging him to increase the annual grant for the purpose of promoting cotton-growing. While congratulating the Tinnevelly cotton growers, we may say that Indian growers generally seem to have good propects before them.

Sheep Breeding.

Experiments have recently been carried out in Kulu with the object of improving the fleece of indigenous sheep by cross breeding with merino rams. Some 25 merino rams were imported last year, but of these only ten have survived. However, among about 100 lambs born, the percentage of loss has been very small and the young stock are reported to be hardy and promise to give very good wool. Merino rams have been imported previously into Hissar and Hazara, where they are doing well. The Punjab Government is now asking the Director of Agriculture whether it would not be possible to replenish the stock of rams in Kulu from these two districts.

Electricity and Sheep Raising.

Talking of sheep and fleece, we find in a Foreign office report that the experiments of Professor Silas Wentworth, of Losa Glos, California, with electric influence on animal and vegetable life at his experimental farm on a ranch near Roseville during the past year have proved that electricity will more than double the production of lambs and greatly increase the yield of wool. A flock of 2,000 sheep was divided, one half being placed in a field under the power wires of an electric power company, while the other was removed from electric influences.

In the field under the electric power line, the production of lambs averaged a fraction over two lambs to each ewe. In the adjoining field where electrical influence was lacking, the lamb average was less than one to each ewe. Similar differences were noted in the yield of wool from the sheep in the different fields. The fleece from the sheep in the electrically-influenced field proved 20 per cent. heavier.

Preparations are being made to plough up both fields and plant wheat, when the effect of the current on the growth of that cereal will be tested.

Paddy for Rice Mills.

Agriculturists who intend their paddy, not for home consumption by the ordinary hand pounding process, but for supply to rice mills, should note that the first essential from a miller's point of view is the supply of a good bold grain of regular size. No process, sufficiently economical has yet been evolved whereby large quantities of paddy can be graded according to size, and it will be obvious that, if the grain is irregular, a means must be selected to which the hullers are set to husk the paddy and the cones to clean the rice. The result of having to mill under these unsatisfactory conditions is that the largest grains get broken up and the smallest escape milling altogether. These latter must either come out in the white rice as paddy, which spoils the appearance and commercial value of the rice, or a slow and expensive method of elimination has to be undertaken, which materially reduces the output of a mill and considerably enhances the cost of production. It will, of course, be understood that broken rice and bran fetch very much lower prices than rice, and the greater the proportion of broken rice and bran produced, the higher the cost of milling becomes. It therefore follows that if a suitable quality of paddy is supplied to the millers, much higher prices can be paid. This is a point which cannot be too strongly impressed on the cultivator.

COMMERCE.

Business Enterprise in India.

The commercial enterprise of India during the month of November 1911 may be gauged from the following abstract of joint stock companies registered in that month.

	Rs.
4 Banking and Loan Companies	23,00,000
8 Insurance Companies	3,96,000
1 Co-operative Association	1,00,000
10 Trading Companies (other than those specified above)	17,80,000
1 Cotton Mills Company	3,00,000
1 Woollen Mills Company	32,00,000
2 Tea and other Planting Companies	4,50,000
2 Mining and Quarrying Companies	5,50,000
1 Land and Building Company	8,000
1 Ice Manufacturing Company	2,00,000
1 Sugar Manufacturing Company	16,000
32 GRAND TOTAL	93,00,000

Indian Trade Statistics.

The sea borne trade statistics of India are now recorded under seven heads, namely :— Animals living ii Articles of food and drink, iii Metals and manufactures of metals, iv Chemicals, Drugs, Narcotics, Dyeing and Tanning materials, v Oil, vi Raw materials and unmanufactured articles, vii Articles manufactured and partly manufactured. The Government of India have now decided to abandon the present system of classification into seven main heads and to introduce in their stead four main heads, namely: (1) Food, drink and tobacco : (2) Raw materials and articles mainly unmanufactured ; (3) Articles wholly or mainly manufactured, and (4) Miscellaneous and unclassified.

Shares in Companies and Misrepresentation.

A decision of importance to shareholders in limited companies has been given in England by Mr. Justice Eve, in Blair *v.* The Christineville Rubber Estates, Ld. A shareholder applied for the return of his application money on the ground of alleged gross misrepresentation in the Company's prospectus. The Company urged in defence that the aggrieved shareholder should have repudiated his liability as soon as the facts came to his knowledge instead of waiting nearly six months before making up his mind. Mr. Justice Eve supported this contention, and dismissed the application with costs The moral is that if a shareholder suspects misrepresentation and wishes to have his money returned and to have nothing more to do with the Company, he must make up his mind, one way or the other, at once.

Trade of India.

A analyses of the trade of India shows that out of a total trade with Europe of £ 144,340,000, the United Kingdom has £ 87,231,000, Germany has £ 15,811,000, France £ 11,806,000, Belgium £ 11,048,000, Austria £ 6,884,000, Italy £ 6,265,000, Holland £ 1,786,000, Russia £ 1,257,000 and Spain £ 1,220,000. This represents the total trade, and it shows how largely Great Britain bulks in it. When we classify it into imports and exports the fact becomes far more striking as the following table shows :—

	Imports from £	Exports to £
United Kingdom	52,686,700	33,973,300
Germany	3,433,300	12,340,000
France	1,386,700	10,380,000
Belgium	3,846,700	7,180 000
Austria	2,106,700	4,700,000
Italy	1,011,800	5,200,000
Holland	...	1,786,000
Russia	173,000	1,084,000
Spain	...	1,222,000

'Capital' observes that a great deal of these imports from foreign countries are of goods that Great Britain cannot supply, and it will be observed that the Continent buys far more goods from us than Great Britain does, and only supplies us with about a quarter. To sum up, Great Britain sells us some 52 millions sterling of goods and buys only 34 millions. The Continent sells us some 12 millions and buys of us some 48 millions. Who are our best customers ?

INDUSTRY.

Dried Guts.

We understand that a London firm (whose name will be furnished on application to the Director-General of Commercial Intelligence, Calcutta) is prepared to take as much dried animal gut as may be available from time to time. It appears the trade in dried guts has been taken up in a very promising manner in the United Provinces, and many persons are engaged in it both on a large and small scale. It is said that the Mussalman weavers of Shahjahanpur are taking to this trade when business in their own line happens to be slack. Difficulty, however, is still found in interesting export firms to purchase supplies from small producers, who can only afford to sell for spot cash. There is good profit to be made out of shipments of dried gut, and plenty of scope for energetic workers. In the opinion of the Director of Industries, United Provinces, Cawnpore, this trade might be suitably linked up with those concerned with bristles and feathers and all three might be appropriately handled by a firm of hide and skin exporters.

Shoddy.

What becomes of all the tailors' cuttings and the rags that are being collected every day by loafers in the streets is an interesting question. The bulk of it is used in the manufacture of shoddy which is a course and inferior cloth, composed of the fibre of old woollen or worsted fabrics which have been torn up or "devilled" and respun with the admixture of fresh wool of inferior quality. People might like to have some idea how cloth is made from rags. "The rags are first passed through heavy rollers, something after the style of a domestic ringing machine, and as they emerge, they are caught by a many-toothed revolving cylinder, which tears or teases the rags back into wool, which is like the raw cotton you get in Lancashire. And the processes of spinning and weaving are very much the same as employed in your cotton mills. Once you have the rags pulled into wool, it is a simple process re-converting them into cloth, or shoddy, as it is familiarly called." By a skilful and judicious blending of rags that cost 8*d.* a pound, with rags that cost 2½*d.* a pound, or less, a fairly serviceable cloth could be manufactured at a good profit. If the more expensive rags were used, the cloth so manufactured would be almost as good as the original article. But, there are new rags and old rags. There are the clippings from merchant tailors' warehouses, remnants of cloth that have never been worn, and there are rags that have seen good service in many countries.

Industrial Development.

The difficulties of starting manufacturing industries now a days and the qualifications required in the men who are to embark on such enterprizes are described in a contemporary. It is perfectly well-known that manufacturing, both in its engineering and commercial developments, gives scope for the exercise of the highest gifts of intellect and character. With the increase in the size and complexity of manufacturing undertakings, the widening in the scope of export trade, the greater intensity of international competition, the deepening uncertainty of the labour situation and the more intricate technicality of the processes of production, modern manufacture calls for keener intellect, more profound knowledge, and broader sympathies than before. This is true not only of the large manufacturers themselves, but of the assistants to whom they must delegate much of the regular work of their enterprises. The men they seek must be gentlemen by habit, liberally educated, with a practical knowledge of men and affairs added to business capacity and a real acquaintance with science and engineering. This specification is itself eloquent enough regarding the difficulty of discovering the proper men ; but the difficulty would not be nearly so great if the most ambitious intellects looked upon an industrial career as a worthy alternative to the more fashionable professions.

We wonder how many Indians there are who will satisfy the above conditions ?

ECONOMICS.

The Economic Position in Bombay.

According to the Times of India, practically all the most fertile land in the Presidency is coming to be placed under non-food crops. The ryot, of course, benefits by the higher prices which his produce fetches but the inevitable effect of the substitution on a large scale of non-food crops for food crops is to increase the cost of living which can only be compensated by a corresponding movement in wages. There is ample proof of such a movement being in progress and it is bound to gain in strength with the industrial development of the country.

The Delhi Loan.

In the opinion of the *Madras Mail*, the Delhi Loan is a loan which on every ground ought to be raised in India itself. There is the sentimental aspect of the matter which deserves consideration. The transfer of the capital to Delhi being an appeal to Indian sentiment, Indians should be quite glad to take up the loan. But that is not the only point. A productive loan raised abroad should, if it is wisely applied, create a surplus within the country more than sufficient to counterbalance the outgoings of interest. But the Delhi Loan cannot create any exportable surplus at all. The transfer of the capital will cause an increase in site-values; the loan will be employed in raising buildings, in making roads and establishing necessary services. It may easily be the case that Government will collect in rents and taxes sufficient to pay the interest and repay the principal within a given term of years. But it will in no way assist Indian production; it will in no way affect the export of commodities; and, however profitable it may be, it cannot but constitute a burden upon the exchange. Considering the relative positions of the Rupee and Sterling Debts and the nature of the loan, the *Mail* considers the proposed issue was a distinct financial error.

The Indian Situation.

On the 25th November last, a representative of the Manchester guardian had an interview with Mr. S. P. Sinha, the first Indian and late Law Member of the Viceroy's Executive Council, on the situation in India generally. Asked to say something about Swadeshi, from the point of view of Tariff Reformers of this country, Mr. Sinha said:—

"There is a general idea among the educated classes in India that without some sort of tariff, our industries cannot compete with foreign countries; but then, what they want is protection against England herself, and they feel they are not likely to get it soon."

"And obviously no kind of Imperial zollverein would meet such a case?"

"Clearly not. After all, we buy principally from England. Mind you, I am not passing an opinion. I have not studied the question sufficiently."

"I suppose the feeling you mention is one very potent cause of unrest?"

"Undoubtedly."

"And how would you suggest we should set about to allay it?"

"By doing all you can to help us to get rich. First, by improving our agriculture; and, secondly, by helping our industries. The former must be for a long time yet, our chief source of wealth."

"And why has agriculture declined."

"I don't know that it has, but it has not improved. We want scientific agriculture."

"How do you account for the great poverty of the Indian people? What about the drain?

"I do not think that the theory of 'drain' by itself accounts for our poverty. But a purely agricultural people must necessarily be poor, specially where there is hardly any technical or scientific knowledge, and capital is not available except at a ruinous rate of interest. I expect great results from the extension of co-operative credit as well as primary and technical education."

"And do you think these things alone will abolish the extreme poverty of the peasantry?

"I don't say so. It is too large a question to be disposed of so summarily. I am inclined to think that we must manufacture before we can get rich, and for that purpose, the customs and the duties must be so arranged as to favour home manufactures."

CO-OPERATION.

Co-operative Societies and Limited Companies.

A correspondent in an English journal compares and contrasts the members of a co-operative society with those in a limited liability company thus:—"I confess that I do not love co-operative societies, probably because my life's experience has taught me that their members consist largely of greedy persons; but then, I am no more in love with the average limited liability company, because the shareholders are also "greedy persons," and in that case sometimes greedy persons who have not the plea of necessity to excuse their greed. The co-operators, greedy as they are, are merely endeavouring to make a small income do the purpose of one a little larger; the share holders of the limited liability company are at least, in a small or a large way, capitalists, and have generally other and sufficient sources of income, or otherwise expect to secure a living by the efforts of others on account merely of invested capital From a strictly moral point of view, therefore, I regard the co-operator as a better justified person than the shareholder in the limited company."

Co-operative Training.

One of the most interesting features of the annual report on the working of Co-operative Credit Societies in the United Provinces of Agra and Oudh for the year 1910-11, is the inauguration of a class for the instruction of suitable persons in co-operative principles and methods, with the object of giving district and central banks the advantage of a trained staff and of providing a competent supervising agency for rural societies. The Registrar, Co-operative Credit Societies, says in his report:—"It is more and more recognised that societies will seldom succeed unless skilled supervision is available in the district itself and there is an organisation for keeping in touch with the societies and exercising some control over them in the initial stages. Accordingly, a number of enquirers and candidates for employment have come of their own accord or have been sent by district and central banks or by private persons to be instructed in co-operative principles and methods under the guidance of the Assistant Registrar and to be initiated into actual work by one of the Inspectors. The Court of Wards have accepted this principle and sent men to be trained as supervisors in five districts. Their pay will be discharged in the first instance by the Court of Wards, but it is hoped that it will not be long before the societies will be able to meet all charges from their own profits. Several *Zemindars* have also sent men to be trained with a view to the organisation of Co-operative Societies on their estates." There is no doubt that cheap credit is a highly popular idea with the ordinary cultivator; and if he could get cheap credit without any effort or sacrifice on his part, the movement would already have embraced a majority of the cultivators of the province. But the members of a society have to give labour and sacrifice to secure their object: and the future of the movement depends essentially on the number of cultivators who decide that it is worth their while, and who are prepared to sacrifice their personal feelings so far as is necessary to secure united effort and to acquire some degree of business-like habits and of collective self-restraint. It is the need of these qualities that makes the mere enthusiast so nearly useless as a propagandist of co-operation: it is easy to preach co-operation and cheap credit, but both knowledge and patience are needed to teach a group of cultivators how to work so as to secure these boons, and while guiding them at the start, to foster among them the growth of the necessary spirit and habits, until they are in a position to stand alone. The recent development of regular training classes for organisers and supervisors is thus, remarks the Pioneer, a most important step towards assisting the successful expansion of the movement.

BANKING.

Opening a Crossed Cheque.

A recent issue of the Journal of the Institute of Bankers has an interestiug note upon the subject of opening a crosed cheque. It would seem that for some time past a letter-box thief has been worrying bankers in London by obtaining possession of stolen crossed cheques. He writes "pay cash" across the cheque, and forges the initials or signature of the drawer. The law provides no machinery for cancelling a caution once placed upon a cheque, and the use of the expression "pay cash" has the sanction of mercantile custom only. Under these circumstances, some of the banks are now refusing to pay cheques across the counter which have been opened in this manner. The crossing is a great protection for a cheque against its being wrongfully applied, and if the mere statement, "pay cash," with initials appended, is sufficient to render it open, the safeguard of the crossing is to a great extent removed. To forge initials is, of course, much easier than to forge a full name, and it would not be surprising if the custom of some banks refusing to recognise such opening were to become more general.

Moral of the Bank of Burmah Failure.

Discussing the failure of the Bank of Burmah in its issue of November 22, *Commerce* of Calcutta says: "The bank failed, not only because of the general slump in joint stock enterprise in Burmah, but because the management put all their eggs in one basket. The bank became closely associated with the oil concerns of the Mower group, and the shares of many of these companies have fallen in value to a deplorable extent. The smash may be attributed mainly to this depreciation. The funds of a bank, like those of an Insurance Company, should always be safely and soundly invested, and if the money goes to speculative industrial ventures in order to meet the demands created by the high rate of interest offered on fixed deposits it is bad bussiness—and it is bad business that has ruined the Bank of Burmah."

In this connection, it is well to remember the truth of the late Duke of Wellington's saying that high interest means bad security. Banks that give high interest cannot afford to lend their money upon first class securities and are therefore driven to advance upon securities, which, though they may be very satisfactory, can only very often be described as speculative. A man in full credit and with ample security can always borrow at the Bank rate of interest. This fact should be borne in mind by investors.

A New Bank in Bombay.

The Central Bank of India, Ltd. is the, most notable recent venture in banking in Bombay with Sir P. M. Mehta as Chairman. The authorised capital is 50 lakhs divided into one hundred thousand shares of Rs. 50 each. Some decent banks have been started in Bombay in recent years and it may well be doubted whether there is yet room for another. The promoters of the new concern however think that there is ample scope for another bank without bringing down current profits and they seek to establish their position by the fact that the trade of Bombay has been progressing by leaps and bounds. The total trade of the Port for the latest year for which the returns are published was nearly Rs. 185 crores. This, compared with the total of the previous year, excluding Government business, shows an increase of nearly Rs. 22 crores. This large increase is due to the increase in the import as well as the export trade. Naturally, this increase in trade is directly connected with the facilities for borrowing provided by the banks. With the spread of education and enlightenment and the increasing perception of the benefits to be derived by merchants by dealing with Banks, the wealth, which was formerly hoarded in the houses or lodged with native shroffs and merchahts on interest is now diverted to Banks. These deposits are advanced to merchants on favourable terms and the Banks make good profits and at the same time they render a valuable service to the merchants who are thus enabled to increase the scope of their mercantile business. The material prosperity of a country depends on its trade, and success in trade is due to the monetary facilities rendered by Banks.

INSURANCE.

Single-Payment Policies.

Single-Payment policies are a form of insurance little realised by the outside public, but to investors of fluctuating means, it is, in many ways, the most business-like and satisfactory. The City Life Assurance Company have put forward a new scheme and it offers attraction to those careful persons who avoid ordinary life policies owing to the uncertainty as to their ability to keep up instalments. "To exemplify the working of the scheme, we may take a young man of twenty-one years of age who can spare a premium of £5. He can obtain from the City Life an assurance of £15 at his death at any time, without any further liability. Supposing however he finds that he has, the following year, another £5 in hand, he can then take out a further policy insuring £14 14s. and so on from year to year. The scheme is attractive, and eliminates a difficulty that has stood in the way of many a would-be policyholder."

Profits of Insurance Companies.

Attention has been directed on several occasions lately, remarks the *Manchester Guardian*, to the large profits supposed to be made by insurance companies, and the dividends paid to shareholders by some of the older companies would seem to bear out this view. These dividends are in some cases equivalent to a very large percentage on the amount of paid-up capital, but the figures are apt to be misleading when taken as an indication of the profits realised on the total sum invested in the business by these companies. None of the large Insurance Companies could conduct operations on their present scale by means only of their paid-up capital, and in the case of all these companies, a large proportion of their accumulated funds is the means of carrying on their business equally with their paid-up capital. Figures recently published relating to twenty of the largest fire and accident offices show that the total funds available for the conduct of their business at the close of 1910 were approximately eight times the paid-up capital of these offices, and the dividends paid to shareholders, together with the interest paid to debenture holders at the close of the last financial year, were equal to rather less than 5 per cent of the total funds. In the case of most old-established companies, a large proportion of the amount thus distributed is provided out of interest on invested funds.

The Life Assurance Bill.

In the coronation number of the Indian Review, Dewan Bahadur K. Krishnaswami Rao, C.I.E., who is also the Chairman of the United India Life Assurance Company, has a very well reasoned article on the proposed Indian Life Assurance Bill. His conclusions may be summed up as follows:-

There is no real necessity to compel Indian Life Assurance Companies to make any deposit; (2) if the legislature finally decide to take a deposit, the amount should be regulated with reference to the capital of each company, one lakh of rupees being the maximum and Rs. 25,000 being the minimum; (3) the existing companies should be exempted from the obligation of making a deposit; (4) if this is not done, special provision should be made for the protection of the interests of those who may be sufferers by the forcible liquidation of the *existing* companies owing to their inability to make the required deposit; (5) foreign companies including those of the United Kingdom should be compelled either to make a suitable deposit with the Government of India or to keep in India a good portion of their assets to meet the claims of Indians; (6) companies, whose business is already subject to actuarial investigation and report, should be relieved from the obligation of submitting a special statement signed by an actuary, under Section 10 of the Bill; and (7) the proposed enactment should clearly lay down the principle to be observed throughout India, in assessing the Life Insurance Companies to income-tax.

SCIENTIFIC AND TECHNICAL EDUCATION.

Toy Making.

Toy making is an industry specially carried on by the Germans. It is possible by means of toys to teach the principles of science, says *Science and Industry*. Nay, toy making must be so conducted as to show the principles of Physical science to young boys. There should be toy engines driven by alchol, toy generators of electricity, toy motors, in short, toy manufacturing should take the turn of scientific instrument manufacturing for schools.

Technical Instruction.

We have it on the authority of the London *Times* that out of the Darbar grant of 50 lakhs of rupees, there will be some allocation of funds to what may best be termed industrial education. Craft schools for the training of artisans were recommended by the Simla Conference more than ten years ago. The underlying idea is to produce artisans who may rise to a distinctly higher standard both of general intelligence and manual skill than can be obtained by the ordinary traditional routine. But though some special schools exist—such as the weaving schools in Bombay and Bengal, the school of handicrafts at Nagpur, and the mechanical apprentice class at the Roorki Engineering College in Upper India, comparatively little has hitherto been done in this direction.

A Technological Institute.

The Bengal Government have issued a lengthy Resolution regarding the establishment of a Technological Institute in Calcutta. The proposals that were before the Government were the removal of the Civil Engineering College from Sibpur to Ranchi, the establishment of a Mining Institute at Asansol, and creating a Technological Institute in Calcutta, but owing to the territorial redistribution of Bengal and the creation of a new Province consisting of Behar, Chota Nagpur and Orissa, these questions could not be considered on their merits. Meantime, a Committee has been appointed to consider whether it will be advisable to create a Technological Institute in Calcutta and, if so, to consider the site, accommodation, staff required, the extent to which the existing institutions can be absorbed, and the probable cost of the scheme.

The Place of the Manual Arts in Education.

According to the Educational Review, the place of the manual arts in education is closely connected with the question of vocational training. Social efficiency is the end of education. Social efficiency in the individual means that each individual must be directly or indirectly a productive member of society. In the great majority of individuals, productivity is the direct result of the intelligent and skilful use of the hands. If that be the case, it follows that manual training should be given in school work a place sufficiently large to allow such training to be effective. Manual training contributes largely not only to ability to earn a livelihood. It imparts first hand knowledge of the material accessories of modern life, develops appreciation of beauty in its relation to material form, texture and colour, and provides a means of transmitting from generation to generation and from age to age, some of the choicest thoughts and feelings of man. Manual training is as the basis of many of our modern methods of teaching, and serves as a method or means of teaching other subjects. Manual training has both a content value and a process value, that is to say, it has a value both as subject and method. In the primary grades, manual training is of value for its method, and as the grades advance, its value as a subject becomes more important and, in the upper classes of the high school, it becomes a highly specialised subject or group of subjects. If the purpose of education is to forward human progress, it should be of a kind that helps to eliminate chance as a factor in human endeavour and to set up in its place some positive certainties. For the great mass of pupils who attend our schools, manual training offers the maximum of opportunity for the elimination of chance as a means of producing the results sought.

ECONOMIC PRODUCTS.

The Papaw.

This fruit is said to rival the durian and the mangosteen of Malaya. The papaw has for years been the source of the pepsin used in pepsin tablets, pepsin gum, &c. Real pepsin is obtained from the stomachs of ruminant animals, while the product of the papaw is a papoid compound possessing practically the same qualities as pepsin. The papaw bids fair to become a popular table fruit.

A New Metal.

Canadium is the name which has been given to a new metal recently discovered in a platinum mine in British Columbia by Mr. Andrew Gordon French. It appears to belong to the platinum group of metals, and fills in a gap in the periodic table of the elements between Ruthenium and Mobydenum. Canadium is described as beautifully white and brilliant in appearance, and is not easily tarnished on exposure. Nor is it oxidised before the blowpipe. It occurs in the native state in semi-crystalline grain, in shoot rods, or as scales in platinum ores. From a few pennyweights to 3 oz. of Canadium may occur per ton of platinum ore. The melting point of the new metal is below that of gold, and it is soluble in hydrochloric and in nitric acids, as well as in the mixture of these two known as *acqua regia*. According to the "Chemical Trades Review," Canadium should turn out to be of considerable commercial importance.

The Useful Lemon.

Very few of us have realised all the usefulness of the lemon, judging from the varieties of the uses to which every part of it can be put according to the "International Confectioner" of Chicago. Its peel, if grated and bottled, then stored in a dry cupboard, will provide delicious flavoring for cakes and curries all the year round; thinnest slices of the outer peel, dropped into a thick boiling syrup of loaf sugar and water, will become crystallised after being spread out to dry upon trays, and serve to ornament the tops of cakes or puddings; sections of lemons, with the peel on, may be boiled a few minutes in a similar syrup, then dried, and they become delicious wholesome sweetmeats of pretty appearance. Lemon pulp, boiled or fresh, used instead of milk to moisten a cake mixture, gives a rich flavor.

Lemon marmalade requires a pound and a quarter of sugar to every pound of fruit; it can be sliced thin or cut into the finest shreds, and half a cupful of sago to six pounds weight of fruit gives a softer taste and more transparent jelly. It is an admirable plan to use half lemon pulp and half that of vegetable marrow in making clear jelly, which can either be spread on bread as jam or turned out in a shape for a sweet.

Lamb, whether baked, roasted or fried, is improved by being sprinkled with lemon juice. Tea that has an unpleasant scented flavor can be rendered palatable if a slice of lemon peel is placed in the pot.

Fried potatoes, whether in quarters, slices or chips, gain flavour by being dipped, when nearly cooked, in lemon juice, or having a little of it added to the fat used in cooking. The strong taste of dripping, when employed for puddings, cakes, pastry or frying dish, is quite removed by the additon of a few drops of the juice of this valuable fruit.

A cure for indigestion can be made by pouring a pint of boiling water over the fresh outer peel of a lemon, letting it stand for an hour or two, then adding a pennyworth of essence of peppermint, obtainable from any chemist.

Lemon juice, in the proportion of four parts to one part of pure glycerine, is excellent to sip when the throat is sore, or a cough troublesome. Many persons find that the same mixture cures chilblains and chapped hands when rubbed on nightly.

In household work, lemon juice will clean Benares brass and silver perfectly; for polishing tarnished copper, a paste should be made with the juice and crushed bathbrick; grease marks in wood are quickly removed if rubbed with a cut lemon. A sunburnt white straw hat can be made like new if painted over with a mixture of lemon juice and flour of sulphur, then rinsed in cold water.

BUSINESS METHODS.

Advertisement.

Six fundamentals must be observed if advertising novelties are to be successful in their object, namely, bringing trade.

(1) The novelty, must be adapted to the person to whom it is sent.

(2) It must be sufficiently unique to attract and hold favourable attention.

(3) It must be such that it will invite regular use and not be merely glanced at and then thrown away.

(4) It should either typify or suggest the goods it is intended to advertise.

(5) In addition to holding attention, the novelty must also impress a buying suggestion upon the mind.

(6) Distribution must be governed by a plan.

Will each merchant and manufacturer in India who issued souvenirs and calendars during the late Durbar and the past Christmas consider how far his advertisement has had effect in the light of the above maxims ?

Dress in Business.

The value of decent dress in securing business is well-known to all respectable houses and the following experience that befell a correspondent of the "Manchester Guardian" recently is worth recounting. "I was walking," he writes, "at the Fleet Street end of the Strand when I met a businesslike-looking man—evidently a commercial traveller—who was strolling along, delightfully oblivious of the fact that his hard felt hat was outrageously dented in front, giving him a rakish appearance. I stopped him, and, with apologies, drew his attention to the fact. He insisted, after thanking me, on having my card. The next day, I received a letter enclosing one sovereign, with apologies and this note:—"Dear Sir,—You did me a remarkable service to-day. I was approaching an important firm, and if I had called with my hat in that condition, all kinds of trouble (and a lost order) might have ensued. For saving me these complications, which no amount of argument could have averted, kindly accept the enclosed postal-order (for £1). The hint was worth far more to me.—Yours gratefully, P——B——.P.S.—Many would have passed by for fear of giving offence in accosting a stranger."

Business Success.

Mr. A. F. Sheldon of Chicago, who prides himself upon having reduced salesmanship and business-building to an exact science, has been lecturing to the keen commercial men of the cutlery capital on the right methods of obtaining business success. Some of the American business philosopher's axioms, are worth repeating. He says: "It is one thing to get business and quite another to build business. Business-building is the power to make permanent, profitable patrons." The old doctrine of "Let the buyer beware" is no good as a motto for modern business. He knew a very wise American businessman who dealt in hats, shoes and overcoats, and who sent out a letter to all his patrons every six months asking if everything they had bought from him during that period was satisfactory. If not, they had the right to bring it back and exchange, or receive again their money in full.

Concerning advertisement, Mr. Sheldon said: "It is the fire under the boilers in business. It makes things warm. The man who advertises just a little, and then says advertising doesn't pay, is like a man who put a single lighted stick under a forty-gallon kettle of water, and when he failed to make it boil, said, 'Fire doesn't heat water."

Then as to the shop assistant, he should be a persuasive teacher, able to instruct the customer in all the merits of every article in his department. When a shop assistant said to a customer who had purchased, say, a collar and a pair of cuffs, "You don't want any neckties, do you?," he committed a grave offence. "He has," said the lecturer, "kicked the customer's mind towards the goal of 'No.'"

FRAUDS AND FAKES.

Cost of Adulterated Food.

It has been estimated that in England the food adulteration of the present day, in fact, constantly defrauding people of something for which they have paid, and which they think they have bought, amounts to a tax of 1*d.* to 1½*d.* in the 1s on all the food. This tax goes not to the Treasury but to the food-faker.

Frauds with Paddy.

It is a favourite argument with some disputants against the land revenue policy of the Indian Government that they should take the half net in the shape of produce instead of in the current coin of the country. Apart from the impossibility of carrying out the suggestion on other grounds, there is one, of which we have heard interesting stories in our younger days. The rent due to the Maharajahs of Tanjore were paid by his tenants in kind and the latter always took care to mix a good deal of chaff with the paddy and measure them out to the Rajahs' agents, bribing them, if necessary, to accept the chaff as grain. That is one form of adulterating paddy. But there is another, we are told, which is practiced by the sellers of paddy to the Rangoon Mills. Of recent years some cultivators have made a practice of mixing a proportion of grain known as Lu with their ordinary seed grain. This grain is said to grow easily, can be planted late and is comparatively heavy in weight; and for these reasons, no doubt, it appeals to the cultivator and trader. From a commercial point of view, however, it is everything that is undesirable. The husked grain is a deep red in colour and when milled, the breakage is, comparatively speaking, enormous. The practice of mixing this with good white grain cannot be defended on any ground, as the latter has to be milled down to the level of the former and the result is little short of disastrous. Unmixed, it is practically unsaleable to millers and fetches low prices for shipment to India as paddy. It appears the rice milling firms of Rangoon have issued circulars warning the cultivators against the practice and we hope the warning will have effect

Tinned milk and Provisions.

The Bengal Chamber of Commerce have done good service to the public by recently pressing on the Government, legislation to control the import of unwholesome tinned provisions. Three years ago, the Health Officer to the Corporation pointed out that large quantities of condensed milk, prepared from separated or skimmed milk, were imported into Calcutta, that this milk was injurious to the public health, if sold as condensed pure milk, and that it was particularly so when sold as food for infants. The Health Officer also stated that tinned meats are imported in every variety of condition. To prevent the importation of milk and provisions of these descriptions, he suggested—

(1) That condensed milk prepared from skimmed milk should be distinctly marked as such on each tin: and that a caution should be affixed, namely "not to be used as food for infants"; and

(2) that all tins hermetically sealed and containing meat, fish, vegetables, or milk intended for human consumption should bear the date on which each tin left the manufactory.

The Committee of the Chamber of Commerce who were consulted on the subject expressed their approval of these provisions, although they thought that difficulty might be experienced in ensuring the stamping of the correct dates on the tins. No action has been taken by Government yet, but condensed skimmed milk is still being imported. Consequently, in the interests of public health, the need for legislation is pressing. A recent Hongkong ordinance requires that the following caution must be affixed to each tin, namely: "This is skimmed milk: children under one year of age should not be fed on it." Contravention of this regulation is punishable by fine, or in default, imprisonment, with or without hard labour, for any term not exceeding 3 months. The rate of infant mortality in India is appalling and if any improvement in this respect is to be secured, the regulation of the tinned milk trade is urgent and indispensable.

MACHINERY AND INVENTION.

British Machinery in India.

In an interesting analysis of the exports of British machinery, the *Times* points out that India is far and away the best customer the United Kingdom has for machinery. India alone buys from the United Kingdom nearly as much machinery as all the other British possessions over sea put to together. The truth is India is beginning to develop on industrial lines, and therefore requires an increasing volume of machinery to supplement her manual labour. That much of this machinery is now being employed under the direct control of the natives of India is further evidence of India's growing industrialism.

Burglar Proof Jewel Case.

In India, the land of the jewel mania, "ladies who possess valuable jewelry, and probably some of their husbands also, may be interested to know that a most ingenious invention in jewel-cases is at present to be seen at one of the leading shops in the West End of London. It is so constructed that when it is put down, an alarm is set, which goes off as soon as the box is moved, and continues to go off until the owner, or the possessor of the key, stops it. This seems to make the theft of the jewel-case an undertaking requiring something like genius on the part of a burglar, unless conditions are exceptionally favourable; while the many frequent robberies of jewelcases that take place while ladies are travelling would seem to be rendered practically impossible."

A Stone Gathering Machine.

It appears that a machine has been invented by Mr. Burnham of Australia for gathering stones from off stony lands. It was recently exhibited and experimented with in the State of New South Wales, in the presence of the Chief Inspector of Agriculture of the State who supplied the following report: "After an hour's work, it was found that the machine had raked together and piled in rows the stones on one acre of land. The work was well done and evidently the machine could be well harnessed into service in this as well as in other countries where there is any large extent of stony land. On examining the machine, however, after the trial, it was found that two types were broken short off, and nearly all the others were bent out of shape. Of course, this is a fault that can be remedied, but, until it is remedied, the machine cannot be recommended. The machine was drawn by six medium draught horses, but it was very heavy work for them. On the other hand, experience shows that it costs too much to clear the stones off by hand." Such a machine, when perfected, will be of great use in India where there are large tracts of land which are uncultivable by reason of the prohibitive cost of getting the stones off the land before cultivation. But we have no horses and our bullocks cannot furnish us with the necessary motive power. Steam would, but it is beyond the average ryot's reach.

Machinery business.

Readers of the Wealth of India who may be interested in the undermentioned machinery should address the Director-General of Commercial Intelligence, New Imperial Secretariat, 1, Council House Street, Calcutta, for particulars mentioning the Wealth of India.

(1296)—A London firm of manufacturers desires to appoint agents in Bombay, Madras, Karachi and Rangoon for the sale of a cheap knife cleaning apparatus.

(1299)—A leading London firm, manufacturers of high and low tension magnetos for all sizes of petrol and gas engines, also spark ing plugs, distributers, etc., desires to appoint suitable agents in India.

(1300)—A British firm manufacturing gas and oil engines is desirous of appointing agents in Calcutta, Bombay, Madras, Karachi and Rangoon.

(1301)—A Dublin concern desires to appoint agents in Calcutta for the sale of a preparation for preserving and increasing the efficiency of machinery belts.

(1307)—A London company of motor car manufacturers desires to appoint agents in Calcutta, Bombay, Madras, Karachi and Rangoon.

INDUSTRIAL AND ECONOMIC LITERATURE.

Ice Manufacture.

Those who are interested in ice manufacture may refer to the following books:—"Refrigeration, cold storage and ice making" by A.G. Wallis Tayler, C.E. A.M.I.C.E. "Artificial ice making and refrigeration" by Louis M. Schmidt, Ph. B. of Lynn, Masa chu setts, U.S.A., and "Ice manufacture in Theory and Practice" by Alakh Dhari of the firm of Messrs. Mookha Singh & Son, Ambala—a paper contributed to the Seventh Industrial Conference at Calcutta.

Trade Journals.

"Young Indians are often blamed, and with reason, for spending nothing on the literature of their trade, which would keep them in touch with what is going on in the world, and give a greatly increased interest to the work in which they are occupied. *A single paragraph in a trade paper is often worth far more than a year's subscription.* A new tool, process or method; a new material or compound, may make all the difference between a good profit and none at all, in a contract; and similarly a new idea regarding a waste product may lead to a fortune. All these things are the outcome of a logical habit of thought which, when properly inculcated, is of more value, comparatively speaking, than a multiplicity of ill-digested studies." The above paragraph is from a recent issue of the Indian Textile Journal and the italics is ours. Viewed in the light of the above remarks, is not "The wealth of India" worth the 3 Rs. that is charged for it? Journals can't teach trades and industries, but they are extremely useful as giving new ideas, new methods and others experiences by which profits may be increased and losses avoided.

Indian Monetary Problems.

By S. K. Sarma, B.A., Law Printing House, Mount Road, Madras. Rs. 2.

In this book Mr. S. K. Sarma examines in detail the recent proposals for introducing a gold currency. He gives a history of the currency policy since the earliest times of British rule and the various attempts that have been made to introduce a gold currency. He points out that the closing of the mints to the private coinage of silver has been fraught with dangerous results and that the difficulties of adopting a gold currency are beset with still greater dangers. He inveighs against the present policy which is an "ugly amalgam" of gold-silver standard and says that unless we return to an automatic currency, our financial and economic troubles are bound to increase; and as a gold currency is not possible, the only remedy is to go back to the silver standard. His reasons why a gold currency is bound to fail are briefly these: (1) gold can only circulate in very small quantity compared with silver owing to the poverty of the people; (2) the silver currency which will be a token currency cannot be regulated; (3) India's indebtedness cannot allow of gold circulating advantageously; (4) sufficient gold cannot be obtained to maintain the gold standard; and (5) even if obtained it cannot be kept circulating. Mr. Sarma concludes by putting forward a plea for international bimetallism, failing which he would open the mints for silver coinage and face the consequences boldly.

King George's Speeches in India.

G. A. Natesan & Co., Madras. Rupee one.

This is a complete collection of all the speeches delivered in India during His Majesty's tour as Prince of Wales and in connection with the recent Coronation Darbar. The most interesting speech from the point of view of this journal is the one which His Majesty delivered in reply to the Municipal address and in which he foresees a great and glorious future for the agriculturists of this country from the spread of co-operation.

Books received.

"Administration in India and Indian Economics" *by Narendra Nath Raye, M.A., Manindra Nath Mitter & Bros., 3 College Square, Calcutta, Price Rs. 2.*

"An Introduction to Indian Economics" *by Radhakumud Mukherjee, M.A., R. Chatterjee, 210, Cornwallis Street, Calcutta. Price 4 As.*

"Sketches of Indian Economics" *by R. Palit, Ganesh & Co., Madras. Price Re. 1-8-0.*

HINTS AND RECIPES.

Cold Cloth for Headache.

In using cold cloths on the head for headache or nausea, see that the cloths are thin and light ; two folds of light muslin are much more effective than a thick, heavy band, as the effect wanted is to cool the head by evaporating the heat, and the thin cloths allow the heat to pass off with the evaporating water, and should be renewed frequently to hasten the cooling.

Powdered Borax.

A tiny pinch of powdered borax placed on the tongue and allowed to dissolve slowly will almost invariably stop a hacking cough ; the same treatment relieves a sore throat, and a gargle of one teaspoonful of salt and one of borax to a pint of water is excellent for the throat, cleansing and healing.

A Clever Device for Toddydrawers.

The Indian toddy-drawer has for ages climbed palm trees in the pursuit of his avocation. The work is laborious and not without risk, but he has never thought of the possibility of reducing his labours by the exercise of a little mother wit. That it is possible to get at all the trees by climbing only a small number of them has long since been discovered by the Filipono, who makes a short air line between the tops of trees by the aid of bamboo poles. These are tied in pairs, horizontally from one tree to another, one being about three feet above the other, the upper one serving as a handrail. With the aid of this very clever contrivance, a large proportion of the day's labour is saved.

To Cure a Cold.

The *Family Doctor* recommends a brisk walk for breaking up a cold. The person threatened should put on extra clothing, and walk hard and fast until he is in a free perspiration. Then, while still heated up, he should go home, quickly undress, and get into a warm bed and take a glassful of hot water or hot lemonade. Where this course is pursued, the chances are many that all the threatening signs will have disappeared the following morning.

If the cold is in the head, the following treatment promises well :- Add a teaspoonful of powdered camphor to a pitcher of boiling water. Over this, place a cone made of thick paper or pasteboard, and hold the nose and mouth over the small opening. The vapour arising from the water is charged with camphor, and will speedily relieve many of the disturbing symptoms. It should be inhaled for four or five minutes at a sitting, and three such treatments are usually sufficient to arrest the most rebellious "cold in the head."

A Good Whitewash.

All whitewash, especially in the East is not white, though it is supposed to be. Not only is whitewash not white enough, but it is, as a rule, rough and unpleasingly applied. Moreover, it suffers pitifully in the rain and at the end of the monsoons assumes varied tints that are only less inartistic and unpleasing than the original outrage. Yet it would be easy to improve it, without having resort to expensive distempers. A little glue, a little care, and the change for the better would be marvellous. But there is a very simple method of improving the tone and quality of ordinary whitewash. It is the use of the extract of the ordinary cactus. The discovery was made in South America, where the common cactus is commoner even than in the tropical East. When travelling through the rural districts of Uruguay, says the American Consul at Monte Video, one's attention is attracted to the fine white colour of the farm buildings, even during the wet season. To obtain this neat effect, a whitewash is used which is made with the sliced leaves of the common cactus, macerated in water for 24 hours, producing a solution of creamy consistency. To this, lime is added and well mixed. When applied to any surface, be it wood, brick, iron, or other material, a beautiful pearly white appearence is produced which will endure for many years.

OPENINGS FOR BUSINESS.

(For particulars, address the Director-General of Commercial Intelligence, New Imperial Secretariat, 1, Council House Street, Calcutta, mentioning the Wealth of India.)

Paints, Colours and Varnishes.

(1284)—A Glasgow firm manufacturing paints, colours and varnishes desires to appoint agents in India.

Myrabolans, Beeswax and Asafetida.

(1286) - A firm in Lahore desires to be placed in communication with importers of myrabolans, beeswax and asafetida in the United States.

Kapok and Goat-Hair.

(1287)--A firm in Hamburg desires to be placed in communication with shippers of kapok and goat-hair.

Wrapping Paper.

(1288)—A limited company about to manufacture "Kraft" wrapping paper, both glazed and unglazed, desires to be placed in communiciation with leading firms in Calcutta, Bombay, Madras, Karachi and Rangoon, in a position to handle such goods either on a commission basis or by direct purchase.

Perfumery.

(1289)—An English firm of manufacturers and exporters of perfumery desires to appoint agents in Calcutta, Karachi, Delhi, Amritsar, and Rangoon.

Fish Oil and Guano.

(1290)—A Government officer desires to be placed in communication with purchasers of fish oil and guano in Calcutta, Bombay, Karachi and other important centres ouside of the Madras Presidency.

Matches.

(1291)—A London match company desires to appoint a first class agent in Bengal for the sale of safety and sulphur matches of English, Swedish and Belgium manufacture.

Kapok.

(1292)—A dealer in Amsterdam desires to be placed in communiciation with actual producers of or first-hand dealers in kapok.

Copper.

(1293)—A firm in Japan desires to be placed in communiciation with importers of copper.

Wines.

(1294)—A firm in London desires to appoint agents in Delhi for the sale of ports and sherries.

Indian Produce.

(1295)—A firm in Japan desires to be placed in communication with sellers of gunny bags, palmyra fibre, bristles, rapeseed cake, bone meal and waste spinning bands.

Caster Oil.

(1297)—A firm in Tasmania desires to be placed in communiciation with shippers of castor oil.

Bedsteads.

(1298)—A British firm desires to be placed in communiciation with buyers of bedsteads in Baroda, Ahmedabad and Hyderabad (Deccan).

Grey Peas.

(1302)—A firm in Marseilles desires to be placed in communication with sellers of grey peas in the Bombay Presidency.

Ochre, Fuller's Earth, and Gypsum.

(1303)—A firm in Ajmere desires to be placed in communication with purchasers of yellow ochre, fuller's earth and gypsum.

Hides and Skins, Oilseeds and Myrobalans.

(1304) - A firm in Trieste desires to be placed in communication with shippers of hides and skins, oilseeds of sorts, myrobolans and incense.

Bentwood Furniture.

(1305) - A firm in Hamburg desires to be placed in communication with importers of bentwood furniture in Calcutta, Bombay, Madras, Karachi and Rangoon.

Corks.

(1306)—A firm in Pairs is desirous of being placed in communication with importers of corks.

Children's Clothing.

(1308)—A Coventry firm manufacturing children's frocks, millinery, etc., desires to appoint agents in Calcutta, Bombay, Madras, Karachi and Rangoon.

MISCELLANEOUS.

The Tata Iron Works.

On the 6th January, on the invitation of Sir Dorabji Tata, Lord Crewe and a distinguished party paid a visit to the Tata Iron works at Kalimati. Among those who went were Admiral Sir J. Slade, the Hon. Mr. W. H. Clark, and Sir Thomas Holland. The party were conducted over the works and were much interested in all they saw.

Paper Industry.

Messrs. W. Heilgers and Co., Calcutta, have started in Burma a new paper manufacturing industry in which paper is made from crushed bamboo. The industry, according to a news agency, is receiving every assistance from the Government, and promises to be a big business.

Irrigation and Railway grants.

The Secretary of State for India has now sanctioned the Railway programme for the ensuing financial year. The total is fixed at thirteen and-a-half crores.

The irrigation grant for the year 1912-13 will be Rs. 275 lakhs, of which Rs. 75 lakhs will be devoted to protective irrigation.

The Financial Statement.

The Financial Statement for 1912-13 will be presented to the Imperial Legislative Council on Friday, the 1st of March. It will be discussed between the 7th and the 11th, and the Budget will be finally presented on Friday, the 22nd idem. The Budget Debate will take place on Monday, the 25th idem.

Technical Scholarships.

A notification of the Bombay Government dated 8th December 1911 invites applications for two State technical scholarships from candidates in the Bombay Presidency who will undergo (i) A course of instruction in Paper Making, or (ii) A course of study of Architecture.

The Reporter on Economic Products.

From the 1st February, the Reporter on Economic Products will be transferred to the Botanical Survey of India, with the title of Economic Botanist to the Botanical Survey.

A Proposed Jute Department.

The principal jute firms of Bengal have addressed a letter to the Imperial and Provincial Governments, strongly supporting the suggestion made by Marcus Koch, regarding the desirability of having a department of Government, created solely for the purpose of supervising the extension of jute cultivation and generally fostering the interests of the jute trade. The proposed department, it is urged, should be placed in charge of a business man acquainted with the jute industry.

The Homage of the Industrial Conference.

The Indian Industrial Conference recently held at Calcutta passed a Resolution tendering the loyal and dutiful homage of that body to their Imperial Majesties and expressing their grateful rejoicings at the boons conferred. Their Imperial Majesties have received this message with satisfaction and pleasure.

Cable Rates Reduced.

The Postmaster-General, in a notice dated December 27, announces a reduction of cable rates to Australasia, Canada, India, South Africa, and other British Dominions, and the United States. He states that on and after January 1, plain language telegrams for the British Oversea Dominions and the United States will be accepted at half the ordinary rates on condition that they may, if necessary, be deferred for not more than 24 hours in favour of full rate traffic. In his statement in the House of Commons on December 4 in which he described the new arrangements for Imperial cable communication, Mr. Herbert Samuel expressed regret (*The Times* points out) that "I have not yet been able to arrange for a similar reduction in cablegrams to and from India and South Africa." The obstacles which apparently then faced the Postmaster-General have been removed, for it will be observed that the notice issued includes both India and South Africa.

THE

WEALTH OF INDIA

A Monthly Magazine of information and instruction on all matters of material interest.

EDITED BY MR. G. A. VAIDYARAMAN.

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The Wealth of India.

A monthly magazine of information and instruction devoted to agriculture, trade, industry, economics, co-operation, banking, insurance, business methods, machinery, invention, popular, scientific and technical education and all other matters relating to material progress.

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No money should be paid to any Agent. All remittances and letters should be addressed to the Publishers, Messrs. G. A. Vaidya Raman & Co., 3 and 4, Sunkurama Chetty Street, Georgetown, Madras.

TOPICS OF THE MONTH.

Forest Industries.

The forest policy of Government may not be very agreeable to the people when the moving space for cattle is circumscribed and trespass is penalised by impounding the animal and fining the owners. Putting aside the benefit supposed to be derived from the promotion of rainfall, the affiliated industries pertaining to extensive afforestation are many, and they afford occupation for thousands of people. For example, pulp mills, cellulose factories, saw mills, furniture work shops, all these are to be found throughout Germany under the control of men who have been educated in the technical high schools and at universities, and who are recognised specialists in their several departments. These industries, according to reliable data, provide work for over 600,000 people.

The forest department in India, which is *quasi* commercial, may, if it will evince a little more sympathy for the people, show to them in a practical manner, how money may be made out of the valuable products that may be had for a song in the forests of India. As a commercial department, it ought to adopt the usual business methods to make its resources known to the public. Something is being done by the publication of valuable memoirs now and then on the possibilities of creating new industries with the economic products available in the forests. But these memoirs are hardly known to the people or to the mercantile community. A wider system of advertisement is therefore required to make known to the public the various forest products and the industries in which they may be used in the several parts of India. This will develop India's economic resources and, at the same time, develop the forest revenue as well.

Investments in Industries.

It is a common cry that capital in India is fighting shy of industries. To the wealthy man, the possible loss of a portion of his capital may do no great harm but to the middle class Indian who does not leave thousands to his children, shares and stocks in industrial concerns do not seem the most desirable forms of investment. To him, the safety of his capital is of more importance than the earning of a per cent or two extra by way of income every year.

Ordinary shares can only be regarded as safe under very exceptional circumstances. If the venture be industrial, it is subject to local conditions as well as national, which might at any moment produce a violent change in its character. National influences may be no less harmful than local and personal ones. Taking England, for example, the effect of trade unionism and its demands for a higher standard of wage throughout the United Kingdom applies to most of the industrial undertakings therein.

Secondly, inventions and mechanical developments of all kinds often decide the fate of industries. Companies formed a few years ago with horse-power traction for their foundation have vanished before the advance of motor and electric power; and even the new companies brought into existence thereby are in danger of being swept out of the commercial field by still newer developments in the engineering and mechanical world.

In the face of these facts, the average Indian is not to blame much if he hesitates to go in for shares in doubtful enterprises.

Exemption from the Income-tax.

At the meeting of the Imperial Legislative Council held on Friday the 23rd February, the Hon'ble Mr. Dadabhoy moved a Resolution that the minimum limit of income assessable to income-tax be raised from Rs. 1,000 to Rs. 1,500. The reason given for this proposal was that the "struggling members of the middle class" in India were hard pressed on account of the rise in the cost of living. The Resolution was very properly rejected by the Council on the ground that it was inopportune in view of the demands of education and sanitation and the cessation of the opium revenue in the near future. The loss of revenue involved is about 30 lakhs of rupees per annum. Much as we sympathize with the 'struggling members of the middle class,' we think that more sympathy should be shown to the ryot from whom, as we pointed out last month, nearly 60 per cent of the income is taken away by the State. The fact is, the class of people proposed to be benefited by Mr. Dadabhoy will be practically the assessees under Part IV of the Income-tax Act: and the bulk of them are bankers, traders, manufacturers, lawyers and medical men who now contribute very little to the general expenses of the State. The income-tax is the only satisfactory means at present available by which the rich in India are made to pay a share of the State expenditure. In England, the income-tax is considered the "centre and sheet anchor of the British financial system," and in India, we think it ought to be retained as a permanent fiscal resource, and the limit should be raised, if and when necessary, instead of being lowered, according to the exigencies of the State. We do not deny that the income-tax is a vexation to respectable citizens but the vexation is an incident of direct taxation and the proper course is to try for the removal of anomalies and a juster administration of the tax.

The Bamboo.

Capitalists in India would do well to keep their eyes open for the commercial potentalities of the several economic products with which nature has bountifully endowed this country. One ot these is the bamboo for which apparently there is a great future. There are a thousand and one ways in which it is worked by the deft hands of the Japanese and made to yield profits. From far off Manilla, we hear that the manufacture and export of hats made of bamboo is one of the home industries in the Philippines, and the work is all done by hand. France is the best customer for these hats, and in 1909 took 227,603,

valued at $73,327 out of a total export of 440,842 hats valued at $142,480. The United States is a new market for these hats, and in 1910 there were exported to that country 176,938, hats while in the preceding year the export had been but 12,169 hats. The total exports in 1910 increased to 600,486 hats; valued at $276,309. As the hats are very favourably received wherever introduced and are comparatively cheap, the industry is one that will probably experience a steady growth. The making of these hats does not interfere in any way with the agricultural pursuits of those who are engaged in the work, as the women and children devote their spare time to it, thus adding in a substantial way to their earning capacity.

Fat profits however seem to be in using the bamboo for the manufacture of paper. Paper is a commodity the consumption of which is bound to go up with every step in the advancement of civilisation, and any investment in the raw product or half stuff required for its manufacture is bound to pay a handsome dividend. In 1904, Mr. R. W. Sindall, a consulting chemist and wood pulp and paper expert, made an enquiry into the possibility of making paper-pulp and paper in Burma. He proved that from the bamboo an excellent pulp could be made and that it could be exported to England at a price that should prove exceedingly remunerative. A difficulty has been in the bleaching, but this has now been obviated. "Treated by the ordinary bisulphate process and by a new method, simple and inexpensively bleached," it yields, it is stated, an excellent pulp, felting readily, and producing a paper, pliant, resistant, and opaque, of enduring colour, thicker than other paper of the same weight, and forming one of the very finest materials for writing and printing, and of exceptional value for engraving. In order that all these excellent qualities may be preserved in the paper, however, it is essential that no part of the preparatory treatment of the pulp is carried out away from the district where the bamboo grows. Mr. H. Vincent, an American expert, estimates that, under intelligent administration of cheap tropical labour, the cost of a ton of bleached pulp should not exceed £6, and that it should be worth, at an extremely modest estimate, £10. "Mr. Sindall calculated the cost of a ton of unbleached Burma pulp landed in London or Liverpool at £7 10s. Having regard to the quality of the pulp, he thought that a much higher price would be secured for it in the London market, as ordinary wood pulp realised from £8 to £9 per ton." Here then is a line which is worth investigating by capitalists in India.

The Coming Industrial Revolution.

Elsewhere in this issue, we publish a summary of a paper read by Sir Theodore Morison before the London Chamber of Commerce on the "Economic Revolution in India." That India is rapidly changing from the agricultural to the industrial stage, there is hardly any room for doubt. The movement towards manufactures and the use of machinery are unmistakable, seeing that India is now the largest single purchaser of English machinery. This industrialisation of India is bound to go on apace hereafter. The bar and the public service, which were the chief openings for the educated Indians hitherto, are losing their glamour and young men are fast turning to commercial pursuits. The knowledge of the country and its people, and the industry and honesty for which they have deservedly earned a name in the public service are sure to stand them in good stead. The result will be that the coming years must see a conflict between India and the other commercial nations of the world. The brunt of the battle will be, of course, in the struggle with England, because she is the largest competitor for custom in India. We are not surprised therefore that English workmen refuse to work with Indian apprentices and that English manufacturers are shutting the gates of their factories to Indian students going there for instruction and training. Each man has his own business secrets and as no man will learn a trade without the intention of engaging in it, it is barely human that the English workmen and factory owners should refuse to allow Indians to pull the bread out of their

months, it may be, in the distant future. It is better that the truth is plainly told and realized on all sides that the Indian with his habits of thrift and frugal living will have an enormous advantage over his European competitor, when he has learned and organised his business. It is the recognition of this fact that is the cause of all the trouble which the Indians have to undergo in South Africa and other English colonies; and it should cause no wonder if Indian interests are sought to be sacrificed in England as Indian industries grow in importance.

The question is what should be done before the commercial rivalry becomes keen and the position becomes embarassing to the British Government in India and England. When that contingency arises, as it is sure to arise, though in the future, it will be idle to talk of English prestige to Indians and of patriotism and benevolence to the English merchants. The position of the British Government will be hardly enviable then. It will be in the condition of a father with his sons fighting for the partition of his property. The adjustment of the rights of the contending parties may be difficult and delicate, but it will have to be done, and done in a manner which will be at once impartial and satisfactory to all the parties and at the same time uphold the prestige and solidarity of the Empire.

English Machinery and Indian Training.

Sir Theodore Morison deplored that Indian technical scholars are refused admission into English factories where English machinery is installed. The consequence of this refusal will be that the machinery trade of England will gradually lose the most promising market of the future.

"What do you think will most probably guide the Indian capitalist of the future in his choice of the firm with which to lodge his order? The high and dry doctrinaire will no doubt reply that he will take a wide survey of all possible sources of supply, and make his choice from among competing tenders. Perhaps that is what he ought to do, but in order to do it effectually, he would have to be exceptionally well-informed, be able to read several different languages, and think in different gauges and different terms of notation, and at all stages be guided by the sole thought of his own interest. Whether so wide and impartial a survey of the industries of the world would always lead to his placing his orders in this country I am not competent to say. But I very much doubt whether the Indian will act with such inhuman perspicuity.

"Men are not made that way; they are never perfectly well informed nor entirely without likes and dislikes. The Indian capitalist or the expert whom the capitalists consult will most probably act as you or I should. He will want the sort of machinery with which he is already familiar, he will want to adapt to India the processes of manufacture which he has studied abroad, and which he knows how to work. Even if the process he adopts is not ideally the best, he will, if a practical man, say that it is the best for him because he understands it better than any other. And, being human, he will probably go to the manufacturers with whom he has had personal relations before or with whom he can at least get into touch through mutual friends. In other words, the Indian will place his order among the people and in the country where he has had his training."

These words of Sir Theodore Morison contain a precious lesson and we are able to bear testimony to it from our own experience. Some 15 years ago, Messrs John Dickinson & Co., had practically the monopoly of supply of printing machines in Southern India. They had the agency for Payne's wharfdales. Competition of other makers had just then begun. A firm of printers was about to instal a machine. Messrs. Dickinson's terms were a little dearer and we therefore thought that another maker who was as good as Payne might be tried. But the Managing Proprietor who had the practical working of the business pointed out that the machines in use in Madras were all of Payne's make, that the machine minders were accustomed to that machine only and that, if any thing went wrong with the new machine, there might possibly be difficulty in setting it right, with the mechanical assistance then available. From the practical point of view, the argument was quite convincing and the order ultimately went to Messrs. Dickinson, even though their terms were a little dearer.

This incident forcibly brings out two things which machine manufacturers all over the world may well bear in mind, (1) that in buying a machine the familiarity of the workman with the machine is a great factor and (2) a corollary of the above, once a machine or maker is made familiar to a group of workers in a locality, it is practically certain that other kind or makers must start under a great disadvantage, if they are to compete in the business

We are not sure that these homilies will have any effect on the English factory owners, because they will be prone to look to their own interests. It may be necessary, therefore, from the point of view of the welfare of the Empire as a whole, that some means should be devised to compel the factory owners to admit Indian apprentices. Where the factory owner is distinct from the machine supplier, the latter should, in his own interest, arrange that Indian students are given facilities for knowing all about his machine in its working condition. Where the machinery manufacturer is the obstructive agent, the Government must intervene to use some compulsion. Fortunately, the Government of India is a large purchaser of stores, machines and engines in England and if, in placing their orders with English firms, they make it a condition that, if and when required, Indian students must be freely admitted into their factories, English manufacturers must yield, though reluctantly. This is what is being done by the Japanese Government who make it a condition before accepting the tenders of the British manufacturers that they must employ a number of Japanese apprentices, with the result, that such firms as Messrs. Beyer Peacock & Co., of Manchester, the well-known locomotive builders have admitted them against their own wishes.

Meanwhile, it will not do for India to risk its future industrial development on the possible attitude of English manufacturers. The report of Colonel Atkinson and Principal Dawson who are now touring through India investigating the character of the technical training imparted in the several existing institutions should enable the Government and the public to decide on the course to be adopted. With the industrial surveys already made and the information already available, a comprehensive programme should be drawn up as to what industries may be improved and what may be newly started with profit. In this programme should be included, not only the industries carried on in private and mission institutions, but also the industries run by Local bodies, Government institutions, Jails, Railway and Public Works Department Workshops. Unless this is done, there is risk of duplication of the provision made for instruction and consequent waste of money. What is intended here is, of course, the technical instruction and training in the higher branches of knowledge and the chief point to be borne in mind is that there ought to be, *some where in India, at least one institution*, where the practical training required to complete the theoretical instruction could be availed of. Much may be done by enlarging the scope of the agricultural and engineering colleges and the *quasi* commercial departments like Forests, Jails, Railways, &c. now run by the Government; and it may be, that the Government may attain its end more economically by subsidising private concerns offering facilities for training as desired by the Government. There will be no question of competition with private enterprise, the object being entirely educational and the whole expenditure will be debited to education.

We trust that the Government and the leaders of public opinion in India will realise that the practical training of Indian students, though it may not seem immediately pressing, is of vital importance to the future industrial development of the country.

SPECIAL ARTICLE.

A DEGREE IN COMMERCE.

BY THE EDITOR.

The progress and prosperity of a nation are largely dependent on its industrial and commercial development. The means adopted in furtherance of this object are many and various; and not the least important of them is the organisation of a sound system of commercial education. "The vocational, or utilitarian, value of subjects is fast becoming the measure of educational value. Not to perfect his faculties on lines of natural growth, but to increase his technical aptitude is now the aim and end of education for the average man." This is the ideal in the elementary classes. Resting on this general education, provision is made in the higher classes, for teaching in industrial and commercial subjects. At the top stand the technological colleges and universities which impart instruction and grant Degrees for proficiency in the higher branches of commerce and industry.

The rapid growth of Germany and German competition is due to the superiority of its technical and commercial education. The same may be said of Japan also. Great Britain, which had the start of the world industrially, lagged behind for many years in technical education. Of late, however, it has recovered lost ground and provided commercial sides to the Universities of London, Birmingham and Manchester.

In India, there is a growing feeling that not much has been done on the educational side to develop the higher branches of commerce and industry. This feeling was first voiced in Bombay by the late Lord Northcote. In his Convocation speech of February 1901, His Lordship pleaded for the recognition of commerce by the University, and suggested that "commerce should be as thoroughly taught and honoured a study as any other of those branches of learning which an Indian University delights to honor." The Universities Commission of 1902 emphasized the importance of the subject when they stated that the "Study of commercial subjects should be fostered as far as possible both by the Universities and the Government." A practical move was made in 1908 when his Excellency Sir George Clarke, the Governor of Bombay, brought out Professor Lees Smith of the London School of Economics to deliver a series of lectures in Bombay which were highly appreciated by people all over India; and in January of this year, the University of Bombay has set an example to the other Universities in India by instituting the Degree of Bachelor of Commerce in the Faculty of Arts. It was quite in the spirit of the times therefore that Mr. G. A. Natesan moved the other day in the Senate of the Madras University, "That a Committee be appointed by the Senate to consider and report at its next meeting upon the practicability or otherwise of the institution of Degrees in Commerce and Agriculture in the University of Madras or make Commerce and Agriculture optional courses of study for the B A. degree and B.A. Honours Examinations and that the Committee be requested, should it find the proposal practicable, to submit with its report a suitable scheme of studies and such further details in the form of Regulations, etc., as may be necessary to give effect thereto."

The proposal was seconded by the Hon'ble Dr. Bourne but it was lost, 24 voting *for* and 34 *against*.

The chief leader of the opposition was Mr. Chatterton. He said that the suggestion was not put forward by one connected with Agriculture or Commerce. The commerce of Madras was carried on to a large extent by the Chamber of Commerce and when he consulted some of the members of that body, the idea of instituting a Degree in Commerce was laughed at by them. Further, the commerce of Madras was not large and commercial work in Madras would not be advanced by instituting a Degree in Commerce. For these reasons, Mr. Chatterton urged that there was no urgent necessity to give effect to the proposal.

We have stated Mr. Chatterton's arguments, fairly we hope, and we think the mere statement of the arguments is enough to condemn them. If there should be a large volume of commerce without higher commercial education, then it will probably be argued that higher commerical education is a superfluity and a luxury? Surely, it is because that commerce is backward that the commercial Degree is suggested to give it fillip. One reason why a large part of the trade of Madras is in the hands of the Chamber of Commerce is that the members composing that Chamber come out here after having acquired a high degree of commercial knowledge in England; and it is because we know this, we ask for provision for similar education. We can very well see why the Chamber of Commerce have not moved and may not move in the matter. The Pioneer's Calcutta correspondent on "commerce and companies" commenting on the institution of the Commercial Degree in Bombay wrote a few days ago, "the useful and practical commercial clerk can never be turned out fully equipped from any college. It is to be hoped that our University will not make the mistake of following blindly the example of Bombay, but that any efforts they may put forth will be more in the direction of providing the essential grounding of a sound all-round education." If this may be taken as an index of the view of the European commercial community of Calcutta, it is easy to see that the European Chambers of Commerce in India may not move at all in the matter. The case of Bombay is different because the trade there is more in the hands of the Parsis and the Bhattias.

Speaking of Madras, the European Mercantile houses generally import their Assistants from home. These assistants and the partners on the spot conduct all the important correspondence to which few Indians have any access. Indians are now used only as short hand writers, typists, ledger clerks and so forth. No doubt a certain amount of training is desirable in the incumbents of these appointments and ample facilities now exist almost every where in the Madras Presidency for young men acquiring the necessary qualifications, as the result of a system of commercial education inaugurated in Madras about thirty years ago. The European commercial houses then largely supported the scheme and several of the young men trained in the Private Commercial Schools and the Government School of Commerce at Calicut even now get clerkships in all the European mercantile offices in Madras. These want only commercial *clerks*; they asked for facilities to create them, and got them in the shape of the Government Commercial examinations: they are quite satisfied; why should European merchants now ask for a higher class of commerical *assistants*? They have no place for them in their offices.

To speak frankly, there is no necessity, and indeed, it will be against the European mercantile interests to create a class of young Indians equipped in all the higher branches of commercial knowledge. Already, there are signs that, in Madras, trade is getting more and more into Indian hands. If further aids were given to Indian commercial enterprises, many more Indians will enter the field, and the consequence may not be quite to the benefit of the European interests. The point has long ago been foreseen. Said Sir Thomas Munro, a hundred years ago, in his evidence before the Select Committee of the House of Commons:—

"The people of India are as much a nation of shopkeepers as we are ourselves. They never lose sight of the shop: they carry it into all their concerns, religious and civil. All their holy places and resorts for pilgrims are so many fairs for the sale of goods of all kinds. Religion and trade are in India sister arts; the one is seldom found in any large assembly without the society of the other. It is this trading disposition of the natives which induces me to think it impossible that any European traders can long remain in the interior of India and that they must all, sooner or later, be driven to the coast. What the European trader eats and drinks in one month, would make a very decent mercantile profit for the Hindu for twelve. They do not, therefore, meet upon equal terms: it is like two persons purchasing in the same market, the one paying a high duty, the other none. The extra duty

paid by the European is all the difference between his own mode of living and that of the Hindu. It is impossible, therefore, that he can long carry on the competition upon such an unequal footing. He may for a time, with a large capital, carry on some new manufacture or improve some old one such as indigo or sugar. The Hindu will wait till he sees the success which follows the undertaking: if it is likely to be successful and to be permanent, he will engage in it and the European must quit the field. There can be no doubt, I think, that this cause, will in time operate so as to force all Europeans to the sea coast; and I can have little doubt but that hereafter when the Hindus come to correspond directly with the merchants in England, many of the Agents now settled upon the coast will, from the same causes, the superior economy and diligence of the Hindu, be obliged to leave India."

In the face of this contingency, Indians have no right to expect European merchants to exert themselves to get them facilities for their commercial advancement. They have come to toil in the tropical heat of India to earn money and not to make charities. Business is business and if Indians occupied the position now held by the Europeans in the commercial world, it is equally certain they will not move a finger to advance European commercial interests.

There is hardly any doubt that the future of India is largely commercial. Banking in India is largely in the hands of Indians. Large numbers of Joint Stock Companies are coming into existence with trading, manufacturing and insurance as their objects. Numerous managers, auditors, accountants, and actuaries will be required. It is essential, therefore, that a good supply of Indians trained in the higher branches of commerce and industry should be made available for service in the near future.

In the present economic condition of the country, it is urgent and imperative that, young Indians should be made to regard commerce as honourable as the law and the public service. To make them take to commerce, there should be placed before them a Degree which is so much valued everywhere in India. As the committee of the Bombay University have said, this is the best, if not the only, way in which the University can encourage the study of Commerce. A special University training is universally recognised to be necessary for the professions of Law, Medicine and Engineering. Similarly, a University training of the kind proposed will be of the highest value to young men desirous of entering on a business career. Without a well-disciplined mind and the faculties specially trained to analyse new commerical and economic situations, and without a scientific study of applied economics, and in India, without a good grounding in English, it is difficult for young men to handle scientifically and critically the numerous complicated problems of modern commerce and industry. This fact has been recognised in Europe and America and by several British Universities like those of London, Birmingham, Manchester, and also Oxford and Cambridge. Should Higher Commerical training not be recognised by the University, it is likely to be divorced from culture, which is as important for men engaged in business as it is for lawyers, doctors, and engineers. In this country, a course of studies not recognised by the University fails as a rule, to attract students of ability. Further, no economic and commercial training of the higher kind can be usefully imparted to those whose general education is not sufficient and cannot therefore profit by a University Course.

There is a distinct demand for the services of youngmen trained in the higher branches of Commerce and the institution of a Degree will open out new careers for Indian youths, and help business houses to secure the services of trained youths capable of being gradually advanced to the highest positions in business. The cause of liberal education will in no way be imperilled by the recognition of the right of Applied Economics and the study of business problems to a place in the curriculam of the University.

We believe it is the second time that the Senate of the Madras University have voted against the institution of a Commercial Degree. We hope, however, that, with the example of Bombay before them, all those who may be interested in the industrial and commercial development of India will agitate again and again until all the Universities in India institute a Degree for Commerce and thus bring the educational ideals and facilities of India in line with the leading commercial nations of the world.

VIEWS AND REVIEWS.

British Investments.

It is a common complaint that the railway policy of India is determined not by the Government of India but by the British capitalists in England. They want investments for their money and they squeeze the Secretary of State for India to open new lines of railway. The wealth of England seeking outlets abroad is great. The following survey of British investments is from an article contributed by the Rev. T. R. Phelps to a recent issue of the Economic Review.

The United States have long been the great field for British investments. There, is to be found no less than £688,078,000 of the savings of Englishmen, and the greater part of it, *viz.*, £586,227,000, is in railways. To Canada the exportation of capital has grown of late; in the last three years, as much as £100,000,000, has gone there, and the total invested is £373,000,000. Canadian railways are mostly built by English capital, the capital of Canadians finding ready employment in the development of the businesses in which it was accumulated. Take, *e.g.*, the Canadian Pacific Railway: all the debentures, all the preference, and 65 per cent. of the ordinary shares are held by England. Australasia, which has suffered, perhaps more than most countries from the vicissitudes of credit, owes Great Britain £380,000,000. To South Africa, Britishers have sent £357,000,000, to the Government, *i.e.*, for railways, £97,000,000, for mines, no less than £125,000,000, for land companies and the like, £73,000,000. Railways have absorbed the major part of the loans to India, 316 out of 365 millions, while tea accounts for £20,000,000.

Summing up, the writer observes that, "it would seem that we have lent to the constituent members of the Empire no less than £1,554,000,000, and are lending at the rate of £80,000,000 a year. When we remember that Canada, Australasia and South Africa, to whom we have lent £ 1,100,000,000 number but some 20,000,000 people in all, we see the force of imaginative faith even on the Stock Exchange. Of the loans to foreign countries, £1,638,000,000 in all, the United States have found a home for 42 per cent. and railways have taken 60 per cent. of the whole. And of all the capital that has left this country, we find 53 per cent. in America, 16 per cent. in Asia, 14 per cent. in Africa, 12 per cent. in Australasia, and but 5 per cent. in Europe."

Sovereigns for India.

The heavy import of sovereigns into India for some time past has been perplexing to those who incline to the opinion that the country is poor and that it is not yet ripe for a gold currency. On this point, we read in the Statist, "India has been a hoarder of gold, from time out of mind. But until the closing of the Indian mints to silver, the gold imports were only about half the silver imports. Since the closing of the mints, the imports of silver have been more or less stationary, while the imports of gold have been increasing. During the past two years, the increase has been quite phenomenal. The question of real interest is, what is the motive for the demand, and especially for the demand for sovereigns? The demand for bars is mainly for ornaments and for hoarding; and, as already said, it has existed from time immemorial. But the demand for sovereigns is new, and it is becoming exceedingly large. Does it mean that sovereigns are being hoarded? Or does it mean that they are getting into the circulation? In other words, does it mean that, just as during the eighteenth century, English opinion turned against a silver currency and in favour of a gold one, and that, during the nineteenth century, the change which had previously taken place in England occurred all over the forward nations of Europe and America, the same thing is happening now in India? Is India, that is to say, insisting upon having a gold currency—not merely a gold standard of value, but an actual gold currency? If she is, considering her absorbing power both for currency and for ornaments, the Money market must be prepared for a drain of indefinite magnitude in the future."

Indian Cattle.

It is a wonder that the worth and value of Indian cattle is not recognised by the people in this country, while others abroad see several good points in them. Thus, a recent American Consular Report says that, more than a century ago, East Indian cattle were brought to Jamaica and crossed with the native breeds, to produce a hardier stock for that tropical climate. Brahmin cattle were first brought over by Lord Howard de Warden, and later, Mysore and Gujerat cattle were imported for his estate at Montpeliar in the parish of St. James. Zebu, Nellore, and Hissar bred Hariana cattle, as well as others from the Maharaj's herds in Mysore, were brought in from time to time. It appears the Hariana first cross produced the finest cattle ever seen in Jamaica, while the zebu with the Mysore also produces very fine stock. The Mysores have proved to be the best draft cattle and the Gujerats are also of large size, but both are found to be somewhat intractable, though it is said that the East Indian coolie labourers in Jamaica have no difficulty in managing them. The oxen used in Jamaica for ploughing and hauling on the larger plantations are partly of Indian blood, and nearly all the ordinary cattle of the island show to some extent the results of the introduction of Indian stock. Especially for draft purposes has the benefit of the hardier stock been most apparent, while the general gain is clear from an official statement that the introduction of Indian blood has decreased the losses of cattle in Jamaica from 34 to 6 per cent. The results of the experiments made in the island seem to be worthy of consideration in other tropical countries. It is said that good results have been obtained in Texas from Indian cattle sent from Jamaica.

The results obtained from 28 cows at the Farm School at Hope, near Kingston,—including Holstein, Leyden, and Barbadian, half-bred Jerseys, Devons and Holsteins; mixed Canadian and Guernsey; quarter bred Indian (Nellore); and ordinary cows—showed that the three cows giving the greatest net profit over their original cost were quarter-bred Nellores. They not only paid for themselves, but placed the sums of £27, £24 and £23 to their credit for the year's record.

The Deterioration of Coal.

Now that the coal question is the burning topic of the day, it may not be uninteresting to note here the maximum loss possible in the best coal by weathering. On this point, elaborate tests have been made by the American Bureau of mines and for an account of them, we are indebted to our contemporary, Power, of January 2.

The question of the loss in coal under sea and fresh water respectively was considered, and it was hoped that the problem of saving by under-water submergence would once and for all be settled. It was found that New River coal lost less than 1 per cent in calorific value by weathering in the open for twelve months. Crushed coal deteriorated much more rapidly than "run of mine." The submerged samples seemed unaffected in either sea or fresh water. This is the coal that is in general use in the American Navy. Pocahontas is the coal used in the Panama works, and extensively as steaming and coking coal in the East. It lost less than 0·4 per cent. in heating value in the year. Pittsburg gas coal came triumphantly from the ordeal, losing in six months nothing of its heating power. Wyoming coal lost over 5 per cent. in two years and nine months, 3½ per cent. being lost in the first three months. It seems proved beyond doubt that storage under water increases the heating value and physical strength of coal. The sole drawback is that its use means firing wet coal—a serious matter in the case of Illinois and Wyoming coals, which mechanically retain from 5 to 15 per cent. of water after draining. The higher class Eastern coals retain but 2 or 3 per cent, and, as the firemen using it generally wet their coal before firing, this retention of moisture is of little importance. The submergence method of storage commends itself to the Bureau on the ground that it absolutely prevents spontaneous combustion. The

seriousness of the danger of this liability to spontaneous heating may be seen from the replies forwarded to the Bureau from 1,200 firms of merchants. These reported 220 cases, and gave no reason for the belief that smokeless coals are any safer than others in this respect. The Pocahontas coals have given much trouble, as there have been many outbreaks in the huge storage piles at Panama. The Bureau suggests that ventilation by pipes does more harm than good. Dust must be avoided as much as possible, and no coal should be stored until it has been out of the mine at least six weeks. No air should be admitted within the pile through interstices round such objects as timbers or brickwork, and no point within the pile should be more than ten feet from an air-cooled surface. Every two months, the coal should be rehandled and screened. Coal should not be stacked near any external source of heat, even if moderate in degree. The Bureau attaches no importance to the presence of sulphur as contributory to spontaneous combustion.

Falsification of Balance Sheets.

Mr. H. J. Jennings has a very informing article on this subject in a recent number of the Financial Review of Reviews. "It is the recognised duty of the directors of a limited liability company to prepare the accounts and arrange the balance sheet. They are in the first instance responsible to the shareholders and the public for the figures and the valuations upon which those figures are based. They are naturally in the hands of their officials to some extent so far as stock-taking is concerned, but with a proper system of check and sound principles of valuing, there ought not to be any difficulty whatever in arriving at a perfectly honest result."

The accounts are examined by an auditor who has to certify that he has examined the accounts with the books and vouchers and that, in his opinion, they are correct and in conformity with the law. Ordinarily, balance sheets are falsified to show high profits by inflating the stock in trade. The auditors may be easily deceived in respect of the value of the stock as, after all, they are only accountants and not valuers.

"The auditor cannot, of course, be held responsible for the value assigned to the stock, as it is manifestly impossible that he should, even if he were qualified, be able to take or check the actual measurement or counting of stocks, whether of raw materials or manufactured articles, either by number, weight or otherwise. He must use reasonable discretion, when the valuation of the stock is handed to him, in satisfying himself that it has been arrived at in a systematic manner." Provided he has done his duty with care and skill, the accepted view seems to be that "in the absence of suspicious circumstances, the auditors are entitled to rely upon the representations of responsible officials, and that they are not guilty of negligence if they accept the certificate of such persons as to the value of the stock-in-trade."

Falsification of balance sheets in connection with public companies have in most cases hinged upon the manipulation of the stock assets, and to detect this swindle, the remedy is, according to Mr. Jennings, to enlarge the powers of the auditor. "In every case where he is not thoroughly satisfied that the stock is properly counted and valued, he should be empowered to call in the services of an independent expert valuer, whose duty it would be to check both quantities and values. The only objection to this plan that suggests itself is that it would penalise a large number of innocent and honestly managed companies, whose stock valuations are perfectly honest, in order to put up a barrier against a few offending ones. But that is the principle of all preventive legislation. We do not employ policemen to look after the honest people who form the vast majority, but to look after the minority of dishonest ones. If there is a screw loose in this balance sheet business, we must, as a community, see that it does not result in future damage It is of paramount importance that the public should be able to put their trust in a published balance sheet."

Industrial Development of India.

A paper on "Some Recent Economic Developments of India" was read by Sir Theodore Morison, Vice-President of the India Council at a meeting of the London Chamber of Commerce on January 25th.

Sir Theodore Morison said it was significant that the thoughts of the educated classes of India were all turned in the same direction. Numberless books and articles converged on the point that India must develop manufacturing industries. The young men themselves were trying to get into industrial careers, being ambitious to get on in the world. Nowadays, therefore, they showed less eagerness to enter Government service or the overcrowded law courts, and sought to create for themselves positions in commerce and industry. He believed that the educated classes would succeed in transforming the industries of the country, and that the young men trained in Government schools and colleges would found factories, employ workmen, and direct industries on modern lines and that capitalist industries would gradually supplant the petty craftsmen who, until recently, had supplied the needs of the Indian people. This would mean that the independent craftsmen would fall into the position of a wage-earner; the population, now diffused over the country in myriads of villages, would be aggregated in large towns; wealth would be increased; education and intelligence would be stimulated, but at the same time, there would come into existence a proletariat living in slums in conditions of which India has hitherto been happily ignorant. If India made for herself most or many of the things which England now exported to her, England should lose a large market in those particular goods. The industrial revolution would, however, bring an immense increase of wealth to India and therefore an immense increase in her purchasing power. She would not take so many of the cheaper goods which England now sends to her, but she would certainly want many of the dearer articles which she cannot at present afford.

On the whole, Sir Theodore Morison thinks that though there might be a change in the quality of the trade, a rich India would prove a better customer than a poor India. A considerable time must, however, elapse before this transformation could be carried to completion. In the transitional period, there must be an immense demand for manufacturing plant. The equipment of modern industries over so large an area would be a very costly process. To finance it, India would have to raise loans in the London Money Market, which would be spent for the most part in the purchase of mechanical and other plant. If England were wise, the orders for that plant, would go to her; if she were unwise, they would go abroad. At present, Sir Morison thinks England is pursuing the unwise course. The Indian would place his orders among the people with whom, and in the country where, he has had his training. Yet, so far from taking care that the future captains of Indian industry were receiving their industrial training in England, Englishmen were shutting the gates of all their workshops upon them and driving them against their will, to get their apprenticeship abroad. There were many Indian students in England. At the technical colleges and modern universities, they learned a certain amount of scientific theory; but when they tried to obtain experience of its practical application in a workshop, mill, or tannery, which all business men said was indispensable, all doors were shut against them. The consequence was that they were beginning to look abroad, and were going for their training to Germany, Japan, and America. English firms, not unnaturally, were jealous of their trade secrets and they fear to train up men who might become their competitors in the future. Manufacturers abroad appear to believe that these dangers were counterbalanced by the probability that Indians trained in their works would send them business when they returned to their own country. From the national point of view, the policy of the foreign manufacturers was far-sighted, while the practice of the English firms by contrast appeared to be pennywise and pound foolish. A particular firm might gain by it, but the effect of the English practice as a whole was disastrous, for, it drove the Indian business of the future into the hands of England's commercial rivals.

Doubling the Corn Crops.

In India, where agriculture is the mainstay of the people, the greatest benefactor is he who would raise two blades of grass where one now grows. Every one interested in agriculture, including the Government, is struggling to do this and there are many ways to Rome. How a billion and a half dollars may be added annually to the national wealth by doubling the corn crops of the United States, without increasing the acreage, is told in a recent issue of the Country Life in America by J. W. Mitchell, of the United States Department of Agriculture. This result has already been attained in some of the Southern States through the agency of the Boys' Corn Club, an organization originated by the late Dr. S. A. Knapp of the agricultural service. According to Mr. Mitchell, 46,000 boys have thus been led to follow improved methods in corn-raising, and, what is more, their parents and neighbours are now imitating them. A dozen boys from eleven to sixteen years old, the prize-winners of the club, recently visited Washington after raising crops four to seven times as large as the average. Writes Mr. Mitchell:

"The average production for the United States has been only 25·5 bushels an acre, although there was no reason why, on the same acreage and at the same expense, it should not have been 50 bushels. It might even have been 80 or 100 bushels, for there are many up-to-date farmers now raising 100 bushels to the acre. But one has to know how.

"For years the Department of Agriculture has been devoting much of its energy to studying corn. Seed selection, improvement of the seed bed, better cultivation, and a few other things that cost care, but little money, have been found out by careful experiment. The results of these researches have been embodied in pamphlets and scattered broadcast. In some places, they have taken hold. In most places, they have not. In recent years, the Department has tried the experiment of sending out field-agents who by insisting on Government methods for a single season train the farmer to double his crop without additional expense.

"It was from this demonstration work that the Corn Club idea started in the South. The farmers there seemed more in need of a helping hand than elsewhere. The cattle tick, the boll-weevil, and the hook worm had combined to stunt the development of what, it would seem, ought to be the garden section of the United States. As the boys were more teachable and less opinionated than the men, Dr. Knapp and the field-agents started working out the Corn Club idea among them first. This was four years ago. It was done in thisway:

"In a country, the boys would be invited to form a Corn Club. During the winter, Prof. O. B. Martin, of the Department of Agriculture, who was specially put in charge of the work, would send them circulars, on seed selection, fertilizers, cultivation, and other subjects that could be studied theoretically. In the early spring, the boys would select seed, test its germinating power by simple experiments, and read up on the life-history of corn. Then the field-agents of the Department would call around and oversee the ploughing and the planting. The public-school teachers, the local business men, and the state commissioners of agriculture would be enlisted and would keep an eye on the development of the crop.

"Each boy was allowed a measured acre and a strict account was kept of the money spent on his crop in labor and fertilizers. Even where he did the work himself, there was ten cents an hour for labor charged against the crop and five cents additional for each horse. The rental value of the average land was placed at $5, and that was charged against the crop too, and for each two horse load of manure, it was charged with another $2.

"When the crop was harvested, the showing was judged as follows: best yield per

acre, 30 per cent.; best exhibit of ten years, 20 per cent.; best written account showing the history of the crop, 20 per cent.; best showing of profit on the investment, 30 per cent.

"The best record made in the county club was pitted against the best record of each of the other county clubs, and so the State record was established. The bankers and local business men who had been interested in the movement were induced to give small prizes, either money, farm implements, trips to the State fair, or other things boys think most worth while. Two years ago four States offered trips to Washington as the first prizes. The four winning boys went to Washington, met the Secretary of Agriculture, and were given diplomas recognizing their work. Last year there were 46,225 boys in the competition and eleven States were represented. Governors of the several States met the State and county winners; the records were shown at the State and county fairs, and the eleven high-score boys who were sent to Washington were given a great send-off from their respective localities.

"They met the Secretary of Agriculture, and after listening to a talk on the importance of good work in general and their own work in particular, were given diplomas. They called on President Taft at the White House and were treated like distinguished visitors. They even appeared by request before the House Committee on Agriculture, and after they had been put at their ease and led to answer all sorts of questions, Chairman Scott of the Committee declared he thought the Boys' Club movement was the best work the Department of Agriculture had ever done."

Not only have these big crops been raised, Mr. Mitchell tells us in conclusion, but corn has been sold for seed to neighbouring farmers as high as $3 a bushel, and each of the demonstration farms has been visited by an average of one hundred farmers to get "pointers." The good work is therefore likely to go on.

Here is a lesson for the Government, the Agricultural Committee and all enthusiasts in the improvement of Indian Agriculture.

The Craze for Technical Education.

The following contribution of Mr. Harold Cox to the Statesman should be read by all who are interested in the industrial development of India and that is our excuse for giving it here *in extenso* :—

Since I have been in India nothing has surprised me so much as the extravagant importance attached by leaders of Indian opinion to technical education. There seems to be a universal belief that technical education is a kind of fetish which has only to be set up and worshipped, and straightway flourising industries will spring into being all over India. Even cautious thinkers seem to regard technical education as the first essential to the industrial development of the country. That this sudden craze should have taken possession of Indian minds is all the more surprising to me, because I can remember that when I was in India before, proposals to substitute technical for literary education were very properly scouted by Indian opinion. To European advisers who somewhat thoughtlessly said : "Learn trades and make fortunes"—Indian gentlemen replied that there was an immediate market at the Bar and in Government service for young men who had received a literary education, but there was no such market visible for boys who had received an industrial training. Twenty years have passed, but the same answer might still be made. It is true that the number of competitors for Government service and the Bar is greater than before, but the prizes are still there in goodly number for the best men to win, whereas, as far as I have been able to earn, in the case of technical education there are practically no prizes at all. People say that until India possesses an industrially trained population she cannot possess industries. That is a question which I will discuss presently, but it only remotely concerns the parent who is considering what are the openings for his son. The sensible Indian knows that a boy who has had a literary education will have a chance of obtaining a really good position as a barrister or as a civil

servant, and that even if he completely misses these chances he will still be able to find some employment as a clerk or a teacher. But suppose the boy has been sent to a technological college and learnt the technique of some particular industry, what is he to do with his knowledge ? Who is going to give him employment? It is no answer to these questions to say that technical education is a prelude to the industrial development of the country. The boy wants employment ; he does not want "preludes to industrial development."

Let me relate an anecdote. Some years ago the Government of India, which has also been bitten with this craze for technical education, sent to England an Indian boy to be taught the art of dyeing according to the latest scientific methods in a technical college in Yorkshire. He was a very bright boy ; he worked hard and gave complete satisfaction to his teachers. Just as he had finished his studies, a big English firm asked the principal of the college to recommend them a scientific expert in dyeing. Without any hesitation the principal recommended this young Indian lad, and the firm, after making further enquiries, engaged him at a salary of £200 to £300 a year. That is not a very princely salary after several years of hard work, but the point of the story is that the employment of this young man in England by an English firm is in no way a "prelude to the industrial development" of India, and is a very unsatisfactory return for the money which the Indian taxpayers have lavished on the boy's education

If anyone asks why this Indian boy finds employment in England and not in India, the answer is very simple. In England, industrial development has reached a high level, and therefore there is a demand for scientifically trained experts; in India industrial undertakings of the modern type are extremely rare, and must remain rare until more capital and more enterprise are forthcoming. Industries are not started because a number of class-room trained experts are clamouring for employment. Before an industry can be started, somebody must have the enterprise and energy to organize its beginnings ; and that somebody must either have capital of his own, or else must be able to persuade other people to supply the capital required. These are the primary essentials to the establishment of any new industry, and, if they can be secured, the remaining difficulties can be faced with some hope of success. But unless the spirit of enterprise exists and capital is forthcoming, nothing can be done. In India, there is very little enterprise, and if capital exists, its owners decline to invest it in Indian enterprises. Therefore, for the Government to spend large sums on technical education would be not only a waste of the taxpayers' money, but a cruel wrong to the boys who had been deluded into acquiring knowledge for which there was no market. The matter can easily be put to a test. Let the Government, before launching out on any big schemes of technical education, ascertain how many firms there are in the whole of India who want an expert chemist or an expert dyer, or any other kind of expert that it is proposed to turn out from the technical schools. Let the Government further enquire what salaries these firms propose to pay, and to what extent they are willing to employ Indians in place of Europeans. When this information has been collected and published, I suspect that there will be very little further demand for technical education on a wholesale scale.

These considerations, of course, in no way affect the altogether different problem of providing tuition for boys who look for employment in the subordinate branches of industry or commerce. There is certain to be in the larger towns a steady demand year in and year out for skilled mechanics, and for clerks who can write shorthand and use a typewriter and who have some knowledge of the elements of accountancy. Doubtless the education authorities already have given attention to these points, but when a native gentleman talks enthusiastically of the blessings of technical education, he is evidently thinking of something very different from the training of clerks and mechanics. He has in his mind the conception that the sons of gentlemen can be

taught in school class rooms how to become great captains of industry. That is the wildest delusion. Even in Europe, the school-trained industrial expert can, as a rule, only look forward to a very modest salary as a paid servant in some big firm. I am told that, in Germany, first class chemists are to be had for little over £ 100 a year. In India, there is not even this outlet for the talents of the industrial expert, and a boy who had devoted precious years of his early life to mastering the technical details and scientific principles of some particular trade would find when he left school that, from the point of view of earning money, all his time had been wasted.

If it is asked—How then is India to develop industrially? the answer is: She must begin by acquiring capital and enterprise; and if these are not forthcoming from her own people, she must borrow them from other countries. In the first half of the nineteenth century, Germany had to borrow capital and enterprise and technical skill from England; she is now able to compete with her teacher. The same opportunity lies open to India, but her progress will necessarily be slower than that of Germany, because most of her people are still on a lower intellectual plane than the Germans occupied two generations ago. Meanwhile, it is worthy of consideration whether, as far as educational work is concerned, it would not be wiser to direct attention to agriculture rather than to manufactures. Agriculture is and always will be the principal industry of the people of India. Already it is in some of its branches a more profitable occupation than many manufacturing industries, and there is a great probability of a further relative advance. On the one hand, the growing population of the world and the general rise in the standard of living are forcing up the prices of foodstuffs; on the other hand, by the application of science to agriculture, farmers are now able to secure a much more profitable return for their labour. It may be, indeed, that the future lies with the farmer rather than with the artisan. But whatever the future may bring forth, at present, it is beyond doubt that there is in India a greater opportunity for applying the teachings of science to agriculture than to manufactures. For, in India, it is only possible to establish manufactures on any extensive scale—and that very slowly—by borrowing capital and enterprise from Europe; whereas agriculture already exists. There are millions of cultivators in India who with the aid of technical advice would be able to increase the quantity or to improve the quality of their produce, thus adding enormously to the wealth of India and to the well-being of her people. Here is unlimited scope for what may be called scientific missionary enterprise; and here is a practical opening for young men who will make it their profession to go about the country—as is already being done in Europe—carrying advice to the farmer on his own fields.

Industrial Education for Indian Women.

The Government of Madras had asked, in July last, the Director of Public Instruction to submit proposals for the opening of industrial classes for women in connection with the Training Schools for Mistresses. The Director recommended that the scheme of industrial classes might, for the present, be confined to the Government training institutions at Guntur, Egmore, Royapettah, Calicut, Coimbatore, Rajahmundry and Mangalore and that the proposal for opening separate industrial schools for women might be considered after some experience had been gained of the working of these classes. He also suggested that the classes, which should be free, might at the outset be confined to needlework, lace and embroidery work and house management including cookery, and pupils of the third and higher standards in the model school who showed a special aptitude for industrial work and all the students in the training section might be required to attend any of the classes for not less than 3 hours per week. He recommended also that Indian ladies of good character, whether widows or not, who have completed either the six or the seventh standard course in an elementary or a Secondary School be admitted to these classes without payment of fees, whenever accommodation is available. The Government have accepted the proposals.

AGRICULTURE.

Eradicating Weevils.

The only way to eradicate weevils is to dry the grain. This is practicable only in the case of small quantities.

Chemical Branding of Cattle.

The experiments made in Ceylon in the branding of cattle with chemicals have been extremely successful. The marks left after the operation seem to be indelible. The cattle suffer no pain whatever, and the time required for healing is very short. It is stated that the results of the experiments have been submitted to Government by Dr Sturgess, to whom must be given the credit of initiating this process. Hereafter, the old crude way of branding cattle will be given up, and the new process will be introduced in all parts of the Island. We hope something similar will be done by the Agricultural Department in India.

Sulphur Fertiliser for Potatoes.

Experiments conducted for some time at the several agricultural stations in Germany seem to show that sulphur is a most excellent fertiliser for potatoes, being effective, not only as a growth stimulator, but also as an exterminator of the parasites that attack the plants, and as a preventive of rotting in cases of excessive rain. The application of refined, powdered sulphur is at the rate of 375 lbs. or more per acre, and in no case has the section so treated failed to give a better and larger crop than fields not treated. Whether the increased crop depends mainly on the direct action of the sulphur or in its pest-exterminating action, the investigators are not willing to declare definitely at the present stage of the experiments.

Dairy Cow Tests.

It has generally been the experience of dairymen that when animals are taken from their home surroundings and milked in a strange place amidst excitement, they do not yield their usual quantity of milk. Good milkers are especially nervous in temperament and such cows are more easily upset in shows and competitions. In order to overcome these difficulties, a practice is coming into vogue in parts of Australia by which the cows are milked in their usual surroundings under the supervision of officers of the show or competition, both in the morning and evening of a day in the two weeks previous to the show, and the day's butter production is taken as the basis for deciding the cow's yield.

Jowar Smut.

The efficacy of steeping jowar seed in copper sulphate to prevent smut was strikingly shown by an experiment performed at the Agricultural College Station, Poona. Two plots, each four *gunthas*, were sown with jowar, side by side, to bring to the notice of visitors the effect of steeping against jowar smut. One plot had its seed steeped in 1 per cent solution of copper sulphate for 10 minutes and the seed of the other plot was not treated.

The total number of plants in each plot, with the number of plants with heads attacked by smut were counted, and the figures are given below:—

TREATMENT.	Total number of heads.	Number of smutted heads.	Percentage of smutted to total.
Steeped ...	5,848	16	0·27
Unsteeped ...	5,859	1,022	17·40

Price of Cotton.

The cultivators of cotton in the Southern States of America have for years been advocating an arrangement for artificially holding up the price of their crops against the consumer. According to a statement from New York, a project to this end has been effected by a number of bankers, who are prepared to finance the crop, which is not to be sold under thirteen cents a pound. If the experiment proved successful, the result would be to stimulate cotton production elsewhere. Indian cotton cultivators would certainly benefit, if American prices were maintained at an artificial level.

COMMERCE.

Business Enterprise in India.

The commercial enterprise of India during the month of December 1911 may be gauged by the following abstract of joint stock companies registered in that month :—

		Rs.
2	Banking and Loan Companies ..	52,50,000
5	Insurance Companies ...	1,70,000
5	Trading Companies ...	6,20,000
1	Spinning and Weaving Mills Company ..	7,00,000
13	GRAND TOTAL ..	67,40,000

Stamped Receipts.

The Allahabad High Court has recently decided an important stamp case. One Balmukund, a wine merchant, received a Postal Money Order for Rs. 34. He signed the usual postal receipt, but the sender demanded a separate stamped receipt which Balmukund refused to give. He was prosecuted by the Collector under Section 65 of the Stamp Act.

For the defence it was contended that the postal receipt was sufficient and that the accused was not bound to give another stamped receipt to the sender.

The Magistrate held otherwise, and convicted Balmukund, sentencing him to pay a fine of Rs. 50, which was upheld by the Sessions Judge.

An application was made to the High Court for revision. The Chief Justice and Justice Banerjee held that the conviction of Balmukund was illegal, inasmuch as he, having signed the receipt, which was exempt from stamp duty, handed it over to the Post Office, which was the agent of the sender for the purpose. Balmukund was not bound to give a second receipt, and his refusal to give a fresh receipt was not a refusal within the meaning of Section 65 of the Stamp Act. The conviction and sentence were set aside, the effect of the ruling being that the receivers of Money Orders are not bound to send stamped receipts to the senders.

Indian Sugar Producer's Association.

We are informed that the incorporation of the Indian Sugar Producers' Association has been completed, with headquarters at Cawnpore. The objects of the Association, briefly stated, are, to determine the principles best suited to the production of sugar in India, and to endeavour to procure their general recognition and practice; also to promote, support or oppose legislation affecting the sugar industry, and, generally, to do all such things as are conducive to its interests. The formation of the Association has been in the air for some years. The body has indeed been in formal existence since 1909, but it has taken some time to establish such conditions as would admit of common action.

Profit and Loss.

The distinction between capital and revenue accounts is not always borne in mind by most businessmen. It is obscured considerably when the capital is employed in lending for interest or is largely invested in shares and securities. It must be remembered that investment is the act of laying out money in order to earn income. Supposing your invested capital a year ago was represented by £10,000, in order to ascertain your income for the year, you must first set aside your £10,000, which is the *capital*, and any sum which you might have received or are possessed of over and above this, is *income*. In other words, if the falls in the value of your securities and the losses on sales during the year amount to more than the dividends received during the same period, then it is clear that the capital has been worked at a loss and has produced no income. A large number of investors regard their stocks as their capital and their dividends as their income, and in this easy but loose way, go on, year after year, living on their capital without being in the least conscious of the fact.

INDUSTRY.

Indian Industries.

With a view to revive Indian industries, Messrs. Surendranath Banerji, Krishnakumar Mitter and Radhachandra Pal of Calcutta have issued a circular to establish a Museum, Industrial Bank, Industrial Directory and Swadeshi Chamber of Commerce. The project is said to have obtained the sympathy of the Bengal Government.

Hat Making.

There seems to be an opinion abroad in the Philippines that India could do a large business with those islands in cheap hats made of bamboo or other vegetable fibre. There appears to be an enormous demand for low-priced hats there, mostly for native use, and perhaps those who are interested in this line of business may take the hint. There is very little doubt, says Capital, that amongst her numerous grasses, India has material for the finest "straw" hats one would care to wear—even for the far-famed Panama, which, by the way, is not made in Panama at all, but in South America. There is plenty of material, but few, if any, pioneers to work it. That is a stage in India's commercial development that will come later.

The Jute Industry.

Referring to the Indian jute trust which is being engineered by Mr. John H. Parks of Boston and New York, a contemporary remarks that the importance of the proposal may be gathered from the fact that the capital employed in the Calcutta jute mills is about £ 10,000,000, which appears to be mostly unremunerative, because, according to a member of Messrs. Bird and Company who manage several mills, "for the last three years the mills have been working practically at a loss, although we have an absolute monopoly of the raw material." The "nigger in the fence," is the Marwari trader, who has "invaded Calcutta from his home in Rajputana, and has practically ousted the Bengali from the mercantile world," besides cutting into the business of British firms. His expenditure is infinitesimal, and he lives "under conditions that can only be described as squalid." This being so, it is difficult to see how Mr. Parks, professor though he may be as a Trust builder, will be proof against the arts of the Marwari Trust "buster."

Jail Manufactures.

One of the Resolutions to be moved at the Eighth Congress of Chambers of Commerce to be held in London in June next, will have a hit at the Indian Jail industries, which have been attacked over and over again by various trade interests in this country. The Resolutions wil assert that private enterprise has the right to be protected against the competition of articles of trade manufactured by convict labour at an artificially lowered cost of production, and the Congress will be asked to approve the principle that State prisoners should be employed only upon tasks which possess a distinctly penal character, and in no case should power machinery be employed in jails for the production of articles of trade. The official reply will probably be that it is necessary to keep convicts usefully employed and that no attempt is made to compete unfairly with private enterprise. Meanwhile, it may interest our readers to know that the Punjab Chamber of Commerce has taken a most sensible view on the question of the competition of jail manufactures with private industry. "While the Committee of this Chamber is prepared to jealously guard the interests of private enterprise against the competition of State-manufactured articles in the open market, it is of opinion that when a Government finds it convenient and economic to utilise its convict labour to manufacture articles required by its own departments, and the manutacturing is calculated to develop the intelligence and elevate the character of the convict, it is reasonable and in the public interest that it should do so."

ECONOMICS.

Export Duty on Rice.

The Lieutenant-Governor of Burma proposes the imposition for ten years of a cess on all rice and paddy exported from Burma. It is 4 annas per bag of two cwts. on exports to India, and one anna per bag on exports to foreign countries, the latter already paying 8 annas a bag export duty. The Lieutenant-Governor asks the support of the mercantile community.

Minting Gold in India.

The Indian Daily News states that we are well nigh within the reach of minting gold in India. The matter is still in a state of discussion but there need not be any surprise if the minting of gold coins becomes a reality.

The Minimum Limit of Income-tax.

At the meeting of the Imperial Legislative Council held on the 23rd February, Mr. Dadabhoy moved a Resolution to raise the limit of exemption from income-tax to Rs. 1,500 annually. He claimed that the adoption of his Resolution would not seriously affect the financial position of the Government of India, and that it would only be carrying out the just principle that the amount for the necessaries of life should not be taxed, the cost of living having increased materially since 1903 when Lord Curzon decided to exempt the tax upon all incomes below Rs. 1,000 annually. The reform would involve a loss of only about Rs. 30 lakhs in the annual revenue, which could be at least partially made good by raising the rate to six pies per rupee in the case of larger incomes, but, in whatever way, the loss was made up, justice should be done and relief afforded to the struggling middle classes. The Resolution was lost.

The Industrial Situation.

The question of market reveals the worst feature of the Indian industrial situation. The country is too much of a producer of raw materials for foreign mills. In an industrially and normally developed India, this process must be reversed, says the Punjabee. The raw produce must be converted into manufactures in India and the surplus products of Indian factories should be sold abroad. The first and foremost incentive to such a consummation is a protective tariff. Protection, is absolutely necessary for the development of the infant industries of a country. That is the lesson of history. England herself had recourse to it in the past with regard to Indian imports. A protective tariff is almost a *sine qua non* of industrial progress, and nowhere it is more so than in India.

Large versus Small Farming.

The advantages and disadvantages of large and small farming are stated by a correspondent of the *Nation* thus :—"Small-holders pay higher rents per acre than large farmers ; but on periods of, say, ten or fifteen years, the rent returns will be in favor of large holdings if they are let at full current valuations. The cost of producing a bushel of corn, a gallon of milk, or an 8lb-stone of meat is much less to the large farmer than to the small-holder, when the time, energy, and self-denial of the latter and his family are fairly reckoned to his credit.

"Personally, I am decidedly of the opinion that any one who wants a garden or a small holding ought to be able to get it or rent it at a fair price ; and to that end, through my long life, I have advocated making the transfer of land as free as dealing in any other form of property. The point which I think should be understood and made clear is the respective values to the State of the two methods of producing food for the people of the nation. Good farming increases the *humus*, or productive "top spit" of the land. On small holdings the constant necessity of making the rent in all seasons is not compensated by variety of crops, and the fertility of the land suffers unless the tenant has other sources of income besides his holding. The large farmer can obtain a fair return for his capital and skill; the small holder gains his independence and a precarious living at a cost of time, work, and strain he rarely takes the trouble to estimate."

CO-OPERATION.

Co-operation in Ramnad.

The first Co-operative Conference for the Ramnad District was held on the 21st January at Vadamalaipuram, about seven miles from Thulukapati Railway Station. The meeting was largely attended by the members of the rural community residing in the villages in the neighbourhood and the members of the rural Societies situated in the area, who evinced a keen interest in its proceedings, which were conducted in Tamil.

Co-operation in Bombay.

From the annual report of the working of the Co-operative Credit Societies in this Presidency, it appears that there were 208 registered Co-operative Societies at the beginning of the year. The total working capital of the societies rose from Rs. 8,29,000 to Rs. 1,347,000. The average working capital of urban societies increased from Rs. 7,412 to Rs. 11,650 and that of rural societies from Rs. 2,722 to Rs. 2,970. Progress in all other respects was steady, if not remarkable. Co-operative Grain Banks continue to have only a limited sphere of operations. There was an increase from 10 to 17 in the number of Leather Workers' Societies and the position of the weaving trade with six societies was the same as last year.

Co-operation in Burma.

In Burma, in the co-operative year ending 30th June 1911, the number of rural societies increased from 252 to 450 and the membership from 6,128 to 11,240 ; while the number of urban societies increased from 22 with a membership of 1,403 to 27 with a membership of 1,788. Unions increased from 8 with 92 affiliated societies to 24 with 293 affiliated societies.

The net capital is 15½ lakhs or more than double the capital of the previous year. Of this amount, 3 lakhs is paid up share capital, a lakh is reserve fund and 2½ lakhs are members' deposits, making a total of 6½ lakhs or 42 per cent subscribed by members which is evidence of the extent to which the establishment of these societies has operated in the encouragement of thrift. Of the capital contributed by non-members, only a little over Rs. 16,000 has been advanced by Government.

On a review of the year's work, the Lieutenant-Governor is satisfied that real progress has been made, that the development of the movement is proceeding on right lines, and that the prospects for the future are hopeful.

Co-operation in Madras.

From the report on the working of the Co-operative Credit Societies in Madras for the year ending 30th June 1911, it appears that the number of societies at the end of the year was 596 as against 377 at the end of the previous year. Of these, five were central societies lending to other societies, one was a union of societies, the first of its kind registered in the Presidency, thirty were urban societies and the remaining five hundred and sixty were rural societies. The aggregate number of members rose from 30,085 to 44,102. 59 per cent of the members were agriculturists, 21 per cent non-agriculturists, and the remaining 21 per cent derived their income from agricultural and non-agricultural sources. The working capital of all the societies was Rs. 49,15,022 as against 38,18,893 at the beginning of the year. The deposits from members amounted to Rs. 12,11,252 and from non-members to Rs. 8,83,498. The net profits of the year amounted to Rs. 1,17,002 as against Rs. 75,958 in the preceding year and the reserve fund rose from Rs. 1,13,982 to 1,85,498. The Madras Government remark that "the management of the Co-operative Credit Societies is on the whole most encouraging."

BANKING.

Interest on Current Deposits.

The usual rate of interest allowed by banks on current deposits is 2 per cent. on daily balances. Some banks with a view to attract customers have begun to pay 2½ per cent. The effect of doing so has been a drop in the profits of the Bank of India, Limited. At the annual general meeting of the shareholders of the bank, Sir Cowasjee Jehangir, who presided in the absence of Sir Sassoon David, Chairman of Directors, said "The profit made for the first six months of the year was Rs. 2,51,809, whereas for the last six months the profit was only Rs. 66,152, and I am sorry to say that the comparatively poor result of the working for the last six months of the year was due, in a large measure, to our continuing to pay the 2½ per cent. interest on daily balances to our current account depositors. When I point out to you that the interest so paid for the six months ended 31st December, amounted to no less than Rs. 1,90,000, and that, at one time, our current deposits reached the large total of 189 lakhs, or 37 lakhs more than the highest total reached the previous year, you will appreciate the serious inroad on our profits, bearing in mind that, for some considerable time, we were unable to utilize very large sums at any return whatsoever, owing to the general extreme slackness of trade." This is so far as the Bank of India is concerned. Of course, a good deal depends on what sort of depositors a bank has, whether the fixed or current deposits bulk largely in the bank.

Prize Packets.

Here is a novel method adopted by a "Swadeshi" banking concern for popularising itself. The United India Bank, Ld., of Allahabad, were to have held a "Grand Prize Distribution" on February 1. We read that 5,000 prizes ranging from Rs. 2 to Rs. 1,000 were to have been distributed among the shareholders.. "Anyone who takes shares of Rs. 10 in the bank will have as many chances of getting prizes as the number of shares taken by him. Only Rs. 4 per share has to be paid now, the rest to be paid when called, in instalments of Re. 1 each. In addition to the prizes, the shareholders will get yearly dividends from the Bank. The sale of shares will be stopped either by the 25th of January 1912 or earlier as soon as one lakh of shares are sold. Drawing of prizes will take place at Cuttack on 1st February 1912 before an assembly consisting of the Directors, Shareholders and officers of the Bank as well as some respectable gentlemen of the town."

Bank Profits.

In an article on Banking, the Bankers Magazine points out that it is advisable in stating the rate of percentage of the profit to include the reserve with the capital. Both are absolutely the property of the shareholders. The profit would not have been obtained but for the existence of the Reserves. They have been accumulated through the self-denial of the shareholders. The statement of profits which does not take this into account gives an idea that the business is more profitable than it really is. It is best to see things as they really are. The following table taken from Capital, shows the working of our principal Indian Banks for 1911 treating the capital and reserves as one :—

Name of Bank.	Capital and Reserves. Rs.	Profit for year. Rs.	Per cent. on Capital, &c.
Bank of Bengal ...	3,75,50,000	35,59,210	8·9
Bombay ..	2,05,00,000	15,91,431	7·96
Madras	1,09,50,000	11,46,189	11·47
Allahabad ...	52 00,000	4,84,000	9·3
Alliance of Simla ...	48,00,000	3,91,075	8 1
India ...	53,00,000	3,17,961	6·0 *
India Specie ...	82,00,000	6,78,379	8·2
Upper India ...	18,60,000	1,41,200	7·0
Punjab ...	12,50,000	1,81,625	14·5
Bengal National ...	8,29,000	43,245	5·2
Rangoon ...	18 80,000	1,46,798	7·85
Oudh ...	8,50,000	89,971	10

*11 months only.

We may note here that the net profits of the joint stock banks in the United Kingdom are now between £10,500,000 and £11,000,000 per annum, which gives an average dividend on paid-up-capital of 15 per cent., or if on a basis of paid-up-capital and reserve taken together, of 9 per cent.

INSURANCE.

The New York Equitable.

The destruction by fire of the colossal structure erected in New York by the Equitable Insurance Company of the United States means a financial loss of enormous proportions. The building is said to have been worth something like seven millions sterling, though it does not appear whether the cost of the site is included in this figure. The safes containing the valuables of several wealthy families and banks escaped unscathed.

Insurance Expert

The Government of India recently stated that the Bengal Chamber of Commerce would be permitted to have an additional representative on the Imperial Legislative Council during the discussion of the new Assurance Bills. The Committee recommended that Mr. C. L. Fyffe, of the Commercial Union Assurance Company, Ld., should be nominated for the appointment. The recommendation has been accepted by the Government.

Cattle Insurance.

Mr. G. F. Keating, the Director of Agriculture in Bombay, makes an interesting proposal to insure cattle against famine. Many difficulties would be overcome if cattle were protected against both famine and disease. Mr. Keating's scheme contemplates the large storage of fodder by Government who are already making great efforts to cut and bale grass in jungles and despatch them to the affected localities. He explains his scheme thus: "Assuming that 5,000 pounds of fodder would be sufficient to keep a grown animal alive in a famine year, together with what grazing could be picked up, I believe that in most tracts this amount of fodder could be stored in a good year at a cost of Rs. 25, and in many localities for less. To insure an animal against famine, therefore, it would be necessary to lock up a capital of only Rs. 25; that is to say, calculating the rate of interest at 4 per cent. the cost of insurance would be only Re. 1 a year for each full grown animal."

The Bonus in Insurance.

With the new Insurance Act and the stricter supervision thereunder by the Government, there will be very little to choose between one office and another. Persons intending to insure their lives will therefore be largely guided by the amount of bonus that may be expected. It will be useful to know how bonuses accrue.

When the quinquennial, triennial, or in some cases, annual actuarial valuation of an insurance company is made, the conservative policy observed in the estimates is usually responsible for a considerable surplus over and above what is necessary to be kept in hand for the safeguarding of policy-holders' interests. This surplus owes its origin to several sources. One of the most important of such sources is the higher interest yielded by the invested funds of the office than that estimated by the actuary. This has been a very notable source of surplus profit during the past few years. While the average estimated income from these investments was not often over 3 per cent, over 4 per cent has in many cases been actually earned.

A second source of surplus is the difference between the estimated and the actual expenditure. Here again, thanks to the conservative spirit in which actuaries conduct their business, there is often a very substantial sum to be taken into account. A third source of surplus is provided by the number of deaths among policy-holders being below that estimated. It is easy to see that this bonus surplus must vary considerably in different offices, and not only is such the case, but different leading offices have various ways of dealing with it, and in some, the holder of a new policy fares better than in others.

It is easy enough for the layman, when once he has gathered some idea of the bonus system and how surpluses arise, to realise that here lies the crux of the question in the selection of a life office. In many cases, there seems little to choose between two or three offices as regards stability and the prospectuses of policies, until the question of bonus and the system of distribution of surplus is gone into.

SCIENTIFIC AND TECHNICAL EDUCATION.

New Technical Scholarships.

The Punjab Gazette announces the establishment of new Technical Scholarships for the Punjab bearing the name of Lieutenant-Colonel Sir Dunlop Smith. Rs. 34,200 have been invested to provide four scholarships of Rs. 25 each per mensem tenable for four years at the Victoria Jubilee Technical Institute, Bombay. They will be awarded at the rate of one annually to a student belonging to the Punjab or to any Native State under the Punjab Government. In case of any Technical Institute being started in the Punjab, the scholarships would be transferred to that Institution.

Government Technical Scholars.

The Secretary of State for India has issued revised rules for the information and guidance of Indian Government technical scholars in England. The Secretary of State has thought it desirable that all Government Scholars should avail themselves of the information and advice which the Educational adviser to Indian Students would be in a position to give them and the rules have been framed with that end in view.

Government scholars, equally with private students, may consult the Educational Adviser upon any question, and will receive from him all possible assistance, and the Secretary of State hopes that they will communicate with the Educational Adviser, not only on the occasions when they are directed so to do in the rules, but also in any circumstances of difficulty and whenever they desire advice or information. Scholars will be regarded as being under the supervision and charge of the Educational Adviser, to whom they should in all cases address any communication they may have to make, and to whom also all reports or other communications having reference to scholars should be sent. The Educational Adviser will bring to the notice of the Secretary of State on behalf of any scholar any question requiring his decision, and will communicate to the scholar the orders passed by the Secretary of State.

Technical Institutions and Factories.

Our readers are doubtless aware that the Government of India have placed Lieutenant-Colonel E. H. De V. Atkinson, R.E., Principal, Thomason College, Roorkee, and Mr. T. Dawson, Principal, Victoria Technical Institute, Bombay, on special duty with the object of bringing the technical institutions of India into closer practical relations with the employers of labour in the country, whether they be Government workshops or factories or private concerns. Colonel Atkinson and Mr. Dawson will study the existing requirements of the employers of labour and how far they can be met at the existing institutions. They will also make proposals for establishing closer connection between the existing business concerns and the existing technical institutions. Similarly, the Government of Madras have appointed a committee with Mr. Chatterton as President to consider and report upon the improvement of industrial and technical education in North Madras.

Technical training will certainly help the earner to fight the battle of life better; but however well trained a youth may be in the best equipped of Institutions it is almost universal experience that he will not be lucratively employed in commercial work till he has had practical experience and has learnt the business side of his profession. The only method to secure this seems to be to arrange for apprenticeships on the completion of the tuitional course. These apprenticeships will only continue if the employer finds the apprentice a useful man and one who will turn out a commercial asset. The aim must therefore be to produce a man with the theoretical and practical training required in the market; a man who will, after experience and specialization, turn out a valuable addition to the staff of his employers.

ECONOMIC PRODUCTS.

The Papaw.

This fruit is said to rival the durian and the mangosteen of Malaya. The papaw has for years been the source of the pepsin used in pepsin tablets, pepsin gum, &c. Real pepsin is obtained from the stomachs of ruminant animals, while the product of the papaw is a papoid compound possessing practically the same qualities as pepsin. The papaw bids fair to become a popular table fruit.

Pineapple and Banana Fibres.

In the Philippine Islands, a promising trade is being done in pineapple and banana fibres; in India, these fibres are deliberately wasted, and, as we have been taught at school, "Wilful waste makes woeful want." In China, they make beautiful cloth out of these fibres and the Philippine Government are so convinced of the utility of these fibres for weaving purposes that they are exhibiting them in various foreign countries so as to create a demand for them. Is it not time that Indians should look into this waste?

Waste Rubber.

We learn from *Capital* that the other day, a Government Department in Calcutta suddenly realised that a market might be found for deteriorated rubber and are now doing so well with their old stocks that they only wonder why the idea did not strike them before. In case any commercial firm is still in the boat that has now been deserted by the Government Department referred to, it may interest them to know that there are buyers of old rubber in Calcutta and dozens of them in London with whom it should be possible to get into touch with very little trouble. Persons who throw away old tyres of their cycles and motors may also profit by this interesting information.

Linseed.

Despite the progress of the soy bean as a commercial asset and as a formidable rival of Indian oilseeds, it is some comfort to see, says the *Pioneer*, that the area under linseed in India this season is about thirteen per cent. in advance of the acreage under that crop in the season that has gone. This fact seems to show that the Manchurian bean trade has not staggered the Indian linseed cultivator to any particular extent; on the contrary, it seems to have encouraged him to go ahead. The fact is that soy bean oil, admirable in many respects, is now found to be incapable of replacing linseed oil in several important industries, notably in the matter of waterproofing, and users are returning again to the produce of the linseed fields. Not only is the linseed acreage large this season (3,371,600), but the crop is doing excellently, except in places in Bombay, where rainfall has been insufficient. But India is not now the only country that produces linseed on a commercial scale. America is a very large producer and estimates an additional out-put of seven million bushels this season. Canada estimated seven million bushels as her yield, but will now be satisfied with six. Argentina has largely increased her linseed area and expects to be able to export a million tons. Nevertheless, the market for linseed is very large, and there is likely to be a brisk demand for all that can be produced this season.

Rubber Seed Oil.

Talking of linseed puts us in mind of the rubber seed. The commercial value of rubber seed oil as a substitute for linseed oil has been favourably reported on by the Imperial Institute. The experimental feeding of cattle with Para rubber seed-cake has given promising results, but its definite value as a food cannot be stated without more extended trials. The oil is clear, and in colour and smell resembles linseed oil. It belongs to the class of drying oils, and gives a clear transparent film when dried by exposure to air. The husks contain a yellow fat which has a high saponification number and a low iodine value, but since the amount of this solid fat in the husks is very small, it hardly affects the properties of the oil obtained by grinding the kernels and husks together. Leading brokers report that the oil would be worth probably 20s. per ton, but that merchants would not take it up without an opportunity of first testing it in bulk.

BUSINESS METHODS.

Shopping by Post.

We learn that an effort is being made by the American Consul in Mad as to popularise what we may call "shopping by post" with the United States. Mr. Olivares states that he has ascertained that in many cases American houses sell useful articles below the price charged by European houses; and, in order to follow up this idea, he has prepared for the use of American tradesman two lists of prominent men and women, respectively, of the Madras Presidency. These ladies and gentlemen are to be bombarded with American catalogues which are to illustrate and describe the class of goods the Consul believes will find favour in Madras, the hope being that a good deal of the present trade in shopping by post will be transferred to the land of the Stars and Stripes.

Salesmanship.

Salesmanship is the power to persuade plenty of people to purchase one's products at a profit. It comes from tact, courtesy, good memory, judgment, and energy. The trouble with the average man is that he does not try. Many a business man has gone down to failure because of the head of that business folding his hands in hopeless helplessness and waiting for the natural born salesman to come along to sell his goods.

It would be a blessed day when every employer realises that he has something to sell, and that the price he gets for it is regulated or very largely influenced in the long run by the quantity and quality of the stuff that he delivers. There are many men who fail to succeed because they ruin their sight looking for more pay. "I am earning my salary now and I will be blest if I will do any more." That spirit was the ruin of millions of men. Confidence is the basis of trade. The man who lies is a fool. He must be a mighty smart man to lie many times and not get caught. When he is caught, then his business vanishes.

What salesmen should know.

Merchants and manufacturers in India who largely lack the capacity to sell their wares may well lay to heart the following advice of Mr. Lewis, of the Burroughs Adding Machine Co., of the United States All salesmen, says Mr. Lewis, should be equipped with the following knowledge :—

(1) He should understand the policies that govern the relations of the house to its customers, its employees and to the business world in general.

(2) He should personally know the men who are managing the business, and he should be given an opportunity to understand them.

(3) He should know the goods the house is selling from the standpoint of the house, that is to say, what it wants to push and why it wants to do so.

(4) He should understand the value of the goods from the standpoint of the customer.

(5) He should always know the true merits of the goods in comparison with competitor's goods.

(6) He should understand what quality claims are made for the goods he is to sell.

(7) He should know the selling experience of the house in the territory which he is about to enter.

(8) He should be put in harmony with the selling methods of the house, and know the real measure of success or failure the house has had in marketing its product in the territory he is to enter.

(9) He should understand all about terms, and he should be told the truth about them, *i.e.*, whether the terms are rigid or not.

(10) He should have an opportunity to get in touch with the other employees and to get in sympathy with the spirit of the house

(11) He should be given ample time to absorb these facts, figures and policies into his system and salesmanship before being started.

(12) He should be put through a course of training that will bring out the degree of his knowledge of these policies, ideals, realisations, restrictions, &c., so that when he goes into his territory or behind his counter, no customer can ask him a question about these things that he can't answer.

FRAUDS AND FAKES.

The High Cost of Living.

One reason for the high cost of living is that, in many instances, the consumer does not receive the amount of what he pays for, through a system of short weights and measures which are more or less used. Computing scales so arranged that the merchant could sell at the same price for which he bought and yet make a good profit; ordinary scales by the hundred arranged to deceive the customer and add to the profits of the merchant, these are some of the dodges used to deceive the buyer. There are many honorable merchants who would not stoop to do these things, but there are many who do not hesitate. These questions should all be considered by the consumer before he charges the high cost of living to the farmer. The farmer has no chance to be dishonest in these cases, for, the merchant does not take the farmer's weights or measures. The merchant "is always right," and it is by his weights and measures that bargains between the farmer and merchant are settled.

Tinned Milk.

Last month we noted that the Bengal Chamber of Commerce had pressed upon the Government of Bengal the necessity for undertaking legislation to check the import of skimmed milk. The Government of Bengal have replied to the Chamber and dealt with the question in detail. They point out that the proposals for legislation that were put forward two years ago were found on examination to be impracticable. The Government of India had, however, instructed all Collectors of Customs to require that "Prepared from skimmed Milk" should be conspicuously marked on the labels affixed to tins of condensed milk so prepared, when imported into Calcutta. These instructions were issued in 1906 and are still in force. If the tins are not so labelled when imported, labels are affixed to them in the Custom house. It is the opinion of the Government of Bengal that nothing has since transpired which would justify the reopening of this decision.

Trade Misrepresentation.

The rice merchant in Madras knows that his customer is particular about having 'Nellore rice' and has no hesitation in giving the assurance wanted, though Nellore cannot supply all the rice wanted by Madras and every merchant can't be selling Nellore rice. This sort of misrepresentation is not confined to Indian tradesmen alone. There has just been issued, after adoption by the Council of the London Chamber of Commerce, an interesting Report by a Special Committee of that Chamber on the subject of Trade Misrepresentation. The Committee were asked "to consider the general question of misrepresentation in trade, and as to whether any preventive action could be taken by the Chamber." They have collected a large amount of evidence which goes to show that there is a growing tendency to misrepresent the nature, origin, quality, quantity and value of goods offered for sale. This evil, the report says, is prevalent both at home and abroad. The Committee have not attempted to prescribe remedies for all the different forms of trade misrepresentation and misdescription, but they recommend :—(1) That the Government be urged to make provision, through the Board of Trade, for watching for cases of fraudulent misrepresentation, and where necessary, taking action under the existing law, which, in the opinion of the Committee, is adequate in most cases, if effectively set in motion. (2) That the law be so amended as to provide that each vendor, whether producer, manufacturer, importer or retailer, shall, if required by the purchaser, be under an obligation to give a description in writing of the articles sold, true to the best of his knowledge, information and belief. (3) That every effort should be made to secure the adhesion of all countries to the Convention of Madrid, 1891, and to ensure its provisions being made operative. (4) That his Majesty's Government be urged, by deputation or otherwise, to give effect to the foregoing recommendations in the interests of fair dealing and of the general community.

MACHINERY AND INVENTION.

Metallic Cement.—

Masonry contractors in France use a mixture for repairing faults in stone which should be known in India. This mixture or cement becomes very hard and may be carved like stone. The following is the composition : One part oxide of zinc and two parts of the dust of the stone to be repaired, ground fine and sifted. This may be tinted as required with dry colours well mixed. A mixture of two parts of water with one of chloride of zinc is used to moisten it to the condition of stiff putty. The surface to be treated must be quite clean and dry. It is moistened with the dilute chloride of zinc just before the cement is applied. The cement sets quickly and acquires the hardness of stone.—*Indian Textile Journal.*

Sawdust as Cattle Food.

It is stated that a by-product plant, at Port Hadlock (United States) will commence operations shortly, manufacturing principally wood alcohol from sawdust by a French process. The company has also imported from the West Indies 400 tons of molasses, which is intended to be mixed with the refuse and used for cattle food, and it is asserted it gives splendid results both as to nourishing properties and production of large quantities of rich milk.

Substitute for White Lead.

White lead, which is very extensively used in all parts of the world and forms the base of practically all our paints is apparently to be shunted out of the market by a synthetic substitute. The new-comer is said not only to be cheaper, but among other advantages claimed for it are that it does not peel or crack, does not become yellow with age, has a lower specific gravity than white lead, and is non-poisonous. Its cheapness is pretty certain to obtain for it a fair hearing.

A Magazine Binding Machine.

A new machine for the binding of magazines without wire or thread, in such a manner that they can be opened flat, has recently been placed on the market. It is called the "Perfect Binder," and is made by the N. T. W. and C. B. Sheridan Company, New York. It automatically binds and covers a magazine or pamphlet in one operation, entirely dispensing with the use of wire or thread, and at the same time turning out a flat-opening book. The signatures, after they leave the gathering machine, are taken direct to the binder, where they are placed in an automatic feeding device, which accurately places them in the travelling jaws. These jaws carry the book first to the knives, which cut the back off, then to the sawing device, which roughs up the edges of the pages. From there, the book is carried to the gluing apparatus, where the back is thoroughly covered with glue. It is then carried to the crash device, which automatically cuts and places on the back a strip of crash. It is then passed on to the covering device, where the cover is taken up and held in place by the glue that is pushed through the crash. The book is then carried to the cover breaker, which smashes the back and thoroughly forces out all the air, at the same time forming the hinge on the cover. The magazine is then finished, and is automatically knocked out of the jaws to the delivery table.

Machinery Business.

Readers of the Wealth of India who may be interested in the undermentioned machinery should address the Director-General of Commercial Intelligence, New Imperial Secretariat, 1, Council House Street, Calcutta, for particulars mentioning the Wealth of India.

Oil Engines.

A firm of Swedish manufacturers of patented stationary and portable oil engines wishes to obtain a representative in India. (1316).

Petrol Engines and Carburettors.

A Coventry firm of motor engineers desires to appoint agents in Calcutta, Bombay, Madras and Rangoon to introduce petrol engines and carburettors on a commission basis. (1325).

Gas and Oil Engines, Marine Motors and Boats.

A Glasgow firm desires to appoint agents in India for the sale of gas and oil engines, marine motors and motor boats. (1328).

INDUSTRIAL AND ECONOMIC LITERATURE.

Hosiery Manufacture.

Such of our readers as may be interested in hosiery manufacture may find the undermentioned books useful—

FRAMEWORK KNITTING AND HOSIERY MANUFACTURE, *by Jas. H. Quilter and John Chamberlain. Price* 12/- *Post Free, England. Foreign* 1/- *extra.* Vol. I contains chapters on "Origin, Rise and Progress"; "Fibres and Yarns"; "Yarn Winding and Winding Machines"; "Textile Fabrics"; "Hand Stocking Frames"; "The Hand Warp Loom"; "Rotary Frames"; "Rotary Rib Frames," and "Circular Frames." 304 pages.

TRIMMING AND FINISHING OF HOSIERY AND HOSIERY FABRICS, *by Jas. H. Quilter. Price* 2/6 *nett.* Contains a collection of valuable formulas, illustrations and recipes for all employed in this department of the trade. 73 pages.

FRAMEWORK KNITTING—QUESTIONS AND ANSWERS, *by Jas. H. Quilter. Price* 2/- *nett.* A series of Answers to Ordinary Grade Questions set by the City and Guilds of London Institute. A valuable Handbook for Students, giving concise definitions and descriptions of Trade Terms and Methods. 54 pages.

COUNTS AND GAUGES, *by Jas. H. Quilter. Price* 2/- *nett.* A handbook for the Spinning and Manufacturing Branches of the Hosiery Trade, including a series of tables on the numbering of yarns, their comparisons and relations to gauges of machinery. 40 pages.

FASHIONING ON CIRCULAR RIB KNITTING MACHINES, *by Jas. H. Quilter. Price* 1/- *nett.* A useful pamphlet for those using such machines. 15 pages.

To be had at the Office of "The Hosiery Trade Journal," Leicester, England.

A Guide to Modern Machinery, *published by the General Secretary, The Indian Industrial Conference, Amraoti, Price As.* 12.

This is a useful publication for business men embarking on new industries. They can find out by reference to this book the names and addresses of the makers of machinery peculiar to their lines. They can thus have the quotations and other particulars relating to the machinery and then buy the most suitable machine for the business. We need hardly state that it is always best to consult and be guided by an expert in the selection of machinery.

The Sterling Debt of India, *by M. R. Sundaram Aiyar, B.A., B.L., The Law Printing House, Mount Road, Madras, Price* 4½ *As.*

A superably got up essay of 28 pages. It is a summary of the correspondence and opinions on the question whether the loans raised by the Government of India should be in gold or silver. The writer points out the financial, political and economic objections against all sterling loans.

Lift Irrigation, *by Alfred Chatterton, G. A. Natesan & Co., Madras, Price Rs.* 2. *To subscribers of the "Wealth of India", Rs.* 1-8-0.

The problem of irrigation is about the most difficult one in the growing of crops in India. For sometime past, owing to the scarcity of labour and the high wages demanded in parts of the country, agriculturists are looking about for some means by which the cost of raising water may be lessened. In the Madras Presidency, thanks to the pioneer work done by the late Department of Industries, the oil engine and the centrifugal pump have become popular and are recognised as a satisfactory combination for raising water, where the acreage to be irrigated is large and and the volume of water available is also abundant. But there are thousands of ryots to whom the oil engine is out of reach considering their finance and the acreage at their disposal. Judging from the enquiries received from time to time by the readers of our Tamil Journal, the "Practical Life," the demand for information relating to the raising of water is certainly great. There was no handy volume dealing the subject, until some years ago, when G. A. Natesan & Co., published a collection of papers written by Mr. Chatterton on the methods of lifting water. This book has been out of print for some time past. Messrs. Natesan have therefore brought out a revised and enlarged edition which now runs to 354 pages of crown quarto size. We have no doubt that the volume will be found extremely useful to all who are interested in practical agriculture.

HINTS AND RECIPES.

Cleaning Playing Cards.

Dip a piece of cotton cloth in petroleum and rub carefully over the card ; finish with a piece of dry cloth. Cover the card with powdered talcum and leave exposed to the air until all the petroleum is evaporated. The cards will look like new.

To Stop the Creaking of Doors.

To stop the unpleasant creaking of doors, either put a few drops of oil on the hinges, or rub the edges with soap. Bureau drawers are rendered easy to draw out by rubbing soap on the edges that touch. A little oil on the rollers of furniture occasionally will make the pieces easier to shove about. The wheels should be oiled where they move, not on the outside.

Water Finding.

A French inventor has recently shown how underground water may, in certain circumstances, make its presence known on the surface through purely scientific channels. The instrument used by M. Dienert is a microphone. One end of a tube is inserted in the ground, and the other is attached to the microphone. Thus, the sound of flowing or dripping water is magnified, and conveyed to the ear from great depths.

Raisins as Food.

An important medicinal value of raisins is in their laxative effects. Raisin juice, extracted in cooking, is merely unfermented grape juice, and is good for weak stomachs. California raisins are the California grapes dried, and require to be simply soaked, then simmered until soft, in order to be used as food. As to comparative food values, one pound of raisins represents a food value equal to any of the following—one and one third pounds of beef ; six pounds of apples ; five pounds of bananas, four and one-fourth pounds of potatoes ; one pound of bread ; four pounds of milk ; four and three-fourths pounds of fish or two pounds of eggs. It is claimed that the English people consume six pounds of raisins per capita per year, while Americans use but one pound. Raisins may be used in bread, in puddings, in cereals, and in many ways, and are exceedingly wholesome in whatever form they are eaten as foods.

Facts about Eggs.

Broken eggs need not always be lost, says the *Dairy* ; in fact, they should never be left about a pen or run, and should be removed immediately from a nest, as the albumen is likely to dry up and bind the feathers of a hen that might be using that nest into a position of very considerable discomfort to her. The good housewife knows what to do with a broken egg. On every farm much might be saved by using eggs for purposes which generally cost money.

If a small lump of freshly-burnt lime is crushed to a powder and stirred into the white of an egg until it makes a soft paste, this will make the strongest of cement to hold broken crockery together. Just put some of it along one line of the fracture, bring the other piece tightly up against it, hold it in position in front of a fire to stiffen the paste, then set aside to dry. This cement will stand washing up, provided that the plates are not allowed to soak too long.

If anyone gets a burn, and carron oil is not immediately available, pour the white of an egg over the burn and allow it to remain. It will exclude the air, and prove far more soothing than dredging the burn with flour. Then, how few know how healing is the action of the skin just inside the shell of an egg. If a thorn is buried deep in one's flesh, and will not come out on being prodded with a needle, tie a piece of the fresh skin of an egg over the spot for twelve hours, and it will have done much to extract that thorn. Every countryman knows the danger of a bad bruise or scrape on his shin bone. If he spreads the skin of an egg over it at once, he will feel very little inconvenience afterwards. It is essential in all instances that quite fresh eggs are used—none of the stored up ones. Thus, it will be seen what an amount of real comfort may be obtained by properly utilising the egg, and every egg so used is a further incentive to the egg industry.

OPENINGS FOR BUSINESS.

[For particulars, address the Director-General of Commercial Intelligence, New Imperial Secretariat, 1, Council House Street, Calcutta, mentioning the *Wealth of India*].

Bones.

A Bombay firm desires to be placed in communication with sellers of bones. (1309).

Saddle Felts.

A Lancashire firm desires to appoint agents for the sale of saddle felts. (1310).

Chrome Tanning.

A chrome tanning expert desires to get into touch with those interested. (1311).

Furniture Leather.

A firm in Leeds desires to appoint agents in Calcutta, Bombay, Madras and Delhi for the sale of furniture leather. (1312).

Fish Guano and Fish Food.

An Aberdeen firm desires to be placed in communication with importers of fish guano and fish food (1313).

Rosa Oil.

An officer in a Native State desires to be placed in communication with firms in India who are interested in rosa oil and who are prepared to state the quantity they are prepared to take and the prices they are prepared to pay. (1314).

Wheat Bran.

A Stockholm firm desires to be placed in communication with exporters of wheat bran. (1315).

Caustic Soda.

A firm in Rangoon desires to be placed in communication with buyers in India of caustic soda. (1317).

Cotton Yarns.

A correspondent in Smyrna desires to be placed in touch with manufacturers of cotton yarn. (1318).

Toys, Hardware, Fancy Goods

A London firm of manufacturers of toys, domestic hardware, brass, copper and fancy goods desires to be placed in communication with importers of such goods. (1319).

Enamelled Ware.

An expert in Italy desires to be placed in communication with a firm likely to be interested in the manufacture in India of enamelled ware for household use. (1320).

Wild Pig Skins and Tushes.

A Government Officer desires to be placed in communication with purchasers of wild pig skins and tushes. (1321).

Jute Sacks.

A firm in Constantinople desires to be placed in communication with firms in a position to supply 950,000 jute sacks. (1322).

Wolfram.

A correspondent desires the names of firms or individuals interested in wolfram mining (1323).

Cheap Cooking Lamps.

A firm in the United States desires to be placed in communication with firms in a position to handle a cheap cooking lamp suitable for use by the native population. (1324).

Cotton Waste.

A Manchester firm desires to be placed in communication with shippers of cotton waste, particularly oily sweepings. (1326).

Cotton Seed Oil Industry.

An expert in producing edible products from cotton seed oil, residing in the United States, desires to be placed in communication with firms interested in the cotton seed oil industry. (1327).

Pine.

A Government officer in Paris desires to be placed in communication with firms in a position to deal in pine wood. (1329).

Coir and Kapok.

A firm in Tasmania desires to be placed in communication with exporters of coir and kapok. (1330).

Umbrella Fittings and Materials.

A firm in London desires to appoint agents in Calcutta and Bombay for the sale of every kind of umbrella fittings and materials. (1331).

MISCELLANEOUS.

All-Ceylon Exhibition.

An All-Ceylon Exhibition is to be held in the Victoria Park, Colombo, next year commencing on the 1st July.

Agricultural Training.

Five newly-joined Punjab Civilians of the Assistant Commissioner Grade have been sent to Lyallpur for instruction in the rudiments of Indian agriculture.

Industrial Survey of Mysore.

Mr. M. Visvesvarayya, Chief Engineer and Chairman of the Industrial Section Committe of the Mysore Economic Conference, has suggested to the Government of Mysore an Industrial Survey of the Province to be conducted by a Senior Assistant Commissioner.

Ground-nut Cultivation in Southern India.

On the motion of Messrs. Dymes & Co., Best & Co., and Parry & Co., the Madras Chamber of Commerce have addressed the Director of Agriculture suggesting that Government may provide a fresh supply of the best Mozambique or other ground-nut seeds suitable for successful cultivation, in view of the deterioration of the ground-nut seed now being sown.

The Madura Technical Institute.

Proposals for the re-organization of the Madura Technical Institute are now under the consideration of the Government of Madras. The teaching of wood-carving in the institute was discontinued as it was considered that the industry could be better taught in the Madras School of Arts, which, in view of the limited and intermittent demand for the fine carving, adequately meets the teaching needs of the whole Presidency.

The New Postage Stamps.

The new half-anna and two-and-half-anna postage stamps bearing the portrait of His Majesty King George the V., will be available in all Post Offices from the 19th April, 1912. From the same date, the new quarter-anna and half-anna service postage stamps will also be available at all Treasuries.

Universal Exhibition.

A Notification giving particulars of the Universal Exhibition to be held at Ghent in April next year is published in the *Gazette of India*. The exhibits will cover the various arts and sciences, commerce, agriculture, forests, mining, textiles, food products, chemistry, public health, education, etc.

Post and Telegraph.

The Government of India have come to the conclusion that the administration of the two departments should be brought under one head. The Government have decided that Sir. C. S. Wilson, Director-General of Post Office, should hold the new combined office under the title of Director-General of Post and Telegraph. The amalgamation is temporary and the final decision will be made after obtaining the views of the commercial bodies and the public at large.

The Australian Sugar Industry.

The Commonwealth Gazette announces the appointment of a Royal Commission to enquire into and report upon the sugar industry in Australia and more particularly in relation to (*a*) growers of sugarcane and beet ; (*b*) manufacturers of raw and refined sugar ; (*c*) workers employed in the sugar industry ; (*d*) purchasers and consumers of sugar and (*e*) cost, profits, wages and prices.

Model Houses for Agriculturists.

A recent Press *Communique* issued by the Punjab Government says that in accordance with the recommendations of the Plague Committee, which assembled in Simla in 1910, the Punjab Government has had under consideration designs and plans for a model house suitable for an agriculturist, to be erected in accordance with hygienic and sanitary principles. A prize was offered by Hakim Ghulam Nabi of Lahore for the best design of a model dwelling suitable for agriculturists, costing not more than Rs. 300. The prize was won by Sherlock Hubbard, and the design has been scrutinized by the Chief Medical and Sanitary authorities in the Punjab. Some modification in the design may be necessary to make it suitable for all parts of the Province, but Sir Louis Dane is asking the Financial Commissioner to commend it to the favourable notice of the colonists on the new canals.

THE
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TOPICS OF THE MONTH.

Religion and Economic Progress.

A remarkable statement appears in the *Times*. According to the latest census, out of the 315 millions in India, only 17 were found to avow themselves Atheists, while, there were only 50 Agnostics, 45 of these being in Burma and presumably Chinese. The above figures merely confirm a fact already well known, namely, that the people of India are the most religious in the world. This extreme spirituality is largely responsible for the slow rise in the economic condition of the people. To the true Hindu, power and pelf in this world are *anitya*, transcient, and the whole life of man is a *maya*. The mass of the people are still orthodox and cling to this belief ; and it is the resignation to this belief and the consequent sacrifice of present pleasure to future bliss that have stifled ambition, which is the root cause of all economic progress. The phenomenon is not confined to India alone. For, as Sir Horace Plunket has pointed out, the influence of religion on secular life in Ireland has been exactly similar. There "Roman Catholicism strikes an outsider as being in some of its tendencies non-economic, if not actually anti-economic. The reliance of that religion on authority, its repression of individuality, and its complete shifting of what I may call the moral centre of gravity to a future existence—to mention no other characteristics—appear to me calculated, unless supplemented by other influences, to check the growth of the qualities of initiative and self-reliance, especially amongst a people whose lack of education unfits them for resisting the influence of what may present itself to such minds as a kind of fatalism with resignation as its paramount virtue."

In this view, unless other influences are brought into play, economic progress in India must be slow. Fortunately, the British occupation of India has drawn it into the vortex of the world's commerce and civilisation. The post, the telegraph and the iron horse have educated the people to a wider sense of the realities of life. The result is that it is not an uncommon sight to see the son of an orthodox Brahmin testing the strength of liquor in an arrack shop or tucking up his sleeve to handle the awl in a boot factory.

The old idea that money is a thing to be despised has nearly given way, and the education of the mass of the people to a clearer perception of the domains of sociology and religion is bound to improve the material advancement of the country. The quicker this education, the greater will be the acceleration of economic progress.

Railways and Agriculture.

It appears from an enquiry recently made by the office of Experimental Stations of the United States Department of Agriculture, that, out of 103 railway companies, 52 are engaged to a greater or less extent in assisting agriculture in their districts. Each company provides at its own expense a locomotive, luggage van, one or two coaches fitted up for lecture purposes and the States and national departments of agriculture provide the lecturers to travel about and deliver lectures. The train is advertised in advance and when the train arrives at a particular station, the farmers are addressed by the lecturers for thirty to forty minutes on the subjects previously announced. In 1910, the fifty-two trains covered about 40,771 miles and made 1,793 stops from forty minutes to two days each. The total cost was $19,000 and the total number of people who attended the lectures, 379,000. In addition to arranging the lectures, one company keeps the farmers informed daily during the season about the state of the market, undertakes to divert consignments *en route* from the market where there is a glut to the market which is less congested The consignor, after despatching his goods to a particular market, may be advised that it is overstocked and on his telegraphing to the railway company, the latter will divert it to another. The railway companies say they are satisfied with the results of their efforts. It is only a question of time when the rest will join them.

SPECIAL ARTICLES.

LIFE ASSURANCE.

BY

DIWAN BAHADUR K. KRISHNASWAMI RAO, C.I.E.
Chairman of the United India Life Assurance Co.

The blessings of life assurance cannot be over-stated. Millions of families who might have been reduced to extreme poverty by the death or retirement of their earning members, have been enabled to live in comfort and with dignity, by the timely prudence of such members in insuring their lives. We owe this most useful, beneficial and poverty-minimising contrivance to the thoughtful ingenuity of the Western nations. It is a happy combination of philanthropy, charity and self-help. The desire to help our brethren in times of distress, must have been the first and foremost cause for this institution. To look upon it as a purely commercial business is to ignore its noble object. The shareholders who supply the capital and the policy-holders who survive the period of expectancy, are to a great extent the real contributors to the relief of the families of those policy-holders who die a premature death. Does not this contribution partake of the nature of charity? Many a noble soul would feel intense gratification at being serviceable to those who are in great distress, and look upon dividends, bonuses and bounties as a secondary matter.

In this world of uncertainties, the only thing certain, is death. The important duty of an earning man is to make due provision for those who are dear to and dependent upon him. Even Emperors and millionares in Europe and America insure their lives, realizing the fact that in the vicissitudes of life, none can be certain of what would happen to him at any moment. The Emperor of China is a nobody to-day. The peace of mind which a dying man, conscious of having made adequate provision for his family, enjoys, is worth the whole world.

Now, in India, there are several indigenous insurance companies working on sound and safe principles. Their assets are all in India, their directorate work under the eye of their constituents. Foreign companies inclusive of those in the United Kingdom have, as a rule, no assets in India, and are virtually exempt from the process of Indian courts. The Indian Life Assurance Act, recently passed exempts the companies in the United Kingdom from the obligation of making a deposit, while the Indian companies should keep with the Government of India, 2 lakhs of rupees as a guarantee for their solvency. Those Indians who wish to insure their lives should deeply consider these circumstances. Their self-interest, if not patriotism, should induce them to prefer an Indian company to a foreign one.

In addition to the security and safeguards provided by the statutory deposit and the retention in India of their assets, the Indian Companies will, in future, possess the invaluable advantage of close scrutiny of their affairs by the Commercial Department of the Government of India. This department will have on its staff, a well qualified actuary who will not only be an adviser to the Government in matters relating to insurance but will also scrutinize the various returns which, under the new Act, the Indian Insurance Companies are bound to submit to the Government of India. The returns prescribed by law are very *elaborate* and *searching*. The Government of India have taken power to order an enquiry into the affairs of any company by a qualified Inspector, on the complaint of 20 or more policy-holders. On the report of the Inspector, the Government may *even* order the winding up of companies whose work is shown to be unsatisfactory. The accounts of these companies are subject to annual audit by gentlemen possessing the qualification prescribed by the Governor General in Council, in addition to the triennial or quinquennial valuation by an actuary. In short, the Indian Insurance Companies will under the new Act occupy a position very similar to that held by the co-operative credit societies under Act X of 1904, whose operations are closely watched by the Government. The Governmental control thus provided by law, ought to dispel all misapprehensions regarding the management of Indian Insurance Companies. It is however obvious that it cannot by itself, secure the full measure of success which every company should aim at. The maximum good cannot be secured, unless every share-holder and policy-holder of an insurance company feels a sort of personal interest in its affairs, takes pride in its success and does his best to promote its prosperity and usefulness. No share-holder should consider that with his contribution to the capital and with the receipt of his dividend, he has done all that he should do as one interested in the progress and prosperity of the concern. The annual reports of almost every insurance company conclude with an earnest appeal to its shareholders and policy holders to use their influence with their friends and relatives to secure new business. But the response given to it, is, as a rule, *nil*. The indifference of policy-holders is easily conceivable; but that of *share-holders who constitute the company*, is beyond comprehension. In the face of the growing competition of foreign companies (of which some idea may be formed by reading the speech of the Hon'ble Mr. Fyffe, Insurance Expert and one of the non-official members of the Legislative Council of India), the Indian companies will need all the hearty co-operation of their share-holders and policy-holders. The credit of Indians in the insurance business may be said to be now on trial. It is therefore the duty of every patriotic Indian to do his best to prove that the reflections cast on Indian companies by the Hon'ble Mr. Fyffe, are undeserved. Co-operation and combination constitute the main elements of success in all matters of business. Nothing is unattainable where they exist.—*Apathy and indifference which are the bane of all business ought to cease, keen interest in it and resolute will to make it a success, taking their places.*

THE FINANCES OF INDIA

BY

Mr. S. K. SARMA, B.A.
Author of Indian Monetary Problems.

It was the privilege of Sir Fleetwood Wilson to present a series of financial statements which, if they do not reduce the burden of taxation or equalise the incidence of it on the community, at all events, confirm the belief that, as in other matters, so in the arena of Indian finance, a new spirit has begun to operate. A wide gulf still separates the Indian from the official opinion on financial questions and there is no likelihood of its being abridged in the immediate future. The differences have been emphasised in the new councils in greater detail and in more fulness than before and the spectacle of the finance department making a determined opposition to any suggestion put forward by Indian members to improve, modify or vary their financial proposals has been sometimes even ungracious.

All the same, the influence of non-official public opinion has been felt though slowly, yet surely. Last year Sir Fleetwood Wilson pointed out that the time "is not distant when the Government of India will require the substantial support from the broader basis of taxation" which the new duties which had the year before been levied had given them. The "broader basis of taxation" to which the Finance Member laid claim contained nothing more than an increase in certain duties and a raising of the customs tariff on silver, petroleum, tobacco, wine, beer and spirits. It is questionable whether at the time that he levied these duties they were wanted: events, however, have proved that they were not; and it is still more questionable whether the taxation of India had been placed on a broad basis by these alterations and corrections in the tariff rates. But there never was a sounder opinion expressed than that the taxation of India had to be placed on a broader basis and the necessity for it has been felt in no time more acutely than now. We are now face to face with a critical financial situation, if not with a financial crisis. Our opium revenue is likely to cease in a few short years and the pressure for the social and educational needs of the country is bound to make an exacting demand upon the public purse. And the question must naturally be asked whether we are prepared for the new condition that has arisen.

The optimism of the finance department is proverbial and Sir Fleetwood Wilson at all events is sanguine about the financial position. He pointed out with pride to the natural growth of the revenue and expenditure, and their elasticity, if true, would certainly be a healthy sign of the times. He said that the total revenue of India excluding the gross opium receipts was £ 69,100,000 in 1909-10, and it is expected to rise to £ 75,700,000 in 1912-13; while the total expenditure during the same two years is £ 73,100,000 and £ 79,800,000 respectively. To have increased the revenue by £ 6,600,000 and the expenditure by £ 6,200,000 in four years is no small achievement and if the balance-sheet was made up of items which were normal, it would disclose a state of things which is eminently satisfactory. Sir Fleetwood Wilson said that they are "steadily building up our bulwarks against the dangers and the needs of the future." We are afraid he overmade the statement. Far from being normal, the growth is abnormal. The following figures show where there has been increase in the revenue :—

	Accounts, 1909-10.	Estimates, 1911-12.
	£	£
Excise ...	6,537,854	7,618,500
Customs ...	4,965,118	6,544,400
Railways ...	12,445,378	15,151,100
	23,948,350	29,309,000

It will thus be seen that nearly five millions of the additional revenue is due to excise, customs and railways, the customs duties having been raised three years ago and the railways showing an excess owing to the Durbar. The true measure can only be had in

those items which largely concern the people. Here is a list of those items :—

	Accounts, 1909-10.	Estimate, 1911-12.
	£	£
Land Revenue ..	21,332,141	20,458,900
Salt ...	3,319,518	3,356,500
Stamps ..	4,548,304	4,739,700
	29,199,963	28,555,100

These figures show that so far as the people are concerned, their material improvement has been such that hardly can anything be realised from them every year as additional revenue. And it is certain that if the demands of the State rise, they can be met only by additional taxation. We should, therefore, have expected from the Finance Member some clue as to how he proposes to meet his demands; but perhaps sufficient unto the day is the evil thereof. He will disclose his intentions when the actual need arises for it

It is, therefore, with sincere pleasure that we have read the suggestion made by the Hon'ble Mr. Gokhale that the whole question of Indian expenditure should be referred to a Royal Commission. Sir Fleetwood Wilson of course parried the suggestion if not by ridicule at least by disparagement. He said that the Departmental Committee that is now sitting will discuss the question in all its aspects and effect possible remedies. We should of course congratulate the Finance Member on the resolute way in which he has set himself to the task of applying the shears; and it is a concession he has shown to public opinion. Departmental Committees can do much and have done far greater service in the past than even Royal Commissions. We know the very poor result of the Welby Commission while the Departmental Committee appointed by Lord Dufferin and the Sir Ashley Eden Committee appointed by Lord Lytton effected considerable economies. But there is one reason now for referring the question of Indian finance to a Royal Commission which was not apparent before. And that is, it is not merely the expenditure that has to be curtailed, but it has also to be discussed if the present methods of raising revenue are all that is desirable.

The question in our opinion that has to be discussed is on whom does the incidence of taxation fall heavily and if there is any glaring inequality, how to modify it. It is remarkable as showing the steady development of certain sections of the community that while the customs and railways show an increase during the last few years, land revenue, salt and stamps which are revenues drawn directly from the larger masses of the population show deterioration, even if we do not take into account the growth of population during the same period. Allowing for accidental increase due to the Durbar and the increased duties, we may take it that those who avail themselves of railway expansion and those who use imported goods are a class who can show better resources than the people as a whole and it is a matter of absolute importance to enquire whether it is not necessary that some portion of the burden that now lies heavily upon the people should not be shifted on to the shoulders of the richer classes.

Firstly, there is the question of land revenue which is admittedly a tax of fifty per cent. on the net income on land. Apart from the question whether that percentage is the real estimate, a different principle is used in assessing it from that used in the levy of other taxes. The Government claim a portion of what they call "unearned increment"; but is there no unearned increment in other trades, businesses and professions? The income tax is only a few pies in the rupee. Why not adopt the principle of "progressive taxation" so far as large incomes are concerned? Why not increase the customs duties on commodities that are consumed by the rich and the middle classes and leave those consumed by the poorer classes free? Why not discriminate in the manipulation of export and import duties and so adjust them that the maximum of revenue is derived with the minimum of interference with trade? If the question of incidence of

taxation is to be considered it seems to us that two financial reforms must force themselves before our attention : first, the introduction of death duties and secondly a graduated tax on charitable and religious endowments. There is no denying now the justice of death duties working so satisfactorily in England ; while a graduated tax on religious and charitable endowments is urgently called for not only by ideas of fairness, but by all the canons of financial justice.

Coming to the expenditure side, since the Welby Commission reported, it has been pushed up in all directions. The following table shows the growth of expenditure in the most important items :—

	Account, 1896-97.	Estimate, 1912-13.
	£	£
1. Direct demands on the revenue...	7,222,949	8,803,700
2. Salaries and expenses of civil departments ...	9,019,212	17,440,900
3. Army services .	16,901,877	20,412,500
4. Railways : Interest and Miscellaneous Charges ...	8804,620	12,518,300

This is an account which beats all record. Salaries and expenses of civil departments have very nearly doubled in a decade and a half, the interest and miscellaneous charges of Railways have increased by fifty per cent and Army services by twenty-five per cent.

The character of the growth is most astonishing and surely an examination is necessary as to why such an enormous growth has been allowed. It will be remembered that the reference to the Welby Commission was most restricted : it was "to enquire into the management of the military and civil expenditure incurred under the authority of the Secretary of State for India in Council, or of the Government of India, and the apportionment of the charge between the Government of the United Kingdom and of India for purposes in which both are interested." It was beyond the scope of the Commission to enquire into the question of the incidence of taxation and how unevenly the public burdens fall upon the people. But the incubus is more oppressive now that there has been an awful growth of expenditure in all directions. Sir Fleetwood Wilson argued that during the last few years, the expenditure on education had been pushed up from £ 1,705,000 to £ 3,043,000 and the medical and sanitary services from £968,000 to £1,683,000. It would have been fairer to state that while the military expenditure swallows the land revenue, salt pays just enough for education and sanitation. Nor are we certain that military expenditure has reached the maximum. We should be surprised if the scare about the Yellow Peril does not lead to the re-organisation of the Army on the North-eastern frontier. We have failed to meet our enemy in the North-west ; why not meet him on the North-east ?

There is again one aspect of military expenditure that we think must be referred to a Royal Commission and that is the payment made by the Protected Chiefs for Imperial defence. It is notorious that these chiefs enjoy the privileged position of the Colonies in the matter of Imperial defence. They keep some battalions perhaps, but that is more as a personal honor than to defend the hearths and homes of their subjects. The ruling chiefs occupy a considerable portion of India. Out of 1,773,168 square miles that form India, the Native States comprise about 675,267 square miles, or a little over one-third. Now that the Indian taxpayer pays twenty millions, it is necessary to enquire whether the Native States pay their proportionate quota of ten millions for the defence of their territories. It is only reasonable that the States should spend at least ten millions on their account for the purposes of a common army and if they do not, it is only fair that they should be made to do so. Whatever may be the political relationship that subsists between the protected States and the Government of India, new needs have brought about new conditions. The Government of India feel that in certain matters, the advice and co-operation of the ruling chiefs is necessary and these think they are competent to give it. The people of India cannot criticize them with the same freedom with which they can criticize independent sovereigns. There were even grave attempts made to constitute a Council of Ruling Chiefs to advise the Government of India on matters purely Indian. Has the Indian taxpayer to pay for the defence of the Ruling chiefs who have such stakes in the country?

It is not the purpose of this paper to discuss in detail the various problems relating to the revenue and expenditure of India. All that we mean to suggest is that they deserve the deepest and best consideration and as they involve principles which do not admit of being solved by departmental committees, it is necessary to refer them to a Royal Commission. The suggestion made by Mr. Gokhale is one that ought to be taken up for agitation in all seriousness and pressed constantly on the Government both here and in England.

So far as the most important features of this year's budget are concerned, very little need be said. The official year as usual closed with a surplus to which opium contributed £ 1,757,000. Two-thirds of this sum was to be remitted to London for the redemption of temporary sterling debt, that is to say, for the construction of railways, and one-third was doled out for such varied and useful purposes, as sanitation, agricultural purposes, the Central Research Institute for work in public hygiene, a school of Tropical medicine in Calcutta and Government laboratories in Burma and Parel. The ordinary revenue has given its own quota of £ 1,800,000 all of which have been given away for purposes which do not immediately concern the well-being of the people. The reduplication of Bengal having cost several crores, the reconstitution will now have its turn and the general taxpayer pays for it about £ 782,000. The starving millions who scarcely get a full meal in two days are to pay £ 212,000 for the cost of the Royal bonus of half-a-month's salary to gentlemen who get up to Rs. 50 a month and so on. The Durbar expenditure has been kept well within bounds, roughly not exceeding a million, the expenditure both by the Imperial and local Governments added together.

The only controversial point in the budget that gave rise to considerable discussion was the Delhi expenditure. The probable cost of the new capital is not yet estimated. The Government of India originally made the remark that it might come to four millions, but Lord Curzon challenged its construction at less than ten millions, Lord Hardinge replied in closing the budget debate that their estimate would not prove very wrong. Till the new expert committee decide upon their plan, perhaps it would be premature to say anything. The only point that has now provoked controversy is the raising of a new loan altogether. The Government of India propose at present to utilise the surpluses as they occur and go into the market for the balance. Nothing of course would be more unwise than to utilise the surpluses for capital expenditure because Delhi is not the concern of the present generation alone. "Governments." wrote the Welby Commission, "not unfrequently undertake supervision over the expenditure of subordinate authorities in order to 'guard the inheritance,' that is, to check any tendencies on the part of the authority to favour the taxpayer of the present at the expense of the taxpayer of the future." But in India especially they guard the inheritance with a vengeance. Mr. Gokhale moved for the whole cost being met by loan, which was not acceptable to the Government. They might have raised a loan payable in thirty years and created a sinking fund for it. But when the money can be found from the present generation, why vex the future ; they will have their own toll to pay.

BUDGET ESTIMATES OF THE GOVERNMENT OF INDIA.

	Accounts, 1910-1911.	Budget Estimate, 1911-1912.	Revised Estimate, 1911-1912.	Budget Estimate, 1912-1913.
	£	£	£	£
Expenditure—				
Direct Demands on the Revenues.	8,856,223	9,071,000	8,706,600	8,803,700
Interest	2,168,902	2,125,100	2,079,800	2,045,200
Post Office	1,950,992	2,021,000	2,037,300	2,049,200
Telegraph	976,832	1,093,600	1,116,900	1,094,500
Mint	92,369	93,800	115,600	101,400
Salaries and Expenses of Civil Departments.	14,931,367	16,858,400	16,458,300	17,440,900
Miscellaneous Civil Charges	4,810,767	4,886,700	4,932,500	4,108,100
Famine Relief and Insurance.	1,000,000	1,000,000	1,000,000	1,000,000
Railways : Interest and Miscellaneous Charges.	11,863,965	12,113,800	12,161,800	12,518,300
Irrigation ...	3,110,134	3,343,600	3,175,900	3,308,300
Other Public Works ...	4,537,462	5,501,500	5,379,600	5,610,800
Military Services ..	20,486,071	20,823,200	20,923,800	20,412,500
TOTAL EXPENDITURE, IMPERIAL AND PROVINCIAL ...	74,784,981	78,931,700	78,088,400	79,292,900
Add—Provincial Surpluses : that is, portion of allotments to Provincial Governments not spent by them in the year.	1,961,202	...	609,500	...
Deduct—Provincial Deficits: that is, portion of Provincial Expenditure defrayed from Provincial Balances.	...	1,716,000	...	1,498,100
TOTAL EXPENDITURE CHARGED TO REVENUE ...	76,746,186	77,215,700	78,697,900	77,794,800
SURPLUS ...	3,936,287	819,200	2,750,000	1,511,600
TOTAL ...	80,682,473	78,034,900	81,447,900	79,306,400
Revenue—				
Principal Heads of Revenue—				
Land Revenue ...	20,877,521	21,418,800	20,458,900	21,349,300
Opium	7,521,962	4,280,400	5,856,700	3,622,000
Salt	3,175,950	3,291,700	3,356,500	3,387,800
Stamps	4,811,691	4,799,600	4,739,700	4,881,300
Excise	7,030,314	7,226,400	7,613,500	7,867,900
Customs	6,619,009	6,214,000	6,544,460	6,398,300
Other Heads	5,010,538	5,063,100	5,139,403	5,227,800
TOTAL PRINCIPAL HEADS ...	55,046,985	52,294,000	53,709,100	52,734,400
Interest	1,465,139	1,177,000	1,448,200	1,227,300
Post Office	1,996,922	2,136,100	2,122,400	2,218,900
Telegraph	997,159	1,046,400	1,066,400	1,065,100
Mint	196,110	198,500	341,000	205,700
Receipts by Civil Departments	1,211,123	1,211,600	1,206,700	1,226,600
Miscellaneous	677,891	600,300	733,200	552,400
Railways : Net Receipts ...	13,881,461	13,963,600	15,161,100	14,540,200
Irrigation... ...	3,694,621	3,824,100	3,956,800	3,921,100
Other Public Works ...	293,833	335,300	349,900	296,700
Military Receipts	1,221,029	1,248,000	1,333,100	1,318,000
TOTAL REVENUE ...	80,682,473	78,034,900	81,447,900	79,306,400

VIEWS AND REVIEWS.

Lac culture in India.

Lac, o Shellac of Commerce, is a resinous substance produced by a species of scale insect (*Tachardia lacca*) which lives on the tender branches of certain trees. These insects suck the juice of the bark and secrete the resin. In harvesting lac, the branches with resinous incrustations are removed from the trees and the resin is scraped off. This is washed and graded for export. Lac is used in the manufacture of varnishes, paints, lithographic inks; in the preparation of gramophone records, in electrical works, and in numerous other ways. The methods of obtaining lac in India are three, namely :—

(1) By collecting whenever the trees which bear natural lac yield a crop ;

(2) By inoculating standing trees with brood lac and afterwards collecting the lac from them ;

(3) By inoculating trees specially grown for the purpose.

The following are some of the trees best suited for lac cultivation in India :—

(1) *Schleichera trijuga.*

(2) *Butea frondosa.*

(3) *Zizyphus jujuba.*

(4) *Pithecelobium saman.*

(1) is considered the best, and the tree is a heavy yielder ;

(2) and (3) stand heavy pruning which is necessary for the production of new wood ;

(4) does not need pruning to the same extent, since it produces succulent branches practically all the year round which enables two crops of lac to be taken in a year.

The chief point in lac culture is its inexpensiveness. The work takes up comparatively little time, so that it need not interfere with the grower's ordinary occupation. Further, the necessary tools, etc., are cheaply procured or made. Again, only a short preliminary training is necessary.

Co-operation.

Diwan Bahadur L. D. Swamikannu Pillai, Registrar of Co-operative Credit Societies, Madras, recently delivered a lecture on co-operation.

In Mr. Pillai's opinion, combined human effort may take one of three forms :—"all for one," "one for all," and "all for all." When the labour of many goes to the profit of one individual or a group of individuals, as in slavery, absolute monarchy, etc., we have the exemplification of the principle of "all for one." Then there is the principle of "one for all." It is sometimes said that the appeal to self-interest is the only appeal that is heard by men. It is not so. There is also the appeal of "one for all" where one labours for the tangible benefit of all. Co-operation is a compromise between the two principles. It says to every man "you cultivate your own interest by cultivating that of your neighbour." It evinces itself by equally, impartially, and scrupulously dividing, among all that have contributed to the result, the profits of any enterprise. There are other aspects of co-operation in which it may appear to be a compromise rather than the logical development of a single theory or principle. Generally speaking, it does not adopt difficult or invidious standards but is eminently practical. It does not die a martyr's death for the principles of equality, fraternity or liberty. It does not say "be just" but "be more just than the non-elect." Its principles are progressive but they are not radical or communistic. On the other hand, it does not ask for charity.

Co-operative work is generally regarded as being of three kinds, credit, distribution and production. Co-operative credit is best exemplified in our own country ; co-operative distribution in the United Kingdom and co-operative production in Denmark, France, Ireland and Germany. The country of origin of co-operative credit is Germany and Raiffeisen is the father of co-operative credit. He discovered and put in practice the princi-

ple that unlimited liability, by itself, can command credit. In England, what is uppermost in people's minds when they talk of co-operation is the wholesale society which produces goods and sells them at a cheap rate to members and others, thus cheapening the cost of obtaining that which is produced. There were in 1906 more than 1400 stores, as such societies are called, with nearly 1¼ million members, £ 33 million of capital and sales exceeding £ 63 million in the year.

Indian Commerce and Industry.

Mr. G. Findlay Shirras, M.A., of the Indian Educational Service, on special duty in the Finance Department of the Government of India, has contributed a paper on the subject of Indian Commerce and Industry to the Industrial Conference at Calcutta. Mr. Shirras deplores the general lack of aptitude and enterprise in the people in the matter of developing the rich resources to be found in many parts of the country and he mentions this as the principal cause of the failure of Indian industries.

As regards weaving, Mr. Shirras is of opinion that the salvation of weavers does not lie in the adoption of large and often expensive looms. It will be more expedient, firstly, to utilise existing looms to better advantage by slight alterations which will increase the yield in many cases to 30 per cent., and secondly, to assist the weavers to buy yarn cheap and to sell their products dear.

As regards the remedial measures to be taken to check the huge imports of foreign sugar into India, the writer thinks that we ought to develop the "central factory system," *i.e.*, factory situated in the centre of a tract of land reserved for sugar and its rotation of crops only. The cane is then as near the mill as possible and cultivation, cutting, etc., can be done with the least possible waste. The complete triumph of this system is seen in the regeneration of the sugar industry in Formosa by the Japanese and in Porto Rico.

Regarding the investment of British Capital in India, the writer quotes with approval the remarks of Mr. George Paish: "No one can doubt the beneficent effect upon the prosperity of India of this expenditure of British capital for the development of the natural resources of the country, and the linking up of district with district, which has so powerfully helped to diminish the severity of famines. The great sums shown below have been lent to India at an exceptionally low rate of interest, and having regard to the immense increase in the wealth of the Indian people which has resulted, and is resulting, from the construction of railways, the burden of the low interest charge is quite negligible."

As regards the labour problem, Mr. Shirras states that production now hungers for labour which is at present like an army without leaders. He advocates the formation of labour exchanges in this country, which would be concerned with the members, movements and condition of labour: similar schemes, says Mr. Shirras, have been successful in the United States, in Switzerland and more recently in the United Kingdom and he believes that Government itself would be greatly benefitted by affording facilities towards this end.

He concludes by saying that a pressing need of India to-day is the unlocking of hoarded capital which ought to be put to reproductive uses. The process has begun, he says, and its continuance is imperative to the industrial development of India.

Artificial Silk.

Several American scientists, headed by Mr. Henry Bernstein, an authority on artificial silk, are arranging to build a large factory in Camden for the making of this extraordinary material, which is now imported in great quantities from Europe.

Europe has 22 artificial silk factories, scattered throughout Switzerland, France, Belgium, Germany, Austria, and England. These factories, says the *Philadelphia Record* are each operating one of three different processes successfully. The different varieties of artificial silk employed in commerce are simply pure cellulose that has acquired the lustre of natural silk. They are distinguished, therefore, from the product of the silk worm by not containing nitrogen. All artificial silks have some form of vegetable fibre for their origin; sometimes in the form of cotton, and sometimes as wood pulp.

Bernstein and his associates in their experiments figured that if they could approximate the method of the silk worm the result would be more perfect.

A great deal of time has been spent in attempting to reproduce this natural method of silk making, so that coagulated substances could be reproduced, and the filaments solidified by the action of the air could be spun into threads, of the length and fineness of the genuine silk thread. The process discovered by Mr. Bernstein reproduces the natural action of the silk worm, it is claimed, as closely as nature, chemistry, and human ingenuity will allow. There is absolutely no danger in manipulating the chemicals, as there is in some other methods of making the silk. The method is said to be virtually non-inflammable and non-explosive as compared with the "gun cotton" or Chardonnet process, which was the first method used.

Not until after the discovery of nitro-cellulose and the properties of this substance were attempts made to produce threads of artificial silk that would aproach in appearance those of natural silk. In 1855 Audemars, of Lausanna, took out a patent for transforming dissolved nitro-cellulose into fine threads which he called artificial silk. At a later date, this idea was worked out practically by transforming a solution of cellulose into artificial thread that was employed as a conducting filament in electric globes. From a textile point of view, these attempts were not crowned with success, and it was only after numerous experiments by Count Hallaire de Chardonnet, the great pioneer of the artificial silk-making industry, that the products of this manufacture became an article of commerce. In addition to the "gun cotton" and "cupra ammonium" process, there is the "vicose" process. All three of these are used in European factories.

By the American method, the first step in making the silk is the preparing of the cotton waste by caustic soda treatment. It is then dissolved in a cuproammonium solution and placed in a receiver which is filled with ammonia water of desired strength. Compressed air is then blown in until the solution is rich enough in copper to dissolve the prepared cotton. Next, the waste, which is a dough-like substance, is carefully filtered and is forced through spinnerets to another receptacle, from which it is spun into a continuous fibre on rollers. It is then washed and freed from all chemicals. In the last stage of preparation it is dried, grouped into 15 or 20 filaments, and twisted into yarns.

The Indian Labour Problem.

This is the title of a paper contributed by Mr. Behari Lal Bhargava to the March number of the *Hindustan Review*. Mr. Bhargava attributes the comparative failure of the Indian swadesi movement and the slow development of Indian industrialism to the "inefficiency of Indian labour in spite of its apparent cheapness."

He divides Indian labourers into four classes:—

First, the common labourers who are mostly landless villagers forming the lowest rank of unskilled workmen. They are generally good workmen in agriculture of the primitive kind, but this profession has made them lethargic, unenterprising and resigned to their lot, owing to there being no gradation of work in field labour.

Secondly, the artisan classes, such as carpenters, goldsmiths. The profession in the case of the operatives of this class is mostly determined by caste—once a shoe-maker always a shoe-maker, such is the inelasticity of the caste system. Though the possession of hereditary

skill is more or less ensured, the caste system has the unwholesome effect of making these artisans inactive and unenterprising. They are generally illiterate and averse from change of profession.

Thirdly, trained mechanics. This class is of a comparatively recent growth and forms an infinitesimally small portion of the population. Lesser still is the number of those who are suited for practical work in an up-to-date modern factory. In spite of their fewness, the rate of salary in this class of workmen is much smaller than in the case of their European rivals, because the standard of life which mostly determines the rate of wages, is lower, and, then, they are not sufficiently patronised by Indian capitalists.

Fourthly, the business managers and assistants. This class is yet to be created in India. Our concerns are mostly managed by amateur lawyers, zemindars and retired Government servants who are totally ignorant of the ways of conducting a modern business, and this is one reason why most of the Indian concerns prove unsuccessful in the end.

Mr. Bhargava suggests the following remedial measures :—

(*a*) One thing which is absolutely essential for making Indian labourers more efficient is to educate them in their profession and otherwise. Much has been and is being talked of technical education in these days, but all attempts made till now have been almost entirely fruitless. One reason of its failure is, as suggested by Mr. J. N. Sirkar in his "Economics of British India," the absence of the system of universal primary education in India. The education of labourers will result in another good, *viz.*, it will produce a most decided improvement in the moral character of the workmen.

(*b*) A remedy for low wages is suggested in trade unions and strikes. Trade unions and labour institutes serve several useful purposes. In the first place, a trade union performs the ordinary functions of a friendly society. But its chief purpose is to organise the workmen of a particular trade into a combination sufficiently powerful to enforce various regulations both upon masters and workmen. The most effective weapon in the hands of these unions is a recourse to strikes, or absolute refusal on the part of the workmen of a particular trade to work. It need not be understood that strikes are impossible without the existence of trade unions. We have in India often seen cases of strikes among Railway and other employees, though there are no trade unions worth the name. But it must be admitted that the existence of trade unions is a help to strikes, as, without them, co-operation in large bodies becomes almost impossible, and then the workmen are afraid to strike lest they may have to starve.

(*c*) Colonisation and migration to other places is another remedy for low wages.

Mr. Bhargava concludes :—"But no remedy for low wages can be really effectual unless it increases the efficiency of labour itself. This being the case, it can easily be surmised that education is the most powerful agency for advancing the cause of wage-earners in India. In the present age of competition, the balance of advantage will ultimately turn in favour of the country which has the most intelligent and best educated workmen.

The Indian Industrial Situation.

Professor P. G. Shaw of the Forman, Christian College, Lahore contributes an interesting paper to the February number of the *Indian Review*. Professor Shaw deals at length with the drawbacks visible to-day in our industrial condition and ascribes our failure to (1) the religious character of the people ; (2) unhealthy social institutions ; (3) climatic difficulties ; (4) poorness of the Indian soil at the present day ; (5) the inefficiency of the ordinary Indian labourer ; (6) want of sufficient capital ; and (7) contact with Britain.

As regards the character of the people and their unfitness for industrial work, the professor says : "The Hindus have been described from immemorial times as quiet, contented, skilful, thrifty and eminently religious or spiritual people. Such a spirit of religious contentment is not the result of an ignorant passiveness but is enjoined by a peculiar view of the philosophy of life, interpreted in the light of religion which reaches even the illiterate through the medium of innumerable religious sects. The Hindu civilisation has been essentially spiritual, and as such, non-industrial ; to a similar extent, the Hindus have been found to be conservative and stationary by instinct, and so, unable to keep up the same permanence of zeal and spirit which characterises the restless industrial activity of the Western nations. They believe in the futility of worldly possessions, perhaps, to a far greater extent than any nation in the world : and sometimes they are apt, to underrate the importance of personal effort."

As regards the climatic difficulties, this is what Prof. Shaw says :—The climate of India, her vast fertile tracts of land, and her great mineral resources, have resulted in simplicity in the habits of dress and life of the people : and this simplicity has in turn reduced their wants. Thus while the bracing climate of England forces the people to work hard for gaining their livelihood, the luxuriant and enervating tropical climate here has made the people less inclined for work. India is a vast continent and the variety of climate obtainable in the different parts is very great ; though this gives splendid chances for variety of employment to both capital and labour and offers an unlimited field for the development of agricultural and manufacturing industries, generally it does not permit of strenuous work. The enervating effects of the climate have been observed in the case of those of sturdy races also, like the Moghuls, and the Afghans, who had lived permanently in India. The difficulties of the climate make it impossible to exact steady work in large factories which are so necessary at present. Thus, the climatic conditions have kept the standard of comfort low, and have sapped the energy of the people."

More than all, Prof. Shaw's remarks as to the effects of our contact with Britain are noteworthy. He writes : "Towards the end of the 18th century, India was a flourishing manufacturing country : the battle of Plassey in 1757 put her in the hands of the East India Company which had the interests of its shareholders nearer to its heart than those of the Indian people. At that time, the commercial policy of England was to limit the colonies to the production of raw materials useful to English manufacturers, and to reserve the colonial market exclusively for the sale of English manufactured products. This was also followed in the case of India, and was successfully carried out by the merchant-administrators under whom she was placed. It was the policy of the Directors of the Company to foster the cultivation and export of raw produce and to suppress the Indian manufactures, either indirectly by taxing heavily and even prohibiting their importation into England or directly by harassing the artisans. Further, with the rise of British power in various parts of India, the native courts gradually dwindled and so could not support the artisans who always clustered round them in large numbers. Apart from its administrative and political aspects (with which we are not concerned here), the struggle was unequal ; the English nation was fast advancing in manufacturing industries, and her progress was helped by improved scientific methods of production and by a considerate system of protective tariff, whereas the Indian manufacturers, buried in ignorance, were too conservative and contented to make a stand worth the name, and were unable to retaliate, even if they dreamt of it."

Egg Preservatives.

We gather from a recent issue of the Westminister Gazette that certain investigations recently carried out by Mr. Oscar Riddle in the Laboratory of Experimental Therapeutics of the University of Chicago may prove, in the future, of considerable economic interest

to the householder and the farmer. The name of formalin is well-known to the public for its antiseptic properties, and it has long been used as a preservative medium. It occurred to Mr. Riddle that it might be possible to feed the fowl with a substance which would decompose spontaneously within the growing egg and set free formaldehyde, which, in its turn, would affect the elements of the egg in such a way as to prove a real preservative. So he tried hexamethylentetramine, or, to use a more convenient term, urotropin. Would it penetrate the cells which guard the germ-plasm? Would sodium benzoate pass through the growing envelopes and enter the young and growing cell? What would be the effect of salicylate of soda? He fed laying hens with urotropin, and found that it passed through the follicular and vitelline membranes surrounding the egg. Once within, it decomposed and set free formalin. This acted as a preservative, or, to use his explanatory statement, "it lengthened the time which normally intervenes between the fresh and the unpalatable egg." Neither benzoate nor salicylate of soda was found in the eggs of birds fed with these substances, but then, they might have entered the eggs in some other form or combination. But sufficient evidence was discovered to show that their eggs, specially those resulting from the salicylate diet, lasted eatable for a longer period than untreated eggs laid at the same time. As for eggs from birds fed on urotropin, those that were laid between June 30 and July 30 were eatable as late as November 10, by which date, it may be fairly assumed that the untreated eggs were not even "good in parts." It was further found that the urotropin was excreted into both the yolk and the white. The urotropin penetrated the follicular membrane and entered directly the egg-yolk, for an egg laid five days after the last dose of urotropin responded to the test for formaldehyde. As for the salicylate and benzoate doses, they were found to preserve the eggs to some extent, there being marked physical differences between them and the untreated eggs of the same date. Further trials are to be made with larger doses, although it may be possible that a natural limit will be found to the receptivity of the domestic fowl in this respect. For, a careful watch on dieted pigeons betrayed the fact that the doses were occasionally regurgitated. Mr. Riddle hopes that others may be able to find substances which will have equally good effects. But he leaves further investigations to those who are "interested in the practical or economic possibilities of the matter."

Dairy-farming in India.

Dairy farming is one of the most useful subsidiary occupations for agriculturists to engage in, for, by this, it is possible to retain and restore the fertility of the soil by applying to it the highly valuable barnyard manure. Some of our rich landlords keep fine horses and finer dogs but they never think of preserving and improving the breeds of cattle either for pleasure or for profit. It is not so in Europe and America. In the U. S. A. bulls and cows are sold at fabulous prices and there are thousands of dairy-farms and butter factories all over the country. Theoretically, the cow is looked upon as a goddess in this country but one has to go to the U. S. A. to see how the mother cow is taken care of. The barn is lighted with electric light, supplied with the purest water, kept clean like a temple and the cows are fed with balanced rations scrupulously selected. Cows producing 100 lbs. of milk a day are not rare. A large number of people in this country are vegetarians who need pure milk and butter, but still how many are there in India who have given a thought to this question. Here too, fine cattle are still available in the Punjab, Sindh, Kathiawar, Mysore, Nellore, etc., and they can surely be improved by proper care and management. Now-a-days, it is hard to get unadulterated milk or ghee in towns and cities and hundreds of dairy-farms can be worked with profit around our large cities,

The Need for a National Storehouse.

The Right Hon'ble Viscount Hill has a very informing article on this subject in a recent number of the Financial Review of Reviews. The article is important in that it shows how much largely England is dependent upon foreign supplies of food and raw materials for its manufactures and how a war or a threatened war against England would reduce Englishman to starvation and close up all her mills and factories.

The following table prepared from the Report of the Royal commission appointed in 1904 to consider the advisability of establishing a national reserve of food and raw materials shows the stock ordinarily carried by merchants and manufacturers.

MATERIAL.	Time for which stocks would last at present rate of consumption.
Cotton	About 6 months.
Minimum in 1901 ...	„ 2½ weeks.
Wool—Foreign and Colonial	„ 2-3 months.
Home-grown Wool ...	„ 6 months.
Mohair, Alpaca, etc. ...	„ 6 months.
Flax (Dundee only) ...	Maximum 9 months. Minimum 4-5 months.
Jute (Dundee only) ...	Maximum 10-12 months. Minimum 4-5 months.
Silk. Raw Silk ...	A few months.
Other kinds	Only sufficient for a short time.
Stock held by manufacturers	2-3 months.
Iron Ore (Foregin)	I-2 months.
Timber (Soft)	Maximum 8 months. Minimum 1¾ month.
Hides and Leather ...	6-9 months.
Petroleum	6 months.
Indiarubber	4-8 weeks.
Tobacco	1-2 years.
Meat supplies (Frozen)...	About one month.
Bacon and Ham ...	12-14 days.
Cheese	(Summer) about 1 month's supply. (Winter) 10 weeks' supply.
Butter	7-10 days' supply in the hands of retailers.
Eggs	Maximum 4-5 weeks' supply. Minimum 7-10 days' supply.
Tea	One month's supply in retailers hands. Five months' supply in wholesalers' hands or in bond (at end of 1902).
Coffee	One month's supply in retailers' hands. 24 months' supply in bonded warehouses (at end of 1902).
Sugar	About three months' supply.
Tinned Provisions ...	Retailers: 1 month's supply. Importers: About 3 months' supply.
Wheat and Flour ...	During a period of 11 years the Commission found there were nine instances where the stocks had been reduced to less than 7 weeks' supply for the United Kingdom.

It will be seen that there are large variations in the reserves. Viscount Hill considers that having regard to present conditons of warfare three months is the least period for which the nation should be protected against probable failure of supplies. Steps should accordingly be taken, he says, to maintain the reserves for that period. His remedy is that merchants should be encouraged to do so by a bonus.

"To encourage merchants to maintain reserves of produce of the extent required, the state would undoubtedly have to offer specially favourable terms. What shape the inducement should take is a matter which would require careful consideration, but probably, the easiest and best method of attaining the end would be to give a bonus on the produce kept, as it were, in bond. One per cent. on the value would possibly be found sufficient for the purpose. This would yield a four per cent. return on capital—indeed, considerably more—if we take into consideration the fact that in any event supplies would have to be kept in bond for a certain period to meet ordinary commercial requirements. The cost to the nation on this calculation would be from four to five millions per annum. This is admittedly a large amount, but it cannot be said to be too large for the advantage of complete security from famine and industrial demoralisation which the system would confer in time of war.

It is the 'Splendid Isolation' of England that makes the consideration of a question like the above imperative for British Statesman. Does the question arise in India? Meanwhile our merchants and manufacturers might compare notes with their confreres in England as to the stocks they keep.

Success in Business.

The following advice of Sir Joseph Lyons should be read, marked and digested by all who are engaged or may embark in business:—In the first place, a business man should, I think, always bear in mind the fact that there is always something fresh for him to learn. During the whole of my career, whenever I have come upon any man in whom I have seen chances of gaining technical knowledge, I have watched and studied him until I have learnt all that he could teach me. It was in this way that I came to know how to profit from the experts around me, and in business, to know how to employ other men's brains, and to turn the power to effective account is half the battle. Still, I think many people overlook this fact, and when business happens to be good, they relax their efforts and say "everything is all right; in fact, the concern is running itself now." Never was there a more mistaken policy than this, for, when the business is flourishing, that is the time that one should put on one's "considering cap" and scheme out new ideas to improve it.

Many people, I think, are too apt in these days to start a commercial career without thoroughly understanding the various branches of the trade they have selected. It is for this reason that aspiring young men would be wise not to spend all their time with one firm, but to remain there until they have satisfied themselves that they have learnt all there is to learn, and then go to some other good house and remain there until they have also gathered as much knowledge as is to be acquired of some other branch of business, and so on and so forth. Thus, when they have been doing this for some little time, they will have acquired a "versatility" of business knowledge which cannot fail to stand them in good stead in their business career.

It is not always the steady-going man who sticks to his work in a thoroughly conscientious manner on old-fashioned lines who makes a fortune. No, on the other hand, the man who probably makes a striking success is he who thinks things out, who moves with the times, and who tries to sell new kinds of goods in new ways. That man has orignality, and will in all probability one day "set the Thames on fire."

It is almost a truism to state that the development and success of any big business is necessarily dependent upon the ability and energy of the man who is responsible for its conduct; but, still, there are times when it may be due to other and more adventitious circumstances.

The stumbling-block of many an unsuccessful business man has been the attempt to make as big profits as possible, whereas the secret of success in trade is to discover at how small a profit one can sell. Once a customer gets the impression that he can get things a farthing cheaper elsewhere—always, of course, assuming the goods to be of the same quality—the further development of one's own business is impossible.

I should like to impress upon all young people starting in business that, practically speaking, the days of big profits in manufacture and trade are things of the past; but, as compensation, and a corresponding and greater advantage, the days of long credit and numerous bad debts have disappeared with them.

I would strongly advise no man to invest his spare capital in a business he knows nothing about, even though he may have resolved to figure merely as a sleeping partner.

Very few "sleeping partners" in any walk of life make a lastingly successful name for themselves, and I have no sympathy with the man who relies on others to make a fortune for him.

Again, the successful business man of to-day must be constructive, for it is the man who is always on the alert to improve on anything and everything who will eventually sit on "those bags of bullion" which are, after all, in a greater or lesser degree the object for work of most business men.

Originality in ideas is so essential to business success for the simple reason that, in these progressive days, fashions in business change almost as quickly as do fashions in the sartorial art.

AGRICULTURE.

Storing of Paddy.

Reaping of unripe grain should be discouraged as such grain will not keep. The common custom of allowing grain, when reaped, to lie on damp ground causes discolouration of the grain and an even worse practice is the wilful damping of the grain in order to increase its weight. This latter practice has almost ruined the rice trade between Akyab and Europe.

Discolouration is also caused by the grain heating when stored in godowns. Paddy which is stored in a damp condition or in godowns with damp floors or leaky roofs will certainly heat in time. The principal cause of heating, however, is undoubtedly due to storing paddy which has been not properly cleaned, *i.e.*, which contains an admixture of husk, dead grain, sand or dirt. Owing to the inherent moisture in the grain, rice has always a tendency to heat when stored in a confined space, and for this reason it is never shipped in bulk, like wheat, but always in bags. Recognising this tendency, great care is taken at rice mills to keep stocks at as even a temperature as possible and when rice is being shipped for a voyage of more than a few days' duration, a most elaborate and expensive scheme of ventilation of the hold of the vessel is carried out, all with the object of preserving grain from damage. A very large proportion of crop is damaged in this way before it is marketed at the milling centres and to such an extent as to render it unfit for shipment to Europe. Much lower prices are paid for such grains and the total loss to the country from this cause alone must be enormous.

If the millers and shippers consider it to their advantage to incur trouble and expense to preserve the grain, surely it would pay the cultivator to exercise a little care while the paddy is in his possession. Of course the greatest offender of all, in this respect, is the paddy trader or speculator who stores grain throughout the rainy season in mud floored, ill-ventilated and badly roofed godowns. If, however, the cultivator supplied grain free of impurities in the first instance it would remedy the evil to a very large extent.

Concentrated Feeding Stuff for Cows.

A matter of importance discussed at the recent Reading Conference was the use of concentrated feeding stuff for cows. This question has an intimate bearing upon the economic side of dairy farming. There is a school of intelligent farmers who hold still that there is a close relationship between diet and the quality of the milk and who include in the rations a liberal proportion of concentrated stuffs when they desire milk with a high percentage of butter fat. Modern teachers hold that this view is mistaken and that at all events it is not supported by the results of searching investigations. This is not the opinion of men of science only but is held as firmly by farmers eager to induce their cows to produce as much and as good milk as is consistent with judicious expenditure in feeding. The speakers at the Reading Conference were emphatic in warning farmers against undue liberality in the use of cake and meals. They admitted that the yield of milk could be increased by augmenting the allowance of concentrated materials, but argued that only within certain limits can increase be obtained at a commensurate cost. The Armstrong College, Newcastle-on-Tyne, discovered and taught this doctrine some years ago, and subsequent experiments at that and other centres have shown it to be well founded. Sometime ago, extensive trials were conducted in Sussex, Kent, and Surrey in connexion with the Wye College, and it was mainly on the evidence of these demonstrations that the Reading speakers advocated moderation in the use of expensive feeding stuffs.

Fertility of Alluvial Soil.

A new theory of the great fertility of alluvial soil has been brought to the notice of the Royal Microscopical Society by the Rev. Hilderic Friend. It is usually explained that the fresh soil brought by occasional floods keeps up the richness of the land but now the real cause is affirmed to be the vast numbers present in the mud deposit of a tiny worm that buries its head and waves its tail above the surface. In some places, an ounce of ooze has been found to contain a quarter of an ounce of these worms.

COMMERCE.

Business Enterprise in India.

The commercial enterprise of India during the month of January 1912 may be guaged by the following abstract of joint stock companies registered in that month :—

		Rs.
4	Banking and Loan Companies	8,00,000
8	Insurance Companies	2,90,000
1	Navigation Company	20,000
1	Railway Company	1,00,000
2	Co-operative Associations	75,940
10	Trading Companies (other than those specified above)	7,90,200
1	Rice Mills Company	20,000
1	Saw and Timber Mills Company	4,00,000
1	Oil Mining Company	5,00,000
29	GRAND TOTAL ...	29,96,140

India and the London Chamber of Commerce.

At a meeting of merchants and others interested in the trade with India held at the London Chamber of Commerce on March 9th, it was resolved to request the Council of the Chamber to sanction the formation of an East Indian section of the Chamber to deal with matters relating to India and Ceylon. Sir Felix Schuster, in seconding the resolution, said he thought the section should devote its attention to commercial matters, and not to subjects trenching on political and social affairs. It was resolved to establish the section. The establishment of the East Indian section does not imply the formation of a special permanent Committee. Any member of the Chamber can attach himself to the section which, therefore, will be wholly indefinite regarding the number and constitution. The only permanent officers are the Chairman and the Deputy Chairman. It may be pointed out that in 1907, the Calcutta Chamber, on the strength of a proposal from London, advocated that steps should be taken to secure the effective representation of Indian commerce and industry in England. To this end, it was suggested that there should be a Home Committee of the Indian Chambers of Commerce, the rough allotment being four members for Bengal, three for Bombay, two each for Madras, Karachi, Rangoon and Upper India and one each for Punjab, Cochin, E. B. and Assam, Coconada and Chittagong. The suggestion was cordially accepted in principle by all the Chambers, Bombay, alone dissenting on the ground that the proposed institution would weaken the influence of the Chambers of Commerce in India. In the end, the proposal was dropped.

V. P. Packets.

Business firms and private gentlemen who may send or receive goods by the V. P. system will be interested to know that if a complaint is made by the addressee immediately after the receipt of a value-payable postal article, that it was sent dishonestly or fraudulently, the Postmaster-General may, if satisfied that there are *prima facie* grounds for believing that the value payable postal article was sent with the intention of defrauding the addressee, withhold the payment to the sender of the money recovered from the addressee. If, after making such enquiries as may be necessary, he is fully satisfied that the value-payable postal article was sent with this intention, he may order the return of the article to the sender and refund to the addressee the sum of money recovered from him on delivery of the value-payable postal article.

Whenever the sender or addressee of a value-payable postal article makes a complaint regarding 'the delivery of or payment for the value-payable postal article, he shall be entitled to have an enquiry made by the Post Office on paying a fee of one anna. The fee shall be paid by means of a postage stamp or stamps affixed to the letter of complaint. The fee shall be refunded in cases where the complaint is found to be well-grounded.

INDUSTRY.

Cottonseed Oil Plant.

We gather from the Indian Textile Journal that there is a cottonseed oil plant with all the most modern improvements at Coorla near Bombay. It is said to be the property of a wealthy syndicate which is prepared to build similar factories in various parts of India for the treatment of cottonseed and the utilisation of all its products.

Bamboo Paper.

Those interested in the idea of manufacturing paper pulp from bamboo may like to know that this can be done by two processes well-known in the trade, *viz.*, the bisulphite process and the caustic-soda process. The bisulphite process produces good pulp, but one that is exceedingly difficult to bleach to a white colour ; that is not the case when the caustic-soda process is used, as then the pulp is easily bleached. Furthermore, with caustic-soda it is an alkali process and requires no special boilers or plant, whilst the bisulphite process is an acid process needing special digestors. With caustic-soda, by means of special apparatus, the soda can be recovered, thus saving in the cost and improving the quality of the pulp.

Hand-loom Weaving Industry.

The necessity of according every possible recognition and encouragement to the hand-loom weaving industry in this country has been recognised by Government. In the Presidency of Bombay, where cotton mills worked by power constitute a flourishing industry, a very considerable degree of activity has also been shown by the hand-loom weaving industry. Steps have just been taken by the Governor-in-Council to arrange for a practical demonstration on an extensive scale of improved hand-looms. A list has been drawn up of all the places in the Presidency where in the aggregate more than 250 hand-looms are at work at present. As soon as suitable arrangements for the supply of teachers can be made, weaving schools will be started in the districts of Dharwar, Nasik, Bijapur, Ahmednagar, and East Khandesh. A special building is being erected in the compound of the Victoria Jubilee Technical Institute, Bombay, in order to accommodate a hand-loom weaving department, and to inaugurate a series of experiments in warping and sizing. An initial grant of Rs. 7,500 has been made to the Institute, and an annual recurring grant of Rs. 2,000 will be paid to the authorities of the Institute towards the cost of the new department.

Worldly Wisdom in a Factory.

For worldly wisdom, it would be difficult to surpass the "Ten Demandments" hanging in the rooms of a London factory :—

(1) Don't lie. It wastes my time and yours. I am sure to catch you in the end and that is the wrong end.

(2) Watch your work, not the clock. A long day's work makes a long day short, and a short day's work makes my face long.

(3) Give me more than I expect and I will give you more than you expect. I can afford to increase your pay, if you increase my profits.

(4) You owe so much to yourself, you cannot afford to owe anybody else. Keep out of debt or keep out of my shops.

(5) Dishonesty is never an accident. Good men, like good women, never see temptation when they meet it.

(6) Mind your business and in time you will have a business of your own to mind.

(7) Don't do anything here which hurts your self-respect. An employee who is willing to steal for me is willing to steal from me.

(8) It is none of my business what you do at night. But if dissipation affects what you do the next day and you do half as much as I demand, you will last half as long as you hoped.

(9) Don't tell me what I would like to hear but what I ought to hear. I don't want a valet to my vanity but one for my money.

(10) Don't kick if I kick. If you're worth while correcting, you are worth while keeping. I don't waste time cutting specks out of rotten apples.

ECONOMICS.

Control of Indian Finances.

A scheme is before the Government of India under which the post of Comptroller and Auditor-General will be divided into two independent sections. There will be an Auditor-General with high audit powers in certain cases, independent of the Government of India, and subject only to the Secretary of State, and there will be an experienced officer attached to the Financial Secretariat, who will deal with currency and other important financial questions. The scheme will be sent Home for sanction. Meanwhile, the present arrangements will continue. The Office of Comptroller-General will remain in Calcutta till accommodation is found for it at Delhi.

Gold for India.

There are certain writers in India who object to a gold currency for the reason, *inter alia*, that if India should join in the scramble for gold along with the other gold using countries in the world, gold will appreciate in value and thus the cost of introducing a gold currency into India will become greater than is estimated. There is apparently some ground for this apprehension. The Indian demand for gold will be considerable and recently it has begun to play an important part in the London Money Market. "As Sir Edward Holden pointed out at a recent meeting of the London City and Midland bank there has been a remarkable rise in the volume of gold imported into India of late years. The net imports of the metal in the five years ended March 31st, 1911, came to about £54,800,000 or just upon £11,000,000 per annum, as compared with £20,500,000 in the quinquennium preceding, or an average of only £4,100,000 per annum. If however, the calendar year 1911 is taken, it will be found that the growth is still more remarkable, for the total amount imported in that period was £21,526,000 as compared with £15,913,000 in the calendar year 1910, and £8,717,000 in 1909. From these totals, about £2,500,000 has to be deducted each year for the gold exported by the Indian mines. After this is done, the figures are very remarkable, as they mean that quite one-fifth of the world's production of gold is absorbed by India"

The Rise in the Cost of Living.

There is a proposal which is likely to take early legislative shape in the United States for the formation of an international commission to gather facts bearing upon wages, cost of living, and prices in various countries, to establish international comparisons, to inquire into the causes of these monetary changes and their bearing upon various grades of income, and to make recommendations for common governmental action, should it be deemed desirable. President Taft, in a recent message, strongly endorsed the proposal, which has received the support of a remarkably representative body of economists and officials in the chief industrial countries. The initiation of the movement is due to Professor Irving Fisher, who is the head of the department of Political Economy at Yale Universty. He has come to the conclusion that the cause of the trouble is the excessive output of gold. The rise is so widespread that it is futile to seek for the explanation in any purely local factors. In the United States the increase in prices has been 50 per cent.; in Germany 30 per cent.; in England 20 per cent.; in India about 20 per cent.; while in no country is the increase less than 18 per cent. He contends therefore, that neither Protection nor Free Trade, neither Trusts nor Middlemen, can be held wholly responsible. The only hypothesis which, in his opinion, satisfies all the conditions is that an expansion of the world's currency has entailed the payment of more money for all commodities—in other words, that gold has fallen in value, with a corresponding rise in the prices of all commodities whose value is measured in gold. In the last fifteen years the annual gold output has increased from £65,000,000 to £100,000,000, and Professor Fisher believes that no decrease in prices is to be looked for unless and until the various countries of the world agree to restrict the output of gold.

CO-OPERATION.

Co-operation and Agriculture.

At the Surat Co-operative Conference held on the 11th March, a resolution was adopted to bring the Co-operative Credit Societies into closer touch with the District Agricultural Associations in order that the former may receive from the latter information and help in agricultural matters. Some of the societies have undertaken to start co-operative seed stores or shops in their villages, while the President of one of the first societies started in Gujarat wanted to try ensilage on a very large scale as a preventive against fodder famine in his village.

The Co-operative Societies Bill.

By far the most important piece of legislation that was passed by the Imperial Legislative Council this month is the bill to further "facilitate the formation of Co-operative Societies for the promotion of thrift and self-help among agriculturists, artizans and persons of limited means." The main provisions of the new bill may be briefly stated thus :—

First, it extends the Act to all kinds of Co-operative Associations.

Secondly, it abolishes the statutory distinction between rural and urban societies.

Thirdly, it relaxes the restrictions previously imposed on the distribution of profits in unlimited societies.

Fourthly, it recognizes unions of societies.

These reforms in law have received very cordial support in all quarters.

Co-operation among Hill Tribes.

At the instance of Mr. S. P. Rice, I.C.S., Collector of the Nilgiris, the Registrar of Co-operative Credit Societies, inspected a number of Badaga villages in the neighbourhood of Kaiti, Coonoor, Katteri, and Kotagiri with the object of devising measures, if practicable, to relieve the Badagas from indebtedness to the Mahommedan Labbais who are the local sowcars. The Labbai begins operations in a village by opening a bazaar from which he sells on credit the necessaries of life, generally a bag of ragi, to commence with. An account once opened at this bazaar advances rapidly with compound interest and the annual produce, whether potatoes or coffee, of each Badaga family having an acccunt with the Labbai, just suffices to keep down the annual interest. If the dry grain raised on the family land, which is generally the only produce that the borrower reserves for his maintenance, proves insufficient, recourse is had again to the Labbai, and numerous cases were reported to the Registrar by the victims themselves and admitted by the bazaarmen in which a bag of grain worth a few rupees and purchased some four or five years ago, had, at the date of enquiry, developed into a debt of Rs. 300 or Rs. 400. To rescue the Badagas from such fearful thraldom, it is literally no less in certain cases, by means of co-operative societies, arrangements have been made to start a few rural banks in suitable localities.

Cheap money for English Agriculturists.

Co-operative credit societies are practically unknown in England, though thousands of them exist on the Continent. This is due to the fact that very little attention has been paid hitherto in England to agriculture, almost the whole attention having been directed to industrial development. The cry of 'back to the lond' has become loud recently and the state is at last awakening to a sense of its responsibility in that direction.

A Bill has now been introduced by the Government before the Parliament which provides for the formation of credit societies. Arrangements are being made with the leading joint stock banks for the loan of money to such credit societies as may be established under the Act.

The formation of credit banks is of the most urgent importance to small-holders, farmers, market gardeners, and all who are trying to get a living out of Mother Earth. Property in land is not of much avail without access to capital with which to stock the land and work it. This indeed is the rock on which many promissing small-holding ventures have come to grief, and therefore, the provision of cheap credit is a necessary complement to any successful development of small-holdings.

BANKING.

Savings Banks for Schools.

Mr. N. L. Hallward, Director of Public Instruction, Eastern Bengal and Assam, has drafted a scheme for the establishment of savings banks for schools in that province. The first institution of the kind was started at Ghent.

Midnapore Central Co-operative Bank.

Mr. W. R. Gourlay, I.C.S., speaking at the third Co-operative Credit Conference at Midnapore suggested the establishment of a Central Co-operative Bank there, for the easy supply of capital to Unions and Societies. Mr. Saroda Charan Mitra, late Judge of the High Court, Calcutta, seconded the proposal, which was unanimously adopted. A sub-committee, with Mr. Gourlay as chairman, was formed to discuss details.

Bank Profits.

It has always to be remembered that successful banks are able to declare a fairly considerable dividend simply because they conduct their business on a very small paid-up-capital in proportion to their total resources ; in fact, bank dividends are so much dependent on the proportion the paid-up-capital bears to the total resources that a comparision of the dividends paid by different banks is not necessarily an index of their relative success. A bank's margin of profit on services rendered is proportionately insignificant.

The Madura Co-operative District Bank.

At a meeting of the leading Indian gentlemen of Madura held recently, it was unanimously resolved to start a Co-operative District Bank at Madura for the purpose of financing the Co-operative Credit Societies in the Madura and Ramnad Districts. The Co-operative Societies in Madura and Ramnad are at present being financed, partly by the Central Urban Bank, Madras and partly by the Madura Permanent Fund. The necessity for giving the benefited societies a voice in the financial arrangements made for their benefit has often been pointed out and it was from a desire to extend co-operative ideas and not to compete with existing banks or to supplement existing funds that the new bank is being floated. The shares in the new bank will be allotted in equal proportions to the Co-operative Rural Credit Societies and to private shareholders, and the former will also be fully represented on the Board of management. A strong Sub-Committee has been appointed to frame the rules and issue the prospectus of the bank and also to take steps for its early registration.

Auditor's Certificate.

Writing of the audit of bank balance-sheets, it may be pointed out that it is not the custom for the auditors to state definitely in their certificate that the item of investments does not exceed market value, says the *Financial News*. "It is most desirable that this should be done in future. We all feel sure that our large banks have written down their investments to market value ; and, in fact, in many of the chairmen's speeches a statement is made to that effect ; but it would give greater confidence in times of stress if the auditors' certificate covered the point definitely. Further, it would have this indirect advantage, that once the custom was established by the big banks, it would at once give rise to criticism, should any balance-sheet be published without such a certificate ; thus, every banking institution, large or small, would be compelled to disclose fully their position periodically—a great safeguard."

Talking of the market value of bank investments, we may state that the capital of the various banks in the United Kingdom is £85 millions, and their Reserves £50 millions. During the year 1910-11, no less than £12,45,000 was written off the value of the securities held by the banks, and £279,000 off Bank premises, and £335,508 added to Reserve Funds. But some £885,000 was taken from Reserves to write off the depreciation in securities, and consequently there is a decrease in the Reserve Funds.

INSURANCE.

An Insurance Bureau.

Mr. C. T. Ponnambala Mudaliar, who was connected with insurance business for some years in the Oriental Life Office and the China Mutual Life Office, has started business on his own account by opening an Insurance Bureau with the object of popularising the development of insurance among the public and giving information and assistance to all would-be assurers and those who are in need of advice and help in connection with their business with insurance companies. The venture is a novel one.

Medical Examination for Insurance.

It cannot be long, says the Insurance writer in Outlook, before there is considerable modification in the methods of insurance companies with regard to medical examination. "The subject is perhaps the most discussed of all problems now a days, and the balance of opinion is certainly in favour of a less drastic policy than obtains at present. It is interesting to note that from a medical man—Dr. John Lumsden, at the Insurance Institute of Ireland—comes the suggestion that the agent and not the doctor should exercise the first process of selection. The agent should be allowed a wide choice in the cases he allows to go forward for examination, and there are many and sound reasons why Dr. Lumsden's advice should be taken."

Cattle Insurance.

Cattle form a large and valuable portion of a farmer's stock-in-trade. With a view, therefore, to compensate themselves for the loss they sustain from the death of their cattle through contagious diseases, accidents and the like, farmers in many European countries have formed themselves into mutual cattle insurance societies. As the risk of mortality of cattle largely depends upon the owner himself, an organisation formed of the cattle-owners of the neighbourhood or of the same district has been found to exercise an effective control over its members as regards the manner in which the animals are kept, and at the same time to be economicaly administered, with the result that the premiums to be paid come to a very small sum The one principle which has been found essential to success is that no compensation should ever be paid for animals dying from ill-treatment on the part of the owner. This makes the owner careful in tending his animals. In some societies a premium is charged on each head of cattle insured, in others it is not fixed but is the result of the apportionment among the members of the total amount of compensation to be paid by the society. But the latter method has this disadvantage that the insured does not know beforehand the cost of his insurance which may vary considerably from year to year. Full compensation is not generally paid, but only three-fourths of the value, to stimulate the diligence of the owner in the protection and good treatment of his animals. In Germany, every important illness of the insured animal must be reported to the insurer, who, in some cases, provides gratuitous veterinary assistance. Societies have found it more convenient to insure groups of animals, as individualisation for payment of compensation is difficult and easily admits of fraud. The compensation is usually equal to the mean value of the animals.

In India, owing to the increasing prices of draught and milch cattle, the want of a means of insuring farmers against the loss of their cattle is becoming every day more apparent. The Village Co-operative Credit Societies which are being rapidly multiplied, and are bringing home to cultivators the manifold advantages of co-operation, are very like the small mutual insurance societies obtaining in Europe. They could add very much to their usefulness if they took up this important line of work.

SCIENTIFIC AND TECHNICAL EDUCATION.

Instruction in Weaving.

It is a question whether, with the Victoria Jubilee Technical Institute giving higher instruction, scholars should still be sent to England. Mr. Dawson the principal of that institution considers that the instruction given in Bombay in spinning, weaving and kindred subjects is better than that which is obtainable in Manchester, because, while the equipment is equal to that of Manchester, the instruction is given under the exact conditions which apply to the trade and industry in the city of Bombay.

Education of Agriculturists.

The attitude of agriculturists towards education is one of solid indifference and that is why the Hon'ble Mr. Gokhale aims at compulsory primary education. On this point the Civil and Military Gazette writes: "In many parts of the Punjab he shows no inclination to be hustled. In spite of all the fuss which is being made around him, echoes of which must reach him, in spite, too, of all facilities, the proportion of pupils who are the sons of agriculturists remained about a half, as before. In Rohtak and Hissar, the Inspector reports that 'tending cattle is preferred to education'; and no wonder. Inspectors of divisions other than Delhi would have no difficulty in being able to testify to a similar preference elsewhere." The Director points out that part time schools for the children is the only feasible solution of the difficulty, "but it assumes that education is valued for its own sake, which unfortunately is not the case as yet."

A Co-operative School.

At a Conference of the Co-operators of the Chingleput District recently held in Madras, the Secretary of the Utramullur Co-operative Union reported that it was in contemplation to start a school on co-operative basis for the education of the children of the members of the Co-operative Societies, within the Union, free of charge. It would appear that there is already an Elementary School which is not conducted in a satisfactory manner. It is therefore proposed to take the school under co-operative management, each member of the Society being called upon to pay annually three annas out of the interest earned by him. It is estimated that Rs. 60 will be collected annually in this way, and it is proposed to conduct the school with this amount and the Government grant-in-aid which is estimated at Rs. 100. Admission to the children of the members of the Societies will be free, while the other children will be charged a small sum.

Industrial Education.

Mr. W. S. Hamilton, Director of Agriculture and Industries in the Punjab, has submitted a note to the Government regarding the development of industrial education in the Punjab. According to Mr. Hamilton, the aim of industrial education in this country must be the training of handicraftsmen and artisans in better methods of workmanship and in higher notions of industrial rectitude and energy. The curse of Indian skilled labour, he thinks, is the lack of conscientiousness. Our workpeople feel no pride in their work. No scheme of industrial education can be complete which will ignore this defect in the character of our craftsmen. With a view to train the hand as well as the character of the artisan, Mr. Hamilton proposes the establishment of eight schools for the sons of these classes in different centres of the Punjab. Considering the fact that the Punjab has 80,422 carpenters, 51,743 iron workers, 766,687 weavers, 79,174 potters, and 9,122 gold workers, the government should not mind, he says, spending Rs. 19,200 a year on European headmasters of the proposed eight schools. If it is thought too much, let the work of the headmasters be done by a few Indians trained in the technical institutes of the country. But the services of an English artisan Inspector to visit each school every few weeks will be absolutely necessary.

ECONOMIC PRODUCTS.

Vegetable Butter.

As the phrase vegetable butter is constantly appearing in journals now-a-days, it is well to explain what it is. Butter, as the term (from a Greek word meaning "Ox-cheese") implies, was originally a name for a product obtained from the milk of the cow, and afterwards, by extension, for a like substance obtained from the milk of other animals such as the ewe and the goat. By a further extension, the name has been applied to certain fixed vegetable oils, the melting point, consistency and aspect of which resemble butter of animal origin, such as "butter of cocoa," a concrete oil of a sweet and agreeable taste obtained from the kernels of the fruit of Theobasoma cacar or "chocolatenut tree;" "butter of Bambuk," an oil obtained from a species of almond in Senegal, and used medicinally; and "butter of nutmegs" or "butter of mace" a sebaceous substance expressed in the East Indies from the arillus of the fruit of *Myristica moschatta*.

To the plants yielding such oils has been applied the name of "butter-trees," and to the oils themselves the term "vegetable butter."

A Substitute for Rubber.

"Professor Ostromislensky, of Moscow university, has solved the problem, long pending, of the production on a commercial basis of artificial rubber by chemical synthesis," says the St. Petersburg correspondent of the Standard.

"He has sold his secret to a syndicate of capitalists, who are now erecting an experimental factory. The method, it is said, produces the purest rubber at a nominal cost from materials native to Russia."

"Hitherto heat has been used to produce the necessary chemical changes but Professor Ostromislensky employs ultra-violet rays from a quartz lamp. The product is claimed to have all the qualities of best rubber, but is too pure for ordinary commercial uses, requiring adulteration before use."

Hard fine Para rubber now fetches 4s. 7½*d.* a lb. The new substitute is said to cost about 1s. 8½*d.* a lb.

The Groundnut.

Most people know the groundnut, otherwise known as the peanut, only as it appears on the corner stand, but its uses are manifold and rapidly extending. Demand for it in the manufacture of all kinds of food-products is increasing, and by-products are being used in making feeds for the farm and dairy, while the plant itself finds wide use as a forage product and as a fertilizer.

During recent years, great quantities of shelled peanuts, especially of the Spanish variety, have been employed for the manufacture of peanut butter. This butter is prepared by the ton in factories, is put up in bottles or tins containing from one-fourth pound to five pounds each, and has become very popular as a part of the luncheon menu and for camping and cruising supplies.

The thin brown covering of the peas has a feeding value almost equal to that of wheat bran. These hulls are specially desirable for mixing with the smaller particles of broken peas for stock feeding. In large factories where peanuts are prepared for the manufacture of peanut butter and similar preparations, the waste in the form of small particles of the meats and the germs is considerable and this is sold to farmers for feeding purposes. In some cases the waste is mixed with a portion of the hulls and finely ground or chopped before leaving the factory. Peanut hulls make an excellent bedding for use in stables, and by using them in this manner and hauling the manure upon the land, their full value can be obtained.

The oil of the peanut belongs commercially to the same class as cotton seed and olive oils. Peanut oil is of a higher grade than cotton seed oil and of somewhat lower value than first-class olive oil. The greater portion of the peanut oil of commerce is manufactured at Marseilles in France, from peanuts that are bought very cheaply along the coast regions of Africa and transported by ships as return cargo. The African-grown peanuts are very rich in oil, often containing as high as 50 per cent.

BUSINESS METHODS.

Business.

Business is simply man power plus money power. Lots of fellows have a wishbone where the backbone ought to be.

If's from Experience.

Advice based on experience is always valuable, especially in business and the following from the 'International Confectioner' of New York will be profitable reading to young business men in this country.

If you are not carrying enough insurance so that some one can settle up your estate and leave a balance on the right side of your ledger, it is about time that you were looking into the matter.

If you are putting through a business deal with a friend, insist on the same formalities that you would if he were a stranger. It's business.

If your shop is a small one and located off from the main street, then have your candy and soda just a little better, and your service a little better than the bigger stores.

If you cannot get your competitor's customers to come and trade with you by means of judicious advertising and politeness, you may be sure that you cannot accomplish it by being sore over their patronising the other fellow.

If you want to succeed, don't wait for opportunity—make opportunity—that's the only way opportunity ever comes.

If there is any one thing that won't draw trade into a candy shop, it's a dark, half-lighted store.

If you make your store comfortable, you will find your clerks more willing to sell and the customers more willing to buy your sweets.

The Secrets of Business Success.

Mr. V. Ramakrishniah, Dubash, Messrs. Wilson and Co., recently delievered an interesting address on the subject of "The secrets of business success." Specialized training in business principles is necessary to become important businessmen. The knowledge secured by years of practical experience, can be acquired by undergoing certain correspondence courses in the best commercial institutions of Europe and America. Nothing can be done in these days without a thorough scientific knowledge of any work taken in hand. Sceintific study of business means the study of the subjects known as salesmanship, advertizing, business correspondence, human and mental sciences, etc. As far as business success is concerned, the study of these subjects will enable us to make our efforts more productive and increase our earning capacity. The study of salesmanship is very essential for business success, because it is development of the mind for the direction and management of forces Advertising is the art of acquainting the public with the name, nature and uses of a saleable commodity, and it may also be defined as the art of creating a new want among the human needs. Thus, advertising must not only tell the possible consumer all about the product, but must also create in his mind a desire to possess it. The aim and end of modern advertising is to create new wants. Advertising through the newspapers, magazines, public posters and so on is made in order that a demand might be created upon the part of the consumers for the advertised article. Several European firms in Madras take large spaces in the newspapers to create a desire on the part of the consumers to purchase the goods they have in stock or which they wish to dispose of. Any young man entering modern business life has not only to study the two sciences of advertising and salesmanship, but has also to study the practical workings of the science known as Psychology. The secret of success does not lie wholly in education. Success in life can be obtained only by developing strength of character and by controlling the mental forces and by possessing what is known as a masterful personality. It is only thought power that brings wealth and brings on success in business life.

FRAUDS AND FAKES.

Adulteration of Butter.

The adulteration of butter by water is said to be on the increase in England. The legal limit of water allowed is 16 per cent. Out of 1,048 samples of butter reported against in 1910, 830 contained foreign fat, either cocoanut oil or beef or mutton oleo and stearin. The process is so ingenious that it is said even an analyst, relying upon preliminary tests might be led to pass such a fat as pure butter fat.

Adulterated Milk.

It appears in England those who practise adulteration are becoming very wary and even scientific in their methods. The plan adopted as regards milk is to tone it down to the "extreme margin of the Board of Agriculture's limits of 8·5 per cent of non-fatty solids, and 3 per cent. of fat." This is done by the addition of separated milk, until genuine milk of a rich quality is reduced to the poorest quality permissible by law.

Free Photo Enlargements.

The following clipping is from "Truth" :—

The Rue de Hambourge Tanquerey, who was denounced some little while ago by the Rue des Martyrs Tanquerey as *un escroc*, has just been flooding India with his circulars and large number of them have found their way to Truth Office. The recipient of one of them, in view of the fact that Tanquerey now offers a frame as well as an enlargement free, asks where the swindle comes in. He will find that if he does not pay for a frame he will be called upon to pay a sum for freight and packing that will still leave Tanquerey a handsome profit on the whole transaction. The free portrait gentry are not philanthropists, and not even a bogus testimonial from the late Mr. Labouchere ought to convince anybody to the contrary.

Fraudulent Advertisements.

Some of the advertisements that appear in the newspapers are frauds intended to rob the unwary reader. Some time ago a man advertised in a local newspaper that he had got a marvellous remedy for killing bugs which he knew never to fail, and he guaranteed refund of money if, in spite of right application, his method proved ineffective. As is usual in these cases, of course, the remedy was to be bought by V. P. P. Orders showered in, because bugs are an ubiquitous pestilence and the remedy would cost only a paltry anna. But the purchasers were supplied in a closed envelope wrapped in many folds of paper no herbs or drugs but two chips of bamboo with the instruction that the bug was to be caught and placed on one of those chips, and to be pressed to death by the other.

Fillers in Soaps.

In the soap industry, any material used in addition to the alkali and fat required to make the soap proper is termed a "filler." Such fillers may be added either to cheapen the cost of manufacture or for various other purposes. They may be divided into the following classes :—

(1) Materials adapted to improve the activity of the soap ; such are ammonium, sodium and potassium salts, glycerol, alcohol and turpentine oil.

(2) Materials added for special purposes, such as bleaching and softening ; among these may be mentioned borax, sodium phosphate, phenol, silicic acid and various bleaching agents.

(3) Fillers in the narrower sense, whose principal function is to simply cheapen the product ; among these are mineral soap stock, silicate of soda, talc and starch,

MACHINERY AND INVENTION.

A Watch That Tells the Time in the Dark.

A distinct novelty in regard to timepieces which has recently appeared upon the market is the Bravington 'radium' watch, the peculiar feature of which is that with it, it is possible to read the time in the dark. The new watch is distinctly one for the masses, being nominal in price. It is a neat little piece of work, two inches in diameter, and very thin and light, so that it fulfils the requirements of a small, light accessory to the pocket. The dial is illuminated, not in a general manner, but by means of round dots composed of a material which emits a phosphorescent glow in the dark, and placed above the indicators of the hour, the hands likewise being covered with this material. The twelfth hour is indicated by two dots, one above and the other below the Roman numeral, so that it is impossible to read the time erroneously. When the watch is examined, the hour-dots, one-sixteenth of an inch in diameter, stand out brilliantly, together with the hands; consequently the time can be ascertained at a glance. The illuminating material is claimed to be of a permanent character, is not affected by dampness, and retains its luminosity under all conditions. In fact, it may be stated that the watch will tell the time in the dark so long as its mechanism keeps going. If desired, the watch can be obtained fitted with an alarm, placed inside, which can be set to ring at any time like the ordinary alarm-clock. In this case, the watch is about twice as thick and heavy as the one already described.

Electro-plating Extraordinary.

A new and distinctly interesting departure in metal, china and glass manufactures has been introduced by the Harvey Electro Chemical Co., of Laurence Pountney Hill, London, E.C. Briefly, the new process, which is known as the Marino patent, may be described as gold and silver plating on metals, china, glass, porcelain, and wood. It is claimed for the Marino system that its results are permanent, that the initial cost is small and that the strength and durability of the articles treated are greatly increased.

The secret of the process is simply a liquid that solves both china and glass, and the metal that is to be deposited. The liquid holds some of the metal in suspension and, of course, permeates the pores of the earthenware; the metal is then precipitated by a chemical reaction and surrounds the molecules of the earthenware, and the essential for electric deposition has been obtained, for there is a metallic conducting medium provided upon which the metal is deposited.

By the Marino process, every metal—gold, silver, lead, tin, zinc, copper, aluminium—can be deposited on any other metal or metallic substance. For example, the process provides for direct and cheap deposition, by electricity, of zinc to any required thickness on steel, iron, or any other metal. Not only zinc, but any alloy of zinc, can be equally perfectly deposited by this process. The metal can be deposited to any thickness required, and it is uniform all over the surface, clean, regular, and free from lumps and excrescences. A notable and distinctive feature of this galvanising process is that the zinc coating adheres closely to the metal body; it is ductile, and does not flake, crack, or peel off.

A fact of the greatest importance is that, as the Marino electrolytic process involves no heat, the inherent quality and temper of the steel or iron so coated suffer no injury. Such things as tanks, cisterns, &c., may probably be best zinc-coated by the method of dipping in molten zinc, because the metal fills and makes all seams and joins watertight. But the Marino electrical process enables many metal articles to be galvanised which it has never been possible before to protect by a zinc coating from oxidisation. Valve bodies, pump chambers, bolts, nuts, rivets and small screws can be all now galvanised with the greatest success. Even steel springs, the temper of which would be affected by the process, are now being coated with zinc without loss of inherent strength by the electrolytic process of Mr. Marino.

INDUSTRIAL AND ECONOMIC LITERATURE.

Indian View of Industry.

A poem in the February *East and West* on "The Hill of Frenzy," by Umrao Singh, contains a very spirited description of the new industrial life that is invading India:—

Far in the distances a factory funnel piercing
the air, and sending to Heaven the incense
of Hell, and grinding things to unwholesome powder,
And the voice inaudible whispering of hope
and fear and warning,
Whispering from looms and grinding stones
and smelting furnace, from whirring motor
and puffing engine, from stitching needle,
From creaking yoke and scratching quill, from
clanking harness and twitching muscle,
Whispering of life, its luring hopes, its vanishing guerdons, its joys ever at hand and ever
receding;
Of ever unwelcome but never departing
sorrows; of hopes reviving from the ashes
of life, from the travail of years,
Of the birth of life from the womb of death.

Hints on Book-keeping.

By T. C. Ranganatha Row, Sri Vani Vilas Press, Srirangam: Price 4 annas.

This tiny book is a sort of "made easy" for the students of Commercial Book-keeping. It will be of use to all who desire to know the rudimentary principles of book-keeping.

Economic Causes of Famines in India.

By Satischandra Rai, M. A., being the Bireswar Mitter Prize Essay for 1905, published by the Calcutta University.'

Burma.

A hand book of practical commercial and political information by Sir George Scott, K.C.I.E., Messrs. Alexander Moring Ltd.

The Principles of Political Economy and Taxation.

By David Ricardo with an introduction by F. W. Kolathammer, Messrs. J. M. Dent & Sons, Ltd., 1/net.

The Economic Transition in India.

By Sir Theodore Morison, K. C. I.E., John Murray, 5/net.

Industrial India.

By Glyn Barlow, M.A., second edition revised and enlarged. G. A. Natesan & Co., Madras. Price one rupee.

This book of over 200 pages should not be mistaken for a hand book of Indian industries. It is not intended to be such. It is an appeal to Indians generally to interest themselves in the industrial affairs of their country. The fact that the book is now in its second edition is an index of its popularity.

Recent Indian Finance.

By D. E. Wacha, G. A. Natesan & Co., Madras. Price 4 annas.

This brochure contains, among others, the letters on Indian Finance which Mr. Wacha contributed to the "Times of India" and an article on the subject of Indian Financial Reform which he contributed to the "Indian Review." They will show those who take an interest in the finances of the empire how imperative is the necessity for effectually checking and controlling the expenditure which for some years past has been allowed to overrun the normal revenue "at a pace which is positively disquieting if not alarming."

The Romance of Pen Industries.

By Dr. R. N. Saha, M.C.P.S., Benares, Rs. 5.

This book is a veritable mine of information regarding the writing materials which have made for the progress of mankind. It contains the history and traces the evolution of the pen, paper, and ink, and also details the processes of manufacturing, ink, paper, pencil the steel pen, gold pen, Stylographic pen and the fountain pen. The history of type-writing, short hand, wood engraving, photo engraving type—setting and printing are also detailed. The latter portion of the book is a survey of the industrial progress and possibilities of India. The work is dedicated to the Hon'ble Sir John Hewett. It will be welcome to all who take an interest in the industrial development of India, and will amply repay perusal.

HINTS AND RECIPES.

Testing Colour of Jam.

A simple method of testing whether the colour of jam is due to fruit juice or to aniline dye is to put a piece of white wool in it; if the stain washes out in water the colour is as it should be; if it will not wash out, it is due to aniline dye.

Poor Light Oil-lamps.

Sometimes oil-lamps give a very poor light. When this is the case, try placing a small piece of camphor in the oil vessel and you will find in a very short time the light will become quite bright. If no camphor is at hand, use a few drops of vinegar instead; it is most effective.

The Tomato as Food.

Dr. Kellogg says that the tomato unquestionably possesses a high dietetic value, and has been especially recommended for use in cases of blood impoverishment, a suggestion which perhaps rests upon the fact that it contains a considerable amount of iron. As a food for supplying iron, it is far superior to many of the combinations of iron so commonly used as a means of enriching the blood.

Soap and Shaving.

Hair readily absorbs, and is softened by water and oil, so it is moistened before shaving. Orientals usually use oil while Europeans mix the water with soap, as water alone is liable to dry too quickly. The barber keeps the lather for a certain time on his client's face in order that the water may have a softening effect. Rough and strongly alkaline soaps are liable to irritate soft skins when used for shaving, but, in other respects, the best soap is the one that lathers most readily.

Renovating Used Files.

The files are first carefully cleansed with hot water and soda; they are then brought into connection with the positive pole of a battery in a bath composed of 40 parts of sulphuric acid and 1,000 of water. The negative is formed of a copper spiral surrounding the files, but not touching them, the coil terminating in a wire which rises to the surface. This arrangement is the result of practical experience. When the files have been in the bath for ten minutes, they are taken out, washed and dried, when the whole of the hollows will be found to have been attacked in a sensible manner; but should the effect not be sufficient, they are placed in the bath for the same period as before. Sometimes two operations are necessary, but seldom more. The files thus treated are to all appearance, like new ones, and will be good for 60 hours work.—*Indian Textile Journal.*

A New Method for Preserving Meat.

A Russian named Devel has recently introduced a considerable improvement in the so-called Morgan method of preserving meat. This method consisted in injecting into the main artery of the slaughtered animal an aqueous solution of 33 per cent. sodium chloride and 30 per cent. saltpetre, the function of which is to act as an antiseptic or preservative. This method is of course patterned after the model of the ancient Egyptian embalming process.

According to the Devel modification of this method, the solution is not pumped in all at once, but in a pulsating manner, imitating the heart's action. A copper tube is introduced into the right ventricle of the heart, and the blood is thus gradually and completely washed out from the carcass. The operation is complete when on severing the carcass at any point, the liquid which issues is perfectly colorless.

The process occupies only four to seven minutes and consumes about four to six bucketfuls of the solution. The meat is laid in barrels which are filled with the same solution as that employed for the embalming process.

OPENINGS FOR BUSINESS.

[For particulars address the Director-General of Commercial Intelligence, New Imperial Secretariat, 1, Council House Street, Calcutta, mentioning the *Wealth of India.*]

Embossing Velvet.

A correspondent in Burma desires to be placed in communication with makers of devices for drawing, pressing and embossing figures or flowers on velvet or cloth. (1332).

Oil Seeds.

A correspondent in Trieste is desirous of being placed in communication with shippers of oil seeds who may desire to extend business in Austria. (1333).

Sporting Goods.

A London firm manufacturing athletic goods desires to be placed in communication with importers. (1334).

Linseed.

A firm in Budapest desires to be placed in touch with exporters of linseed from Calcutta. (1335).

Rape and Mustard Seed.

A firm in Austria desires to be placed in communication with exporters of rape and mustard seed from Karachi. (1336).

Rice.

A Budapest firm desires to be placed in communication with Calcutta and Rangoon shippers of rice. (1337).

Wild Pig Skins and Tushes.

A Government officer desires to be placed in communication with purchasers of wild pig skins and tushes. (1338).

Cotton Yarns.

A correspondent in Smyrna desires to be placed in touch with manufacturers of cotton yarn. (1339).

Furniture Leather.

A firm in Leeds desires to appoint agents in Calcutta, Bombay, Madras and Delhi for the sale of furniture leather. (1340).

Patna Rice.

A concern in Trieste desires to be placed in communication with shippers of Patna rice, sample of which may be seen at this office. (1341).

Oilseeds.

A correspondent in Trieste desires to be placed in communication with exporters of oilseeds. (1342).

Fancy Leathers.

A firm in Leeds desires to be placed in communication with suitable agents for the sale of all kinds of fancy leathers for book-binding, bags, purses, and fancy goods generally. (1343).

Pumping and Turbine Installations.

A London firm wishes to be placed in communication with firms interested in pumping and turbine installations. (1344).

Wood for Boxes.

A firm in London desires to be placed in communication with importers of shooks of wood for box manufacture. (1345).

Gut.

A concern preparing dried gut desires to be placed in communication with purchasers in Calcutta. (1346).

Belt Dressing.

A Dublin firm desires to appoint agents in Calcutta, Madras, Karachi and Delhi for the sale of a special belt dressing. (1347).

Jute Sacks.

A Government office in Turkey desires to be placed in communication with shippers of jute sacks, particulars of which may be obtained at this office. (1348).

Tussore Silk.

A firm in the Transvaal desires to be placed in communication with suppliers of tussore silk. (1349).

Market Bags.

The Director-General of Commercial Intelligence desires to hear from European importers of the bags known as "market bags" made of matting and used by fish-mongers and greengrocers. It is requested that samples and specifications of size and packing be furnished with approximate quotations. (1350).

MISCELLANEOUS.

Congress of Chambers of Commerce.

The eighth Congress of the Chambers of Commerce of the British Empire will open in London on the 10th June. The only resolutions that the Indian Chambers have yet decided to bring before the Congress relate to (1) the question of jail manufactures; and (2) the question of excise duty on Indian cottons.

Revolution in Shipping.

Great interest has been aroused in shipping circles by the arrival in London from Copenhagen of the Danish East Asiatic Company's funnelless 7,400 tons motor ship, the "Flandia," on her maiden trip to Bangkok. The Company are so satisfied with her trials that they have ordered two similar 10,000 ton vessels. It is declared that the economy involved will revolutionize shipping.

Inspectors-General Abolished.

With effect from the 1st April, 1912, the post of Inspector-General of Agriculture in India has been abolished as a separate appointment. The appointment will in future be combined with that of the Director of the Agricultural Research Institute and the Principal of the Agricultural College, Pusa, under the title of Agricultural Adviser to the Government of India, and Director of the Agricultural Research Institute, Pusa.

Similarly, the post of Inspector-General, Civil Veterinary Department, will cease to exist with effect from the 1st April, 1912. The functions of the Inspector-General, Civil Veterinary Department will, in future, be discharged as follows: (*a*) The Imperial Bacteriological Laboratory, Muktesar, United Provinces, will be placed under the immediate control of the Agricultural Adviser to the Government of India, (*b*) The management of the Government Cattle Farm, Hissar, will be made over to the Government of the Punjab and the Camel Specialist will also be placed under the orders of that Government.

The Overland Mail.

One effect of the transfer of the capital from Calcutta to Delhi will be the revival of the proposal that the Overland Mails for the North-West India should be detached at Aden and sent by a quick ferry steamer to Karachi. The proposal was made when the last contract with the P. and O. Company was made but apparently no action was taken on it then. With the Government of India now transferred to Delhi, the arrangement is certain to come under consideration, as it will save a delay of about a day in the arrival and despatch of the Mails.

The New Rupee.

The King-Emperor has been pleased to order the issue of a new rupee, bearing His Majesty's image and superscription. The new rupees are being issued at the Government treasuries, and, in common with all existing rupees, are legal tender throughout the country.

In order that people may not be deceived by false imitations, purporting to be the new rupees, the following description of His Majesty's new rupee is published, so that it may be easily identified :—

On one side is the image of the King-Emperor, wearing the Imperial Crown. His Majesty is shown as wearing the collars of the two Indian Orders, the Star of India and the Indian Empire. On the lower of the two collars, that of the Star of India, will be seen the figure of an elephant, which is the ancient symbol of kingliness in India. Round the edge is the superscription in English "George V, King-Emperor."

On the other side, in the centre are the words in English "One Rupee, India" above, and the year of coinage, with the words "One Rupee" in Persian below. In the ornamentation will be seen, at the top and bottom, a lotus, the emblematic flower of India, and, on either side, a rose, a shamrock and a thistle, the emblematic flowers of England, Ireland and Scotland.

The new small silver coins are of the same pattern as the new rupee; and the same effigy of the King-Emperor has been placed on the new bronze coins and the one-anna nickel piece.

All the coins have been manufactured in India.

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SPECIAL ARTICLES.

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HOW TO COMMAND SUCCESS.

BY

RICHARD LE GALLIENNE.

Go from the East to the West, as the sun and the stars direct thee;
Go with the girdle of man, go and encompass the earth;
Not for the gain of the gold; for the getting, the hoarding, the having;
But for the joy of the deed; but for the duty to do.
Go with the spiritual life, the higher volition and action;
With the great girdle of God, go and encompass the earth.

ARTHUR HUGH CLOUGH.

Success! What a beautiful word it is! Who will deny that it is the most beautiful word in the dictionary? Who would not choose it out of the whole world of words? Perhaps there is no other word so often on the lips of man, and surely there is none other so often in his thoughts or so constantly close to his heart. The boy takes it for his motto. He dreams over it to himself. It is not his own word, but some day it shall be. "Some day," he says, "I shall win success." Not the chiming of all the gold pieces on all the bank-counters of the world, not the gentle rustle of all the world's paper money, is so sweet to him as the sound of that word, "success." What a word it must be to die with! "Thank God, I have won success!" So soon as a man can say that, death has lost half its sting, for no little of our

fear of death is the fear that we may die before we have succeeded. When our success is surely ours, death means only new worlds for us to conquer. But, in that hour, we shall need to be sure that it has been true success, or fairly won ; success which our own inmost hearts affirm—not merely exterior success, which one's sincere self knows to be false, or of which it may even be ashamed. Such, it is needless to say, is no true success ; for an essential element of success is peace. To any but the meanest soul, how humiliating is success we have not deserved ! But, actually, such a thing is impossible. We get all we deserve, and deserve all we get.

THE TRUTH ABOUT OURSELVES.

This may seem a hard—or easy—saying ; but, if pondered, I believe it will be seen to justify itself, not from the standpoint of cheap optimism, which merely ignores the stern facts of life, but from that of an experience which fears not to accept them. Of course, the usual margin must be allowed for that element of accident which enters into all human affairs, or occasionally upsets 'the best laid schemes of mice and men.' The swiftest runner in the world may have the bad luck to break his leg, and so lose the race. The race is not, invariably to the swift, nor is the battle always to the strong ; but it usually is—in fact, so uniformly as to make the few exceptions of no account. To deserve success is to "command" it.

What is success ?

Success consists in getting out of yourself all the good there is in you, or out of life all of worth there is in it for you. As to whether or not a man has done this, he alone is the ultimate judge. His own soul will tell him truthfully about the matter in the end, even though for many an intervening year he may have stilled the ache of failure with flattering sophistries. Sooner or later—too often later—we tell ourselves the truth about ourselves. If we have failed we know it too bitterly. There is no need to print our names in the Gazette. When the time comes to cast up accounts with ourselves, there must be no "hedging." If our dream was to be rich, and we have ended poor, it is no use pretending that we are well off, or that we have "moral compensations" which adjust the balance. Let us face it manfully. We have failed. Better luck next time, may be ; but meanwhile, we have flatly or completely failed. After all, success is success, and if we have missed it, it is no use pretending that we have found a substitute. There is no substitute. Of course, we may say that we don't mind having failed. Some grapes are very sour and grow particularly high.

When one man says that to deserve success is to win it, it by no means follows that success is easily won. To deserve success is no light matter. Mere gifts or talents will not suffice. Gifts and talents are merely the raw material out of which your artist in success—for success is an art in itself—creates his masterpiece.

THE FAILURES.

This is no doubt sufficiently evident. Yet, like all obvious truths, it is being continually overlooked by the competent failure, the man that, one would say, ought to have succeeded —for he had the capacity. Such failures are usually explained by lack of opportunity, but the kindly fiction deceives no one. If there is one thing the world is full of, it is opportunity. The market is overstocked with it. Opportunities no one seems willing to take are as common as girls no man seeks to marry —nice girls, too. No, if one brings the ability, the world will provide the opportunity. Sooner or later, if we go the right way about it, the world gives us a fair rate of exchange for ourselves. But, of course, much depends on how we place our goods on the market.

Gifts in themselves are not enough. We must know how to manage our gifts. More than half of success lies in the proper management of our gifts. The gifts are hardly more important. Of course, there are people who expect success, without gifts, or work, or anything ; idle malcontents, who seem to think the world is in debt to them for honouring it with their presence, thriftless camp-followers in the battle of life ; a strange race of men and women, at whom one can only look with curious wonder.

Few processes are so delicate or complicated as those of success. Who would venture to say that he has mastered them ?—mastered them so thoroughly that he can venture to tell another human being how to make a success of his individual life. Some people who succeed never seek counsel. They have instincts which guide them aright in the most difficult moves of the game. They make mistakes, of course. It is often necessary to make mistakes once, so that one need not make them a second time.

It is, of course, easy to give general advice. We can follow the process here and there, or point out this or that feature of it, but we can only see so far. At a certain point the secret eludes us.

THE LIPTON AND WANAMAKERS.

Take, for example, the great business builders, the Liptons, the Wanamakers. When one reads of their methods, there seems nothing remarkable, or mysterious, or even novel about them. Many clever and industrious men are daily employing the same methods—as far as we can see—without achieving any such substantial success. Wherein lies the difference ? Is it mere luck ? No, that explanation will not suffice. Your Liptons and Wanamakers never wait for luck. No doubt, they have their share, but, as one reads the stories of their success, he finds no evidence of any special providence or luck attending them. Such "luck" as they have had seems to have come through the capacity for fearlessly taking opportunity on the instant. They are men of rapidly working imaginations, are of great courage ; for imagination and courage are qualities which one can safely set down as indispensable to any form of success. The part played by imagination in business is but little recognised ; yet a moment's thought will show how important it is. A business man, like J. Pierpont Morgan possesses enough imagination to set up a dozen poets. Such courage is obvious.

Still, a man may have imagination and courage, and all the other gifts or qualities guaranteed to assure success, and yet miss it. One may marshal all the various components necessary for the mysterious compound, yet it may obstinately refuse to result ; just as two men may take materials and tools of the same kind, and the one turn out a product correct to a fraction, and the other make a dismal failure by many places of decimals. There must have been something in the blending, or sleight of hand, some knack of which the successful man is probably as unconscious as the unsuccessful. Of course, there must, and, alas ! it is just that mysterious something or other which makes success.

OPTIMISTIC FATALISM.

However, whatever may be the qualities necessary to command success, and whatever may be the secret of their combination, there is certainly one quality that the would-be successful will do well to cultivate. I might call it an optimistic fatalism. Earlier on, I said that, in a real sense, we get all we deserve, and deserve all we get. I am sure that the successful man always believes this with all his heart.

Unsuccessful persons are usually those who are not sure of their own value. The successful man never doubts his for a moment. I don't mean that he is arrogantly sure of himself. He is scientifically sure of himself. If you possess a fine diamond, and know how fine it is, you have no misgivings as to its being marketable. You may, indeed, should you offer it for sale, be offered less than its worth, or there will be those who, from ignorance, may honestly underestimate its value ; but you know well enough what it can bring you, and know that the world will give you honest value for it, if you offer it in the right market.

So a man with the jewel of brains knows that it rests with him to get his value for it from the world. He must, of course, use tact and skill in offering his mental goods, and not foul his chances ; or, if at first he doesn't

succeed, he laughingly tries, tries, and tries again.

Laughingly, I say; for a light heart under failure is another condition of success, which may be written down as an essential. No one should need to be warned against the deleterious effects of blues. Nothing deadens the heart of enterprise, or unstrings the nerves of action, like a fit of the blues. In one of those beautiful prayers which Robert Louis Stevenson wrote for us, in his Samoan household he prayed for courage and gaiety and a quiet mind. A man who backs up his brains with these three gifts has all the odds in his favour. It is next to impossible that he should fail in what he undertakes to accomplish.

Gaiety is the essence of power. What is there in a failure or two to cry about, or in a dozen failures, when you know you are bound to get there? Success is not an external trophy, not something you have to hunt or ensnare, like a bird. Success inheres in one self, or in every true piece of work one does. Not the most powerful opposition, not the bitterest or meanest under-estimation, can do more than delay any success we really deserve. Ultimately, we and our work must be assessed at its proper value; and, though we may be dead when the time comes, we shall have succeeded none the less. Every day we hear of men succeeding in their graves. But that only means that the world was slow to see that they had succeeded years ago, while they were living and working with us. The men themselves, we may be sure, though robbed of temporary rewards, knew, deep in their hearts, that they had succeeded, and confidently left their work behind to "report them and their cause aright," when the time should come for its value to be understood. To be misunderstood, to be vilified, to be laughed at, to die poor and unregarded, is not to fail. So long as you know, without a shadow of doubt, that your work is real, and that the very universe is committed to take care of it, and compel its recognition, you can afford to die with a smile on your lips, or the sunshine of success filling your heart.

Browning has told us of "Rossini patient in his stall" during the triumphs of a rival that for a time obscured him. But it was easy for Rossini to be patient. He knew the value of his music. He could afford to sit still and wait. His time was bound to come. It is not only "foul deeds" that "must rise, though all the earth o'erwhelm them, to men's eyes." True work, no less inexorably, ascends, sooner or later, into the light of the day.

William Watson, in one of his poems, has spoken of "that stillness on a base of power." There is fine counsel, as well as truth, in the phrase; for true power goes as quietly about its work as gravitation. Failure is usually a nervous, fidgety creature, perpetually agitating itself as to whether or not it is succeeding; whether or not it is winning acceptance. Success, on the other hand, does its work, does it with all its might, knows for certain that it has done it well, and, come praise or blame, passes quickly on to its next job; or, if it be not always so scientifically sure of itself as this, it practises what I have called an "optimistic fatalism."

A SUCCESSFUL WORLD.

Good or bad, the work must find its level. The stern assessment laws of human labour are not to be influenced a hairbreadth by any solicitude of ours. If we have adulterated our goods, so much the worse for us in the end. The sham is certain to be exposed. But if our goods be sound throughout, it will be counted to us for righteousness with the same unerring justice.

Oh! of this there can be no doubt at all. It is merely a law of the universe. Therefore, the honest workman in his workshop of the world need not trouble his head about the fate of his work. His business is to do it, do it well, for the distributing agencies of life will see to it that he, in time, shall receive a reward.

I am aware that all this seems very optimistic, and I may be reminded that, for all that, the world is well stocked with brilliant failures. Of course, no one denies the existence of failure, even under the most advantageous conditions. But, then, think how overwhelmingly the successes preponderate. Ours is unquestionably a successful world. We have no knowledge of how the other planets are succeeding in their worldbusinesses; but ours, undoubtedly, is a thriving, prosperous, and go-ahead world for its size. So far we know, we fear no comparisons, and might, indeed, venture to invite competition. If the world were not a success, it would stop being a world, and become bankrupt like any other foundered enterprise; for success is the law of life—one might define it as vitality victoriously applied; and success must, therefore, and obviously, be the rule, not the exception, in human life.

Of course, we cannot all be Wanamakers, or Liptons, or Morgans; but, perhaps, one may be permitted gently to whisper that there are other forms of success, for need I say that it is of the essence of true success that it is our own we want, not somebody else's idea of success. For heaven's sake, don't think you have failed because other people tell you so! You couldn't make a greater mistake. Self-confidence is a noble qualification.

161674

LOW WAGES IN INDIA.

BY

M. BALAKRISHNA, M.A.

[*Late Principal and Governor and Professor of Economics, Gurukula, Hardwar.*]

All dressed in raiment bright and clean
And every townsman might be seen
With ear-rings, wreath or chain.
A piece of gold, the smallest pay
Was earned by labour for a day.
On every arm were bracelets worn
And none was faithless or forsworn.
(Ramayana)

Such are the remarkable scenes of the great affluence and prosperity of ancient Aryavarta in the days of its glory. Such soul-stirring descriptions of its mighty civilization are not few and far between but are profusely scattered when we anxiously penetrate through the thick vistas enshrouding its unexplored regions of antiquity. A similar abundance of wealth continued to exist in India and its dependencies through countless centuries of the Treta and Dwapara Ugas and even up to the time of Chandragupta in the Kali age.

To-day when we turn our eyes upon the dazzling glare of Western civilization, we find nearly the same state of things as regards material wealth, although there are fundamental differences in the distribution of wealth in the ancient and modern *regime*. In the civilized countries, a common labourer is getting gold as his daily wages and is happily living in affluence. For instance, in England, America and Australia, labourers of ordinary skill and intelligence are getting 4, 5, 6 shillings respectively *per diem*. While in India, the average daily wages of a labourer come up to As. 6 only: that is, his European compeer and co-worker is getting ten times as much as he. Such a vast and marked difference in the rewards of labour in our country and the European countries, should naturally attract the attention of all. Above all, it appears to be the duty of all students of economics to disclose the causes of the terribly low wages in India and to suggest the remedies if any, for enhancing them, at least to the margin of the absolute necessaries of human life.

We know that no social phenomenon is the result of a single force, that most generally, it is a complex and heterogeneous entity and is the product of many visible and invisible forces. We can not explain the genesis, growth and persevering continuity of this all-engrossing phenomenon on the basis of a few causes. Various factors, social, religious, mental, political and economic have conspired together to bring about such an abominably low standard of living and an awfully low wages found in the world. A complete study of these causes is essential for the systematic study of the Economic History of India. In the present essay, an humble attempt has been made to reveal the principal causes and discuss them as briefly as possible.

Foreign aggression may be mentioned as the first cause of the low wages and low standard of life.

This is not the time and the place to lay bare the oppressions on the peasantry of the country, by the almost independent Viceroys of the Provinces of the Muslim Kings of Delhi. They are writ large in the pages of the History of the Moghuls, Wheeler's History of India, and found interspersed in many other histories of the time. One small quotation from Prof. Max Muller's "India: What can it teach us" would be sufficient to show indirectly the consequence of the supremacy of the Muslim rule.

"When you read of the terrors and horrors of Mohamedan rule, when you read of the atrocities committed by the Mohamedan conquerors of India after that time (1000 A. P.) to the time when England stepped in, the wonder, to my mind, is how any nation could have survived such an *inferno*, without being turned into devils themselves."

It goes without saying that an oppressed and heavily-taxed peasantry is the greatest curse to a country—and especially to agricultural countries like India where even to-day more than 80 per cent. of the population are living on agriculture. Agriculture has been considered as the noblest and most lucrative profession in India. Agriculture has been named as the only basis of national prosperity and progress by philosophers and economists of the Physiocratic school. The peasantry have been truly called the backbone of a country.

But during the Muslim domination of India, the peasants had to pay almost all the output of their harvests in the shape of land-taxes, *jazia*, exactions of the village and higher officials, billetings of soldiers and bribes toward off the wrath of the petty village kings. After hard work in the field from the dewy morn to the starry night, a peasant was contented with poor meals—such as a slice of bread and a cup of whey—and thanked God that his head was at least saved.

For the above mentioned reasons it is our strong belief that peasants throughout Muslim India lived a life of appalling poverty and heart rending misery.

Now, it is an economic principle that wages in manufacturing as well as other professions are sooner or later governed by agricultural wages. The mode of living on the part of the agricultural population necessarily sets a minimum standard of wages for mechanical labour—as that of a carpenter, blacksmith or mason. If the wages of the mechanical pursuits be higher than those of agriculture, then the farm-labourers, quitting their farms, would adopt those professions and thus reduce those wages to the level of those obtaining in agriculture. Although movements of labour in India from agriculture to other professions are very slow, yet six hundred years are no small period for such changes to be effectively made.

The upshot of the argument of this section thus is that owing to heavy taxation and exactions in different forms, a low standard of living came to prevail among the agricultural population which set a standard to the wages of all other occupations. Students of economics are well aware that the sympathy of markets plays a prominent part in the economic life of a nation.

(2) Let us turn our attention from the village to the town. Even there, the Hindu was fully fleeced of all his belongings. Insecurity of life, person and property always stood incarnated before him. The less blood the rulers drew the more they took of treasure is but a truism. Morton's practice of extorting money for his Sovereign Henry VII of England was practised with a vengeance in India. Greedy Kings and Officers extorted gifts from men who lived handsomely, on the ground that their wealth was manifest and from those who lived plainly on the plea that economy had made them wealthy. Clearly then, the springs of industry, honesty, hopefulness and abstinence were fast drying at their very source. "Successful falsehood is the best defence of a slave." The Hindus wore rags and clung to falsehood and dissimulation as if for life itself. They were prohibited during

certain reigns the use of horses and palanquins, they had to ask permission to celebrate their festivities and even then, there was no joy because they were fettered by restraints and disabilities all around. The Hindu nation was really in sackcloths and ashes. The rich had to cut short all their wants and act like poor men, in living, eating and drinking. Thus the standard of comfort was lowered still and there was the decline of real wages.

(3) Religious hatred played no less a part in lowering this standard. The bigoted Muslims looked upon every Hindu as a Kafir—as a being to be preyed upon by the injunctions of God himself, so he could not brook the sight of a Hindu joyously tripping in richy clothes or whiling away his time in busy idleness in his palatial residence. He must be reduced to the level of brutes, especially when he, by the grace of God, had been made a slave.

(4) *Religion favours a low standard of living.* Both the Muslim and the Hindu religions condemn show and extravagance and sing the praises of simple living. Still further, the social customs of the Hindus themselves encourage a low standard. Prof. Marshall has truly said, "In India, and to a less extent, in Ireland, we find people who do indeed abstain from immediate enjoyments and *save up considerable sums with considerable self-sacrifice*, but spend all their savings in lavish festivities at funerals and marriages." *This considerable self-sacrifice denies the body its full requirements and thus habituates it to live on a low standard.*

(5) *Equal Division of Property also fosters a low standard of living.* The Hindu law regarding the distribution of parental property is that it should be divided equally among the sons and it is not the law of primogeniture as in England. The Hindus under the strictly unsympathetic foreign rule for centuries had lost all spirit of enterprise and adventure. They had no longings for fresh fields and pastures new, like the pilgrim fathers of England. They might have bid adieu to the country of their birth and colonized new lands. But the manly spirit of old was killed out of the Indians. They suffered tyranny and oppression as if they were the rare gifts of providence. The law of equal division of property in a limited area has the tendency to divide and sub-divide, the paternal immoveable property and thus bring poverty on those who content themselves with this inheritance. In France this same law holds good. But that country would have been ruined like India, had not the members of a dividing family waived their rights of inheriting property in favour of the strongest member and themselves gone in search of fresh fields in new countries or engaged in other industries. Besides the evil of minutest division of property and consequent small and dear production, *there crops up a still graver evil of over population which still more lowers the standard of living.* If the agricultural population sticks to the land as in India and does not stir out to the towns to seek new professions, the parasites of the community shall be ever on the increase. Thus destitution, hunger, degredation—sisters three, worked alike in bearing the corpse of the dead and country to the graveyard of eternal oblivion.

(6) *Poverty is itself the cause of poverty.* All the five causes enumerated above working concurrently, rapidly lower the standard of comfort and this again has terrible effects on the efficiency of labour. As Prof. Nicholson remarks, "A man, for example, might live for a long time on two shillings a week, and the consequent degradation might utterly destroy the efficiency of his labour, so that there would not really be more than two shillings to receive." Thus poverty is itself the cause of poverty.

(8) *Law and custom both influence wages* and in India both have conspired to bring down the standard of wages. In England and on the continent of Europe, rent of land has been fixed up to even, now by the force of custom, and not by competition. Similarly wages might be prevented from going down by the force of public opinion. General Walker writes:

"When the writer first ventured in 1874, to urge that respect for labour and sympathy with

the labouring class might become a force in determining the market rate of wages, he was greeted with derision. He has reason to believe that the cause thus adduced is not an unreality but one which actually operates with perceptible force within the field of economics." If we remember aright, in Australia there is a law that every strong bodied labourer shall be given 5 *sh.* as daily wages and if he cannot secure work of his own accord, he shall be provided with it by the Government at the same rate. If the forces of competition should have their full play in Australia, the daily wages of a labourer might be fixed as 4 *sh.* But the law has increased them by creating extra demand for labourers. In India, Mahomedan legislation was not favourable to high wages. The *Begar* system was prevalent from top to bottom and labourers found scant justice in the law courts.

Custom is historically prior to law (Maine's Ancient Law) but law also makes certain customs. No wages or low wages was the law of the day and this grew to be a custom. The Hindus submitted to it as to a decree of Providence and public opinion was by and by gained to it.

(9) *Inefficiency of Labour is the most potent cause of low wages.* The Hindus had lost with their political greatness all the arts and industries in which they were proficient. An un-skilled labourer can get small remuneration. Again with the loss of skill, if a nation has also lost self-respect, social ambition, courageous habits of initiative and enterprise, then there is very little hope of its recovery. If the previous wages had been barely sufficient to furnish the necessaries of life, the falling off in the quantity and quality of food and clothing and in the convenience and healthfulness of the shelter enjoyed would at once affect the efficiency of the individual labourer. With less food, less clothing and scantier and meaner quarters, the labourer would become less efficient, simply through the reduction of his wages (Walker 287).

(10) *Abundance of food stuff and scarcity of coins.* The last but not the least important cause of the low wages was the relative abundance of the necessaries of life on the one hand and a great scarcity of coined money which serves as a medium of exchange. The pure quantity theory of money is to be strictly applied here. The exchangeable things in a country remaining the same, the greater the number of coins in circulation, the less articles would be exchanged with one coin and *vice versa.*

The value of money, like the value of any thing else, is determined by the relation between demand and supply, The goods to be exchanged for money pieces remaining the same in amount and the number of coins having been increased, the purchasing power of each piece falls. (Walker's Pol. Eco.)

It can be shown by various arguments while we are unable to detail owing to exigencies of space, that during the Muslim domination, *good* money was extremely scarce, and even quite insufficient for the daily use of the community. The number of coins being very small, all things remaining the same, each coin will buy more articles. Hence it was possible that our forefathers could get 5 seers of ghee and one maund of wheat for one rupee only. During the British Raj, the position of the two factors were changed. India was flooded with silver money, while, owing to the growth of population, exportation of corn and unavoidable connection with the world-wide markets, Indian prices rose to a higher level. But more of this afterwards.

Now we have finished the discussion of the principal causes which converged to lower the wages of the labourer and the general level of prices in India during the Muhammadan rule. In our succeeding articles, we shall disclose new principal causes which have kept up the low wages even during the British Raj and if possible, we shall point out some remedies to raise them to the standard of reasonable comfort—a standard which should render man's life at least tolerable to himself and to others.

VIEWS AND REVIEWS.

Principles of Paddy Manuring.

A Bulletin of the Department of Agriculture, Madras, dealing with the above subject states, that broadly speaking, in manuring these crops, attention is primarily paid to supply an adequate amount of nitrogen and phosphoric acid, the supply of potash only receiving a secondary consideration. The need for supplying potash in paddy manuring is comparatively unimportant and is determined chiefly by the character of the soil on which the crop is grown. This is an exceedingly fortunate result to obtain, for potash is expensive and consequently the fact that its use can usually be dispensed with decreases very greatly the cost of manuring. It is true that the use of a comparatively large amount of potash has often led to a large increase in yield, but in these cases, the cost of the manure supplied has often been greater than the increased value to the crop obtained, and has in fact resulted in a small loss to the cultivator.

The results arrived at so far may be summarized as follows:—1. Paddy soils need manuring with bulky organic manures which readily decompose under anærobic conditions, yielding humus; 2. Nitrates are unsuited for the purpose, whereas ammoniacal manures or manures which yield ammonia under anærobic conditions of fermentation are of great value; 3. Nitrogen and phosphoric acid must be applied to all paddy soils, whereas potash should only be applied when the soil is in particular need of that ingredient.

The Indian Sugar Industry.

At the last meeting of the Indian Industrial Conference, Mr. Mukhtar Singh, of Meerut, gave a rough sketch of the improvements in sugar manufacture which he considered could be very easily introduced into India and the advantages to be derived therefrom would, he thought, be appreciable. In Mr. Singh's opinion, the thin soft skinned cane is always the best suited for sugar-making as the juice can be expressed more easily and completely. Another important factor is seed selection The upper part of the cane should be chopped off for seed, but only from those canes which are healthy. Still another important point on which the cultivator should be enlightened is the value and proper use of suitable manures. There are very cheap manures which can with advantage be used by cane cultivators. One is green manuring. Pea, hemp, indigo and such other crops are grown and, when ready to bring forth flowers, ploughed in and irrigated. Thus the whole crop so sown is turned into manure. Indigo and pea crops are not so well suited as green manure for cane; hemp is better. The next important point in cultivation is the hoeing of the cane crop, which is now often neglected in favour of irrigation, though the one is not a proper substitute for the other. On the other hand, hoeing and watering, in their proper places, are the best remedies against cane diseases. Another point to which cultivators should give much more attention is the importance of crushing newly cut canes at the earliest possible moment; otherwise, chemical action sets in and the cane rapidly deteriorates.

Duck-Rearing at a Profit.

This is a commercial age, and every one is looking out for something which pays, for, owing to keen competition in all branches of business, very few people can afford to indulge in hobbies merely as such. In return for food consumed nothing gives such a thoroughly satisfactory return for the outlay, says the *Poultry Journal* for March as a good strain of fowls or ducks, because there are eggs for consumption as well as the most delicate and delicious food it is possible to produce. There are several breeds of fowls which provide all that is required in this combined production, but only one breed of ducks, the Buff Orpingtons, has solved the question of profitable duck raising for every one who takes it up. They are *the* ducks of the present and of the future, because they can be relied on to produce eggs

just at the time when it is absolutely necessary for them to be forthcoming to get the young birds hatched out in time to secure the best prices for table ducklings. A profitable plan would be to have two pens of birds unrelated to each other; then the drakes raised from the one could be mated to the ducks raised from the other, and *vice versa*; then enough drakes for the following year's breeding should be reserved, and the remainder killed.

From this small start, a man should be able to get a good living after the first year by raising ducklings alone; and the suggested plan of procedure should receive the careful consideration of those who have grass land, or who are not fully occupied, as well as those who want to take up a profitable branch of work in connection with poultry-keeping, because there is a tremendous demand for table ducklings at paying prices; but hitherto the supply is infinitesimal.

Commercial Education.

There is a general notion, says Mr. C. Gopal Menon in the April number of the *Indian Review*, that Commercial Education is nothing more than the bare teaching of Commercial subjects, and that methods of commerce may even be gathered by undergoing an apprenticeship in the routine of office work. It may be that some men have been successful in business without much specialised training, but the characteristics of modern commerce being increased competition and increased complexity, it would be only men of exceptional ability and energy that would triumph over enormous difficulties. The two outstanding points of difference between the commerce of to-day and the commerce of fifty years ago being increased complexity and increased competition, the education of a business man should be such as to develop in him business powers and business knowledge. *Business power* is best developed just as other intellectual and moral qualities are developed, by a good general education in the School and the University, but the acquirement of *business knowledge* should be considered as specialised instruction. The so-called Business Schools and Commercial academies are not an aid to true Commercial Education; they may be aids to a certain extent so far as the training of junior clerks are concerned, but such education is merely elementary in its character. They are useful for counting-house clerks, bank, railway and insurance clerks. But Commercial Education is not only for clerks; it is as much, or more, required for employers, heads of houses and departments, agents and travellers, and Captains of industries, especially those industries which involve the application of science—the study of higher Commercial Subjects including (1) Economics—the Study of Economic conditions of commerce; (2) Commercial Law; (3) the Commodities of Commerce and their Geographical distribution; (4) the machinery of commerce including such subjects as Commercial Practice, Theory and Practice of Accountancy and Company Administration and (5) the special subjects of particular business, such as banking, insurance, shipping, the sale of goods and railway administration.

The Temperance Movement in India.

Professor Jogindranath Samaddar writing on the above subject in the February issue of the *Hindustan Review* quotes from the *Calcutta Review* of 1844 to prove that both Hindus and Muhammadans at that time were very sober and temperate.

As a contrast, he presents to his readers the following figures: the alcoholic beverages imported into India in 1858-59 totalled, 652,246 gallons; in 1863-64, they rose to 1,338,684 gallons; in 1868-69 to 1,367,350 gallons; in 1873-74 to 1,429,244 gallons; and in 1888-89 they reached a total of 1,484,209 gallons. The increase has been so much that the revenue derived by the Indian Government from the sale of intoxicants rose from £1,561,000 in 1874-75 to £6,281,000 in 1905-06, the annual yield having been more than trebled in 30 years. In 1908-09, it was £6,342,000 *i.e.*, it had quadrupled in 35 years. The annual Excise Reports reveal some facts regarding the various Provincial Governments of India. Almost without exception, these documents report a continuous rise in liquor revenue and consumption. In Bengal, in 1894-95, 455,595 gallons were consumed, but in 1904-05, 700,000 gallons were devoured. The excise revenue in 1902 was Rs. 1,25,82,808; in 1903—Rs. 1,30,11,358; in 1904—Rs. 1,35,18,313; in 1905 Rs. 1,46,24,956; in 1906—Rs. 1,53,44,423. In the Punjab, there has been a continued growth in the revenue, amounting in three years to a rise of 8½ lakhs of rupees. In the Central Provinces, there has been an increase of 20¾ lakhs in revenue.

The Professor after pointing out that both the great religions of India, Hinduism and Muhammadanism, prohibit drinking, thus a new adverts on the economic evils resulting from too-great a consumption of intoxicating liquors: not only does drinking cause an economic loss because drinkers are less capable members of the community than they would be otherwise, but the very preparation of a strong drink, involves a great waste of the resources of the country. The materials from which alcoholic drinks are made are all or nearly all excellent foods; but when they have been converted into strong drinks, they are of very much reduced food value. Thus, when barley is converted into beer, 70 p. c. of its value as a food is lost, and an increase in drinking thus means an increased waste of national resources, a matter which cannot be considered as of no importance. The manufacture of drink has another economic disadvantage, *viz.*, that less employment is given in proportion to the value of the product in the manufacture of liquor than in any other kind of industry carried on in the civilised world.

Cotton-seed oil in the U.S.A.

The growing importance of cotton-seed oil as a factor in international commerce as well as in domestic consumption is well illustrated, says *Commercial America* for March 1912, by the following figures: The value of cotton-seed oil exportations in the year ending December 31, 1911, were $21,839,157, against a little over 2½ million dollars in 1885, 6½ million in 1895, 15½ million in 1905, and $19,813,823 in 1908, the former high record year in exports of this article. For the month of January alone, the value of the exports is nearly 4 million dollars, suggesting a still further increase in the total for the current year. The value of cotton-seed oil exported from the United States during the decade is considerably more than 150 million dollars. The development of the cotton-seed oil industry in the United States has been phenomenal. The total value of the product of cotton-seed oil and of oil cake and oil cake meal resulting from its manufacture was, according to the census of 1880, 4½ million dollars; 1890, about 20 million; 1900, 42 million and 1910, 125 million dollars. Of crude cotton-seed oil only, the production increased from 54 2/3 million pounds in 1880 to 308 million in 1890, 724 million in 1900, and 1,260 million in 1910. That a growing proportion of the enlarged production is consumed in the United States is evident from the fact that 82 per cent of the total output was retained for home consumption in 1910, against 49 per cent. a decade earlier.

Europe offers the largest market for cotton-seed oil exported from the United States, the principal countries of destination being the Netherlands, the United Kingdom, Italy, France, and Germany in Europe; and Mexico and Canada in North America. To the Netherlands, last year's exports aggregated 65 million pounds, or 20 per cent. of the total; to the United Kingdom, 58 1/2 million, or 18 per cent.; to Italy, 33 3/4 million, or about 10 per cent; to Mexico, 28 1/2 million, or nine per cent.; to France, 21 million, or 6 1/2 per cent.; to Germany, 15 1/2 million, or 4 3/4 per cent.; and to Canada, 13 million pounds, or 4 per cent. of the total exports during the calendar year.

The increased consumption of cotton-seed oil in the United States, as well as the large exportation to foreign countries, is largely the result of the rapid extension of the industrial and other uses to which it is applied both in

this and other countries. Cotton-seed oil, which has now come to be recognized as a cheap yet wholesome article of food, is largely used in the manufacture of lard compounds' butterine and other substitutes for butter, in the packing and preserving of fish, in making salad oils, and in the manufacture of the so-called olive oil of commerce. The crude oil is valuable as soap stock, yielding, when treated with certain alkalies, soap, washing powder, glycerine, etc Among its miscellaneous applications may be mentioned its use in medicine, in the preparation of cosmetics, liniments and emulsions, in mines as an illuminating oil for miners' lamps, for tempering edged tools, for mixing with putty, and for rough painting.

Woollens in India.

Mr. R. Palit, late Editor, *Indian Economist*, contributes to the March number of the *Modern World* a valuable article on the "Prospects of woollen manufactures for India." Mr. Palit gives detailed particulars of the woollen industries as now carried on in Europe, a succinct summary of which is furnished below :—

The industry may be divided into two great divisions, primarily dependent upon (1) the class of wool, and (2) the method of manipulation. To a certain extent, the first dictates the second. These two are the woollen and the worsted trades, each being sub-divisible again into several minor branches. The woollen industry of Europe takes for its raw materials chiefly the fine, short, felting wools technically denominated "clothing" or "carding" wools, to which are added the manufactured wools, "shoddies," "mungos" and extracts From these are produced the fine clothes of the West of England, Leeds and other places, and those of several centres on the Continent, the heavy fabrics of the Huddersfield districts ; the tweeds of Scotland and Ireland ; and the shoddy clothes of Dewsbury and Batley—including all ranges and qualities, from the finest to the coarsest, for male and female wear. The worsted division, for its share of the raw materials, claims all the long or "combing" wools, as they are termed, represented by the wools obtained from the Leicester breeds of sheep and the varieties which have been developed from them.

The processes of manufacture are then described. They are: (*a*) stapling or sorting, (*b*) the cleaning processes of washing, scouring and rinsing (*c*) drying, (*d*) wool-opening or disentangling the matted fibres of wool, (*e*) burring or the removing of the vegetable seeds embedded in the wool and lastly (*f*) oiling. The processes hitherto described—although woollen manufacture has been specially kept in view—are more or less essential to wool for all purposes to which it is applied. But from this point, the manufacturing operations diverge into three main channels, which may be regarded as almost distinct textile industries. First, we have the felt manufacture, in which cloth is made without either spinning or weaving ; second, is the woollen yarn and cloth manufacture, embracing the preparation of carded yarns and of cloth which is so felted as to have the appearance of felt; and, thirdly, in the worsted yarn and cloth industry, combed yarn is prepared and cloth showing the yarn and pattern is woven.

Mr. Palit quotes from the *Ramayana* and the *Mahabarata* to furnish historical proof that the manufacture of woollen goods was one of the earliest occupations in India and concludes :—

In India, the hilly tracts of Sikkim and Thibet have from time immemorial been known as the best places for rearing sheep. The quantity of wool available from Thibet, for export, is believed to be enormous. It is further stated that between Kamba and Shigatse, within a march and a half of the Sikkim frontier, at the head of the Lachen, sheep are killed not for the sake of their hides or fleece, which are practically valueless for want of a market, but in order that their carcasses may be dried into jerket meat, and sold for 8 annas each. We thus see that there is much possibility of carrying on a thriving business in and about those territories.

Agricultural Education in India.

Dr. N. Kunjan Pillai, M.A., B. SC., PH. D., Director of Agriculture, Travancore, read a paper on "Agricultural Education" at the last annual session of the South Indian Association, Madras. Agricultural education is regarded everywhere as the most potent factor in the introduction of permanent improvements in agriculture. All other measures, such as holding demonstrations, delivering lectures, publishing leaflets, etc., will have but a temporary effect in a country which has not made ample provision for the training of its boys in agricultural science. Agricultural education is, therefore, the basis of all real progress in agriculture. Its importance has been recognised by all countries which have adopted scientific methods of cultivation. This is what the late King Edward VII said about it on the occasion of opening the new buildings of the University of Leeds in July 1908 :—"It is a source of pleasure to me to know that you have provided also for the study of the theory and practice of agriculture, for, I am convinced that the best possible results cannot be derived from the industrial and natural ability of our farmers unless they are properly instructed in the scientific aspects of their work."

Mr. Pillai reviewed the educational work done in foreign countries such as Germany, United States, Japan and Holland and outlined the following scheme for adoption in India : All boys should along with the 3 R's be taught something about Nature that surrounds them and should be given some practical experience in school-gardening, kindergarten, etc. The elementary knowledge of agriculture which the boys may gain in these schools will be of practical use to all those who are to follow the agricultural profession in after-life, and a large majority of them will have to follow this profession. Then, they should undergo an apprenticeship of one or two years on a well-managed arm to get the necessary practical experience in farming. After they have acquired the necessary practical training, they should have facilities for continuing their agricultural education. Then again agricultural schools should be started.

The courses may extend over two years and more, if necessary, and should deal with the fundamental principles of agriculture in general and with such aspects of it in particular as are applicable to the conditions of the localities in which the schools are situated. Of course the medium of instruction should be, the vernacular of the locality and the teaching should be as far as possible practical.

Education is essentially a Government concern but not entirely so, said Mr. Pillai. In India, the question of agricultural education is receiving some attention at the hands of the Government but not as much as its importance requires. Till recently, the question of agricultural improvement did not seriously engage the attention of Government. But now they have come forward with a liberal heart and a full purse to help the agricultural population. They have organised the Department of Agriculture, they have opened Experimental Stations and Demonstration Farms, they have established a magnificent Agricultural Research Institute and several Provincial Agricultural Colleges, they have done these and intend doing more for the sake of the people. But the people themselves practically remain idle ; they, not only do not help Government in the work they have undertaken, but are even loath to avail themselves of the splendid opportunities that Government offer them. Unless we wake up and see clearly the present backward condition of our agriculture, unless we realise that the attempts of Government to improve our agricultural methods are for our own good, and unless we strain our nerves to help and co-operate with them in the difficult task of spreading scientific knowledge among farmers, India cannot hope to regain, in the near future, the glorious agricultural prosperity which she enjoyed in the time of our forefathers.

The Wizard of Modern Invention.

A remarkable article on Thomas A. Edison appears in the April issue of the *Chambers*

Journal from the pen of his assistant Mr. W. H. Meadow-soft. Even as a child of five or six years, Edison showed a tendency to much originality of thought and an inclination to take interest in mechanics. At about ten or eleven years of age, Edison became greatly interested in chemistry, and, having got some books on the subject, he persuaded his mother to allow him a space in her cellar for a laboratory. Here he experimented with such chemicals as he could procure with his limited pocket-money. He had gathered together about two hundred bottles of various sizes and shapes to preserve his chemicals, and labelled them all with the word 'Poison,' so that they may not be disturbed.

Among his several inventions are a Duplex system of telegraphy; improvements and inventions relating to stock-printers; the automatic telegraph; the quadruplex telegraph; the electromotograph; the telephone; an efficient electric dynamo; electric lighting plant; eighty-two patents on the improved phonograph and its parts; four hundred patents relating to electric lighting; basic patent covering apparatus for the taking of motion pictures; Edison storage battery; and finally an improved kiln for making Portland Cement.

The following is characteristic of the man. To supplement the scarcity of iron ore in the eastern part of the country he proposed to crush bodies of lean ore carrying magnetic iron, separate the iron magnetically from the gangue, and sell the concentrates to the furnaces. In order to accomplish this, he planned to reduce mountains to dust, pass this finely divided material through sieves, dryers, and magnetic separators, and finally to press the concentrate into briquettes as a convenient form for the furnace.

This tremendous project called forth some of Edison's most brilliant inventive and engineering efforts. At every step there arose new and unprecedented difficulties, which were met and surmounted successfully one by one. In solving these problems many important inventions were made, and Edison took out over fifty patents covering them. Unfortunately the story does not end well, for after nine years of hard work, when Edison had succeeded in bringing his project to the point of financial and physical success, there came the discovery of the Mesaba range of iron ore, where phenomenally rich ore could be scooped up with a steam-shovel. This could be shipped and sold for little more than one-half the price at which Edison could sell his concentrated ore, of course rendering his enterprise commercially impossible, and he was reluctantly obliged to cease after spending nine years of his time and over two million dollars of his money.

From 1869 to the present time he has filed more than one thousand four hundred applications for patents; and, in addition, over one thousand five hundred other inventions are embraced in one hundred and twenty caveats filed by him during these years. These and some other inventions are also covered by one thousand two hundred and thirty-nine patents issued to him by foreign Governments.

When one considers the practical value of Edison's inventions as a world asset, the tremendous force of his personality is apparent, for it has been one of the most potent factors in bringing into existence many entirely new arts and industries, and in contributing very largely to others, all of which are now capitalised in America at seven thousand million dollars, earning annually over a thousand million dollars, and giving employment to an army of more than six hundred thousand people. Not that Edison has brought these arts and industries to their present magnificent proportions; but he is the father of a number of them; and as to some of the others, it was the magic of his touch that helped to make them practicable.

Indian Industrial Development.

Mr. Alfred Chatterton, Director of Industries, Madras, delivered an address in connection with the celebration of the Founder's Day by the staff and students of the P. T. Lee Chengalvaroya Naicker's Technical and Industrial Institute. Regarding the need for technical education in India, Mr. Chatterton said: "The general cry throughout India has been for technical education in the hope that men will be trained who will develop industries. The facilities offered in this country are admittedly not very great and many of you are inclined to attribute the ineffectiveness of recent efforts to the lack of educational institutions. I would like, however, to point out that a fair use has been made of the opportunities for instruction available in other countries, and that the young men who have come back have been unable to realise the hopes with which they set out. It is not their fault that they have failed, but it is due to a wrong policy having been adopted. I hold very strongly the view that industries must be first developed, and that technical education should then be provided to suit the needs of these industries, and that in the first place we must go abroad for men who are to establish the new industries."

After briefly referring to what the Madras Government have done for the development of the aluminium and chrome tanning industries, Mr. Chatterton observed: "Lastly, we have concerned ourselves with what may be termed agricultural engineering, and in this direction results are probably pregnant with greater developments than all the rest of our work put together. It has been demonstrated in hundreds of cases that the cost of lifting water can be reduced from one-half to one-quarter the cost when cattle are employed, and where the supply of water is sufficient, mechanical methods of lifting water have proved extremely profitable. One very important result of this attempt to introduce mechanical appliances for lifting water has been the discovery that the underground water supplies are enormously greater than was generally supposed to be the case. I am quite certain that in course of time we shall have more than 1,000,000 acres irrigated by means of pumps. The development of lift irrigation under pumps has led to the use of the oil engine for many other agricultural operations, notably for crushing sugarcane, for hulling paddy and for extracting oil. In the case of sugarcane crushing, the economies effected are very important and there is no doubt that the area of sugarcane cultivation will enormously extend. We are all aware that there is in this Presidency an enormous area of land covered by black cotton soil, and that in normal years without irrigation, extremely good crops can be grown if once in every few years the land is ploughed very deeply. This is a costly business, as it is generally done by cooly labour to turn over the soil with crowbars. Steam ploughs could undoubtedly do the work much cheaper and much better, and if some system is devised whereby the cost of ploughing is spread over the years during which the soil benefits from that operation, it will extensively come into use. Again, I have credible information as to the unduly high cost of harvesting and threshing. This, I am confident, can be reduced by the use of harvesting machinery and by the use of mechanically driven threshing machines.

The Perfume Industry.

Perfumes are produced from a very wide range of substances, from animals, from the resinous gums which exude from the trunks of trees, from the stalks and leaves of certain plants, and from certain flowers. Modern chemistry has also produced several of the important perfumes synthetically. They have been built up by the chemist from the substances of common life, very largely from the tars that are the waste products of the gasworks. The perfumes obtained from animals are ambergris, castor, a kind of musk, civet, and musk itself. Ambergris is obtained from the sperm whale; musk from the male musk deer and the musk ox and musk rat; castor, or castoreum, from the beaver; and civet from the cat of that name. What are termed essential oils, or attars, are obtained from flowers and from plants by distillation, maceration, and a very beautiful process known as *enfleurage*.

COMMERCE.

Business Enterprise in India.

The commercial enterprise of India during the month of February 1912 may be gauged by the following abstract of joint stock companies registered in that month :—

		Rs.
2	Banking and Loan Companies	2,14,000
11	Insurance Companies	4,75,000
1	Navigation Company	50,000
2	Railways and Tramways Companies	19,56,500
2	Co-operative Associations	40,000
1	Shipping, Landing, and Warehousing Company	5,00,000
4	Trading Companies (other than those specified above)	5,25,000
1	Bone Mills Company	5,00,000
1	Tea and other Planting Company	2,40,000
2	Coal Companies	5,50,000
1	Mining and Quarrying Company (other than specified above)	1,00,000
28	GRANT TOTAL ...	51,50,500

Development of Exports.

"British Manufacturers' Mutual Export Development Scheme for the East" is an organisation recently started in London which has for its object the erection and equipment of a permanent exhibition in Calcutta, for the exhibition of articles of British manufacture only. It is considered that the increasing demand for articles of various kinds which are now imported into the country, justifies a permanent exhibition which would be of enormous advantage. The movement would be governed by a council resident in England who would be guided by a committee of manufacturers.

Dividend Warrants by Post.

Shareholders in banks and companies will be interested to learn that a question arising out of the practice of sending dividend warrants by post has just been decided in a case in the Sheriff's Court of Glasgow. "It appears that the Treasurer of the Glasgow Corporation sent to certain of the holders of the City Gas Annuities by post a warrant for the payment of the amount due. The warrant did not reach its destination and was evidently lost in transit through the post. The Corporation required, as a condition of issuing a new warrant, an indemnity from the holders, which they refused to give, and, as payment of the sum due was held back because of this refusal, an action was brought to recover the amount. The Court held that, in the absence of any agreement by the holders that payment of the annuities was to be made by cheque or warrant posted to them, the posting of the warrant was not equivalent to payment and the Corporation must pay the amount due, with costs." The decision would have been different of course if the posting of the warrant was in accordance with the declared intention to pay the dividend in this way.

The Burma Shareholder's Association.

The Burma Shareholders' Association has now taken concrete shape. The association was the first of its kind but the promoters were not to be thwarted in their aims simply because they could not obtain materials for their articles. They have drawn up their rules and articles of association, and these could be improved or modified as experience may dictate. It has been decided to register the Burma Shareholders' Association on the lines of a charitable organisation, tor which no registration fees are required. The subscription fees have been fixed at Rs. 12 per annum payable in advance. *Capital* points out that an association of this nature can be of incalculable service both to the shareholding community and the public. Its functions would be wide and varied. It will decide upon the merits and demerits of any local prospectus, render valuable advice to its members, take action in a court of law against dubious companies, bring directors of companies to book for any discrepancies which they might perpetrate, carefully analyse the balance sheets of all local joint-stock companies, take action against promoters for issuing fraudulent prospectuses and confine its operations to other kindered subjects that would come under its purview.

INDUSTRY.

Manufacture of Stearine and Glycerine.

A factory is being set up at Billimora (Baroda) to manufacture stearine and glycerine. It will be the first of its kind in India and will also manufacture stearine candles.

The Cotton Industry of Lancashire.

The advantages which enable Lancashire to maintain her lead in the export of cotton goods appear to be:—

(1) Suitability of climate.

(2) Hereditary specialised skill of operatives.

(3) Concentration and technical specialisation of the industry and allied trades.

(4) Highly developed commercial organisation.

(5) Low capital costs and high economy of wages due to absence of import duties.

Industrial Progress in the Punjab.

In pursuance of the policy of encouraging infant industries by judicious subsidies, the Punjab Government has offered a grant of Rs. 5,000 to 7,000 a year for five years to the Amballa Glass Factory, a private concern. The factory tried to specialise in glass blowing but failed. The Punjab Government grant is made to encourage the owners to try again, the conditions being that a Practical Chemist and blower be employed and arrangements made for training 5 to 10 apprentices at a time, three of whom at least should have University qualification in science.

Artificial Silk.

In the March issue of the *Wealth of India*, some particulars were given about artificial silk making. As a result of his enquiries recently made in England regarding the artificial silk industry, Mr. Alfred Chatterton says that there appears to be no probability that this industry will materially interfere with the natural silk trade. The product differs in many ways from natural silk and is an altogether inferior material. It is most largely used in the manufacture of ribbons, neck ties and cotton goods with silk figuring. The material is seriously defective in two important respects, which prevents its being largely used as a substitute for silk : (1) it is almost impossible to dye it in a uniform colour or shade, and (2) when wetted with water, it loses from 60 to 70 per cent. of its strength, so that a fabric made of artificial silk not only cannot be washed but is very easily damaged if accidentally wetted. In recent years, however, the quality of artificial silk has been greatly improved.

India's Industries.

The ninth annual meeting of the Central Council of the Association for the advancement of the Scientific and Industrial Education of Indians was held at the Town Hall Calcutta, on 21st April and was presided over by the Maharaja of Burdwan.

The following resolutions were agreed to : (1) That in the opinion of this Council it is undesirable that the Sibpur Civil Engineering College should be abolished. (2) That the Government be asked to give effect to a scheme for raising the Sibpur Engineering College to the status of a first class Technological College, teaching mining, engineering, mechanical engineering, electrical engineering and industrial chemistry for B. E. degrees which was approved by it some time ago. (3) That this Council recommends that capitalists should undertake the starting of the manufacture of hosiery, umbrellas and sugar in this country. (4) That the Indian Steam Navigation Companies now existing be requested to combine and start a large company with a good dock. (5) That it is desirable that the people of this country should always give preference to matches, pencils, pottery, printing ink, buttons, combs, leather goods, biscuits, shoe-black, soaps, dyed clothes, silk chudders, and cotton goods of Indian manufacture, more especially to those manufactured by experts trained in foreign countries under the auspices of the Association. (6) That a memorial be raised to the memory of the late president Rai Narendra Nath Sen Bahadur, and a sub-committee be appointed to report what form the memorial should take,

ECONOMICS.

The Peasant in India.

Lord Curzon once observed 'The peasant has been in the back ground of every policy for which I have been responsible a e very surplus of which I have a isted in the disposition."

Protection in India.

Replying in Parliament to Mr. M » t on in reference to contracts for bridges given to foreign firms, Mr. Montagu explained the facts and added that the Government of India did not intend to practice protection at the expense of the Indian taxpayer. Its policy was to get the cheapest and most suitable goods in the cheapest market.

The Inchcape Mission.

Our readers have doubtless read in the newspapers all sorts of surmises about the object of Lord Inchcape's visit to India. The Hon'ble Mr. Gokhale moved that all papers and correspondence relating to the appointment of Lord Inchcape's Committee to conduct the enquiry into the Railway Administration in India which may be in the possession of the Government of India be laid on the table of the Council.

The Hon'ble Mr. Clark replied that there had been no Committee and consequently there could be no terms of reference and no enquiry of any sort at all. He explained that certain questions were outstanding between the Railway Board and the Railway Companies. It seemed better to the Secretary of State that these questions should be dealt with by a Conference rather than by correspondence which would necessarily have to be prolonged. The Agents of the Railway Companies were only the Agents of the Directors at Home, involving constant reference to London. The Secretary of State thought it better that these matters should be disposed of by a Conference in India. It was arranged that Lord Inchcape who was coming out to India in any case should be President of the Conference which consisted of the several Chairmen of the Companies and the Railway Board. The Conference had met, discussed the subjects at issue and finally arrived at certain results. The Conference, Mr. Clark said, was entirely of an informal character and the Government of India did not think it necessary to lay any papers on the subject on the table.

The World's Gold Production.

The world's gold production in each of the past twenty years is as follows in dollars :—

		$
1892	...	146,292,600
1893	...	158,437,551
1894	...	182,509,288
1895	...	198,995,741
1896	...	211,242,081
1897	...	237,833,984
1898	...	287,827,833
1899	...	311,505,947
1900	...	258,829,703
1901	...	260,877,423
1902	...	298,812,499
1903	...	329,475,401
1904	...	349,088,293
1905	...	378,411,054
1906	...	405,551,022
1907	...	411,294,458
1908	...	448,434,527
1909	...	459,927,482
1910	...	469,865,610
1911	...	473,383,543

Sir W. Nicholson's Commission.

A Committee presided over by Field Marshal Sir William Nicholson, G. C. B. has been appointed.

(1) To carry out a comprehensive survey of the various circumstances requiring the use of Military Force which may arise out of the external and internal situation in India under the conditions which now exist or may probably arise during the next few years. (2) To consider and report on the numbers and constitution of the armed Force which should be maintained in India to meet these obligations. (3) To consider and report whether any, and if so what, measures for the reduction of Military expenditure are compatible with the efficient maintenance of that Force.

CO-OPERATION.

Co-operative Societies in Travancore.

At present there are no Co-operative Credit Societies in Travancore. Mr. S. N. Krishna Aiyar, B.A., B.L., High Court Vakil, has made a representation to that Government to pass a law to organise such societies. He has also suggested that to economise expenditure, the Director of Agriculture may be appointed Joint-Registrar of Co-operative Credit Societies.

Advantages of Co-operation.

Some of the advantages of co-operation are thus stated by a writer:-(1) Co-operation leads to mutual help and good will; (2) it inculcates habits of saving and foresight; (3) it brings us into touch with the Joint Stock Banking system of the country; (4) it provides cheap credit under safeguards against extravagance; (5) it gives debtors a chance of rehabilitation and of escape from debt; (6) it provides for a Reserve fund which will hold the members together; (7) it provides places where men may safely deposit spare money the system reducing risk of loss to a minimum; (8) the Central Bank provides Government servants with a convenient place for depositing savings; (9) the Central Bank has opened a Savings Bank to suit those who have only small amounts to deposit; (10) the Central Bank should provide a centre from which schemes for the economic good of our country may be devised and put into shape.

Co-operation in India.

A very interesting return has been issued by the Government of India, showing the general progress of Co-operative Credit Societies in the several provinces during the year 1910-11, which brings to light some curious facts. There are three classes of these societies, *viz.*, Central (lending to other societies only), Urban, and Rural. The extent of progress in each of these classes differs so materially in the several provinces, that one is tempted to enquire whether equally sustained efforts have everywhere been made to make known the benefits which the people can derive by participating in the general scheme. To illustrate the point, in the case of Central Societies, Madras with only six at the end of the year had a working capital of Rs. 19,86,564; while Bombay with seven had only Rs. 4,62,648. Bengal had four, with Rs. 189, 933. The United Provinces hadtwelve, with Rs. 6,02,011; while the Central Provinces had also twelve, but only Rs. 1,74,576. The progress in the Punjab has been very remarkble. At the beginning of the year, there were seven, with a capital of Rs. 2,75,650; but by the end of the year the number of societies had increased by two, but the capital had risen to Rs. 7,02,475. Taking the whole of India, the number of these societies had risen from 34 to 60, and the capital from Rs. 24,06,300 to Rs. 50,16,458, an increase of over 100 per cent.

In Urban societies, the United Provinces heads the list, both as to numbers and capital. The number rose from 95 to 138 in the year, and the capital from Rs. 20.82,767 to Rs. 24,13,523. Yet, curious to note, the membership decreased from 35,587 to 33,808. Bengal does appear to be advancing very rapidly, as the number of societies rose from 47 to 53, and the capital from Rs. 1,55,682 to Rs. 2,26,929. The Punjab is particularly backward in this class. Although the number of societies rose from 5 to 10 in the year, and the membership doubled itself, the capital only rose from Rs. 32,127 to Rs. 43,693.

The greatest progress is noticeable under the head of rural societies; and this is the most satisfactory feature of the movement; for it is among the rural population, after all, that the co-operative system is expected to be most helpful to the heavily indebted raiyats and petty traders. In this class the Punjab is at the head of the list with 1.074 societies, having a membership of 59,529, and a capital which rose during the year from Rs. 15,27,802 to Rs. 29,38,926. The United Provinces come next with 1,108 societies, 59,639 members and Rs. 1,91,44,695 capital. All provinces show a keen desire to participate in this class of societies, and good progress is recorded in every one.

BANKING.

Central Banks

The Central Urban Bank that has been working in Madras for some years past is a Co-operative institution only in name. Under the present arrangement, the Co-operative Societies borrow from the Central Urban Bank and thus contribute to the interest. But they are not allowed any representation in the administration or any participation in the profits. Central Banks are merely financing agencies not far distinguishable from sowcars. Co operative Credit Societies, to deserve their name, should get out of the clutches of such banks and organise Federal Banks, whose general body of management should be composed of representatives from the Co-operative Societies having transactions with them. The societies holding shares in them should participate in the dividends in proportion to the shares held by them or according to the amount of the borrowings. A Federal Bank is the school from which knowledge of co-operative ideals and co-operative practices would spread to all societies comprised within its area of operations.

The Strength of a Bank.

In calculating the strength of a bank to meet a panic, it was customary at one time for many banks to look upon "Money at call and short notice" as representing cash. With the growth of banking liabilities, this impression has been gradually dispelled, for, in a time of panic, it would be impossible to call in the greater portion. The Short Loan Fund, in reality, represents a gigantic system of transfers —hence the danger of attaching too much importance to it as a cash reserve factor. In a time of panic, £50,000,000 of gold would be worth more than £500,000,000 of "Money at call and short notice and investments."

Crossed Cheques in France.

We read in the *Bank Notes* that for some time past the management of the Bank of France has been considering the advisability, if not almost the necessity, of bringing into use the "crossed cheques," almost unknown in France. Further, legislative action was taken in its favour. The Legislature, however, moved too slowly to satisfy the Bank of France, and as a means of effecting a start, it has issued a circular to all its managers in which they are urged to do their utmost to further the employment of crossed cheques by their customers. To further this object cheque-books with printed crossings are to be supplied to customers, and the various managers are instructed to point out the greater security which is granted to the cheque by means of the crossing.

Banking in Bombay.

In the opinion of the Government of Bombay, there has been a considerable increase in the number of smaller country "banks" which do not restrict themselves to legitimate banking business. Certain institutions call themselves banks, though they have no real right to the title. It has also come to the knowledge of that Government that certain cotton mills and other jointstock companies not infrequently accept deposits and indirectly do business as bankers, "a procedure that gives great opportunity for fraud." The matter was referred to the Bombay Chamber of Commerce who agree with the Government that the standard of auditing of banks and other joint-stock concerns, which is the principal safeguard of public interests, is often quite inadequate, and they express the hope that something will be done to remedy this defect. To a large extent, good auditing means good banking; and until we have it, the native of India will argue with some show of force that the safest place for his money is underground. Frequent bank smashes are no inducement to the people to relinquish hoarding which tells so heavily against the commercial development of the country. Apparently, however, the Government of Bombay are preparing to take a step forward in banking matters, and other Local Governments are considering this problem as well. So it may well prove that bank disasters have not been in vain.

INSURANCE.

Insurance and Advertisement.

Why not advertise? The largest, strongest, and most progressive insurance companies are those who advertise most, and it is such offices, says the "Insurance Press" of New York, that have made insurance journalism possible. It pays the companies and it supplies the agents and managers with material to work upon.

Accident Policies.

A striking illustration of the numerous serious risks run in everyday life is afforded by the Ocean Accident Insurance Company's statement, that in 1911, it had been called upon to deal with the huge total of 98,886 accidents, of which 966 were fatal, an average of 271 each day. This experience of the largest casualty insurance company in the world will come as a startling surprise to most people. Everyone can see for himself, or herself that the constantly growing rush of daily life is steadily increasing the accident risk, which is infinitely greater now than it was 10 years ago. It is time then that people think of taking out accident insurance policies.

Insurance Literature.

The rapid growth of the insurance business in India, and the advent of the Indian Assurance Bills, have created an increasing demand for books which deal with this branch of industrialism. The demand for this class of literature is improving, also, in Great Britain, the phenomenon being due, according to the "Market World and Chronicle," to the desire of the average man to know something of the chief provinces of our economic life. On the other hand, the extent to which insurance has been the subject of public discussion and of legislation in more recent years has caused people to recognise the importance of the question. A generation ago insurance was regarded as a matter which was only intelligible to a limited number of specialists—as, indeed, in its more technical branches it is still—and people took out policies in a spirit of blind faith.

Insurance Humor.

The manager of a life company, having written to an agent to investigate certain discrepancies in the family history as related by a proposer in two proposals for life assurance, received the following reply:—

"The discrepancy about his having two brothers or no brother occurred in the following way:—The proposer and his two brothers aged 29 and 32 respectively were born of the same father and mother. He was afterwards adopted by his uncle who had no male issue at the time. Since then, his own brothers are his cousins and the adoptive uncle, his father and the uncles' wife his mother in the eye of the law. In the former statements, he carelessly made mention of his own brothers who are really his cousins now. In the present statements, he made another mistake in mentioning his two step-brothers—really cousins—who are begotten of his natural father and the stepmother married to his father after the death of his own mother."

Cattle Insurance.

The formation of cattle insurance societies, of which there are reported to be six in Burma with a membership of 169, forms a novel feature of the co-operative movement according to a contemporary. The annual loss to the Province by cattle disease is enormous, and the loss of his capital frequently means ruin to the cultivator. Societies of this kind will do much to minimise the loss sustained by the cultivators while, if associations of cultivators can be formed in the villages, who are mutually interested in stamping out any disease which may break out among their cattle, the force of public opinion will do much to secure the enforcement of the restrictive measures by which alone cattle disease can be effectually combated. Caution should, however, be exercised in fixing the amount of premia for cattle insurance, and in extending the liabilities of the societies until experience has afforded a wider basis on which the necessary calculations can be framed.

SCIENTIFIC and TECHNICAL EDUCATION.

The Madras Engineering College.

The Government of Madras have long contemplated the development of the College of Engineering so as to embrace a wider range of instruction in technological subjects having their basis in mathematics and physics such as mechanical and electrical engineering, but no comprehensive proposals on the subject have been submitted.

The Need for Technical Education.

The following is taken from the Report of the Departmental Committee in England appointed to consider the scheme of establishing in London an Imperial College of Science and Technology. After describing the origin of the Royal Technical High School of Berlin, the Report proceeds : "Such is the organisation and character of one of the ten higher technical institutions which have been established in Germany for the promotion of scientific training and research. So close is the connection which is considered in Germany to exist between technical education and industrial prosperity, that the Germans believe that the establishment and maintenance of these institutions merely as a financial speculation have repaid over and over again the vast expenditure incurred, and that they have been of benefit not only to the few who gain directly, but to the wage-earning classes and to the mass of the nation as a whole, by being the means of creating new industries, by preventing the decay of existing industries and by increasing the demand for skilled labour."

Indian Institute of Science.

Dr. Morris Travers, Director of the Indian Institute of Science, popularly known as the Tata Institute has issued the following statement:—

1. It is the immediate policy of the council to develop the Institute as a post graduate University Institution, providing facilities for study and research in pure and applied science, particularly with the object of bringing science to the aid of Indian arts and industries.

2. The departments of general chemistry, organic chemistry, applied chemistry and electrotechnics were opened in July 1911 for the admission of students. The second session will commence on the 3rd July of the present year.

3. Students desiring to be admitted to any department are requested to apply to the Director for the necessary forms. Copies of the Calendar will be forwarded to all *bonafide* applicants for admission, free of charge.

4. As the Institute is a post graduate institution, students will be required to possess a degree of some recognised University or an equivalent qualification. All students will be admitted on probation. Should the Senate be of the opinion that any student is incapable of taking advantage of the facilities for study and research provided in the Institute, he may be required to leave at any time.

Technical Education in Bombay.

At the prize-giving of the Victoria Jubilee Technical Institute, the Chairman of the Board of Trustees said :—The necessity for the development of technical training in India is now widely recognized, and arrangements are being made in various Provinces and Presidencies to establish technical schools. Up to this time the Victoria Jubilee Technical Institute has stood practically in a class by itself, and has drawn its students from all parts of India. Now its very existence is threatened by the competition of these other schools. Students will naturally prefer to attend schools in their own Provinces, unless we can maintain our superiority. Competition will be more keen, and, however high our standard remains, we are certain to lose a large proportion of our students from other Presidencies. Our experience has shown that the advantages of technical education are not sufficiently widely recognized in this Presidency to permit of the Institute being maintained solely with recruits that come from the Bombay Presidency. It is, therefore, necessary not only to amplify and extend our courses so that we may continue to attract students from beyond the Presidency, but that the whole system of Technical education in the Presidency shall be reorganized.

ECONOMIC PRODUCTS.

Camphor.

Camphor is used principally in the manufacture of celluloid. The world's consumption is about 11,000,000 lb. annually, of which 70 per cent. is used by celluloid factories, 2 per cent. in gun-cotton works, 15 per cent. for disinfecting and deodorizing purposes, and 13 per cent. for medical preparations.

Japan, Formosa, and China are practically the only countries of export, and the Japanese Government supplies about 70 per cent. of the world's output. Germany and the United States are the largest importers.

Cotton, Sugar and Indigo.

It is surprising to find that in the classical days of Greece and Rome three products of India attracted the notice of curious enquirers —a tree from which the Indians made cloth (the cotton plant)—a reed from which a sweet juice was expressed (sugar-cane) and a plant yielding a dark blue dye known as indicon (indigo). These are the very industries which are in jeopardy to-day. These plants were not known to the ancient agriculture of Egypt and Mesopotamia. India has found herself surpassed by America and Egypt in growing crops that were peculiarly her own. In Egypt the cotton plant produces fourfold, in the West Indies the sugarcane produces nearly threefold the return that they yield in India. And the cultivation of indigo now appears to be doomed by the manufacture of artificial dye in German laboratories.

Asbestos in Chota Nagpur.

According to *Commerce*, asbestos of a very superior quality has been discovered in a large tract of land in Chota Nagpur, extending to at least six miles. The initial discovery was made eight miles, or thereabouts, from Chakradharpur. This is the first asbestos that has been found in India. The extent and quality of the deposits will provide ample scope for a progressive industry of great possibilities.

The uses to which asbestos is now put are very extensive. The range of its utility extends from tobacco-pipes to fire-escapes. It is used as packing for all classes of machinery, for firemen's fire-proof clothing, boiler and steampipe covering millboards for all sorts of purposes, cloth for filtering acids, for covering rollers in printworks where aniline dyes are employed and where it is necessary to resist heat and the action of acids ; it is used also as flooring-felt, proofing-felt, wall-felt, and as fire-resisting screens ; for the construction of portable fire-proof safes and lamp shades ; or curtains in theatres ; as a non-conductor in electrical works, as tubing for covering telegraph wires, and for non-conducting globes worn by electricians. There seems to be no end, indeed, to the variety of the articles in the manufacture of which asbestos is utilised, and there can be no shadow of a doubt, therefore, says *Commerce*, that the discovery made in Chota Nagpur will eventually lead to the establishment of a new Indian industry of very great value.

In this connection it is a matter of more than ordinary interest that the production of asbestos in the United States is rapidly increasing, having more than doubled in 1911. The increase was largely in the fibre of the serpentine variety, of which the best grades are spun and woven into fireproof fabrics for theatre curtains, motor-brake bands, and the like, where incombustible materials must be used. The finest asbestos yet spun carries a small percentage of cotton and runs over two miles to the pound. One of the most remarkable features of the asbestos industry in recent times is the growth of the demand for the lower grades. Being fireproof and an electric and heat insulator, asbestos is extensively used in the building arts, and the interest in this sort of manufacture at a number of points throughout the country indicates that the industry is developing rapidly. The most striking new application of asbestos has been made in Louisiana, in extinguishing a burning oil well from which 40,000 barrels of oil were escaping daily. The finest asbestos yet found in the United States, comparing favorably with the best from any part of the world, is in the Grand Canyon of the Colorado in Arizona ; it is not, however, easily accessible.

BUSINESS METHODS.

An Advertising Idea.

A writer in the *Amrita Bazaar Patrita* suggests a new method of advertising in India. Something in the form of a moving exhibition as is prevalent in many parts or Europe and America will be effective. For example, places lying on either banks of a river may be given a trial by boat exhibitions. If a furnished boat containing on board all the varieties of clothes turned out at a mill, or acids tinctures, liniments and other medicines prepared in a pharmaceuticel works, or a collection of soaps, scents, scented oils and other articles of toilet made by a manufacturing perfumer be arranged by the manufacturer himself or by one dealing in his manufactures to ply in a river with a large population on either bank, enough trial to the suggestion would be given ; and if it proves effective its application may be extended. It will not only do a great deal to strengthen the cause of Swadeshi but start a new source of livelihood to a large number of persons—so necessary at the present time when hundreds of educated young men are loafing about for want of a respectable living.

Scientific Salesmanship.

Sir James Crichton Browne, speaking at the annual dinner of the Institute of Certificated Grocers the other day, addressed a few remarks to salesmen which advertising men may with equal advantage take to heart. "I should insist," he said, "that you knew something of the articles you vend, not only as regards their place of origin, but as regards their chemical composition, nutritive properties, and liability to adulteration." There can be no two opinions, says the *Advertising World*, as to the value of technical knowledge of this sort as a part of the salesman's equipment, and we fear it is as certain that in only too many cases it is lacking. It is even more important that the advertising man should thoroughly understand the article which he is endeavouring to introduce to the public, but instances are by no means rare in which this first essential in planning a campaign is neglected. Many a campaign, in itself cleverly conceived and carried out, has failed because in one particular or another it has not been exactly suited to the article advertised. It cannot be too clearly understood that no two propositions are precisely alike, and that the conditions affecting the selling of even closely similar articles may be altogether different.

Promptitude in Business.

The '*Business Magazine*' for March contains an article describing how some concerns coped with the disaster in the great Equitable building fire which took place in New York in January last. By ten minutes past ten on the morning following the outbreak of fire, and while it was still raging, the Equitable Assurance Society, which occupied the main portion of the building, had entered into a lease of three floors of another building for three years ; by evening of the same day these floors were fitted and furnished and ready for business ; and before morning of the next day the telephone company had fitted up 21 trunk lines, 140 extensions, and 8 private lines. Another remarkable feature was, that the Company's business for the week immediately following the fire was $658,000 greater than the business done in the corresponding week of the previous year. By extensive telegraphing and cabling all over the world, the Company's announcement of their enforced alteration of premises appeared alongside the newspaper reports of the fire. The methods adopted by other businesses located in the same building are also described. It is estimated that more than $300,000,000 in securities lay in the safety deposit vaults of the building, but these, apparently, were all recovered. The whole account reads like some fairy tale, and affords striking illustration of the American capacity for promptitude in overcoming seemingly 'insurmountable difficulties.

FRAUDS AND FAKES.

A Novel Use of the Snake.

A remarkable revelation was recently made in the course of the hearing of a civil suit in the Court of the Subordinate Judge of Hooghly. One of the parties, a Mahomedan tallow merchant, produced his *khata* book, which among other things, contained an item to the effect that Rs. 500 had been paid for the purchase of snakes of various kinds from the Nepal frontier. It was ascertained on enquiry that the snakes were purchased for the purpose of lard being extracted from them by boiling to be used in adulterating ghee used for human consumption.

Egg Powder Danger.

Grocers in England it would appear, are doing a trade in "egg powders" which the guileless public are asked to substitute in cooking on economical grounds for baking powders of proper composition. If these were pure, much might be urged in their favour, but it seems that some of them are largely adulterated with sulphate of lime—even to the extent of more than half their bulk. Sulphate of lime is another name for plaster of Paris. It is absolutely useless in these powders, and is only added to give a cheap packet a showy bulk. It is objectionable in food, and is quite indigestible.

Tricks in the Building Trade.

A writer in the *Architects' Journal* says, "I have worked on many jobs in my time and it has often been very amusing to me to see how architects and clerks of works have been gulled. A man is appointed clerk. He may be a joiner, or bricklayer, or mason, or architect's clerk, or in any other branch. He may know the theory of the work, but it is utterly impossible to know the practical part of all branches, or the quality of the wood, paints, stone, or lead, etc. He may be very clever at his own trade, but he is bound to be deceived in some of the others, however clever he is." Then follows the precise exposure :

"A builder contracts for a job. He cuts everything as fine as he can to secure the job. He has only the plan and specifications to work or estimate from. The details of some of the work are only given him as the work progresses, when, to his sorrow, he finds a lot more work than he bargained for. So, to curtail expenses, he will slip all he can, and be out of pocket at the finish. He cannot do the job to be a credit to himself or the party he is working for. But the clerk and architect are not out of pocket. They get paid. I know a painter who had to take several kettles of paint off the job because it was not of the quality specified—not enough lead in it, or inferior lead. He took it home, emptied the kettles, got some sheet lead, struck a circle with compasses, the same size as the kettle bottom, clipped them out, inserted them in the bottom of the kettle, filled the kettle with paint again,, and took them back. The clerk was well satisfied when he felt the weight. He acknowledged it was far better lead.

"An architect sent some heavy timber from a church on account of large knots. The timber was taken to the builder's yard, the knots painted over, and then grained to match the other part. It was taken back again, and the roof put on. It is there to this day. The architect acknowledged it was better stuff !

"Another builder had a roof condemned because it was Swedish timber, instead of Memel, according to specifications. It was taken off the job, laid out four or five days in a blazing hot sun, turned over every day until it became quite brown. It was put on. The architect was quite pleased, and said : 'That looks more like Memel.'

"Another was a painter who had to paint a room a certain colour according topattern sheet supplied by the architect. There were about 20 different colours on the sheet. The one that was ticked he had to work from. He could not get the proper shade. He got it very near, but it did not satisfy the architect, so with a fine brush he painted the pattern sheet with the same paint, submitted it to the architect, who said : 'You've got it at last.' This will give some idea how architects and clerks are deceived."

MACHINERY AND INVENTION.

Rosotogen.

"Rosotogen" is an artificial otto of roses prepared by a British chemist from products separated from paraffin oil by freezing at 70 degrees below zero.

Electricity and Tobacco.

A great scientific discovery is the use of electricity on tobacco, which has been proved to kill the mould spores or bacteria. This is a great boon to smokers. The tobacco is placed under a sheet of metal which is prepared, and in connection with an electric battery the tobacco is treated. Each grade requires different amperes of electricity. The tobacco so treated makes smoking more healthy.

Machinery for Village Factories.

The British Export Gazette says: The creation of important manufacturing centres by the aid of either European or native capital, and generally under European management, is one of the symptoms of the remarkable industrial revolution which is taking place in India but it is by no means the only one, and Sir Theodure Morison, K.C.I.E, a distinguished member of the India Council was quite justified when, in the course of a recent address at the London Chamber of Commerce, on 'The Economic Revolution in India,' he laid still greater stress on the industrial progress of village life. The fact that 90 per cent. of the people of India live in the villages, as against a village population amounting to only 23 per cent. in England, is sufficient to indicate the relatively greater importance of rural life in India, especially, when it is remembered that 90 per cent. of the population represents 350,000,000 persons. The emphasis of the situation, however, is to be laid on the further fact that as a consequence of lack of adequate communication between the villages and the towns, every small community is ndustrially complete in itself, a condition of things still further helped by the caste system. Craftsmen of all kinds, metal-workers, wood workers, potters, weavers, leather-workers, all are to be found in the village, in each case carrying on in a small way, and very inefficiently, their particular work in order to meet the local requirements. For the country as a whole, no system could be more wasteful of labour, for, potters, wood-workers, and weavers alone carry on their operations in no fewer than 2,500,000 establishments, the craftsmen themselves with their assistants numbering over 10,000,000 an average, therefore, of only four workers per establishment.

It is in regard to these village industries that the true economic revolution of India is taking place. No doubt the construction of better roads and the growth of railways will tend to some extent to concentrate manufacturing processes in the larger towns, but they are also having the effect of bringing modern appliances to the villages themselves, and to-day in many remote communities the native worker is forsaking the hand methods of the past and setting up small factories equipped with steam and electric plant. It would not, of course, be worth while to start factories in every village; it is, therefore, probable that such establishments will tend increasingly to serve groups of villages, near enough to one another to contribute labour as well as to consume the products. It is in the direction of the revolution of village industries that importers interested in manufacturing plant should look for profitable business quite as much as, if not more than, in the expanding factory life of the towns. Such an evolution, at any rate, has to be reckoned with by all engaged in supplying the commercial needs of the country, and it is to be considered as something quite apart from the Swadeshi movement; rather, indeed, as the natural falling into line with economic conditions eleswhere by an intelligent and industrious people. Of course, both power plant and manufacturing machinery required for these village establishments will be relatively small individually, but in the aggregate, they should represent a very large trade, worked mainly of course, by merchants and agents at the ports and suitable inland centres.

INDUSTRIAL AND ECONOMIC LITERATURE.

The Economic Cause of Famines in India
by Satischander Ray, M.A.

The subject of Indian famines is one of perrenial interest to us in India when their periodical visitations can no more be denied by any one. They have become so to say, fixtures in our administrative history and the Government of India recognising, their frequency have elaborated a scheme of relief for which they claim perfection. Mr. Ray's object in this paper is to point out the absurdity of shutting the door after the horse is stolen, and he suggests the methods of preventive relief that ought to be adopted. He prefaces his remarks by a careful summary of the history of the great famines in India since the passing of the administration of India into the hands of the Crown, and examines the causes that have led to their frequency. In his opinion two economic causes have steadily operated and they are, poverty and indebtedness. He does not think that the produce of the country is not enough to feed the people, but "the people are too poor to buy the food which already exists in the country." And "it is indisputable that the cultivator has no better financial reserve than the land he holds, and that he is driven in necessitous times to borrow on the security of his only property of value. The most peremptory necessity for borrowing arises when the demand for Government revenue comes to be enforced: and it is at that supreme moment that he places all his resources at the feet of the Collector—sacrificing health and comfort and the last ray of hope and cheerfulness." The Government have of late attempted some remedial measures for mitigating the effects of rural indebtedness, namely, the prevention of the easy alienation of the ryot's holding and relief from the grip of the usurious creditor. Mr. Ray has taith in the Land Alienation Acts and he expresses the hope that the public will gladly welcome them in the interest of the sowcar-ridden peasantry. He think thats the officers of Government are sufficiently enthusiastic in bringing home to the people the benefits of co-operation and "if it takes a firm root in the country it will be fraught with untold benefits to the community." But in Mr. Ray's opinion, the most important reform is the extension of permanent settlement to all parts of the country. He refutes the observation of the Government of India made in the Resolution of 16th January 1902 which is the *locus classicus* of their literature, that permanent settlement is no safeguard against the disasters of famines. On the other hand he considers that it is one of the measures which confers a certain amount of resourcefulness and resisting power on the people to enable them to withstand the disastrous effects of a physical calamity. Among the other remedies, he suggests an extension of irrigation works, the preservation of forests, a careful system of agricultural education so as to reach the agrifultural classes in all parts of the country; and the resuscitation of home industries. He suggests that the Famine Insurance Grant may be more freely utilised for these purposes, by increasing the grant to three crores.

Books Received.

DOUBLE ENTRY IN ONE LESSON by R. Fleming, A. C. I. S., 19, Chetwode Road, Tooting, London, S. W. Price 6 *d. net.*

THE ARTS AND INDUSTRIES IN KASHMIR by A. Mitra.

REPORT ON THE PROGRESS OF AGRICULTURE in India for 1910-11, Superintendent, Government of India Printing, Calcutta. Price 12 as.

REPORT OF THE AGRICULTURAL RESEARCH INSTITUTE AND COLLEGE, Pusa, for 1910-11, Superintendent, Government Printing, Calcutta. Price 6 as.

DEPRECIATION AND WASTING ASSETS by P. D. Leake, Henry Good & Son.

HINTS AND RECIPES.

How to Extract a Splinter.

None of the small accidents to which everyone is liable is more annoying than to have a sliver of wood stuck into the hand. Moreover, it is very painful if not promptly removed. If the wood of the splinter is soft, its removal is not easy, if attempted with a needle or other sharp instrument. Steam may, however, be employed, without inconvenience or pain, and is very effective. A wide-mouthed bottle, such as a milk bottle, should be filled nearly full of water as hot as the glass will stand, and the injured part placed over the mouth of the bottle, pressing down slightly, and preventing any steam from escaping. This will cause the flesh to be drawn down, and in a minute or so the steam will extract the splinter, at the same time relieving all inflammation.

An Alloy for Keys.

A French subscriber asks whether we can suggest an aluminium alloy which while preserving the appearance and lightness, will be harder than the pure metal. He wishes to use it for keys.—*Reply*: "Subscriber might try a mixture of 96 parts aluminium, 2 parts magnesium, and 1 part each of nickel and copper, or, if he preferred a somewhat simpler formula, aluminium not less than 80 parts, magnesium not less than 1 or more than 10 parts, and zinc not less than 1 or more than 20 parts. The three constituents give a homogeneous alloy which is stated to be tough and to wear well. Another serviceable alloy of aluminium for hard wear, but not, we believe, quite white, is made from aluminium 70 to 85, manganese 5 to 15, cadmium 2 to 10 parts. Other mixtures are: Aluminium 96 parts, nickel 3 parts, copper 1 part, for a tough result, and aluminium 85 parts, tin 10 parts, copper 5 parts, with a trace of tungsten, say 1 part, to give a hard strong metal."—*Brass World.*

How to Preserve Eggs.

Some processes merely stain the eggs with acids and then provide them with a coat of wax, paraffin, etc., in order to close up the pores. They do not cope with germs that have been enclosed in the egg. These germs push inward and cause decay. The shells often become very soft from the application of silicates or calcium salts. Other methods impart an unnatural appearance and flavor to the egg. The methods of treating eggs with antiseptic solutions have not yielded satisfactory results. Two firms have just introduced some egg-preserving processes, which, according to report, promise much in this direction. The eggs are said to remain fresh a long time and may be transported long distances. They may be despatched in common crates through which the air passes, or in tightclosed boxes. Thus there is no danger of eggs absorbing bad odours and becoming unfit for use. Instead of preserving the egg itself, the market is now provided with fresh egg-yolk chemically preserved. Preparations of this nature have become leading articles of trade. Kitchen salt, boric acid, benzoic acid, formalin and its derivates, and salts are generally used for preserving purposes, but are not altogether unobjectionable from the standpoint of food chemistry. Ethylic alcohol is a practical preserving agent for egg-yolk, for, as is commonly known, it is used for making egg-nog. A firm of the food branch are making a stable quality of preserved egg-yolk containing all the essential ingredients. The fresh yolk is mixt with cocoa, and the mixture desiccated at a low temperature. Egg-yolk and albumen powder are made by various houses. Some branches of industry make use of egg-yolk substitutes, which are placed on the market by several firms, and consist chiefly of albumin, casein, and coloring-matter. These surrogates may be distinguished without any trouble from the natural product, by making the following test. Pour the substance under investigation into a reaction glass, shut it tight, and warm to a moderate temperature. If it is real egg-yolk the characteristic odour of an egg will be apparent; the odour of the substitute resembles that of skimmed milk, which is due to the casein.—*Energy.*

OPENINGS FOR BUSINESS.

Mechanical Ploughs and Reapers.

A correspondent in Burma desires to be placed in communication with firms who supply engines and machinery for ploughing and reaping in connection with the cultivation of grain crops, more particularly rice. Catalogues should be furnished. (1351).

Oilseeds.

A correspondent in Trieste is desirous of being placed in communication with shippers of oilseeds who may desire to extend business in Austria. (1352).

Asbestos.

A Government Office in Russia desires to be placed in communication with importers of asbestos. (1353).

Household Goods of Aluminium and Copper.

A Stockholm firm wants to get in touch with importers of these articles. (1354).

Incandescent Oil Lamps.

Swedish manufacturers in Stockholm wish to get in touch with a firm willing to take the sole agency of their patented lamps. (1355).

Match-boxes.

Swedish manufacturer wishes to communicate with buyers of empty match-boxes. (1356).

Safety Matches.

Manufacturers in Sweden wish to get in touch with buyers of these goods. (1357).

Machinery.

A firm in Madras desires to be placed in communication with manufacturers of gas and oil engines and dairy and knitting machines (suitable for small industries), who may be desirous of appointing agents in South India. (1358).

Fish Oil and Guano.

A firm in Cochin manufacturing fish oil and fish guano desires to be placed in communication with producers. (1359).

Kapok.

A concern in London is desirous of being placed in communication with exporters of kapok. (1360).

Sporting Goods.

A London firm manufacturing athletic goods desires to be placed in communication with importers. (1361).

Essential Oils and Mica.

A London firm of commission merchants desires to get into touch with manufacturers of all kinds of essential oils and also with miners of mica. (1362).

Rice, Tea, Yarns, and Bags.

A firm in Constantinople desires to be placed in communication with shippers of rice, tea, yarns, and bags. (1363).

Stamped Metal Ceilings.

A firm in London desires to be placed in communication with importers of stamped zinc ceilings, which are claimed to be exactly suited for use in hot, damp climates. (1364).

Wood for Boxes.

A firm in London desires to be placed in communication with importers of shooks of wood for box manufacture. (1365).

Pumping and Turbine Installations.

A London firm wishes to be placed in communication with firms interested in pumping and turbine installations. (1366).

Cotton.

A firm in Smyrna desires to get into touch with buyers in India of raw cotton produced in the neighbourhood of Smyrna. (1367)

Hardware.

A Sheffield firm of manufacturers of saws, files, machine knives, etc., desires to be placed in communication with firms in a position to take up agency business. (1368).

Belt Dressing.

A Dublin firm desires to appoint agents in Calcutta, Madras, Karachi and Delhi for the sale of a special belt dressing. (1369).

Gum Tragacanth, Rhubab and Chiretta.

A Lahore firm desires to be placed in communication with importers of gum tragacanth, rhubarb and chiretta in the United Kingdom, France and Japan. (1370).

Beeswax and Dried Gut.

A firm in Trieste desires to be placed in communication with shippers of beeswax and dried gut. (1372).

MISCELLANEOUS.

The Paper Currency.

The Government of India have invited the opinions of the Chambers of Commerce on the subject of the future location of the headquarters of the Head Commissioner of the Paper Currency. These bodies have been invited to consider this question, especially from commerce and currency points of view. It may be stated that the office of the Head Commissioner is now located in Calcutta.

Rubber Congress and Exhibition.

A Rubber Congress and Exhibition will be held at Batavia in April 1914. The Congress and Exhibition will be organized by the Netherlands Indies Agriculture Syndicate. Both Congress and Exhibition have the support of the Government of the Netherlands East Indies and many influential persons, commercial bodies and estates. This will be the first International Rubber Exhibition to be held in one of the important rubber producing countries.

Trade Resources of the Empire.

A Royal Commission has been appointed to enquire into the trade resources of the British Empire. The enquiry is restricted to the "extent to which mutual trade between the several parts of the Empire is affected by existing laws other than fiscal laws." Lord Inchcape has been appointed Chairman of the Commission.

City Populations.

In the House of Commons recently Sir Herbert Roberts asked the Under Secretary of State for India : whether he can state the number of municipalities, having a population of 20,000 and upwards, in Bengal, Eastern Bengal and Assam, Madras, Bombay, the Central Provinces, the United Provinces, and the Punjab, respectively.

Mr. Montagu: The figures are:—Bengal, 34, Eastern Bengal and Assam 5, Madras 39, Bombay 24, Central Provinces 8, Punjab 21, United Provinces 36.

Farm Organization.

The Secretary of State for India has sanctioned the deputation to Europe for seven months this year of one of the Divisional Inspectors of Agriculture of the Bombay Agricultural Department, to study the system of farming and farm organization in England and France.

Supernumerary Agriculturists.

The Secretrry of State for India has sanctioned the creation of two temporary appointments of Supernumerary Agriculturists for the Agricultural Service, in connection with the formation of a leave reserve for the service. The appointments which have been recruited from Home will be absorbed in due course on the occurrence of permanent vacancies in the service.

Cawnpore Industrial Conference.

In this Conference which was held this month at Cawnpore Mr. A. H. Silver, who presided delivered a lengthy address in which he referred to the Cotton excise duties, jail industries, State purchase of Indian goods, education, co-operative credit, railway tariffs, commercial honesty and Government aid to industrial enterprise. Several resolutions were adopted. The first dealt with the sugar industry and was moved by Mr. A. D. Pickford of Messrs. Begg, Southerland and Co. The resoltuion acknowledged the measures which the Government of India had put in train for improving the industry, and urged that neither staff nor money should he spared to secure the industry from injurious competition with foreign countries.

A resolution urging the abolition of the cotton excise duty, particularly in view of the fact that the value of cotton cloth imported since the imposition of the duty had exceeded the increase in the value of the Indian product, was moved by Mr. C. C. Malley, of the Cawnpore Cotton Mills, and supported by Pandit Kishan Pershad Koul, and unanimously adopted.

Other resoulutions dealt with questions connected with the Co-operative movement, railway rates, adulteration of food and drugs, and sheep-farming.

The Conference also adopted a resolution thanking the Government of Sir John Hewett for the steps it had taken for the advancement of technical education by establishing a Technical Institute at Cawnpore and Industrial Schools at various other centres.

OFFICE OF THE REGISTRAR OF BOOKS, REGISTERED 13 JUL 1912 MADRAS.

THE

WEALTH OF INDIA

A Monthly Magazine of information and instruction on all matters of material interest.

EDITED BY MR. G. A. VAIDYARAMAN.

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No money should be paid to an Agent. All remittances and letters should be addressed to the Publishers, Messrs. G. A. VaidyaRaman & Co., 3 and 4, Sunkurama Chetty Street, Georgetown, Madras.

SPECIAL ARTICLES.

THE CONDUCT OF LIFE.

BY

ARNOLD WHITE.

[*Copyright.*]

[Last month we published an article from Mr. Richard de Gallienne on "How to Command Success." The following contribution from the pen of Mr. Arnold White on the same subject will, we have no doubt, be read with interest—ED. W. I.]

Success in life is the result of things left undone as well as the possession of gifts that commend a man to his fellows. Why is it that men of ability, even with a flash of genius, are so often left behind in life's race by rivals who are inferior to them in brain power, in eloquence, and in general ability? Perhaps the reason why the race is not always to the swift is because, in the desire to shine, the swift and brilliant folk make more mistakes in judgment or fail in tact more often than slower and surer natures.

When the late Sir Robert Morier was our Ambassador in Petersburg, I remember talking to him on this subject at 2 A.M. on one of the "white nights" in June on the shores of a Finnish Island. He said: "I have been young, and now am old, and have seen more men mar their lives by being too-clever-by-half than from any other cause. Never," he added, "be more than five per cent. ahead of your public. That with reiteration is the secret of influence.

If you are ten per cent. ahead of your public you will be counted a crank and a dreamer. If twenty per cent. you must be content to be thought a madman by contemporaries, and however sound your ideas, you must look to posterity to vindicate them."

I am inclined to think Morier was right, but he was speaking, of course, of men in the great world—of Ambassadors, Chancellors, Ministers, and Administrators.

Success to the average middle-class man is the resultant of many forces. Some of them are temperamental and inherited from ancestors. Others are acquired by environment in home, school, and office.

A third set of forces that conduce to success is perhaps even more important than the qualities drawn from heredity and absorbed by environment. The chief element in this third division of the causes that lead to success is the resolve to know thoroughly our limitations, our strength, and the measure of our will power. If you do not believe in yourself, nobody outside the family circle will impute to you the qualities of a swan when you are at heart a goose.

The pushful man may be socially unpopular, but there comes a time in the life of all of us when we must push hard and push home for all we are worth, wholly indifferent to the charge of pushfulness from any quarter whatsoever. Tact and judgment are required to know when to push. Next to an accurate knowledge of one-self, driving power is the most useful equipment for the voyage of life. Driving power in a man, unlike driving power in a ship, implies the knowledge of how to progress in the right direction. Judgment without energy is sterile. Energy without judgment is fatal. An owl looks wise but does nothing. A runaway horse, the embodiment of energy without judgment, is a pest and a danger. Some people run amok all through life and wonder they do not succeed.

With a sound knowledge of one's own abilities and limitations, and with well-guided driving-power there is another quality, easily cultivated in youth that is seldom acquired when youth is passed. I refer to sympathy. To sympathise is to "suffer with." What use to a business man ambitious of rising to the top of the tree is sympathy? The answer is complete Nobody can succeed in the management of men, especially in the control of great numbers of men, without the power of seeing things with other people's eyes, of putting himself in another man's place, and of comprehending the full perspective of events as they reach the other man's brain. Sympathy is not only useful and necessary to the understanding of friends, colleagues, and assistants, but also of one's enemies, rivals, and opponents in business, society or war.

What the Duke of Wellington said about the other side of the hill is true of every other department in life, as well as that of commanders-in-chief by land and sea. To imagine correctly what is taking place on the other side of the hill implies imagination, sympathy, and rapid intuition from slender material. The man who sees ahead most clearly is not always the man of the greatest intellectual distinction. But the antennae of his mind are receptive, sensitive, delicate and alert. He hears things that no gross ear can hear, reads the signs by the wayside with the unerring sagacity of a Malay tracker of men or big game in the jungles of Ceylon, Siam, or India.

The success of the Rothschilds as a business house for four generations, has been more largely due to the sympathetic appreciation of all facts that related to the business in hand than to any colossoal intellect or phenomenal faculty for figures, languages, or industry.

This quality of sympathy when added to a good brainpiece and common sense, should carry a man far. Failure in life is not seldom the result of being entirely wrapped up in oneself. To act the egotist always is like looking at the stars from the bottom of a well as compared with an observatory set on the top of a mountain. The magnetic influence of Nelson at sea, and Lord Roberts on land, and I would also refer, as a case in point, to General John Nicholson, of Delhi fame, who died at the age of thirty-five, was the effect of illimitable sym-

pathy. It is better for a ruler of men to think that his geese are swans than to doubt, mistrust, dislike or snub every capable man who serves him, on the ground that possible rivals must be crushed.

People with sympathy, though endowed with inferior abilities, often beat brilliant creatures with biting tongues and hot tempers. Sympathetic men are often selected in preference to more intellectual rivals, not because they are "good" in the moral sense, but because they may be trusted never to make a difficulty. Sympathy often goes with great strength. How many men fail because they may be trusted to raise a difficulty and to establish a "raw" as long as there is a breath in their body These are the "impossible" men. They are prone to take offence, and they compel wise administrators, or people with patronage, to avoid them for the same reason that the porcupine is avoided by the smooth-haired terrier.

The faculty of "getting on" with people is of immeasurable importance. The art can only be learnt by rubbing shoulders with your equals, and, it may be added, by being kicked by them at some time or another in one's life. One may be kicked actually as a boy, or metaphorically as a man But the kicking comes to each one of us great and small. As we must be kicked sometime it is better to get the kicking over young, and learn once for all that there are better people in the world than we are, that if we make mistakes we must suffer for them! that before we can command we must obey, and that it takes all sorts to make a world. Never be ashamed to say you are sorry when you are wrong. Men or women who make it a point of honour never to apologize when they are palpably in the wrong are unbalanced in mind.

I have often noticed extremely clever men fail in life because they attribute evil motives to other people as a matter of course, without waiting to discuss whether or not sinister intentions are present and therefore to be guarded against. It is a mistake always to impute our own motives to other people whether we are good, bad, or indifferent. As a matter of fact there is so much good in the worst of us, and so much bad in the best of us, that it is not worth while acting upon the principle that everyone is a knave. As a matter of humble personal experience I find that if one courteously credits the average man with honourable conduct he usually behaves honourably. If he deceives me once that is his affair If he deceives me twice that is my affair; he may be a rascal, but I must be a fool. To be what is commonly called "good natured" is not the same thing as being a fool, but simply to attribute to other people motives as good as those we habitually act on ourselves Whenever I hear a man constantly "crabbing" other people I know that he is an undesirable acquaintance. Detraction of the absent is a habit which mars a man's chances in life, because people are shrewd enough to see that they will get their turn the moment their back is turned.

A further point of importance in the conduct of life is the art of yielding on trifles, and even on matters of greater moment. Life is a zigzag. Nobody goes straight from A to B in the matter of success. The object is to set a course that at the end of the day will carry us nearer our destination. Owing to unfavourable currents, foul winds and fog, we may sometimes find that little or no progress has been made. To get on we must sometimes get off the track. To surrender insignificant advantages is a fruitful source of friendship, when uncontaminated with the weakness that comes from surrender, from weariness, apathy, or idleness. To mistake obstinacy for firmness is a common foible of the weak. "What I have said I have said," is a magnificent motto for Pontius Pilate or a party politician, but in the give and take of life we can neither expect uniformity of opinion nor catholic acceptance on all occasions of our own views and opinions. Foolish consistency is the bugbear of the feeble-minded. Sometimes this art of yielding in trifles is cultivated unworthily with Machiavellian skill, but the people who do that are detestable.

I knew a Member of the House of Commons

now dead, who was in the habit of saying things for which he was promptly called to account in order that he might win popularity to the frankness of his retraction. The calculating political adventurer was found out, and lost all the respect he had laboriously acquired. He had done the same thing at school, and was known as the "Toadeater."

To believe that what we don't know could never have happened is to proclaim oneself an occupant of the lowest rung of the ladder of life —and a dullard. How many people denied the possibility of railways, steamships, telephones, wireless, motorcars, and aeroplanes? On the other hand, sanguine credulity in the impossible is a fruitful source of failure, especially in matters of money. The world is always changing, and I firmly believe, allowing for the ebb and flow of the tide is always advancing. The erosion of the cliffs of prejudice proceeds rapidly. Men are becoming more large-minded. More quarrels are settled out of Court. More wars are averted by diplomacy. More clever men get their chance. These tendencies point to the growth of friendship as a world—force in public and private life. To recognize the tendency of the times is a valuable weapon in the march through the jungle of life. Recognize, then, friendship as a force. It happens sometimes that people take a dislike to you for no particular reason. The fact remains you are disliked. It is not good to be disliked, for, as they say in the mining camps of Alaska and Idaho, "a man who gets himself disliked is apt to leave the room feet foremost." To discover and correct the causes that inspire antipathy in other people is an act of true wisdom.

Many of us talk too much or talk about what we do not understand. When amateurs lay down the law there is always the danger of a proficient professional being present in the room. Nothing is more engaging than sincere modesty. Artificial modesty is carefully cultivated by diplomatists because a modest estimate of one's own powers is always engaging. People are afraid of being modest because they erroneously think that failure to secure an available piece of publicity tells against them in the race of life. There are two kinds of publicity—notoriety and fame. Notoriety may be secured by standing on one's head in a public place, by screaming, or by crime. To get fame you must do things that other people think of and remember with reverence. Paragraphs in newspapers which are inserted to increase the notoriety of ambitious individuals do not benefit them in the least, because the limelight reveals defects as well as beauties on the world's stage. Fame is the only form of publicity worth having, and though Fame is drawn with a trumpet, only notoriety hunters take the trumpet out of her hand.

One of the mysteries of human life is the obliteration of knowledge and experience when man goes to his Long Home. Stocks and shares, chairs and tables, can be bequeathed from one generation to another. Knowledge of the world is the wisdom of the wisest but each generation prefers to get its wisdom for itself. In early youth the Golden Plain, bounded by the distant hills of age, is so fair and sunny that pilotage seems needless. As one who has trodden the Golden Plain, I am wondering what is behind the hills that are distant no longer. If we knew that, we should know all.

RELIGION AND ECONOMIC PROGRESS.

BY

Rev. P. Carty, S. J.

Professor of Economics, St. Joseph's College, Trichinopoly.

A note on "Religion and Economic Progress" in your issue of March seems to call for some remarks. This note was in the main practical and suggestive but some of the assertions on which it rests are open to criticism. Its purport evidently was to rouse from a dangerous fallacy those who would justify their apathy as regards social progress on the ground of religious and supramundane aspirations. This scope was excellent. But

then it was urged that "extreme spirituality is largely responsible for the slow rise in the economic condition of the people." Whether or not Hinduism deserves the stricture passed by your contributor on "the extreme spirituality" of its adherents, it is not for me to say; but one thing, I think, I am qualified to say, and it is, that contrary to your contributor's assertion, Roman Catholicism is not responsible for the slow rise in the economic condition of any country.

And this I presume to affirm because your contributor, when assuming the contrary, screened himself behind the honoured name of Sir Horace Plunkett. Indeed, it is Sir Horace's words and the principle, underlying them as quoted in your columns, that I primarily intend to discuss; your contributor's error being chiefly to have accepted them without sufficient discrimination. This I shall do with the simple desire of helping to the diffusion of scientific truth. Sir Horace is accepted by all as an authority on social questions. The benefits he has conferred on Ireland are great. Yet we must remember that human authorities are worth only what their arguments are worth, and it is no disparagement to Sir Horace to say that he is not infallible in subjects which stand outside his range.

"Roman Catholicism," says the passage quoted in your issue, "strikes an outsider as being in some of its tendencies non-economic, if not actually anti-economic. The reliance of that religion on authority, its repression of individuality, and its complete shifting of what I may call the moral centre of gravity to a future existence—to mention no other characteristics—appear to me calculated, unless supplemented by other influences, to check the growth of the qualities of initiative and self-reliance, especially amongst a people whose lack of education unfits them for resisting the influence of what may present itself to such minds as a kind of fatalism with resignation as its paramount virtue."

I do not mean to refute here the strange assertion that "reliance on authority" in religious matters must "check the growth of initiative and self-reliance" in other fields; nor will I comment on the sophism that Roman Catholicism "represses individuality." The economic point of view is what concerns me here. Economic theories receive their value from the facts on which they rest. If they ignore facts or go against them they must be rejected. In this one case, however, Sir Horace ignores facts and puts a theory in their place. No wonder that his ungrounded theory leads to a false assumption. Had Sir Horace argued from facts, his inference would have been the very opposite. The facts from which this inference should have been drawn will readily occur to students of European history, and I cannot attempt even a bare enumeration of them. Yet, to mention at random only a few, were not the medieval guilds Catholic in origin and spirit? Yet only those who have made a study of their organisation can realise the immense social benefits they procured. These benefits were such that our modern industrialism with all its progress is reduced to envy them. Again the magnificent cathedrals and other public buildings spread throughout Europe, those master-pieces of medieval art unequalled by modern skill, were the result of Catholic faith and Catholic organisation. And again, the great medieval cities,—the Italian Republics of the south as well as the members of the Hansa League in the north,—were, long before the Reformation, the pioneers of a trade which even to-day strikes us with admiration; their facilities were next to none as compared with ours. The Eastern and Western trade routes were discovered in Catholic times. And have not the Popes of those times been accused by moderners of going too far when, for the sake of peace, they divided the newly discovered lands between the two nations foremost in discoveries—Spain and Portugal? Finally, lest by recalling the past we should seem to forget the present, mention must be made of the Encyclicals of Pope Leo XIII on social subjects giving to the Catholics all the world over a splendid social programme. That this programme has not been uttered in vain is forcibly brought out by the doings of the

Catholic Parties in all modern nations: it is enough to name the Catholic *Boerenbund* of Belgium, the *Action Populaire* of France and that splendidly organised party, the *Centrum*, not less active in the social than in the political field wherein however it has held the balance of power in the German Reichstag and caused the downfall of the Iron Chancellor Bismark.

These are some of the facts which may well lead fair minded students of history to wonder that Roman Catholicism should be accused of being "anti-economic" or even simply "non-economic." Why, Sir Horace Plunkett himself thought it well to tone down his first assertion by adding that the evils he mentioned would be found "especially among a people whose lack of education unfits them," etc But does not this addition simply destroy the first statement? For if "lack of education" is what makes people socially unfit, why acuse Roman Catholicism? That ignorant Roman Catholics misunderstanding their religion, should have anti-economic tendencies is no fault of Roman Catholicism but only of ignorance and in such cases let their ignorance of religion, not their religion, be condemned. Moreover, this sweeping accusation of "lack of education" when speaking of Catholic Ireland is hardly fair on the part of Sir Horace, for nobody knows better than he that Ireland's secular stagnation in education and industry has nothing to do with religion It is due to the narrowminded bigotry of those who for centuries have proved the remorseless persecutors of the sister Island. That the Irish remained true to their conscience notwithstanding, is a rather hard fact against Sir Horace's suggestion that "resignation was their paramount virtue."

What precedes has I think sufficiently shown the value we must attach to the argument taken from the words quoted from Sir H. Plunkett. But it is not merely the argument, it is the principle itself as laid down by your contributor and as implied in the words of Sir Horace, which is fallacious. The fallacy comes from making the religion of a country exclusively or primarily responsible for its social progress or stagnation. We have had —I do not blame your contributor for being unaware of this a whole literature on Protestant *versus* Catholic countries to the effect that Protestantism led to the prosperity of England, Germany, the United States, whilst Roman Catholicism checked the progress of the Latin countries. As a matter of fact the writers who defended such a statement committed a strange confusion, attributing to religion what was due to material advantages. Few will deny to day that it is the coal and iron mining countries which have taken the lead in the economic race of the civilised world. This is so true that Belgium, a Catholic nation if any, with a frankly Catholic Government, is now perhaps the most prosperous nation in the world. But just as it would be childish on our part to attribute Belgian prosperity to Roman Catholicism so it is futile to speak of English or German progress as a result of their religion. And what of the Catholic States in Germany which are second to none of their Protestant neighbours in material prosperity? In fact it is not their religion, it is their coal, their iron and their other advantages of race and clime which account for the economic advance of modern nations. To speak otherwise is to go against facts and is so far anti-economic; this is the main reason which has induced me to recall facts and to disprove Sir Horace's allegation.

I do not deny however the possibility of a religion standing in the way of material progress. Writers have pointed out that for those who accept the whole Code of Manu as a part of their religious creed, it must check their industrial aspirations to find in it the ordinary trades reproved as unfit for the higher classes*

I do not even deny that Roman Catholicism stands in the way of a kind of so-called modern progress, which holds the acquisition of wealth and material prosperity to be the chief or even the sole aim of man's life. In this sense I readily admit that Roman Catholicism is anti-economic; but Sir Horace's Christian principles forbid me to suppose that he meant this as a charge against Catholicism. Whilst

* I am likely not alone to regret that, owing to such checks, the Brahmin race, with its superior average intelligence, does not take a sufficiently active share in the industrial work which is needed for the improvement of India.

then admitting this anti-economic or rather anti-materialistic tendency of Roman Catholicism. I still maintain—and facts prove it—that a Roman Catholic may remain perfectly faithful to his religion and be an excellent man of business. Nay, no Catholic is fully such who has not to some extent the social progress of his human brethren at heart. The reason of it is that, contrary to Sir Horace's assumption, Roman Catholicism is a religion made for this life as well as for the next.

REMISSION OF ASSESSMENT.

BY

THE EDITOR.

Among the several questions debated at the meeting of the Madras Legislative Council on the 24th instant, the most important, from the point of view of the ryot, was the Resolution moved by the Hon'ble Mr. G. Raghava Rao Pantulu regarding remission of assessment. The wording of that resolution was as follows:—"That this Council recommends to the Governor in Council, Fort St. George, that a rule be passed to the effect that in the case of Government Jirayati (ryotwari) lands remission of assessment shall be granted when the crop on any holding or revenue field is less than $5\frac{1}{3}$ annas in the rupee in the case of wet lands."

The idea of the Hon'ble Mr. Raghava Rao in moving the Resolution was:—

(1) "to impress upon the Government that the grant of remission for total loss is not a matter of grace but a matter of indefeasible right possessed by the ryot by long established usage under the terms of the settlements and under the rules and resolutions promulgated by responsible authorities from time to time;

(2) "to urge upon the Government the necessity to indicate as definitely as possible what constructive total loss means and not to leave it in the hands of Collectors to determine it in the light of the existing rules which take it for the basic principle that the grant of remission is a matter of grace,

(3) "to request the Government to recognise as constructive total loss, such loss as would leave no profit after meeting the cultivation expenses, etc., and

(4) "to fix $5\frac{1}{3}$ annas in the rupee as the cost of cultivation etc."

It will thus be seen that the Resolution relates only to cases of *total loss of crops* in wet lands and has no reference whatever to cases of *partial loss of crops* on such lands. Yet, the resolution is so worded that, on the face of it, only one construction is possible and that is, that it relates to cases of *partial loss* alone, or to *partial* and *total loss*, but *not* to cases *of total loss alone* which are the *only* cases contemplated by the Hon'ble Member. As a result of this unhappy error in drafting the Resolution, the Hon'ble Mr. A kinson on behalf of the Government appears to have been led to believe that the Hon'ble Mr. Raghava Rao was asking the Government "to add one more to the existing large number of deductions or remissions which Government make in favour of their ryots." He therefore explained the nature of the deductions already made in conducting settlements and ultimately pointed out that there was absolutely no reason for granting the extra concession asked for.

No one who has any knowledge of the principles of Land Revenue Settlement in this Presidency will now raise any question of remission as of right for *partial* failure of crops in wet lands. That is allowed for in all settlements by a percentage deduction on account of 'vicissitudes of season' before the Government's share is fixed. Hence, no ryot is entitled to any remission in this behalf in all settled tracts and as all tracts in the Madras Presidency have been practically settled, the question of remission for partial loss in wet lands does not arise for consideration.

The case is different however in respect of remissions for *total loss* of crops. No deductions are made on this account in calculating the settlement demand. Hence provision is made in the Standing Order No. 13 for granting full remission where there is a total failure of crops. This was also admitted by the Hon'ble Mr. Atkinson when he observed: "I think the Hon'ble Mr. Raghava Rao got a little confused between the question of partial loss and that of entire loss. He has said that the resettlement procedure makes no provision for cases of entire loss. *No; we provide for cases of entire loss in the Standing Orders and for entire loss we grant full remission.* The remissions given under the settlement procedure are, as I have endeavoured to explain, in order to meet cases of bad years" (*i.e.*, partial loss of crops).

Thus, it is admitted that the Government is under an obligation to grant remissions for total failure of crops. The only point in dispute is whether the obligation admitted by Government is legal or moral. In other words, whether the remission granted is a matter of right possessed by the ryot or a matter of grace on the part of Government.

The contention on behalf of the ryot is that he has a *right* to remission; but the Government

deny that he has any "*legal claim* for remission" and assert that the remissions granted by them, are purely of *grace*.

The 'N. B.' to para. 13 of the Standing Orders regarding season remissions runs :— "It should be distinctly understood that these rules and those in Standing Order No. 14 provide for concessions which will be granted as a matter of *grace* and are liable to be modified from time to time at the discretion of Government" This note however is of absolutely no value as evidence in favour of Government because it was inserted by them only about 10 years ago when claims were put forward regarding remissions as a matter of right; and the fact that one party to a case puts on record in writing a denial of the right of the other party is no evidence whatever in favour of the former. It is therefore necessary to go back a long number of years to see what exactly was the nature of the remissions granted by Government to the ryots.

A perusal of the papers relating to the introduction of the survey and settlement in this Presidency about 1857, and the discussions on the subject in the Legislative Council, particularly the speeches of the Hon'ble Messrs. Raghava Rao and Wynch, show, that in olden days, the assessments were heavy, that consequently remissions had to be granted every year and it is in order to cut short these remissions, *inter alia*, that a settlement was recommended. This is clear from G. O. No. 806, dated 18th June 1859 in which it was laid down that "the Government have resolved that the practice of *yearly remissions* shall cease and this, less from any idea of gain to the revenue than with the view of freeing the ryot from the subservience to the inferior native revenue servants and simplifying the revenue system." The Hon'ble Mr. Atkinson admits this when he says that previous to the introduction of settlement about 1857 "the *annual* remissions had disfigured our Madras Revenue System." Soon after the settlement operations were commenced, the remission rules were revised in 1865 and they provided that "full remission will be granted on irrigated land when the land is left waste or when the crop is totally lost owing either to deficiency or excess of water." This is the rule that is in force even to-day. And mark the words. It is not that the Government '*may*' grant remission but '*will*' grant remission Thus for nearly a century, and admittedly for over half a century, the ryot has been getting remissions when his crops failed totally. Is there not, then, a *customary right* to remission enjoyed by the ryot and sanctified by long enjoyment? Is the right of the State to half a share of the net produce of land anywhere *laid down in law* except as it has been interpreted by the courts? It is customary right ; and so it is with a host of other rights connected with property in land in this country. Nevertheless they are *rights* though not recognised by codes. The only unfortunate thing about these rights is that until they are so recognised or adjudicated on by a court of law it is open to the more powerful party to question its existence as in the case under discussion.

The Hon'ble Mr. Atkinson relies on a six-line judgment of the High Court in which it was decided that "as to the claim for the recovery of the assessment paid by the appellant, the suit cannot be sustained as there is no obligation on the Government to make remission of Land Revenue." With due deference to their Lordships, it seems to me that remission of assessment for entire loss of crop follows as a *corollary from the theory of land assessment*. That theory is that the assessment on wet land is the commuted value of the Government *share* of *a wet crop* after all expenses of cultivation have been deducted. If there is a total failure of crop or just a sufficient crop to pay for the expenses of cultivation only, then, obviously there is no share at all which is due to Government. The fact that the settlement with the ryot has been made for a term of years does not apparently affect the case, because as shown above, the case of *entire failure* of crops during the period of settlement is admittedly not provided for in arriving at the terms of the settlement.

The Government have "emphatically declined to withdraw the note in the Standing Order" to the effect that remissions are a matter of grace until the question is taken to the High Court as a test case and decided in the ryot's favour. There is no question of rate of assessment or amount of assessment here, questions whichare barred from the jurisdiction of the Civil Courts. The contention is simply that no share is due to Government in a year in which there is a total failure of crop and that, I believe, is a question which can be adjudicated on by a Civil Court. So then, unless and until some public spirited ryot takes a case against the Government and wins it, it must be taken as a settled fact that he must pay up the assessment even though the crop on his wet land is entirely lost from causes beyond his control.

VIEWS AND REVIEWS.

The Fertility of Indian Soil.

In the *Agricultural Journal of India* for January, Mr. Bernard Coventry, Officiating Inspector-General of Agriculture in India, has an instructive article under the heading "Has the Fertility of Land in India decreased?" The subject suggested tself to him owing to Dr. Voelcker's oft-quoted dictum that the land in India is becoming exhausted, and to the more recently expressed view that the yield of crops to-day is less than in the time of Akbar as given in the *Ain-i-Akbari*. Mr. Coventry accordingly invited the Directors of Agriculture in the various Provinces to supply such information as they could obtain as to whether, in their opinion, the fertility of agricultural land in India had increased or decreased as compared with former times. The replies disclose the great want which exists of reliable data from which to draw exact conclusions regarding so complicated a question. Nevertheless they afford a considerable amount of information from which Mr. Coventry draws the following deductions:—

(1) That there is no progressive decrease in the fertility of agricultural land in India, once the period of virgin productivity is passed, but, on the contrary, the fertility of Indian soils has been in a more or less stationary condition with a tendency to improve under better treatment ;

(2) the average of productivity might have become lower owing to inferior land having been taken into cultivation on account of the great agricultural prosperity and expansion brought about by the peaceful influence of British Rule, but this does not mean or imply that the objective fertility of the soil has become less ; and

(3) India's rate of production is low, compared with that of Western nations mainly due to the amount of capital employed being small. If more capital is used, Mr. Coventry believes that the rate of production will be greater.

Ploughing with Dynamite.

In the *World's Work* for April, Mr. F. A. Talbot writes on farming with dynamite. The ordinary plough does not reach the deep subsoil. A farmer in desperation buried dynamite in holes drilled in hard soil, which, exploding, broke the ground up into small pieces for a depth of several feet, letting in the water, and so dissolving the essential nutriment, while the roots were able to descend to a greater depth. The idea is now spreading throughout Canada and Mexico like a prairie fire. The method is used for ploughing fields deeply. It is also used for clearing stumps from the soil. Nay, more ; dynamite is used for planting trees. The spade-made hole leaves the surrounding soil in a hard condition, and the roots find it difficult to start. With dynamite a large clean hole is blasted out, and the soil on all sides is loosened for five or six feet. So the trees planted in the dynamited holes grow twice as quickly as those set in the usual spade holes. A new profession has arisen of expert dynamite farmers. In the cotton growing Southern States, dry weather no longer inflicts widespread damage. Though the streams and lakes are dried up, the cotton roots, having penetrated deeply into the dynamite-shattered soil, are able to obtain enough moisture. "The use of dynamite is proving the salvation of the cotton country. The number of farms which are being ploughed in this way are increasing by thousands." Dynamite is found effective in draining swamps A farmer in Kansas was handicapped by a swamp extending for forty acres on his farm. At last he blasted a row of holes across the lowest part of the swamp where the collected water was about three feet deep. The water sank into the ground, and ever since then, his forty acres have produced four crops of alfalfa every year.

Cheap Labour and Modern Equipment.

The question of *cheap labour* versus *modern equipment* as a means towards low cost of production is discussed in the *Statist* of the 30th March. The writer reviews the history of manufactures and railways in Western countries and concludes that 'economy of output comes from good management, careful organization, highly efficient machinery and high wages: not from incompetency, inadequate machinery, rule-of-thumb methods and low wages." The question is one that should be closely studied by persons who are interested in the development of India's industries and the expansion of her trade. The tendency to rely on mere lowness of wage and to eschew the modern equipment adopted by our competitors is very strongly marked in India, and this in spite of the continuous rise in the cost of labour. Since reliance on cheap labour invests the question of wages with supreme importance, it happens that the manufacturers and exporters in this country who dwell most upon its advantages are those who at another time are most clamant in their complaints about the rise in the inadequacy and dearness of the labour supply. The *Statist* dissents expressly from the contention that industries cannot pay higher wages because of the competition of cheaper labour in other countries. No greater mistake, it says, could possibly be made. It contends that the main danger lies in the failure to adopt those scientific methods and mechanical appliances which are cheapening the production and handling of products elsewhere.

Some Industrial Possibilities for India.

We take the following from a paper read before the Industrial Conference at Calcutta by Mr. G. F. Shirras, M.A.:—Twenty years ago, hardly any manganese ore was produced in India, but last year, the quantity exported was 572,979 tons and the value was Rs. 91·9 lakhs. The advance on the previous year was therefore 14·5 per cent. in quantity and 16·2 per cent. in value. No attempt has yet been made to manufacture ferro-manganese.

Again, nothing has been done in regard to the manufacture of sulphuric acid on a large scale. As every one knows, sulphuric acid is the key to most economic and to many metallurgical industries. This has been frequently urged by Sir Thomas Holland. India pays 30 crores annually for products obtained in Europe from minerals identical with those lying idle in her own soil.

A great deal has to be done in the utilisation in India itself of raw materials, such as oil seeds which are utilised in Europe and America for the manufacture of various articles of commerce. In the last two years, the share of seeds in the total value of raw produce exported, has been successively 17·4 per cent. and 22·4 per cent. In 1910-11 it rose to 26·7 per cent. If well organised oil mills are established, there is no doubt that the export of cotton seed would decrease. There is every likelihood of a ready sale for the manufactured article in the form o farticles of food, and the edible oil might also form a suitable substitute for ghee, of which the supply is now falling short of demand.

Then again there is the case of paper. The raw materials for paper making are available in the country though not in an exactly accessible form. Large supplies of wood-pulp and wood meal could be made available from the forests of spruce and silver fir in the mountains and fibrous grass from the forests at the foot of the Himalayas.

Vast quantities of hides and skins are exported which ought to be manufactured into leather and enormous consignments of cotton cloth which might be made within India itself if the staple of her cotton was systematically improved.

Co-operation in India.

A writer in the February number of the *Hindustan Review* tracing the history of the co-operative movement from its earliest days writes:—

The principle of co-operation is not new in India. The ancient village community where

it existed was a typical illustration, and survivals of it are still to be found in more or less crude or debased forms in the archaic parts of the Indian States. In British India, however, generations of law and order have strongly developed the individualistic tendency. The joint family system is nothing but a type of compulsory co-operation. The various forces of the present day are acting as a powerful solvent of the joint family system also, and for many reasons, the result is not to be regretted. The new methods of co-operation are an attempt to reconcile individualism with communal interests. The history of the movement in Europe does not require recapitulation here. In India, the first serious attempt to study co-operative methods and their adaptation to this country was made by Sir Frederick Nicholson, a Madras Civilian, whose masterly and exhaustive report published in 1894, is still the basis of the work of the Indian co-operator. This was followed by some small books published by Mr. Dupernex, a United Provinces Civilian, suggesting modifications of European systems for adoption in Northern India. Lord Macdonnell than whom the Northern India peasant has not had a stouter champion in recent decades was at the time Lieutenant-Governor of the United Provinces. He originated experiments in this direction in various centres in the United Provinces. Public interest in the movement was awakened, and subsequently Lord Curzon's government assembled a small committee of experts who recommended legislation and systematic propaganda. The result was Act X of 1904 (the Co-operative Credit Societies Act), and the appointment, in all the larger Provinces, of Registrars controlling a very small staff of Inspectors and Auditors. Much experience has been gained in the last seven years of active work regarding the proper methods of organising, supervising and developing such societies. Provincial Conferences have met in various parts of India and discussed the needs and problems peculiar to each Province. Similarly, the Registrars of the different Provinces have, from year to year, met in Conference, compared notes and suggested improvements for the benefit of one another.

Britain's Gain from India.

What has India done for Britain? That is answered by Col. Sir F. H. Holdich in the *Weekly Chronicle*, London Britain's gain has been of two and indirect. The direct gain is the matter of actual wealth which has accrued to this country, not only through the ordinary channels of commerce, but in the salaries, emoluments and pensions of the great host of British subjects who have lived and struggled in India with the almost invariable result of spending their gains in Britain. There is no means of calculating the immense material gain which has accrued to this country in this way. As regards commercial gain, it seems to have been ordained by Providence from the beginning of history, that whosoever held the right of way to the Indies should stand first in the commercial ranks of the world. Tiglath Pilesar of Assyria was perhaps the first authentic monarch who held the golden keys, and his were keys of the land gates. Persia followed later and drew most of her revenues from India, still by way of the land; then Arabia; and finally when the water gates were opened, came the rush of Dutch, Portuguese, French and English, jostling each other in their efforts to keep command of the Eastern seas and to hold the highways of Indian trade. And so Britain finally became paramount, and year by year has grown rich with much more silver and gold than has anything to do with official Treasury returns. Official India does not figure always to great advantage in the reports of the Official Treasury. The balance may sometimes be doubtful. That makes but little difference in the actual amount of material wealth that Britain has drawn from India—the amount of which is incalculable. But greater by far than direct returns are the indirect returns for our administration. Can any other country in the world exhibit such a roll of famous administrators and soldiers trained in so magnificent a

school ? If Indian administrators, responsible for the purest and most efficient administration of an alien people that the world has ever seen, appear to receive scant acknowledgment in their own country, it is because they are men of action come home to rest, and not men of words trained up in a voluble parliamentary school. None the less are they representatives in Britain of all that is straight and dignified in manhood, holding a record which ensures them an honourable place in the social ranks of this country ; excellent examples are they for the generation which is said to be "rising." As for our soldiers, if the position of Britain amongst the natives depends at all on her ability to fight her battles and to win them with good soldiers under able leadership, then indeed do we owe to India a deep debt of gratitude for the service she has rendered this country as a magnificent field for training in the past, and as a source of military strength in the present which need never fail us if we don't spoil it by muddling.

The Dyeing Industry in Madras.

In a report on the dyeing industry of the Madras Presidency, Dr. Marsden, the tinctorial expert, deals exhaustively with the various technical aspects of the industry, points out the defects which he was able to notice and suggests suitable remedies. The outstanding facts regarding the present condition of the industry are, that it is in the hands of people who have little or no education or technical training, who have not much capital, and who do not keep abreast of the improvements and progress made in the West in regard to the dye stuffs which are so largely imported now-a-days and which have more or less completely displaced the indigenous dyewares. In the first place, the European manufactured stuffs have almost superseded the indigenous wares, indigo being more largely used than others because of the purity of its shade and its fastness. But since the coming into the market of the synthetic indigo, and because of the length of time required to prepare the vat and the variations in its quality, Indian indigo is at the present day being driven out by the imported stuff. The defects prevalent in the industry as it is carried on in South India are many. The preliminary treatment to which yarn is subjected before dyeing is too incomplete to remove the impurities of cotton, so that the colour that is required by the dyers is not very often obtained. An amount of secrecy is observed in the matter of the processes of dyeing which is ultimately inimical to the development of the industry, tending to stagnation. This is more prominently observable among those who are ignorant of the business. Again, the industry is carried on, generally, on a very small scale, and want of capital, ignorance of the principles of dyeing, low educational qualifications and the general poverty of the dyers 'make it a matter of difficulty to see how they can be moved to progress and to adopt more modern and suitable methods.' They are besides utterly at a loss to devise new methods of meeting Western competition in regard to coloured yarns.

"The general idea for meeting competition, is not to improve the method or conditions of dyeing or the quality of the work, but consists rather in lowering the price, resorting to the use of inferior materials or to methods of business which are still less to be commended. The lack of perception by purchasers of the difference between what is good and what is only poor value, is responsible for cheapness being the deciding factor (and the question of quality becomes apparently but of minor importance), and it is little wonder that the quality of a lot of the dyeing done in Indian dye houses is poor, for the prices paid in many districts do not permit of any but the lowest class work being supplied." There is no disire to effect improvements ; anilines, which were in use years ago in Europe and which have been superseded by infinitely better stuffs, are largely used in the Presidency and the methods used are at variance with those recommended for the particular dyes and thus inefficient, all

this necessitating 'a radical change in the attitude of the people engaged in the industry and the methods under which it is carried on before any appreciable improvement can be looked for.' Commenting on the report, Mr. Chatterton considers that expert assistance could be of help, both by demonstrating to the dyers how the process could be made less costly, by more judicious use of the dyes, and also by the introduction of pure chemicals such as alum and soda ash, which will probably be less costly and more useful than dhobie's earth, Sarracutti, Kasa leaves, &c.

Desiccation of Potatoes.

The drying of potatoes is an industry that has been developed in the past five years in Germany. It grows one-third of the world's potato crop. During the past year, under the orders of the Secretary of Agriculture, an investigation was made in Germany of the starch and dried potato industries, dealing especially with the machinery and methods in use. Germany has potato drying plants with a combined yearly capacity of nearly twenty-five million bushels of potatoes, equal to more than 7 per cent. of the average annual potato crop of the United States for the three years ending with 1911. The two general methods of manufacture are known as the roll system and the drum system, and are thus described by a Washington correspondent.

In the roll system, the potatoes are steamed until softened, and then passed between large revolving cylinders which are heated by steam. The potato forms on the roll in a layer, which dries and is scraped off during a revolution of the roll. This product has the appearance of one of our breakfast foods known as "corn flakes," and is used as a general substitute for the fresh potato in the household, in addition to being ground to a flour and mixed with other flours for bread making and in the making of cereal foods.

The drum system makes a product at about half the manufacturing cost of the roll system, and for all purposes other than human food, the drum system is used. It consists, essentially, of an iron shell about two and one-half feet in diameter and eight times this length. Through this a heavy current of air is drawn by means of a fan, and the fire gases from a stove feed directly into it, the mixture of heated and cold air being such as to make a temperature of about 600 degrees Fahrenheit at the entrance. From a cutting machine, chipped potatoes are conveyed to the slowly revolving drum, which is provided with an interior construction that gives the potatoes the maximum exposure to the drying action of the hot air. The drying operation must be done on rather a large scale, as small drums are not merely so efficient in proportion to size. The fuel requirements are about 300 pounds of coke, or its equivalent, for one ton of potatoes, and the labour requirements are small. The approximate cost of operation, including fuel, labour, interest on investment, taxes, wear, etc., is $. 1·30 per ton of potatoes. Four tons of potatoes yield one ton of dried product. In Germany, most of the product is used as feed for all kinds of animals, having about the equivalent value of corn for cattle, horses and swine. It is used, technically, in the manufacture of yeast, alcohol, etc. The product, being partially cooked, is not suitable for the manufacture of starch. One of the large manufacturers of machinery is now trying out a process for making a material that will be suitable for making into finished starch.

Plantain Fibre Industry.

Writing in a recent issue of the *Ceylon Patriot* on the above subject, Mr. T. P. Masilamony of Jaffna says : Perhaps many are not aware of the latent source of wealth that lies buried in the plantain fibre which now practically goes to waste. Experiments have shown that the plantain fibre is admirably suited for cordage of a superior quality. The Manila rope which is very largely used in ships and for machine driving is made of the fibre extracted from the "Manila Plantain,' which is a native of the Malaya Archipelago. Experiments for manufacturing fabrics out of plantain fibre were also made and were found

satisfactory. Some of them looked even better than silk.

The extraction of the fibre is a very easy process and is done by means of a machine which is very simple A very good machine of the kind is the invention of Mr. Proudlock of Ootacamund. It consists of a smooth piece of wood 4" by 6" by 6" on two posts fixed to the ground, and a blunt knife fixed to it lengthwise, with its edge downwards. One end of a string is attached to the handle of the knife, and the other to a long piece of bamboo to form a lever which is pressed by the foot to raise the blade when working. The cost of this is only about Rs. 3.

Experiments have shown, says the writer, that a man with a few days' experience on the machine will be able to work about ten plantain stems a day, with the assistance of a boy to tear the sheaths into longitudinal pieces of an inch and a half wide, and assist him generally. An average plantain stem cut for fruit yields about 1½ lbs. of fibre. The wages of the man and the boy may be put down at 50 cts. per day, and for this 50 cts. we get 15 lbs. of fibre. At this rate it costs about Rs. 75 to extract a ton (2,240 lbs.) of fibre. Add to this Rs. 45 for freight, traders' commission, baling, insurance, etc.; the total comes to Rs.120. And for this sum of Rs.120, a ton of fibre reaches the London market. The price there is about Rs. 300 a ton—of course subject to fluctuation. From this we see the profit on a ton of fibre is Rs. 180. This figure is arrived at on the presumption that the stems could be had free. About 1,500 plantain stems would be required to produce a ton of fibre, and even paying at the rate of 2 cts. for every stem, we may require only Rs. 30 for the whole lot. Deducting this Rs. 30 we can be positive of a net profit of Rs. 150 on every ton of fibre exported. An acre of land could be planted with 1,500 plants, and it takes about 18 months to bear fruits. The bunches could be sold (putting the lowest average value) for 40 cts. each, which would give Rs. 600; and about Rs. 250 will be more than enough to cover the cost of cultivation, and the balance Rs. 350 could be added to the profit on the fibre.

Industrial Education.

According to the *Educational Review*, it is a baseless dogma which is frequently propounded in certain quarters that "industries must first be developed and technical education should then be provided to suit the needs of these industries." It points out that the industrial development of the little province of Wurtemburg in Germany gives the lie direct to this dogmatic assertion. The Duchy of Wurtemburg was, a few decades ago, a purely agricultural country, but the Government under the guidance of a far-seeing Minister of Education bestirred itself to improve the economic condition of the Province. Astonishingly heavy investment was made on industrial education. Though on the whole a poor hilly country with very poor transportation facilities, it has, besides its splendid system of elementary and secondary schools, about 250 industrial schools in its towns and villages, one knitting school, three weaving schools, two industrial workshops for actual practice in weaving, two technical schools for textile and mechanical work, a large State university, a technical university, a royal building-trades school, a great commercial college, several commercial improvement schools, a great agricultural school, many farming schools, an art trade school for industrial art, a pure art school and many miscellaneous schools of all kinds for workmen of various grades, evening schools, continuation schools, etc. including schools in domestic economy for women. Until some investment of this kind has been made in at least one of the Provinces of India, let no one dogmatise, writes our contemporary, about the impossibility of regenerating India through industrial education. Have we, it asks, any industrial school worthy of the name all over India? In one of the industrial schools in Munich are equipments and workshops in the following: electric motive power; electric lighting; locksmith and machine-forging; book-printing and lithography; cabinet-making; stucco work; carving; chain making; metal work; plumbing fittings; tinsmith work, and photography. "Can it be denied that there are openings along these lines of work in the presidency of Madras? But what has the Director of Industries, who talks big on all occasions about the achievements of his department, done to improve the condition of this Province in these directions?"

The evolution of Germany as an industrial nation of the first rank has virtually come about in our own day and generation. It has all been brought about by the heavy investment made in industrial education. The soil of Germany is not naturally rich, but her industrial schools are. Nearly every small village has at least one industrial school, and often in small cities, several are found. A city system of industrial education, such as that of Munich, covers the courses suited to sixty-seven trades, while that of Berlin provides for two hundred and twenty-three trades. And this education is not only technical, but also includes the hygiene, the civics and the laws that concern every workman as a man and a citizen. It may be pointed out that Germany learned industrial processes from Great Britain and borrowed the idea of industrial schools from France and Switzerland. On the basis, primarily of evening drawing schools, she built up her education of the artisan. Without abandoning the apprenticeship system, Germany met the new conditions necessitated by the decrease of training offered in the trades by increasing the training offered by the State. It may be said that to-day throughout the length and breadth of the German Empire, the State offers all the technical instruction supplementary to the trade, needed in all vocations. Every apprentice, boy or girl, from fourteen years of age, undergoes throughout the period of his or her apprenticeship training for from six to eleven hours a week in schools under the direction of the State, and the certificates are issued according to State standards by the State.

Everywhere in Europe, industrial education is regarded as an essential factor in industrial efficiency. To develop a new industry or to revive one that is languishing, schools for the training in that industry are established. The Swiss make the most perfect watches, and the oldest technical trade school is said to be the school for watch-making in Geneva. German chemical industries lead the world, because Germany has over six thousand school-trained chemists in her chemical industries. The industrial rehabilitation of Italy is due to the establishment of technical schools, for the soap industry, for the paper industry in Milan, for the textile industry at Prato, for the art industries at Rome, Florence, Venice and Milan, for mechanic arts in every important town. In all countries technical instruction is considered indispensable both to the artisan and the industrial expert. "But is there one institution in all India which can stand comparison with even the smallest of the trade schools of Germany? Educated public opinion, as represented by the National Congress and the National Industrial Conference, is practically unanimous in holding that industrial education alone would form the best guarantee for the industrial efficiency of India but the Government has not given due attenten to this demand."

The Indian Census.

At a recent meeting of the Royal Society of Arts, England, a paper on the "Indian Census" was read by Mr. E. A. Gait, C. I. E., I. C. S., Census Commissioner for India. Speaking of previous censuses, Mr. Gait writes:

Although in some provinces it had long been the practice to make periodic estimates of the population, the first attempt to do so throughout India was carried out in the years 1867 to 1872. But even then the census was non-synchronous; the methods followed in different parts were far from uniform, and the information collected and tabulated varied from province to province. The first

synchronous census on a uniform plan was taken in 1881.

Then follows a vivid account of the present census operations :

In India, with its teeming population, its great distances and its varied local conditions, a census presents difficulties which can only be overcome by careful organisation and a judicious combination of close supervision and decentralisation, and in particular, by the creation of a complete and well-drilled graded staff, the officers in each grade being carefully linked up with those above and below, so as to provide a ready ladder of communication between the top and the bottom of the structure.

Each tahsil, etc, was divided into circles under supervisors, and each circle into blocks containing forty to forty-five houses under the enumerators who actually took the census. The total number of supervisors and enumerators was about two millions.

The efficiency of the organisation is shown by the great speed with which the provisional totals were got in. According to the instructions, each enumerator on the morning after the census was to prepare a statement showing the population of his block, and hand it to his supervisor, who, after checking it, was to prepare a total for his cricle and take it to his charge superintendent. The latter was similarly to prepare a total for his charge, and send it to the District Officer, who added up the charge figures and reported the district total by telegraph. This work was so admirably done that the results for the whole of India were received complete on the 19th March —*i. e.*, within nine days of the census—and were issued in print next day with full details, not only for Provinces and Agencies, but also for districts aud states and the principal towns. This constitutes a world's record. The accuracy of the figures thus obtained is also noteworthy. The net difference in the whole of India between them and those arrived at after detailed tabulation was only ·40 per cent., and for nearly half of this, a mistake in one district in Burma was responsible.

The following interesting particulars are gleaned from Mr. Gait's address :

The total population of India is now 315 millions, of whom three-fourths are resident in British territory and one-fourth in Native States. The mean density of the population is 175 per square mile, bnt there are great local variations, from 900 and upwards in a few favoured districts of Bengal, to less than fifty in Burma, Kashmir, the west of Rajputana, and Baluchistan.

In most parts of Europe the females outnumber the males. More boys than girls are born, but the mortality amongst them is greater both in infancy, owing to physiological reasons, and in later life, owing to the greater risks to which they are exposed in their daily avocations. In India, as in most other parts of the world, males are in excess. The proportion of the sexes at birth is not very different from that in Europe, but subsequent conditions are relatively less favourable to female life. Female children are not wanted, and it is well known that the practice of killing them was formerly widespread amongst certain communities, chiefly in the north-west of India.

The number of Christians is now nearly four millions—a gain of a million in ten years. The largest actual addition (411,000) has occurred in Madras and its Native States, which contains three-fifths of the total number of Christians in India, but the greatest proportional increase (200 per cent.) is in the Punjab.

The proportion to the total population returned as able to read and write has risen during the decade from ninety-eight males and seven females per mille to 106 and 11 respectively. The progress amongst males has been greatest in Eastern Bengal and Assam, Madras and Mysore, and amongst females in Baroda and the United Provinces. The proportion of literate persons is greatest in Burma and the extreme south of India, and smallest in the north-west.

AGRICULTURE.

Ploughing in Rice Cultivation.

In Siam, the rice planters plough throughout to a depth of four inches as against ten inches in the experimental land of the State School of Agriculture. By the latter method, an increase in production of 33 per cent. was obtained, as against the best rice soils in the country ploughed to the lesser depth.

Foot and Mouth Disease.

According to the *Medical Press and Circular*, Dr. Siegel, the well-known bacteriologist, has isolated a bacillus, which he has named *Cytorrlycles*, which he regards as the specific pathogenic organism of foot and mouth disease. He has successfully inoculated lower animals with the culture and after much experimentation has succeeded in producing a considerable degree of immunity against infection.

Assimilation of Nitrogen by Rice.

Experiments conducted at the Hawaii Agricultural experiment station show that ammonium sulphate is of the greatest use as a manure for rice in wet cultivation, while nitrate of soda produces little or no effect; that soy bean cake is useful, but inferior to ammonium sulphate in this connexion; that denitrification takes place in paddy soils, causing the formation of nitrates, and possibly the loss of free nitrogen; that in submerged rice soils, the formation of ammonium salts occurs to a considerable extent; that the provision of nitrate as the only source of combined nitrogen, for rice plants, gives unhealthy and stunted growth; that the greater the presence of nitrates the greater is the extent to which nitrites are formed, and that this may reach such a degree as to injure the rice; and that the failure of rice properly to assimilate nitrates is probably due to a lack of nitrate-reducing enzymes, caused through the non-use of these over a long period of time.

For the agriculturist, the matter of practical importance is that ammonium sulphate and organic nitrogenous bodies are preferable to nitrates in paddy cultivation. For the investigator, the suggestion arises regarding lines of research for the purpose of enquiring further into the forms in which nitrogen is assimilated directly by plants.

Some Agricultural Improvements.

In a paper read before the Industrial Conference at Calcutta, Mr. G. F. Shirras has the following suggestions to make with regard to Indian Agriculture :

Agriculture means the culture of the people who live on the soil, as well as the cultivation of the soil itself. Our chief difficulty lies in the fact that Indian Agriculture is in the hands of small men, the capital is required in small sums, and it is supplied by small capitalists to men of small commercial intelligence at anything but a small rate of interest. During my tours in the United Provinces, Bengal, Eastern Bengal and Assam, Central Provinces and the Bombay Presidency, I was much struck by the lack of real practical knowledge amongst the ryots who are conservative to a fault. Many conclusions arrived at agricultural colleges in this country are never heard of even by the better class cultivators. We perhaps are to be blamed slightly in this matter. There is only one way of improving the ryots' welfare and that is the eternal truth of getting into their skins, of realising their ideas and feelings. The soy bean, for example, has undoubtedly enormous interest for India and a struggle between bean oil and cotton oil in the soap countries in the world has already begun. If its introduction into this country is successful, there should be little difficulty in competing with Manchuria. Dry farming, which has been so successful in America, might be introduced in a larger degree. Dry farming means roughly the cultivation of drought resisting plants and also the most advantageous use of rainfall on the soil by careful preparation. A great deal can be done in the way of co-operation whether in the form of credit societies or of supply societies, *e.g.*, for providing the materials of agriculture, productive societies, *e.g.*, co-operative dairies and sale-societies such as lac or grain societies.

COMMERCE.

Business Enterprise in India.

The Commercial enterprise of India during the month of March 1912 may be gauged by the following abstract of joint stock companies registered in that month :—

		Rs.
2	Banking and Loan Companies	1,00,20,000
4	Insurance Companies	2,45,000
2	Printing, Publishing, and Stationery Companies	3,03,000
8	Trading companies (other than those specified above)	16,35,000
1	Jute Mills Company	6,00,000
1	Tea Planting Company	2,00,000
1	Rubber Planting Company	90,000
2	Mining and Quarrying Companies	62,50,000
2	Companies (other than those specified above)	3,20,000
23	GRAND TOTAL ...	1,96,63,000

The Rice trade of Burma.

The importance of the rice trade of Burma is exemplified by the fact that *rice* and *paddy* represented 63·76 per cent. of the combined value of the foreign and coasting exports of merchandise during 1911-1912. Although Burma has not a monopoly of the rice trade, yet owing to the marvellous regularity in the volume of her exports, she holds a strong position in the markets of the world. During the last five years the average quantity and value of the rice trade of Burma were 2,364,169 tons and Rs. 2,255 lakhs respectively, the largest quantity exported was 2,520,730 tons in 1909-10 and the smallest 2,196,563 tons in the year under review; the highest value Rs. 2,384 lakhs was obtained in 1907-08 and the lowest Rs. 2,177 lakhs in 1910-11.

The number of immigrants and emigrants at the port of Rangoon during the year was 255,769 and 224,363 respectively, the majority of whom were labourers from Madras and Bengal, who visit Burma annually for work principally in connection with the rice trade. Burma has passed through troublous times, happily without any serious harm to the general prosperity of the country; individuals have no doubt been hurt, but much useful experience has been gained, which will be of great advantage to the future development of the resources of the Province.

Trade Statistics of Three Nations.

The following table giving the trade figures of the three great foreign nations will be perused with interest :—

	IMPORTS Millions of dollars			EXPORTS Millions of dollars		
	Great Britain	United States	Germany	Great Britain	United States	Germany
1882	1,693	752	744	1,163	749	758
1883	1,756	687	776	1,167	777	778
1884	1,591	629	775	1,133	733	762
1885	1,523	587	699	1,036	673	680
1886	1,430	663	684	1,036	699	710
1887	1,474	708	740	1,080	703	745
1888	1,576	725	778	1,143	679	762
1889	1,756	770	949	1,211	814	753
1890	1,732	823	990	1,279	845	791
1891	1,815	828	987	1,202	957	755
1892	1,751	840	956	1,104	923	703
1893	1,683	776	942	1,060	854	786
1894	1,703	676	937	1,051	807	704
1895	1,737	801	980	1,099	807	790
1896	1,878	681	1,025	1,167	986	839
1897	1,902	742	1,114	1,138	1,079	865
1898	1,990	634	1,209	1,133	1,233	894
1899	2,043	798	1,304	1,240	1,252	1,001
1900	2,238	829	1,372	1,372	1,453	1,097
1901	2,209	880	1,290	1,318	1,438	1,054
1902	2,248	969	1,340	1,352	1,333	1,113
1903	2,306	995	1,428	1,396	1,457	1,193
1904	2,340	1,035	1,512	1,440	1,425	1,242
1905	2,369	1,179	1,696	1,581	1,599	1,364
1906	2,545	1,320	1,909	1,786	1,772	1,513
1907	2,696	1,423	2,081	2,024	1,895	1,629
1908	2,496	1,116	1,824	1,786	1,728	1,522
1909	2,593	1,475	2,027	1,810	1,700	1,568
1910	2,793	1,562	2,126	2,048	1,829	1,778
1911	2,812	1,583	2,255	2,185	2,058	1,928

Excludes value of ships.

INDUSTRY.

Brush Making in Baroda.

The Baroda Brush Factory, Ld., has started work and turns out various kinds of brushes. It is interesting to note that brush-making is worked as a cottage industry. Backs of brushes and bunches of hair and fibres are provided to a number of women, who work in their own homes and return the finished brushes. They are paid on the piece work system.

A Cotton-seed Oil Mill.

The opening ceremony of the cotton-seed oil mill built at Navsari by the Indian Cotton Oil Co., Ld., was performed on the 17th March, by the Hon. Mr. G. K. Parekh. Mr. Parekh had no doubt that as people commenced to learn the various uses of the oil and its bye-products and as knowledge in this matter became more widely spread, this industry was bound to succeed. In America, 50 years ago, there were only four factories, 25 years back there were 119 factories, in 1900 there were 668 and in 1910 there were 981, and he saw no reason why in this country, where there was so much of raw material of this kind, we should not be able to improve in the same way. At the conclusion of the ceremony, the guests partook of the refreshments, a novel feature of which was, that almost all the dishes were prepared with either cotton seed flour, oil, or both.

Old Cedar Wood for Lead Pencils.

Pencil manufacturers have been buying old cedar rails and cedar boards from the old barns of the farmers for the reason that such wood having been exposed for many years to the elements is in far better condition than new cedar. The latter carries a large amount of resinous matter and it is difficult and expensive to get rid of this. It tends to warp the pencils and to ooze out, marring, it not destroying the finish.

The Industries of Madras.

Mr. Chatterton in his notes on the industries of the city of Madras explains why it has failed to become a centre of industrial activity in spite of the attempts made by the European houses of Agency. The natural poverty of the country, the lack of raw materials as a basis for manufacturing operations, the primitive type of the indigenous industries which were entirely in the hands of uneducated artizans, the non-official European communities whose business was entirely commercial and were, therefore inclined more to finance agriculture and develop trade than risk their capital in industrial work and lastly, the limited market for specialised manufactures due to the poverty of the people and the want of facilities for transport, are the reasons that are said to have operated in preventing industrial development in this city. In addition, it is pointed out that the high price of fuel, a material so essential for the establishment of modern industries, is said to handicap any venture and the price of coal which has to come from Bengal, precludes the idea of using it for purposes of fuel. To compensate these disadvantages, labour is however cheap, but it cannot go a long way in helping new industries.

Manufacture of Strawboards.

In the *World's Work* for March, a writer discribes the process of the manufacture of strawboards thus :—

"The straw is first put through a giant chaff-cutter and boiled in lime for four hours in immense, extremely forbidding, cooking boilers. . . . Then the straw mash goes through a beating process first in a dry and then in a wet state. The resulting product is led over a sieve, and then between a wire mesh, the effect being to drive out more and more water. The pulp continues its journey through tighter and tighter presses until, at the final stage, it no longer passes over wire meshing but travels over canvas, and is strawboard, albeit in a somewhat doughy state.

All that remains is for this unending strip of strawboard to dry itself over cylinders more and more highly heated. It is then cut and trimmed by means of guillotines to the desired sizes. The kind of strawboard which is white or red on one side is made by white or red paper being made to adhere to the strawboard by means of potato-flour starch."

ECONOMICS.

The Rate of Interest.

The output of gold and the Index Numbers of Commodity prices are frequently referred to as giving an indication of what practical men or theorists think of the future prospects of the rate of interest, but the companion factor in the situation, the importance of which is every bit as great as that of gold, namely, the volume of the world's trade, is not even mentioned, says a contemporary. Of all the conjectures recently made as to the likely direction of future developments, the most authoritative is contained in a Report by the Director of the American Mint, referred to in '*The Economist*' of 17th February. Mr. Roberts inclines to the view that the influence of increased gold supplies is waning, and that coming years are more likely to see gradually falling than rising prices. It seems to be generally admitted now that falling prices would tend to depress the rate of interest, thus raising the market value of irredeemable securities with a fixed return.

The late Mr. J. N. Tata.

The life of the late Mr. Tata was not the life of the philosophic thinker, who merely dreams away his existence in beautiful visions of his country's spiritual welfare : not the life of the political agitator who talks over so enthusiastically, but only talks away the abstract benefits of political rights and political privileges for educated Indians. His was the quiet, unselfish life of a thorough man of business, the unassuming activity of a practical statesman in the best sense of the word, who understood the needs of his country, and whilst working for himself worked energetically and enthusiastically for supplying his country's needs. Mr. Tata was one of those who believed that the regeneration of India could best be helped on by helping those elements of Indian life which bore signs of vitality, and by leaving the rest to take care of themselves. The development of the natural resources of India, the revivification of the industries of the country, the training of Indian youths in Western Science and Western Arts with a view to this development—this was the ideal which he set before himself, and which he endeavoured to realise throughout his life. In working for this ideal he made no distinction between caste and creed ; he worked as an Indian for the good of India, and when he died he was honoured and his memory has since been cherished as of one who subordinated all class and race considerations to the one great object of advancing his country's interest.—*Parsi.*

The Economic Development of Japan.

The Chugai Shogyo expresses the opinion that under existing conditions it is well nigh impossible for commerce and industry in Japan to show much development. To encourage the export trade and thereby to check the imports is most urgent for Japan, and the commercial paper urges the Government to lower railway rates, to extend the system of rebates, and to reduce the various taxes, especially the business tax. Furthermore, the customs tariff on rice, wheat and other foodstuffs must be either abolished or reduced, in order to lower the high cost of living and the high scale of wages. The railway freight now in force is so extravagantly high that manufacturers and merchants in the interior cannot obtain fair profits in forwarding their goods to the open ports and thence abroad. In the extension of the rebate system, the paper hopes the authorities will make the present complicated official routine much simpler. The business-tax is at present levied in such a way that the greater portion of the profit is consumed. The commercial paper therefore suggests that the business tax now imposed upon those lines of industry which are likely to check imports and develop the export trade should be abolished for a certain length of time, say for ten years or so. Without adopting these measures, remarks the paper in conclusion, the commerce and industry of Japan will not only be stationary, but in many cases will decline.

CO-OPERATION.

Credit Societies in Ireland.

Mr. W. A. Ward writing in the *Agricultural Economist* for February points out that the function of credit societies (sometimes known as agricultural banks or land banks) is not to receive savings, but to place capital in the hands of agriculturists on loan for a stipulated time and at a moderate rate of interest. The principle on which these useful institutions are run is the simple one of co-operative credit. Where commercial men give some tangible security when arranging an overdraft at their bankers, a self-contained community such as a village or group of farmers can find an equally safe security in the good character and industry of its members. In Ireland, there are many credit associations composed of groups of individuals registered under the Friendly Societies Act. The members hold no share capital, but borrow money from outside sources at 3 or 4 per cent., and lend it out at 5 per cent. to those of their own number in need of capital. All that the borrower has to do is to find two sureties, and to satisfy his committee that the loan is genuinely required for productive purposes, such as the purchase of stock, seeds, implements, and so on. This is an essential part of the scheme, because if the money is used productively the borrower is reasonably sure of his ability to repay the loan when his crops are harvested or his produce sent to market. The society depends for its security on the personal honesty of the borrower, and it is very rarely, if indeed ever, has this trust been abused. In the congested districts of Ireland, where credit societies are most numerous, the peasants faithfully and promptly repay all loans, and the experience of the Raiffeisen banks on the Continent has been the same. The fact that the members are collectively and individually responsible for the debts of the society, and that, in a small village community, the borrower is generally well-known to all his fellows, would appear to be a sufficient guarantee for the repayment of loans.

The Aims of Credit Societies.

The main object of Co-operative Credit Societies is to render financial aid to the poor agriculturists and artisans who are very often in the clutches of money lending capitalists. These societies enable the cultivators to obtain, without paying usurious rates of interests and without being given undue facilities for incurring debt, the advances necessary for carrying on their business. There are three kinds of Co-operative Credit Societies founded by three eminent philanthropists of Europe, Raiffeisen, and Schultze of Germany and Luzzatti of Italy. The Raiffeisen Societies are the best suited to the conditions of India. The main principles of such societies are (*a*) Unlimited liability of its members. (*b*) The operation of these societies is restricted to small areas. (*c*) There are no shareholders, and consequently, there is no payment of any dividend. (*d*) The creation of what is called the Reserve Fund. (*e*) The rendering of gratuitous services by the members in the management of their concerns. (*f*) Repayment of the loans from the profits made by the borrower. (*g*) And last but not least the moral as well as the material benefit of the members. The moral benefits derived from these societies may be summed up in the following words. "The Societies enable the people who were hitherto at the mercy of usurers to live in peace and contentment and to put by some money ; they enable the cultivator who carried home his produce only to hand it over to his sowcar at three fourths of its price (not paid to him but adjusted to his account) to store it till he can sell it to advantage and live upon the proceeds for the rest of the year. The Societies enable people, who, for generations, paid debts contracted at marriages performed fifty or sixty years ago, to marry decently without becoming debtors for the rest of their natural lives. The societies have introduced ideas of thrift, sobriety and cleanliness into villages which were hitherto strangers to civilisation."

BANKING.

Savings Banks in India.

The savings banks figures in India are a sure index of the material prosperity of the country from year to year says the "Pioneer." In time of famine they fall at once, and it takes two or three years for a full recovery to set in. Thus in 1907-8 the net addition to cash deposits was under 15 lakhs of rupees, as against nearly 51 lakhs in the preceding year; while in 1908-9 there was a minus return of over 22 lakhs. In 1910-11, however, the net addition to deposits was 105 lakhs, and in the revised estimates for the year 1911-12 the figures are put at about 188½ lakhs. This is an unprecedentedly large sum and 95½ lakhs more than was estimated, but it is partly due to the introduction of the rule raising the limit of annual cash deposits from Rs. 200 to Rs. 500. The savings banks enjoy great popularity, and we may take it that in normal years the net addition will in future average over a crore of rupees.

Advertisement by Banks.

American bankers are much more alive to the benefits obtained from a properly-displayed advertisement than are their confreres in England. In this regard some of the advertisements appearing at Christmas time in the States are particularly striking. The managers controlling this department seem to lay themselves out not to fill up a space with as much small print as possible, but rather to put into a fair-sized space some smaller amount of matter which can be so arranged as to attract at once the attention of the cursory peruser. It is most desirable for any business institution to keep its name and salient points before the people from whom it derives support, and "we think," says the *Financial News*, "a study of the question of advertising would amply repay some of our bank officials."

Banking in India.

The paper which Mr. T. Smith of the Allahabad Bank, Cawnpore, read at the Industrial Conference recently held in that city on the necessity for legislation to control banks in India has not attracted the attention it should. There are two ways of looking at this question says a contemporary. "If banks have multiplied recklessly or if it is proved that they are a source of insecurity to the savings of the people, then legislation may be called for but it would be wrong to introduce legislation merely because banking is being understood and beginning to flourish in India. Is there any law in England to control banking, and if not, why is such a law needed in India? Some years ago a bank managed and controlled by Indians was deemed an impossibility. A bank was founded in Calcutta several years ago and was placed under the management of some leading Bengali gentlemen. In a short time the bank failed and a large number of people suffered heavily. Then it became a settled belief that Indian banking of the *hundi* system was entirely different from European banking and Indians would never be able to conduct banks on the European system. There is ample evidence now that this belief was wrong and there are many flourishing banks entirely controlled by Indians. Is legislation to be resorted to merely because the number of Indian banks is increasing? We must strongly condemn the tendency to throttle Indian enterprise whenever it tries to make headway. The cotton industry was shackled at the dictation of Lancashire. Factory laws were introduced because of the philanthropic owners of factories in England. Life Assurance Companies have been brought under legislation. And now a European banker proposes that banks should be similarly treated. There should be some evidence of fraudulent banks or banks which have closed and involved a good deal of loss and suffering before a demand for legislation can be justified."

INSURANCE.

Insurance Business.

Every Life Assurance Company has a capital. According to ordinary conceptions, the companies pay the claims of their policy-holders out of the accumulations of premia paid by the latter, the capital being utilized for preliminary expenses and held in reserve as a contingent fund. If the receipts from premia be not sufficient to meet the claims as they occur, no company in the world will be able to continue its business, whatever be its capital. It is a well-known fact that the capital of an Insurance Company is a very small fraction of its assets.

Live Stock Insurance in Sweden.

Insurance in respect of livestock has yet to be created in India and some attempt is being made to introduce it by means of co-operation among the agriculturists themselves who are largely interested in it.

In Sweden, however it is evidently being done as a business. "Insurance of livestock is there carried on by 46 societies extending their operations over the whole country and by 107 provincial and 552 cantonal or parochial societies. The premia paid yearly by the Swedish farmers for livestock insurance come to about 5 million francs, while the value of the cattle insured may be estimated at about 300 million frs. The largest number is insured in the "Scandinavian Livestock Insurance Society," with headquarters at Stockholm. In 1908, the amount of claims paid by this society was 1,636,184 frs, almost half of the total amount paid by all Swedish Livestock Societies.

In contrast with what is observed in several other countries, as, for example, France and Italy, where local mutual societies are most prominent, in Sweden it is the National Insurance Societies whose sphere of action is the whole kingdom that insure the greater number of livestock. They insure 72 per cent. of the horned cattle.

Two causes have specially contributed to the development of the large societies; one is the frequent fluctuations of mortality risks, which are dangerous for an insurance society in proportion as its sphere of action is limited; and the other is the increase in the capital value represented by the livestock, by which the risk is increased and becomes less easy for local societies to support.

Some Arguments for Life Assurance.

There is one article that always increases in price. It is Life Insurance.

Every year the cost of guaranteeing your mother or wife or children an agreed sum in case of your death increases.

No company will insure you when you are a year older at as low a premium as now.

The cost increases because the chance of your dying next year is greater than for this year.

Next year you will have one year less of expectation of life.

This diminished expectation is an element of the cost in the premium.

You may pass a medical examination now for any kind and size of policy.

But next year the doctor may discover a slight defect in some vital organ and recommend that your application be accepted for only a small amount, and for only an endowment or sub-standard form.

And the doctor who will accept you now may in another twelve months turn down your application as that of a too-impaired life. The life streams of ancestry may then be carrying the seeds of untimely death.

This is worth consideration. Consideration means serious thinking.

Besides, it is the unexpected that happens.

An automobile, a banana peel, a burglar, or an unsuccessful surgical operation, a fire or a collision, may put a period to the sentence of your earthly life.

Death is always within a step—a mis-step—of every man.

Sickness lurks in every restaurant.

A fatal accident is within the service of every vehicle of transportation.

If you needed something and knew the price would be higher to-morrow, what would you do?

If you had the money you would buy to-day. Being a man of character you would have credit.

Now you need life insurance. Every decent and affectionate man needs it. For his dependents and for himself.

The premium loan will take care of you at a good hospital.

The life insurance will take care of your family.

Some day, if you are a bachelor, your life insurance policy may justify and make possible with your conscience the union that you then know is essential to your happiness.—*The Coast Review.*

SCIENTIFIC and TECHNICAL EDUCATION.

Indian Students in England.

Lord Crewe has appointed a Commitee to enquire into the facilities available to Indian students for industrial and technological training in England, with special reference to the system of scholarships established in 1904. The Committee is composed of Sir Theodore Morison, Sir Krishna Gupta, Mr. Reynolds, late Principal of the Manchester Municipal School of Technology, and Professor Dalby, of the Imperial Science College, South Kensington. It is understood that the Committee will visit University centres in the United Kingdom, and hear the evidence of Professors and others, on whose co-operation the success of the system depends. There are now 27 State scholars, undergoing instruction in England in America, and on the continent. Though it is believed that the system rests on a sound basis, it is held that it may be capable of improvement. It is recognized that, if the full benefit that may be derived by scholars of Indian industries is to be obtained, there must be a somewhat wider and more systematic survey than hitherto of the existing facilities here. The difficulties of meeting scholars on returning to India are matters for investigation here, and not in England, and the present enquiry is regarded as a preliminary to a full examination of the system by the Government of India.

Technical Education.

Sir Theodore Morison, lecturing before the Indian Guild of Science and Technology, at the King's College, answered the various objections to the system of sending Indian students abroad for Technological studies, but he said that none should come who had not read up to the B.A or B.Sc. standard. He had great faith in attacking the problem of Indian economic development through the educated classes. They were alert and appreciative of new ideas. Success among them was reproductive in ideas, initiating movements and thought. Admitting that difficulties existed in finding suitable avenues for technically trained Indians, he said that they had a right to ask their countrymen for more practical sympathy and a new and enlightened form of Swadeshi. Indians should invest more largely in well-managed concerns, and when they held a majority or a considerable portion of shares they should urge the Board to take in Indians as juniors in posts of control and thus promote Indian development and open up avenues of employment for their sons.

Technical Schools.

The technical school has now travelled beyond the experimental stage: it has become a recognised part of the educational system of almost every civilised country in the world. The first trade-school in Belgium, the object of which was to give girls a thorough training in the elementary principles of dressmaking, was established only a quarter of a century ago, yet that little kingdom—one of the busiest and most densely populated of all industrial hives—is now in possession of a number of technical schools of quite remarkable excellence. The ironworker there; the worker in wood, lead, zinc, or leather, the plumber, the housepainter, and the decorator—all these are provided with opportunities of presenting themselves in the labour market furnished with a sound general education, and a good working knowledge of the principles of the craft they intend to follow; in many cases also with some practical experience in the application of those principles. The province of Liege, already well supplied with technical and trade schools, recently enriched its list of such institutions by the establishment of one for the teaching of printing, lithography, and bookbinding, at which the complete course covers a period of five years. In the light of what is being done in other countries for technical education, it almost begins to look as if the old apprenticeship system is finding its natural successor in the trade-school of the present day. The trade-school will never give us quite the same influence which flowed from the daily personal touch of employer, workmen, and apprentices; but customs and practices change as generation succeeds generation, and it may be, says the *Punjab Educational Journal* that in time the new system will justify itself by results comparable in permanent value with those of its predecessor.

ECONOMIC PRODUCTS.

Sola Topi.

A contributor to the *Manchester Guardian* points out that the word "sola" in connection with 'topi' has no connection whatever with the sun. "Sola" is the Hindi and Bengali, name for the tall leguminous swamp plant known to botanists as *Æschynomene aspera*, the stems of which furnish the pith, otherwise spongewood, which is made up into the helmets worn by Europeans in the tropics. Hence "sola topi" is not to be translated verbally as "sun helmet," although the confusion is natural enough, considering how precise is the translation in fact.

Fibres.

At one of the sittings of the Fibre Congress recently held at Sourbaya (Java) the subjects for debate were cotton and kapok, and pine-apple and cocoanut fibres. During the discussion over pineapple fibre, Mr. Bluntschli said that the dry fibre cost him 20 c. per kilo., and had realised 36 c. in Europe. After his first shipment to London, he immediately received orders for more, and buyers were ready to make purchase contracts. Prof. Van Iterson of Holland said that the pineapple fibre was a magnificient fibre. Compared with other textile fibres, it had the smallest diameter, and the professor had also received information from a Dutch paper factory declaring that it was an excellent paper fibre. It was decided to make experiments in five different places.

Rubber Substitute.

One of the many proposed substitutes for rubber is obtained from the soya or Manchurian bean, which resembles the kidney bean, and is being introduced from Japan and the East Indies into other countries. A rubber-like product that can be vulcanised is obtained by treating the bean with nitric acid, alkalies, and great heat.

Glycerine.

Glycerine owes its chief importance as an article of commerce to its part in the manufacture of high explosives, the demand for this purpose having increased greatly of late years. It is obtained principally from the oils and fats used in the process of soap-making, the waste liquor containing an average of 9 per cent. of glycerine. Soapmakers as a rule sell their crude glycerine to the refiner, particularly to the great European house of Nobel.

Castor Oil Plant for Paper.

Mr. F. Gosling, Commercial Attache' to the Imperial German Consulate-General, Calcutta, sends to the press some particulars regarding the suitability of the fibre of the castor oil plant, *Ricinus arboreus giganteus* (*Hortus Wulle*), for paper-making, based on an article in *Der Papier, Fabrikant*, which states that, as a microscopic examination has shown, this fibre resembles very much that of popular cellulose or the so-called American aspen cellulose, and will be particularly suitable for the manufacture of paper in which softness and good printing properties are more important than great strength. The wood itself is easily treated. A 4 per cent. lye produced an excellent pulp after four hours of boiling at a pressure of five atmospheres. The yield amounted to 46 per cent. (air dried). By treatment after the sulphide process, a yield of 50 per cent. has been obtained.

The Soy Bean.

The soy bean has been a source of such wealth in Manchuria that its cultivation in India has been taken up though not as yet on a large scale. But the bean has its peculiarities. Thus, according to *The Indian Trade Journal*, a plot of land in one of the experimental farms in the Central Provinces was sown with a Japanese variety which had been acclimatized at Nagpur. A splendid crop, giving a yield of over 800lb. of beans per acre, was gathered; but when the seed was analysed the percentage of oil was only 10. This was a great disappointment and it is remarked that "this variety is evidently best suited for forage purposes and some new varieties which have been obtained from Manchuria will be tried with regard to their oil-producing qualities."

BUSINESS METHODS.

Idea Box.

In a few up-to-date business concerns, an *Idea Box* is provided, to receive suggestions from employees for improved methods of business. Many firms would materially benefit by a more general adoption of so commonsense a plan, provided that due recognition were made of the brain-power thus utilised. For brain-products are assets of Industry—the Capital of Labour.

Good Advertising.

Good advertising is advertising which carries out efficiently and economically the policy which it is employed to support. Policy is the definite plan adopted by an advertiser for the support of his business. This almost covers everything. The policy may be simply to sell more goods, or it may be to establish a reputation, to check substitution, to provide trade representation, to obtain inquiries, to impresss a particular idea on the public mind, or to do any one of many other things. If the advertising does what it is meant to do, it is good advertising. If it does not, no amount of 'brilliancy" will redeem it from condemnation.

The Alphabet of Success.

Baron Rothschild had the following alphabetical list of maxims hanging, framed on the walls of his bank :—

Attend carefully to the details of your own business.
Be prompt in all things.
Consider well, then decide positively.
Dare to do right ; fear to do wrong.
Endure trials patiently.
Fight life's battles bravely, manfully.
Go not into the society of the vicious.
Hold integrity sacred.
Injure not another's reputation or business.
Join hands only with the virtuous.
Keep your mind from evil thoughts.
Lie not for any consideration.
Make few acquaintances.
Never try to appear what you are not.
Observe good manners.
Pay your debts promptly.
Question not the veracity of a friend.
Respect the counsel of your parents.
Sacrifice money rather than principle.
Temperate be in all things.
Use your leisure for self-improvement.
Venture not upon the threshold of wrong.
Watch carefully over your passions :
'Xtend to everybody a kind salutation.
Yield not to discouragement.
Zealously labor for the right.

What the Salesman does.

In Dixon's monthly for May, there is a valuable article by Thomas Dixon on the "Science of Salesmanship and Business Building." It contains a scientific analysis of the psychology of sale.

What the customer wants to buy and what the salesman wants to get rid of are two very different points which it is absolutely necessary to bring together into harmony. The customer must be brought to see eye to eye with the salesman in regard to the purchase and sale. Be the prospective deal the sale of a shirt stud or the disposal of a suite of furniture, the same rule will govern in every case. Stages of thought making up this mental view will run :—(1) attention ; (2) interest ; (3) desire ; (4) resolve. Each is a link in the chain of thought passing through the buyer's mind before he takes action. With that comes the salesman's view, namely, what steps are necessary to be taken in order to bring about the stages referred to with despatch. The salesman should therefore look to (1) securing attention to the goods offered; (2) arousing interest in them; (3) creating a desire; (4) fanning the flame of desire until it is sufficiently warm to determine the customer to that decision which is a positive and practical climax from a business point of view. The salesman conducts the sale because he manipulates certain laws of mind ; he is the active factor in the transaction, while the customer is relatively the passive factor. Of course, the more highly trained a salesman is, the easier is the customer to handle.

FRAUDS AND FAKES.

Adulteration of Food.

There were some strange revelations about the adulteration of meat a few years ago, but there seems to be a decline in the adulteration of food says Mr. Edison. They do not adulterate sugar, because they cannot purchase for use in the adulteration a white material that is cheaper than sugar, but they adulterate salt with chalk and then charge more for it because it won't stick. Let us then beware of American salt !

Tuition by Correspondence.

A correspondent writes to a newspaper that many of the advertisements offering to teach some subjects by correspondence on deposit of certain sums are simple humbug. "These fellows simply type up portions from treatises on those subjects, send those typewritten portions and advise you with the air of pedagogues—"practise and you will master the art." Three of my friends have been thus befooled by a mesmerism teacher and a teacher of book-keeping."

Adulteration of Cocoanut Oil.

"Adulteration in Cocoanut Oil" was the subject of a paper read before a meeting of the Bombay Presidency Science Association, held in the University Buildings, Bombay, on the 28th February by Mr. Kanitkar. Some time ago, a sample of cocoanut oil came into the author's hands in Poona which was sold at a low rate, but it was regarded with suspicion because it did not solidify in the cold weather, as cocoanut oil usually does. On examination, it was found to contain over fifty-seven per cent. of mineral oil. On further investigation, it was found that pure cocoanut oil was almost unobtainable. The adulteration was traced to Bombay, where the admixture with mineral oil was done. The adulterant was found to be a material sold under the name of "Saphit" or white oil No. 1, which is specially deodorized for the purpose. As remarked by the *Indian Textile Journal*, the extent to which the adulterant is added is astonishing, and while for purposes of lubrication it may not be altogether a disadvantage, yet the fact that the adulterant is worth little more than a third of the price of real cocoanut oil makes the whole process exceedingly objectionable.

What We Eat.

The actual details of adulteration as revealed by the Government reports are an amazing record of commercial dishonesty and Government apathy. To take the staple articles of food which appear on our tables every day, and almost every meal, we find that 10 per cent. of milk, 7 per cent. of butter, 10 per cent. of cocoa, 8 per cent. of sugar examined during 1910 were condemned as unfit for human consumption. Cheese, lard, bread, coffee, mustard, confectionery and jam, wine and beer and even margarine were all adulterated in a lesser proportion. When we pass to preserved, tinned and bottled foods, the figures are even more alarming. We find that 27 per cent. of the samples of potted fish examined were condemned, of fruits in syrup 40 per cent., of potted meats 16 per cent., 20 per cent. of sausages were adulterated, 10 per cent. of vinegar, 10 per cent. of all kinds of spirits, and of cider 40 per cent.

Cheap coffee "essences" which have come under the analyst's hands have proved in many cases to be entirely devoid of coffee, and to be faked up out of chicory, roast rye, acorns, and burnt sugar. In one sample of cocoa, reported upon, the Government analyst found only 32 per cent of cocoa matter, and of this nine-tenths was cocoa shell! To-day modern technique and the public demand for brown bread enables the baker to use up any kind of flour whatsoever.

Milk is the food which is more at the mercy of the food-faker than any other. London alone pays its milkmen £100,000 annually for water fraudulently added to its milk supply. The store of the milkman never goes bad; borax, salieeylic acid, and carbonate of soda enable him to keep it fresh, at any rate, until the milk has been delivered.—*Pearson's Magazine.*

MACHINERY AND INVENTION.

Agricultural Machinery.

The report on the agricultural stations in the Central Provinces and Berar shows a very remarkable extension in the use of agricultural machines among the zemindars and ryots of those Provinces. Winnowers are in considerable demand, and a simple machine which blows the chaff from the corn without sifting or grading the grain and will cost only Rs. 40 is being designed.

Apparatus for the Deaf.

A hearing device for the deaf lately shown to the Paris Academy of Sciences is so small that it can be worn easily in the ear. It is a microphone transmitter and receiver connected by a tube, and one in each ear can be supplied with the electric current needed by means of a vest-pocket dry battery.

Blunt Tools.

According to the *Indian Textile Journal*, the waste of muscular force by the use of worn-out or blunt tools in India exceeds all other wastes in magnitude. It indicates a widespread ignorance of the elementary principle of work, which even a liberal education does not correct. It is not the craftsman alone who is to blame The Indian members of the medical profession are equally open to reproach, for, the disgraceful condition of many of their instruments when sent to the cutler for sharpening or repair discloses an amount of disregard, for the commonest precautions which should have become a second nature among the owners. As much may be said of large numbers of the hypodermic needles used in plague inoculation, which are returned to head-quarters for resharpening or renewal. Indians are lacking neither in intelligence nor muscle, but their intelligence seems to prefer unprofitable paths, and prejudice continues to regard skilled labour as a reproach instead of an honour to the worker.

Scaring Crows.

Attention is drawn, in the *Agricultural Journal of the Union of South Africa* for October 1911, to a clock gun for scaring birds and vermin from cultivated lands. It is automatic in action but simple in construction, and has been patented by Mr. Charles Millchamp, Presteigne, Radnorshire, South Wales. It holds nine 16 pin-fire cartridges and can be set to explode these at intervals lasting from 15 minutes to 1½ hours; it can also be set to fire a shot at any required time. Supplied with the figure of a man, the gun costs £2·12·6; without the figure, its price is 10*s.* 6*d.* less Special cartridges are obtainable at 4*s.* 3*d* for 100, or 11*s.* 6*d.* for a box of 250 cartridges.

A New Weaving Loom.

A correspondent writes to the *Hindu* (Madras): We learn that a new Weaving Loom has been invented in Lancashire which is likely to revolutionize the cotton trade. The main object of the new loom is to secure great economy in weaving. It will shortly be placed in many Lancashire mills. Two weavers and a supervisor, it is stated, will be able to watch and guide with ease 80 to 100 looms. The new looms are being made by a well known Lancashire firm which has already received orders for several thousands of the looms. The invention will result in a great saving of labour which will certainly mean a cheapening of production. A special feature of the invention is that where anything goes wrong with any part of a loom, an electric light will light up and the machine will stop automatically. The new loom being a power loom, it will not seriously affect the Indian hand-loom weaving industry, as there are various classes of fabrics woven on the Indian hand-looms which no power loom can produce, and there will always exist a steady demand for such fabrics so long as Hindus remain Hindus.

A New Yoke.

Proctor S. Katiresu has won the prize of the Society for the Prevention of Cruelty to Animals in Colombo by designing a new yoke that will more evenly distribute the load at the neck and be specially easy on sore or tender necks.

INDUSTRIAL AND ECONOMIC LITERATURE.

Paper Trade Literature.

Merchants and capitalists who may be interested in paper and paper making will do well to keep their eye on the column of "bibliography of current paper trade literature" which is being published in the *Paper Makers' Monthly Journal* commencing from April last. There is hardly a journal or newspaper now-a-days which does not contain some information at some time or other which is of extremely high value to persons who may not be its regular readers. One function of the trade and technical journal should be to collect such suggestions and present them to its readers in a compact form. So far, there appears to be no journal which does the above work in respect of paper and allied topics. This feature in itself should make the *Paper Makers' Monthly Journal* a useful reference work, apart from the intrinsic value of its literary contents.

Burma.

By Sir George Scott, K.C.I.E., Messrs. Alexander Moring, Ltd.

This hand book of over 500 pages contains a lot of practical information of interest to tourists and others who might like to know anything about Burma. The book is divided into 7 parts and in the first 6 are described the country and its climate, the Government, Industries, Archaeology, Religion and the Language and Literature. Part 7 contains useful hints to visitors and new residents. To the readers of the *Wealth of India*, the chapter on Industries will be most inviting. Over a hundred pages are devoted to the forests, mines, agriculture, trade and transport of Burma. Two industries for which Burma is famous are ruby extraction and petroleum mining and the processes adopted in working these two industries are very interesting reading. One fact about the petroleum industry is worth noting here. It appears from observations made by Dr. Notling that "the outturn of oil fluctuates regularly throughout the year. The minimum of production is in the first quarter of the year, usually in February. From March to May there is a slight rise. From May to August is the maximum flow, which is highest in August and there is a general fall in the last four months of the year From this it appears that the minimum of production is in the dry season, and the maximum in the rains. Dr. Notling even thinks that he has established a coincidence between the quantity of production and the level of the Irrawaddy River. In the months when the river is at its lowest the flow of oil is at its lowest and when the river rises the production rises and reaches its maximum with the greatest height of the river floods. Similarly, the Minlew Salses appear to be indisputably controlled in their activity by the river level. The drilled oil wells show exactly the same fluctuation as the pit wells." The book contains 64 illustrations.

Indian Railway Finance.

By D. E. Wacha, G. A. Natesan & Co., Madras: Price 4 annas.

A revised reprint of the series of papers contributed by the author to the "Wednesday Review" in 1908 on the report of the Indian Railway Finance Committee.

The Arts and Industries of Kashmir.

This is the title of a small booklet published by Mr. A. Mitra, Public works Minister in Kashmir. The author describes fully the manufacture of shawls for which Kashmir is famous from the remotest times. Other industries dealt with are embroidery, woollen and cotton textile fabrics, carpets, Papier-mache, wood work, metal work, stone work and sericulture. There seems to be vast scope for industrial development in Kashmir and apparently much improvement will follow if the artisans are taught the first principles of drawing and other subjects which underlie all art industries. The writer mentions several industries which may be introduced or improved in Kashmir. Capitalists in India who want a good climate to live in and good investment for their money may look into Mr. Mitra's list of industries with eagerness and care.

HINTS AND RECIPES.

Unused Boots.

Boots that have got wet, or that have not been worn for some time, are often stiff and uncomfortable. A little vaseline well rubbed in with a cloth, and then removed with a dry one, will make them quite easy and comfortable again.

Crushed fingers.

A crushed finger should be plunged into water as hot as can possibly be borne. The application of hot water causes the nail to expand and soften and the blood pouring out beneath it has more room to flow; thus the pain is lessened. The finger should then be wrapped in a bread and water poultice. A jammed finger should never be neglected, as it may lead to mortification of the bone if it has been badly crushed.

An Error in Account.

For seven months an expert accountant searched the books of a certain grain company of St. Paul for an error of an even hundred dollars. There was that shortage in the cash. Whom to suspect the firm did not know. It spent much more than a hundred dollars trying to trace the matter down.

And then, after having gone over the books time and again, the accountant's pencil chanced to stop on an item of 150 dollars. The pencil point rested on the figure "one," when the figure suddenly broke in two and slid down the page!

Upon examination, it proved that the supposed figure "1" was a fly's leg which had become pasted in front of the 50, raising the item to all appearances a hundred dollars. The fly had undoubtedly been crushed in the book when it was closed.—*Cleveland Press.*

To Preserve Books.

The preservation of books from damage by moulds and insects is a serious matter to anyone in India, but especially so to owners or custodians of technical books and books of reference which are notoriously costly. It may be largely accomplished by applying with a soft brush to the covers of the books and at one or two points between the leaves near the stitching a fluid compounded as follows :—

Rectified spirit	...	...	1 oz.
Corrosive sublimate	..	..	10 grs.
Camphor	...	...	20 grs.
Alum (burnt)	...	...	1 pinch.

Remedy for Small-pox.

A correspondent recommends cream of tartar as a remedy for small-pox. The treatment he proposes, is simple, and he insists that it has proved wonderfully efficacious. He says the worst cases of small-pox can be cured in three days simply by the use of cream of tartar. The recommendation is as follows :—One ounce of cream of tartar dissolved in a pint of water, drunk at intervals when cold, is a certain and never failing remedy. It has cured thousands, never leaves a mark, never causes blindness and brings speedy relief.

Some Good Rules for the Dairy.

To ensure that milk shall be free from visible dirt the following points should be observed :

1. When cows are housed they should be groomed regularly. This will get rid of loose hairs and dirt, which at the time of milking might fall into the milk-pail.

2. In winter, when cattle are housed, the hair about the hindquarters should be clipped so that dirt may not cling to the hair and become matted.

3. The flank and udder of the cow should be wiped with a damp cloth immediately before milking, in order to remove dust and loose dirt, but should not be brushed at this time.

4. In milking, the hands of the operators should be moist, but not dripping wet; to have excessive moisture on the hands, owing to a habit of dipping the fingers in the milk, or wetting them with milk from the teats during the milking operation, is a common but most objectionable practice, and is the chief cause of contamination that leads to putrefaction and decay in the milk, cream, and butter.

5. The milker should take care that no dirt falls from the cow or from his own clothing into the milk.

6. All the milk must be poured immediately it is drawn through a fine metal gauze strainer or a few folds of fine muslin.

OPENINGS FOR BUSINESS.

[For particulars, address the Director General of Commercial Intelligence, new Imperial Secretariat, 1, Council House Street, Calcutta, mentioning the *Wealth of India*.]

Aloe Fibre.

A firm in Bombay desires to be placed in communication with buyers in India of aloe fibre. (B1)

Axle Bushes.

A firm in England desires to be placed in communication with importers of cart and wagon axle bushes. (B5)

Canned Goods.

A London firm of exporters of canned goods of all sorts is desirous of appointing agents in Calcutta, Bombay and Madras. (B6)

Oils.

A British merchant in Trieste desires to act as agent in that centre on behalf of shippers of sesamum and other oil seeds from India. (B7)

Coir and Kapok.

A London firm desires to be placed in communication with exporters of coir and kapok. (B8)

Jute Sacks.

A firm in London requires the addresses of exporters of jute sacks. (B9)

Cocoanut Oil.

A firm in Sweden desires to be placed in communication with Cochin exporters of cocoanut oil. (B10)

Lac Cultivation.

A landed proprietor of Benares and Mirzapur desires arrangement with a capitalist interested in lac for the development of lac cultivation within certain forest tracts. (B11)

Soapstone.

A correspondent desires to be placed in communication with buyers in India of soapstone. (B12)

Beeswax and Dried Gut.

A firm in Trieste desires to be placed in communication with shippers of beeswax and dried gut. (B13)

Typewriter Ribbons and Carbon Paper.

A firm in Austria desires to appoint a sole agent for India for the sale of typewriter ribbons and carbon papers. (B14)

Cotton.

A firm in Smyrna desires to get into touch with buyers in India of raw cotton produced in the neighbourhood of Smyrna. (B15)

Buckram.

A Director of Ordnance Factories desires to hear from firms manufacturing buckram in India. (B16)

Mango Chutney.

A London firm desires to be placed in communication with manufacturers or exporters of sweet sliced mango chutney. (B17)

Ores.

A firm in Bombay desires to be placed in communication with shippers of manganese and other ores to Europe. (B18)

Plant for Decreasing Cotton Waste.

A London firm handling an extraction plant for decreasing cotton waste desires to be placed in communication with engineering firms or dealers in agricultural implements who would be prepared to act as agents. (B19)

Ground Cocoanut, Cashew Kernels and Cinnamon.

A Consular Officer desires the addresses of Calcutta exporters of ground cocoanut, cashew kernels and cinnamon. (B20)

Piece-goods.

A firm in Amritsar desires to be placed in communication with importers of cotton and woollen piece-goods in Calcutta, Bombay, Karachi and Delhi. (B21)

Iron.

A firm in the Punjab desires to be placed in communication with Calcutta, Bombay and Karachi importers of iron. (B22)

Portable Buildings.

A British firm desires to be placed in touch with houses in a position to take up the agency for portable buildings, such as green houses, poultry houses, etc. (B23)

MISCELLANEOUS.

Agricultural Engineer for the Punjab.

The appointment of an agricultural engineer for the Punjab has been sanctioned as an experimental measure for a period of two years.

The Cotton Industry of Great Britain.

Great Britain easily retained her pre-eminence in the year 1911 among the cotton spinning and manufacturing countries of the world, as the following figures show :—

	Spindles.	Looms.
Great Britain ...	58,002,000	741,000
United States ...	29,065,000	633,000
Germany	10,163,000	230,000
Russia	9,413,000	140,000
France	7,633,000	110,000
India	6,196,000	83,000
Austria	4,557,000	150,000
Italy	4,200,000	120,000
Japan	2,100,000	17,000

The International Cotton Committee.

The International Cotton Committee, which concluded its sittings on May 16th at Salzburg, Austria, under the presidency of Sir Charles Macara, has issued a report recommending that bills should be introduced into the Indian Legislatures making the damping of cotton a penal offence ; that tenants leasing land alongside irrigation canals should give an undertaking to devote a certain proportion of the land to cotton cultivation under the direction of the respective agricultural departments ; that seed farms should be established in all cotton-growing provinces ; that the agricultural departments of India be recommended to obtain statistical values of crops on the lines adopted in the United States ; and that everything possible should be done to encourage the growth of Cambodia cotton in Southern India and cotton from American seed in Sind and the Punjab. The next meeting of the Committee will be held in Paris.

Railway Accidents in India.

The following are extracts from a report by the Railway Board on accidents which occurred on the Railways in India during the year 1911. (1) Accidents to trains, rolling stocks, permanent way, etc., caused the death of 55 persons and injury to 285 persons, as against 55 and 335 persons respectively during the previous year. (2) Accidents to passengers from causes other than accidents to trains, etc., including accidents from their own want of caution, or misconduct, as also accidents to persons passing over level crossings, etc., resulted in 1,627 being killed and 918 wounded. (3) Accidents to Railway servants, contractors working Railways, resulted in 396 being killed and 666 wounded. (4) The total number of persons killed and injured in the working of public traffic amounted to 2,078 and 1,869 respectively, as against 1,857 and 1,664 of the preceding year.

Roads Lined with Trees.

In Germany fruit trees are now planted along many of the rural and village roads, for shade purposes, the protection of traffic, and for the revenue from the sale of the fruit. The varieties are mostly pear, plum, cherry, and apple. In cities and towns shade trees, such as ash, linden, poplar and mople, are usually planted. The fruit is sold on the tree, at auction, to the higest bidder, when the green fruit indicates what the probable harvest will be. The proceeds of the sales are expended by the authorities for the maintenance and contruction of the roads, and are not used for the benefit of the poor of the respective communities. Guarding against theft and gathering the fruit are left to the purchaser. In the Province of Hanover, the climate and soil of which are not especially adapted for fruit raising, the annual gross income per tree along the roads averages 50s. From 1876 to 1902 the amount realised from the sale of the roadside fruit was £121,479. Surely an ideal plan to consolidate the economic, æsthetic, and hygienic interests of a community.

THE

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A Monthly Magazine of information and instruction on all matters of material interest,

EDITED BY MR. G. A. VAIDYARAMAN.

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SPECIAL ARTICLES.

RELIGION AND ECONOMIC PROGRESS.

[In response to a request from the Editor as to how far religion is responsible for the slow growth of the material prosperity of India, the following replies, among those which have been received, are published as the first instalment.]

DR. SIR S. SUBRAMANIA AIYAR, *Kt.*, C.I.E., LL D.

In responding to your invitation for a few remarks upon the question as to how far religion is responsible for the slow growth of material prosperity in this country, I must confine myself to the religion of the community to which I belong—the Sanathana Dharma as it is appropriately called.

The more I study and reflect upon it, the greater the admiration, reverence and love, that I feel for it, grow. In my humble judgment, it is, in very truth, a system of philosophy, religion and science combined.

From the point of view of philosophy, this body of ancient learning traces, in grand outline, the nature of the whole Kosmos from atoms to Solar systems and Universes consisting of countless Solar systems. It also endeavours, so far as imperfect human language would allow, to give a definite idea of *Brahman*—the transcendent sourceless source of that boundless Kosmos. The well known symbol for this sourceless source is the three-lettered sacred word *aum*, into which simple syllable knowledge of the highest significance is skilfully woven. The first letter thereof stands

for the ultimate abstraction, the Supreme Self which is the Self of all individual Selves the *Pratyagatman* or the *Antharyamin*. The second letter stands for the ultimate abstraction—the root of the entire Not-Self or *Mulaprakrithi* the root of all matter. The third and last letter stands for the remaining ultimate abstraction which constitutes the relation between the other two abstractions. This last is spoken of as the *Mahamaya or Shakti par excellence* ; it being the fount of the links or relations between all the infinite numbers of individual Selves on the one hand and their respective *Upadhis* or material envelopes, on the other. The summation is Brahman—Nirghunam, the attributeless ever unmanifest Absolute.

As religion, the system under consideration explains the whence and the why of man and prescribes rules of life founded on reason and calculated to facilitate his progress towards his goal. In brief, it teaches that the human spirit is divine, that the principle, which gives life, dwells in him and outside of him. is undying and eternally beneficent and though neither heard nor seen nor smelt, yet is perceived by the man who desires perception ; that each man is his own absolute law-giver, the dispenser of glory or gloom to himself ; the decreer of his lite, his reward, his punishment ; and finally, that his future is the future of a thing whose growth and splendour know no limit.

Lastly, the Dharma in question is a science in that it comprehensively describes the various planes of nature in our Solar system, the structure of the different vehicles or bodies of man and their relation to those planes of nature as well as the conditions of his consciousness other than the present physical or brain consciousness. Furthermore, it points out how one may, by due control and guidance of his will, thought power and activity, quicken the complete development of those senses and faculties inherent in him, though as yet not fully evolved, which would enable him to investigate for himself the realms of nature and the states of consciousness just referred to and thus verify by direct observation the accuracy of the knowledge bearing thereon handed down by Rishis and Seers of old.

The essence of that knowledge is this. Man's evolution consists of two parts—*Pravrithi marga* the path of forthgoing and *Nivrithi marga* the path of return. In the former, his spirit descends into matter deeper and deeper till it reaches the densest plane—the physical ; laboriously building all the while the different vehicles and gathering experience through them. Then, the way back begins, in the course of which, the vehicles already constructed are refined and perfected. Eventually the home is reached with the long-garnered experience which would one day enable the spirit to build worlds and systems of worlds. The potentiality of such power to build is implied in the view of Man's nature conveyed by the expression Microcosm—an epitome, a miniature representation of the Universe. Transcending the human stage his spirit transcends the mere epitome stage and becomes actually capable, in due course, of creating and pervading a universe itself. This of course is the justification for the statement made in the former part of this article that the future of man is that of a thing whose growth and splendour know no limit.

Such being the case, it is *prima facie* difficult to understand how a system of thought and ethics so complete and perfect could have in any way tended to operate as an impediment to the acquisition of wealth essential to social well-being and to the promotion of material prosperity Nor is positive evidence wanting to show that Shastra unequivocally recommends the acquirement of wealth for various purposes. It is well known that *Artha* (अर्थ) Wealth is the second of the heads of the fourfold classification of objects appropriate to human pursuit adopted by the Shastra Again with reference to the first head of that classification धर्म, Manu and other law-givers enjoin that everyone should diligently perform the duty of liberality दानधर्म by gifts for, among others, such un-questionably beneficent purposes as the foundation of colleges and schools, hospitals and dispensaries and rest-

houses and the construction of tanks and planting of avenues for shade, all of which are expressly mentioned in the Law books. The performance of such duty, of course, necessarily implies and involves the acquisition of wealth by all who have not renounced the world. As to the third object of the said qualification (कामम्) Family-life, it is needless to say that from the very nature of the position and circumstances of the members of a family and having regard to the constant and manifold demands thereof, it is imperative on those members earnestly to strive for possessions of all descriptions. It may, therefore, be taken that there is no warrant for holding that the religion is responsible for the slow material progress in question.

In urging this view, it is perhaps necessary that notice should briefly be taken of the possible objection to it, to the effect that the importance attached by the Shastra to मोक्ष Liberation, the fourth and last of the objects in the classification alluded to, virtually produces in men's minds, indifference to wealth and worldly prosperity. The first observation to be made with reference to this objection is that it is laid down that a house-holder should not think of becoming a recluse unless and until he has faithfully performed and discharged all his duties as such and is in a position to hand over the management of the family to a fit successor. In the next place, the possession in a fair degree, by an aspirant to liberation of a whole group of most stringent qualifications is made a *sine qua non* to his seeking the path for that liberation. Those qualifications are first (विवेक) discrimination (*i.e.*) clear and definite knowledge as to the real and the unreal, the permanent and the impermanent, the everlasting and the fleeting ; secondly (वैराग्य) detachment, dispassion, desirelessness for enjoyment of the fruit of action in this and in the higher world, thirdly (शमदमादि) control of the senses and of the mind ; tolerance, renunciation of formal religion (*i.e.*) renunciation of the mere forms and rites of religion ; endurance under the adversities of life ; confidence in the teachings of Shastra and in those of true spiritual guides—the wise Seers of Truth, as well as in one's own divinity and powers ; and equanimity and joyous serenity ; fourthly (मुमुक्षुत्व) desire for liberation accompanied by a constant effort to love all and serve all. For, the distinguishing characteristic of a truly liberated soul is universal love and universal service. And the glorious consummation of liberation itself is no other than the eradication of the heresy of separateness by the actual realisation of the immanence of the deity in all, which is indicated by the Vedantic terms Brahma Sakshat Karam Samyak Dharsanam, etc. or by "seeing the one in the many" as Plato puts it. The path for liberation, thus hedged in and graphically described, as narrow and as sharp as a razor's edge, being only for the select few whose perfection in thought, speech and act is in the very process of making, others are dissuaded from attempting to enter it. They are told that such an attempt would only harm them inasmuch as they thereby instead of advancing, only throw themselves back and go further and further from the goal to be reached. It will thus be seen that the Shastra, with reference to the matter of liberation, offers no inducement whatsoever to any one not duly qualified, that should make him abandon worldly concerns. On the contrary, it offers an incentive to him to continue the life of the house-holder by pointing out that through the practice of virtue in the household, he may create for himself an indefeasible title to a long lease of life in Swarga or the Heaven-world, from which to return with renewed strength and power for seeking and treading the path to liberation. Be this as it may, it is certain that the doctrine as to liberation has not contributed in the very least to diminish the craving for wealth in the Hindu community taking it as a whole. Were proof for this assertion necessary, the popular saying "the mere mention of the word money would revive even the dead" should suffice as such a proof. I well remember a friend of mine being gently

reminded that it was high time to think of something other than making money, when he wanted to get into harness after he had retired on an ample pension secured by forty years' service. He promptly defended himself by quoting a vedic text arguing that it commended the acquisition of abundant wealth. Scores of similar instances of unwearied effort to add to one's pecuniary resources must be within the experience of some at least of my readers.

It therefore seems to me wrong, with reference to the existing state of material progress, to cast any blame on the religion. And in these columns devoted to discussions of matters connected with the wealth of India, I think I may without presumption claim for that religion the character of a national asset of inestimable value. For, I hold that, if its dictates are rightly understood and lived up to, that would pave the way to a peace and happiness which no amount of riches could confer. No doubt, erroneous notions as to those dictates prevail—a state of things of course not peculiar to this particular religion. But to condemn it because it is misunderstood would be, to speak mildly, indeed as queer as condemning sanitary science because its directions are hourly violated, and morality because moral precepts are day after day ignored in practical life. To say ignorance is the source of all such evils and true education the remedy, may seem a trite remark. Yet it embodies vital truths which are constantly overlooked.

K. KRISHNASAWMI RAO, DIWAN BAHADUR, C.I.E.

It cannot be affirmed that any religion is opposed to the economic progress of its followers. The greatest stimulus to commerce and industries, is the human wants, natural and artificial. These wants arise primarily from appetites and passions implanted in us, and assume an inconceivable magnitude from our surroundings. They require some moderating influence in the general interests of humanity; and this much-needed influence is supplied by religion. A close and rational examination of the leading principles of any religion will show that it encourages economic progress and seeks to check only abuses and excesses. As the Hindu religion comes for a large share of the accusation of being unfriendly to worldly prosperity, it is necessary to see how far the charge levelled against it is true.

2. The much-abused caste-system of India is an economic arrangement. Brahmins who do not constitute more than $\frac{1}{100}$ part of the Indian population, may be said to be the only class, who under the ancient law of India, are bound to lead a rigidly spiritual life. But the changes brought about during the last 1200 years, have converted most of them, into workers in the economic fields. The duties assigned to other classes have been from the earliest times intended for the material prosperity of the country. The Kshatrya has to preserve order and peace; make and administer laws; and defend the country against foreign invasion. The Vysya is entrusted with agriculture, trade, and manufactures; and the remaining class supplies the labour required by the Kshatrya and Vysya in the pursuit of their avocations. It is clear that Hindu religion compels a very large majority of its followers to attend to temporal duties which must lead to economic progress.

3. A priestly class is not the special characteristic of India. Christians have their Missionaries; Mahomedans, their Mullas; and Buddhists, their Monks. As they are but a very small fraction of the population, they cannot reasonably be said to have a perceivably deterrent influence upon the economic progress of any country.

4. It will be difficult to find a religion which preaches self-denial at the expense of the duties one has to perform. The Sree Bagavad Gita (the paramount authority of the Hindus) repeatedly exhorts Arjuna, not to neglect the duties assigned to him as a Kshatrya; and contains more than one passage impressing on all classes, the importance of discharging the duties allotted to them, as a means towards salvation. A Hindu whatever may be his or her caste, has duties as a father, mother, brother, sister, husband, wife, son, relative, friend, citizen and fellow being. None of these duties he could neglect without committing sin which bars the road to salvation. The anecdote of Thula Dhara (a butcher by birth) in the Mahabaratha, shows that notwithstanding his high spiritual knowledge which drew to him, Brahmin disciples of high rank for instruction, he did not give up his hereditary profession of killing animals and selling meat. The proper discharge of one's duties require money without which it would be impossible for him to maintain his aged parents, wife, minor children and destitute relatives, and to assist friends and his fellow-beings in distress. Manu, the greatest of the Indian law-givers, goes the length of saying that the sin of the commission of 100 condemned acts is less than the sin of neglecting to maintain aged parents, wife and minor children. All the sacred books of the Hindus which are a legion, enjoin in strongest language, the erection of temples, rest and feeding houses, the digging of tanks and wells, the planting of avenue trees, the opening of schools, distribution of food, medicine and alms to the poor, the patronge of the learned and the pious, and the doing of numerous other acts beneficial not only to humanity but also to the other creatures of God. How can the injunctions of the Shastras be carried out without money? How can money be obtained without industries, commerce, and remunerative work? Are not these injunctions strong inducements even to the most religiously inclined people to earn money by means of some profession?

5. In the past when the observance of the Hindu religion was much more strict than it is now, Indian civilization stood very high. India then held a conspicuous position in arts, industries, and commerce. The rise and fall of nations seem to be subject to laws similar to those that govern individuals. Great Britain, Japan and Germany are instances of the rise; and Rome, Greece, India and Egypt, of the fall. The favoured nation meets with success in its work of progress irrespective of its religion. Natural inclinations and passions are too strong to yield to the preachings of ascetism. Moreover, the latter is meant only for those very few who have crossed the age of physical activity and possess mental equilibrium.

6. The real obstacles to the economic progress of India are the weakness of the spirit of enterprise and co-operation, want of punctuality and mutual confidence, absence of technical knowledge, timidity of investment, lack of business-habits, abnormal fear of failure, tardy performance of obligations incurred, and above all, strong foreign competition.

DEARTH OF MONEY DURING MUSLIM RULE.

BY

M. BALAKRISHNA, M.A.,
Professor of Economics, Gurukula, Hardwar.

In the article entitled "Low Wages in India" which appeared in the April issue of the *Wealth of India*, we stated that it could be shown by various arguments that during the Muslim domination good money was extremely scarce and even insufficient for the daily use of the community.

Our reasons for the dearth of coined money are as follows :—

(i) *Foreign invasions.* India without a sigh and an effort has let its enemies plunder its wealth and take it away to their own countries. The plundering expeditions of Mahmud Gahzni, Muhammad Ghori, Timur and scores of other Mogal invaders, Nadir, Muhammad Abdali are matters of Indian history. What an inconceivable quantity of coined and uncoined money was taken away by these scourges of God can be roughly estimated by the following facts :—

(*a*) In the *loot of Nagarkot alone* Mahmud took away :—

Gold mohars	to the amount of	700,000.	
Gold and silver plates	,,	700	maunds.
Gold bars	,,	200	,,
Silver bars	,,	2,000	,,
Gems containing diamond, sapphires, etc.	,,	20	,,

(*b*) The booty of Somnath was still greater. Farishta says : "The King of Gazni found in this temple a greater quantity of jewels and gold than it is thought any royal treasury ever contained before."

(*c*) Muhammad Ghori in his conquest of Delhi and Kanauj possessed himself of all the fabulous wealth that was accumulated in these cities for centuries together.

(*d*) Just two centuries after, Timur did his worst in depleting this *Swarnbhumi*. Mr. Kennedy in his 'History of the Great Mogals' says :

"Tamur's inroad brought absolute ruin. Perhaps the best proof of it is that for fifty years after his departure *the old silver and gold coinages of India almost entirely disappeared.* The coins struck for fifty years after that December Wednesday are almost uniformly copper."

(*e*) After India had passed through many vicissitudes and had seen the long and peaceful reigns of the four Great Mogals for nearly three hundred and forty years, the dark and terrible *Nadir* appeared in Delhi who put to sword one hundred and twenty thousand persons in that city alone and carried away a booty estimated at *eighty millions of pounds sterlings besides all the private plunder of the soldiers.*

(ii) *Internal struggles.* (*a*) On account of the internal insecurity, (*b*) the fear of the revolt of the Hindu subjects, (*c*) the meeting of the Muslim troops under some strong-headed Muhammadan Viceroy, and (*d*) still more on account of the constant danger of the inroads of fresh hordes of Afghans and Mogals, the Kings of Delhi were obliged to keep their treasuries full, so that in the time of need they might be utilized. So much idle accumulation surely meant the withdrawal of money from the business world. When the decline of the Roman Empire is forcibly attributed to a deficiency of the circulating medium which was remitted in payment of taxes in large quantities to Rome and the central cities of the Empire, may not India's poverty, slackness of business and ultimate downfall be somewhat due to the same cause when it was in full operation for several centuries together ?

(iii) *Hoarding of money.* Exactly for the four reasons just enumerated in the last section, *the subjects concealed their money in hoards underground* lest they should be despoiled of it. This highly commendable habit of those times greatly reduced the medium of circulation and thus abnormally lowered all prices.

(iv.) *Ornaments and works of art* also with draw the precious metals from circulation. The Hindus usually buy precious metals for ornaments with their savings or turn the very coins into ornaments because they are a very cheap and safe insurance. In those times when you could not rely upon the credit of the Sahukars, this was the only method of securing your savings.

(v) *Debased money.* Although there were good many mints, once their number having in India grown to two hundred, they were not free, but coins could be issued by the Government only at its own discretion. The Imperial, the Provincial and, in some cases, Town-Governments, issued debased coins—that is, coins containing a quantity of the precious metals less than the publicly expressed mint-value. Both in quantity and quality, in weight and in fineness, the circulating money was punched and robbed, until the actual amount of pure metal bore sometimes a ludicrously small ratio to the original fine contents of the coins.

We read the following remarks in the Imperial Gazetteer of India—Indian Empire Vol. IV, p. 511. "In the local mints the *coinage was gradually debased for the illicit profit of the rulers or* of the mint officials, until the whole *country was filled with a bewildering collection of rupees of different values.*"

These debased coins must have disturbed the internal, provincial and external trades. People even resorted to barter to avoid the inconveniences and losses of getting coins. Thus although the number of coins might have been adequate for the purposes of trade, a general mistrust to handle them must have curtailed their use. The nation even accepted to relapse into barbarism rather than accept those reduced coins. It is an economic law that bad money drives out good money. In short, for all practical purposes, there *was an awful scarcity of good money*—that which should be universally acceptable to the nation wherein it is to effect exchanges. *Hence inevitably general prices should have been very low in those times.*

(vi) *Anarchy.* The too frequent changes in the heads of central Governments, the falling off of the distant portions of the Mogal Empire, the revolt of the petty chiefs, the rise of the Rajputs, Jats, Sikhs and Mahrattas convulsed the country into one unorganized heap of confusion worse confounded. Rising Chiefs heartily plundered their subjects to heap up as much money as possible that they might fight the Imperial Government. They first directed their efforts to secure the newly acquired sovereignty and thought little of the pure medium of exchange. Thus money grew still more scarce and prices continued to be extremely low.

RICE MILLING IN SOUTHERN INDIA.

BY

K. SURYANARAYANA RAO,

Mill owner and machinery merchant.

The three most important paddy producing tracts in the Madras Presidency are : The Godavari, the Krishna and the Cauveri deltas. The deltas of the Tamraparni and the Pennar are of less importance. It is the districts lying in these deltas alone that are best fitted for the promotion of the Rice Mill Industry. This has been carried on and is still being carried on to an abnormal extent in the Krishna and the Godavari deltas. Now, as a spirit of enterprise and enthusiasm is springing up in the southern districts of the Madras Presidency, unless this enthusiasm to gain wealth by this stereotyped industry is properly and opportunely controlled and guided in the right channel, it is sure to lead the enthusiasts to ruin and repentance as has been the case with many in the northern districts of this Presidency.

The writer of this article is himself a big rice mill owner and, apart from that fact, a machinery and mill stores merchant. Being constantly in touch with almost all the mills now in existence, he can affirm that out of the nearly 300 Rice mills existing in the Northern Circars, 50% are still defective, 25% have undergone and are still undergoing alterations and modifications for want of satisfactory results, while about 15% have totally brought the proprietors running them to the verge of bankruptcy. The reasons that have led to the above unsatisfactory results may be classified under 3 heads.

(1) The ignorance of the proprietor who starts the industry, just impelled by the enthusiasm to get richer, himself not knowing what money to spend and how to spend it, which person to choose for the construction of the mill, what his real and actual requirements are and which machine is well adapted to his requirements.

(2) The engineers' prolonging the construction of the mills to get their pay quietly for as long a period as possible and huddling on the proprietor all sorts of unnecessary machinery in view of the commission from the firms and dealers. They also make the investors buy that machinery which pays them the largest commission irrespective of merits.

(3) The last but not the least important cause is the ignorance of the man who undertakes the construction of a mill empirically to gain knowledge and experience at the expense and the ruin of the investor. It will not do if the person who undertakes the construction of a mill is only a certified engineer or purely a miller. He must be both and such men are very scarce in our Presidency. For the benefit of those who intend to construct Rice Mills in the south of the Presidency, the writer of this article offers the following sug-

gestions which will prove of immense value to those that follow them correctly and carefully.

The chief operations involved in a rice mill are only four and they are the following :—

(1) Shelling or husking the paddy is the first process and, for this purpose, may be employed the Rangoon pattern shellers that can be made in any ordinary foundry at a cost of Rs. 400 to 500, in preference to the imported American shellers priced over Rs. 900 each with numerous wearing parts unlike the former.

(2) Blowing off the husk from the shelled paddy is the next process and this is done by what are called winnowers or fans. These are to be made locally only but by a first class expert as the percentage of rice yield depends wholly upon this machine which does not cost more than Rs. 500. No machinery need be imported from a foreign country for this operation.

(3) The third important step is, not to speak of separating the unhusked paddy from the cargo rice which at times becomes necessary and at times not, the whitening of the cargo rice. This can be done either by Cones or Hullers ; but most of the mills employ both as the former is well fitted for making boiled rice and the latter for white or raw rice according to the quality of rice demanded by the market ; but for all practical purposes, the one is as good as the other, and the Cone is even better, in as much as it has got fewer wearing parts The Rangoon system Cones also can be made in a good local foundry at a cost of Rs. 500 to 550.

Coming to the Hullers, there are many on the market manufactured on the Engelberg Huller system sold by many dealers at about Rs. 700 each, but none works so satisfactorily as the Engelberg Huller. These Engelberg Hullers need not and should not be purchased in the complete form in which they are imported into India. Most of the parts can be made in India at 1/20 of their present cost without prejudice to their quality and utility and only a few parts need be purchased at their current exorbitant prices to make up a complete Huller, which, as indicated above, would cost 40o/o less. Here again it must be most carefully noted, that it is extremely detrimental and ruinous to put paddy into Engelberg Hullers to make rice as the cost of the wearing parts exceeds the profits likely to be made however immense they may be and the percentage of rice yield also is far less.

(4) The polishing of rice is the final stage in a rice mill and many Polishers are sold by foreign merchants ; but none of them need be purchased as one can be made here at almost the cost of freight and packing which a machine costs to be got into India, as this is always a bulky machine.

An important point to be considered in this connection is this : what is the power that ought to be employed for a Rice Mill ? At the outset, it looks more economical to employ a steam engine and a boiler, as the same can be used both for milling and boiling the paddy; but deeper consideration will prove that the disadvantages outweigh the advantages, as boiling and milling cannot be effected simultaneously. It takes a few hours every day to raise steam, the mill has to be stopped every week and very frequently also for inspections, and with all that, the husk will not be sufficient for both milling and boiling and a boiler constructed to burn husk is ill adapted for the use of other fuel. Therefore the best thing would be to employ an Oil, or better, Gas Engine of about and over 45 B. H. P. to drive the mill and vertical or Loco Type Boiler of about 10 H. P. for boiling the paddy, the husk produced being employed as fuel for this boiler. The advantages of this system are manifold and the mill can be worked without interruptions and for longer hours and more efficiently, conveniently and economically.

It is not also out of place to determine what ought to be the capacity of the mill. It need not exceed 300 to 400 bags of paddy per day and if mills are constructed for a larger capacity, the troubles are many and they can never compete with mills of this capacity. A mill for this capacity can be built very compactly at a cost of Rs. 20,000 all things put together.

VIEWS AND REVIEWS.

The Silk Industries of Benares.

To the May number of the *Muslim Review*, Mr. B. D. Gupta contributes a brief review of the silk and embroidery industries of Benares. Benares has from ancient times been noted for the excellence and purity of its silk fabrics, while the elaborate but chaste designs of its embroidery work have extorted admiration even from those familiar with the skill of the Kashmiri weaver. We are told that "the looms are, in all cases, of the primitive indigenous style and no improvement seems to have been made in them since centuries. They turn out very slow work and it is expected that, with the help of improved modern appliance, quicker and cheaper work would be made possible. The weavers are very clever and have the requisite capacity to turn out new things although they are rather conservative. They are turning out numberless new designs and colours every month although no change in the machinery is visible. There are a few large establishments working from about ten to thirty looms, but generally, the weavers are workers on a small scale, each working by himself and with his own one or two looms."

As is the lot of their compatriots elsewhere, the silk-weavers of Benares are handicapped by want of capital and lack of education in the techniques of their art. The Hindu Mahajans advance money and raw silk to the poor weaver and purchase from him the finished product at a very low rate, thus leaving to the weaver only starvation wages. Mr. Gupta thinks that the establishment of Co-operative Credit Societies can do much to relieve the weaver of his absolute poverty. "The demand for Kashi silks and other Benares fabrics is steadily increasing," concludes Mr. Gupta, "and if Government were to lend a helping hand to the weaving community of Benares by educating them in the technique of their art and placing cheap capital at their disposal, the city would become an Indian Manchester in a short time."

Why Coffee is Dear.

A writer in the columns of the *Investor's Chronicle*, dated 8th June, 1912, ascribes the dear prices at which coffee sells to-day in Europe and America, to Brazil's coffee valorisation scheme successfully introduced by the Rothschilds in 1907. How at first over production occurred is thus related : "The coffee planting community had been enjoying a period of remarkable prosperity. To achieve wealth, it appeared to be only necessary to plant and sell coffee. Nearly all the three million people of San Paulo gave up planting corn, rice, beans, everything they needed for themselves. They bought them, because coffee was so immensely profitable that they put all their labour into coffee. The coffee tree takes three to five years to come into bearing and it was not until a few years had elapsed that the effect of overproduction began to tell. But from 17 cents in 1890 the wholesale price began to fall and it declined year by year until, in 1897, it was 7 cents, and between 1901 and 1903 around 5 cents a pound. The Government, to remedy affairs, taxed new coffee plantations. The planters mortgaged their estates and planted more coffee until San Paulo was producing more coffee than all the rest of the world put together, whereas in 1890 about half the world's supply came from Brazil."

The story of the valorisation reads as follows: "It was in 1907 that the Rothschilds came in, and they stipulated that the Federal Government must assist in the essential of keeping down the crop. A tax on coffee was imposed, 9 per cent. of its market price in Brazilian ports and heavy penalties were imposed upon anyone who planted a new coffee tree. Federal inspectors were appointed to tear up any new trees they found planted. The State guaranteed that, of the next crop, not more than 9 million bags should be exported, nor more than 10 million of any succeeding crop. On these terms, San Paulo was financed, and now, four years later, we see the result. The price of coffee on the New York Exchange in

December, 1908, when the Rothschilds and other bankers gave their support to valorisation, was 6½ cents. In December 1910, it was 13½ cents. It is now 14½ cents. By restriction on coffee trees and on coffee exports in Brazil, a shortage had been brought about of a little more than 10 per cent. in the world's supply as against demand as far as crops go. And there had been a rise of over 100 per cent. in two years in price."

Peasant Scholarships.

In the May (No. 2) number of the *Collegian*, Mr. S. S. Thorburn, I.C.S., (retired) offers a friendly criticism of the Hon'ble Mr. Gokhale's Elementary Education Bill which was recently thrown out by the Imperial Legislative Council. The fault that Mr. Thorburn finds both with Mr. Gokhale's Bill and with the Imperial grant of Rs. 50 lakhs announced at the last Delhi Durbar for purposes of Elementary Education is the entire absence in both of proper provision for the education of the sons of the country's poor peasants. This considerateness on the part of Mr. Thorburn for the Indian agriculturist is due to the fact that "upon their contentment rests not only the good Government of the country but the very stability of our rule. "It is reasonable to presume," writes Mr. Thorburn, "that, as in the framing of our laws and regulations, their effect on the peasant masses should be the question for first consideration, the Government, when shaping its educational policy and allocating funds in its furtherance, should have exact knowledge of the numbers and classes of agricultural children in the various schools of each province. As far as I know, it has none. The want of this information illustrates a defect which runs through our whole administrative system."

In the end, Mr. Thorburn advocates a system of agricultural scholarships and advances the following reasons in support thereof :—(1) Though the agriculturists of India are the chief tax-payers, "the pillars of the State" so to say, their interests in the past have been less considered than those of town-dwellers; they have therefore a right to special preferential treatment; (2) only by the means proposed will needy parents appreciate education and make personal sacrifices to send their sons to school; (3) one scholar will be a shining example to a whole community and do more "for the advancement of learning" than the exhortations of a whole succession of Tahsildars, Education Inspectors and District Officers.

Agricultural Demonstration Train.

Mr. S. Sinha, B.S.A.,M.A.S.A., has a short note on the above subject in the June *Modern Review*. The Demonstration Train of American Agricultural Colleges is an agent of Agricultural Extension run in co-operation with the railroads, carrying a corps of instructors and lecturers to the various parts of the State to teach the farmers the practical side of farming within a short time. Some sixteen years ago, we are told, on account of a failure in the corn crop, agriculturists in Iowa induced the railroads to co-operate with them in running a demonstration train to teach the farmers how to handle their seed corn and till their lands, so as to prevent a repetition of such disasters.

One illustration of the demonstration train is given :—During the summer of 1909, the "Modern Farming Special" was run by the Maine Central Railway, under the auspices of the University of Maine. It covered some fifteen hundred miles. The "special" was composed of some baggage carts filled with exhibits of interest to general and special farmers, and some flat cars carrying modern village, planting, and harvesting machinery, also a passenger coach carrying a corps of College and State Department lecturers. Several stops were made, at each of which the assembled crowds were given an opportunity to see the illustrations and exhibits. Attendants explained each exhibit, answered questions and directed attention to new methods in farming. Four short addresses concluded the programme. In the towns where night stops were made, the work of the State Agricultural College was illustrated by a stereopticon, and practical talks were given to forty thousand farmers.

A Substitute for Pencil Cedar.

It has been estimated that over 200,000 tons or about 1,500,000 cubic feet of wood are required annually to supply the demands of Germany and the United States for pencils. In other words, a little over 600 tons of cedar wood are used for making pencils each day in the year. How long the supply will last at this rate of consumption is difficult to answer: but the recent discovery of a new substitute for cedar will be received by pencil manufacturers with delight.

The wood for making pencils must be soft, light, strong, close and straight-grained, and must not check and warp. Such a quality of wood has been discovered in East Africa, and it may be obtained in sufficiently large quantities and at a reasonable price. The tree which yields this wood is closely allied to the common pencil cedar and is known botanically as *Juniperus procera*. It usually grows from 75 to 125 feet in height and is from 2 to 4 feet in diameter. It is said that this new cedar is distributed largely over the mountainous regions from Abyssinia southward into German East Africa and is also found in great abundance around Killimandscharo. In Usambra and further inland in East Africa, there is such an abundant forest of it that travellers always speak of it as an article of great promise for export trade.

In Europe, manufacturers seem to have agreed as to the usefulness of this new material. In America, they are only waiting to see the result of the new experiment. It is therefore only a question of time when this new wood will be largely used as a substitute for the ordinary pencil cedar.

The Oxygen Industry in India.

A new factory has been completed recently by the Linde British Refrigeration Co., Ltd., at 188, Balliaghatta Road, Calcutta, and is now actively engaged in the manufacture of oxygen gas from purified liquid air, says the *Indian and Eastern Engineer* for May. This manufacture will be conducted on exactly the same lines as at home. Cylinders have been made to comply with the home regulations which the Indian Railway Board have adopted *en bloc* and will be annealed and tested at the regulation periods. Oxygen produced by this method is very pure, a purity of 99 per cent. being easily obtained. From a large gas-holder, the oxygen gas is drawn by a three-stage compressor and compressed into steel cylinder to a pressure of 120 atmospheres (1800 lbs.) per square inch.

The use of oxygen in India has been almost prohibited by the high prices charged for imported gas. On this account, the quantity used by the medical profession has been restricted, and the price has wholly prevented its industrial use for welding, metal-cutting, etc. The Linde Company, however, is now selling at home prices and quote as low as 9 pies per cubic foot to industrial users. In connection with the uses of oxygen for medical purposes, it is interesting to note that a healthy man inhales about 400 cubic feet of air per twenty-four hours, and consumes about 20 cubit feet of oxygen during that period. Oxygen is of the utmost value for purposes of resuscitation after suffocation or asphyxia. In mines, chemical and gas works, and other places where such cases are of frequent occurrence, cylinders of oxygen should be placed in accessible positions and made available for immediate use when required. Where these measures are taken, many lives have been saved by the prompt administration of the gas. Oxygen inhalation, however, is not restricted to extreme cases of this description. Its value in cases where respiration is impaired through illness is now fully recognised by the medical profession, by whom it is largely prescribed. Oxygen is also extensively employed in the treatment of wounds and sores and of many maladies not connected with the respiratory organs. For lime-light purposes, the blow-through jet, which consumed 5 feet of oxygen and 6 feet of coal gas per hour and gave from 400 to 600 candle-power, has been largely superseded by the injector jet, which uses 6 feet of oxygen and 7 feet of coal gas per hour for 1,000 to 1,200 candle power. Oxygen and coal gas in cylinders give lanternists a good,

cheap and portable light for their apparatus in any part of the country. It is, however, in the use of oxygen for welding and metal-cutting that we are particularly interested. The value of the oxy-acetylene blowpipe for welding purposes is now universally recognised by engineers, many of whom have derived their knowledge of the process from practical experience. The rapidity with which the oxy-acetylene blowpipe has been taken up throughout the world is in itself the most striking testimony to its merit. It is not too much to say that it affords one of the most practical and valuable methods yet discovered for dealing with an immense variety of metallurgical operations.

India's Mineral Resources.

Sir T. H. Holland writing in a recent issue of *Commerce* on the above subject says: It would obviously be dangerous to attempt any detailed discussion of the mineral occurrences that appear to offer reasonable hope of exploitation. It is possible, however, in general terms to indicate certain occurrences that require more serious attention. Among these might be mentioned, the alum-shales of the Punjab and North West Frontier: the bauxite deposits which are known to be rich in alumina in various parts of the Peninsula; barytes, which is in small demand for paint; various clays, including fire-clays, for the products of which there is a growing import bill now approaching £400,000,per annum; copper-sulphide area which in some cases may possibly be sufficiently rich in sulphur for the additional manufacture of sulphuric acid; gypsum now raised to the extent of over 6,000 tons per annum in Rajputana for use merely as a white-wash; lead, zinc, and silver ores, known in small quantities in various parts of the country and now being prospected on a considerable scale in Upper Burma; various rare earths, of which finds are reported from time to time, including monazite occurring with the seashore sands of the Travancore Coast; pitch blende, occasionally found with the mica. bearing pegmatites, and wolfram, occasionally found in considerable quantities with the tin deposits of Burma. With these might be considered also corundum and mineral waters.

Sir T. Holland in the end sounds a note of warning in regard to the conservation of these resources: He says:—It should be remembered that the conservation of the mineral products is in India not merely a provincial question; the future of the country as a whole is dependent on its minerals; the small amount of revenue obtained locally is unimportant in comparison with the great political question of economic independence, and the mineral policy, not only of Provincial Governments, but of the Native States, whose prosperity depends upon the stability of the Imperial Government, should be controlled with the greatest care. I would more readily grant the power of life and death to an administration than freedom in disposing of its minerals. The time is coming when the mineral question will be to India, in its geographically isolated position, one of the greatest of its political questions. We have there an enormous population rapidly learning the arts and luxuries of civilisation, and there is not one among those that are the luxuries of this and the necessities of the next generation that is not dependent on its inorganic products.

Requisites of Indian Production.

Professor J. N. Samaddar writing in the May number of the *Muslim Review* on the "Requisites of Indian Production" enumerates: (i) Improved Agriculture; (ii) Efficient Labour and (iii) Cheap capital, as the three essentials we stand in need of at the present day.

Writing of agriculture, the Professor points out two directions in which improvements can be effected: (*a*) waste lands should be brought into cultivation, of which, the Professor thinks, there is plenty available in this country to-day and very productive; (*b*) more money should be employed for purposes of irrigation than what is now being done. The writer reproduces the necessary facts and figures and points out that "the capital outlay on irrigation comes to 46 crores as against 346 crores spent on railways, although the return from irrigation is an average of 4·6 per cent. as against 1·05 per cent. from State Railways." The Professor therefore urges that Government should spend more money in extending irrigation works, it may be, by retrenching the huge Railway expenditure and ensure to the ryot a full and continuous supply of water for cultivation purposes.

Speaking of labor, he remarks, with the rest of critics, that Indian labor is cheap and abundant but, in spite of its seeming abundance and cheapness, it is inefficient and dear in the long run. "Our laborers are, on the whole, ignorant and generally unenterprising. They are also careless and we have also to fight with his 'poor physique and hence poor out-turn.' Over and above all these, Indian labor is altogether immobile. In some parts it is over-congested, in others it is not at all available. Over and above all the disadvantages mentioned above, we have to do with uneducated labor." The writer therefore thinks it very necessary to give our laborers a tolerably good education, technical and general.

Talking of capital, the Professor states his belief in the "Hoarded Wealth" theory and gives us the benefit of his views thus: "We must have foreign capital, so long as we do not get indigenous capital, so long as those in the country who possess money will not risk their reserve funds in industrial purposes. Japan and Canada are resorting to foreign capital to better their industries. Although there is some difference between India and the two countries just mentioned, still we can follow suit and have as much of foreign capital, though we must take care that we do not pay for it more than other nations, and it would have been, to a certain extent better for the nation, if our minerals had remained unexploited for years and years and then developed by the 'newly awakened and highly-trained native industrialists of the future,' but no one can deny the great educative influence of foreign capital on us, which is day by day coaxing our hoarded wealth to come out and taking all things into consideration, it would be foolish not to have recourse to it."

The Indian Cotton Industry.

Writing in the April issue of the *Modern Review*, Professor P. G. Shah of the Forman Christian College, Lahore, points out the following advantages in favour of the Indian Cotton Mills in this country:—

The raw produce and the market for the finished product are both near, thus saving a double cost of freight, etc. The Indian labour is cheap, abundant, docile, and less liable to strike: this point is well under the eye of the English manufacturer, who has tried to equalise the labour conditions by limitation of work, etc., forced by legislature: but it should be noted that Indian labor is not so efficient as it is cheap. Indian manufacturers generally possess a more intimate knowledge of the market and its fluctuations than the foreign manufacturers. Indian goods are naturally welcomed and encouraged in the Indian market with a legitimate feeling of sympathy (Swadeshism) which cannot be extended to foreign goods except for their cheapness and durability.

The following, says Professor Shah, are among the difficulties which the Indian mill-owners have to contend against in their competition with Lancashire: "Besides this difficulty about the excise duty (like which none is levied in any country throughout the world) the Indian mill-owner labors under certain other disadvantages. The cost of erection of a factory is far greater in India than in England. The Englishman can set up in his mill a spindle at the cost of about £1 per spindle, including the cost of building, etc., whereas in India we have to spend Rs. 40 or more per spindle. This makes the initial outlay required here 2½ times as large as that in England; consequently, the mills built from the capital of poor India cannot compete with English mills, either in their number or the fulness of equipment of each mill, or the cheapness of the manufacture."

Also, the high rate of interest paid by the Indian mill-owner, not only debars him from using more floating capital but takes away a large portion of his net earning. Again, just as the cost of machinery is too great, so also the cost of fuel and the "stores" which have to be imported is also greater. The immense freight charges affect also the price of raw cotton and the cost of sending the manufactures to market. The short staple of Indian cotton leaves a portion of the Indian market uncontested for Lancashire; Indian cotton cannot yield higher counts above 30s. Consequently, Indian mills have to import these higher counts to weave finer fabrics.

"Indian labor though reputed to be cheap is not efficient. The Indian laborer is ignorant and idles, wastes much of his time in loitering and whisking and works indifferently. The English laborer on the other hand, is keen at his work and sees it neatly and accurately done; he values his time and his own labor. The efficiency of the English and the Indian mill hand, is in the ratio of about 6 : 1.

"Apart from these external disabilities of the cotton mills, our mill-owners lack in the necessary business capacity and commercial integrity. In the foreign markets, no efforts are made to keep hold of those already secured, but the quality of the goods is not kept uniform, and few make systematic efforts to push their goods into new markets; many are content with a smaller profit rather than be ready to adapt themselves to the requirements of the new markets. There is little of healthy competition in the home market: a lack of originality has resulted in many dishonest practices, *e.g.*, imitation of established labels short reeling in spinning, and heavy sizing of cloth. It is high time for our cotton mills to enter into combinations both for production and sale; it is necessary to avoid conflict in home market by specialising in certain branches of production and to control the foreign markets by the regulation of marks and labels under a syndicate or guild such as (sic) organised in England or Japan .....Further, there is not a sufficient number of bleaching and dyeing factories in the country to supply the needs of the hand loom industry: recently, some of the mills have been introducing dyeing and bleaching plants; but these are sufficient only for the mills and cannot do much work for the handlooms."

Indian National Economics.

Professor V. G. Kale, M.A., of the Fergusson College, Poona, contributes a thoughtful and suggestive article on the above subject to the May number of the *Indian Review*. What is National Economics? National Economics, says Professor Kale, is not a separate science. It is only a particular case of the general science, an aspect, a standpoint, from which things have to be looked at. It lays stress upon the exception to the abstract generalization of the economic beneficence of perfect competition between individuals and individuals, and nations and nations. It thus sanctions Protection, restrictions upon trade, and restraints, in certain recognized cases, upon individual liberty. As the State is the only authority which can enforce these limitations, we find the theory propounded, as the next logical step, that Governments ought to interfere with liberty in the interests of the nation as a whole. The principle of State control represents a revolt against the old *laissez faire* theory and is the direct fruit of the nationalist and historical development of economic thought. On this subject there are sharp divisions of ideals and opinions. "If we leave aside those who hold extreme views on the point, such as those whose aspiration it is to reduce the functions of Government to the narrowest possible limits and those, at the other pole, who discover the root of all economic evil in private poverty, there still remains a wide ground for dispute as to the degree of State interference. It is impossible to conceive how, even in a progressive state, complete competition and liberty of action can be allowed without ultimate detriment, not to this or that class in society, but to the nation taken as a whole. And in fact, by common consent, Governments have taken upon themselves the conduct and ownership of certain concerns for the sake of public good, and liberty has been openly restrained to minimise the evil effects of competition even in countries which are the recognized strongholds of *laissez faire*."

At present, the British Government in India excuse their inaction in their avowed duty of advancing the material and economic advancement of India by saying that India must be kept out of party politics. The writer offers here a few trenchant remarks :—"This doctrinaire policy of "hands off" is a great stumbling block in the path of India's progress. The Governments in almost all foreign countries and even in British self-governing colonies, have adopted quite an opposite course and they have attained a considerable measure of success. Whatever the fiscal and economic faith of Britain may be, it is essential that Indian problems should be looked at from the purely Indian point of view. The *laissez faire* policy has failed in India and is unsuited to it. The Government of India must become a national Government conserving the country's resources, initiating measures for its economic advancement and, in other ways, promoting its interests exactly in the way in which Governments of other nations are doing. Indian policy ought not to be swayed by political considerations or party exigencies. Whether England continues to worship in the shrine of Free Trade or becomes a convert to Protection, her duty to India requires that her affairs should be regulated, in the economic no less than in the other spheres, solely by Indian National considerations."

The Professor concludes: "Being a mere dependency, this country's natural resources cannot be conserved and utilized in the interests of and by the people of the land and have to be thrown open to be worked up by European capital and enterprise. Being backward in every particular, Indians cannot tap indigenous resources themselves and they are not being trained for the purpose as they should be. If the Government of India were perhaps left to itself, it may be able to do much more than it actually does. In the famous despatch of 1903 relating to the Government of India's opinion concerning preferential tariffs, Lord Curzon observed :—"All past experience indicates that in the decision of any fiscal question concerning this country, powerful sections of the community at home will continue to demand that their interests, and not those of India alone, shall be allowed consideration." Speaking in the House of Lords on May 21, 1908, His Lordship said :—"What has been our experience in the past in India of the manner in which the influence and power of the Secretary of State, as the ultimate ruler of India, are exerted in the direction of the fiscal policy of India? It is that in fiscal matters the Government of India has to take the views of the Secretary of State whether it agrees with them or not, and those views are more likely to be guided and shaped by English than by purely Indian considerations.' In this way, the political factor, the constitutional dependence of our Government upon the British Cabinet and the lack of popular control in the counsels of the State in India, dominate the economic situation and other factors are subordinate to it. Not until the Indian State becomes national in spirit and is in a position to take measures calculated to promote India's economic and industrial progress, solely in the interests of the Indian people, can the hope be entertained that our advance will be on the lines of other progressive nations."

A Successful Swadeshi Concern.

Under this heading, a writer in the June number of the *Modern Review* describes the origin, growth and success of the Bengal Chemical and Pharmaceutical works whose guiding spirit and genius is the well-known Bengal chemist, Dr. Praphulla Chander Roy. Dr. Roy was the first in India to place himself in competition with the manufacturers of European patent medicines and boldly began preparing indigenous drugs as rivals against the British Pharmacopœia products. We are told that, as a result, many allopathic physicians in Calcutta now prescribe indigenous medical preparations and this innovation is due entirely to the exer-

tions of Dr. Roy and his co-adjutors. Sulphuric acid is also manufactured in the above works.

Over the extensive grounds stand their engine room, pharmacy, acid chambers, carpenters' workshop, laboratory, packing room, casting room, godowns, officers' mess, &c. The conductors have learned by experience that, for convenience and economic working, the Works must be self-contained. For this reason, the factory has become a conglomeration of various kinds of business. "We first entered the press. As the Works have to print a large quantity of placards, handbills, catalogues, pamphlets, Bengali almanacs and calendars, labels, &c., obviously, it was wise of the manager to have a printing establishment of his own. The firm make their own wood-cuts, stereos, and electros, too. The carpenters' workshop similarly helps them to make their own packing cases of all sizes. The steam saw serves to supply the firm with planks made on the premises from logs of wood."

By doing everything themselves, from the drawing up of the plans onwards to the construction of the buildings and the installation of various kinds of machinery, they have got an excellent and thorough training As the result of this training and experience, they have won a reputation as the best laboratory fitters in the country. Various apparatus, furniture and fittings for laboratories are being constructed in the workshop. The firm have become experts in designing and furnishing laboratories. They have made arrangements in many laboratories in many places for manufacturing gas from petrol and kerosene oil. Their services have been requisitioned in connection with laboratories in Calcutta, Dacca, Mymensingh, Barisal, Khulna, Gauhati, Cuttack, Bankipore, Madras and Lahore; and everywhere they have done their work with credit. In planning laboratories, even distinguished professors of science consult them.

On entering the Works, a wilderness of pipes at once arrests one's attention. Steam pipes, air pipes, unfiltered water pipes, filtered water pipes, &c., there is no end of them. It is also useless for a layman to try to remember the names of the various machines made use of,—Percolator, Extractor, Evaporator, Tincture Press, Filter Press, Disintegrator, and so on. "Our familiar drugs, Basak, Guruchi, Kutaja, Neem, &c., pass through these machines, and come out with different colors, odors, properties and names."

In their perfumery department, they prepare essences, hair oils, &c., from Indian flowers. In the seasons, when particular flowers open, their employees go to Cuttack, Ghazipur, Kanauj, &c., with machinery, and obtain extracts by special contrivances. From these extracts, essences are made in the laboratory in Calcutta with small machines. In these essences, other ingredients are also used, in order to make them suited to the taste of the public.

The Works being situated on a canal, it is very convenient to load and unload goods from ships and boats. Within and without the Pharmacy and the Acid shed, everywhere trolly lines have been laid. This has made the conveyance of goods very easy. The Works have obtained licence to draw water from the canal, and have laid pipes accordingly. Whenever needed, water is pumped from the canal into the small lake or pond situated within the compound. There are several bullock carts for the conveyance of goods to and from the office and the Works. There is a private telephone connection between the office and the factory. No arrangement is wanting that may make for convenience, economy or safety. They have a fire brigade of their own consisting of twenty men. The men have become well-trained in their work.

Costly New York Sites.

A new record has been established for New York City real estate by the sale for £200,000 of a plot of ground less than 1,200 ft. square. The area, which is about half the size of a regular city lot, thus has a value exceeding 23*s.* per square inch. It is at the corner of Broadway and Thirty-fourth-street, adjoining R. H. Macy's famous department store.

AGRICULTURE.

Sun-Hemp.

Bulletin No. 47 of the Department of Agriculture, Bombay, is a note on sun-hemp (*crotolaria juncea*) by P. C. Patil. Mr. Patil pleads for the more extended cultivation by farmers of sunhemp and furnishes detailed particulars as to its culture and commercial value. (1) It produces good fibre; (2) it serves as a useful fuel; (3) it is an excellent green-manure; (4) it is also very useful as a rotation-crop; and (5) it provides a useful feed for cattle.

Seed from Young Trees.

The Editor of the *Tropical Agriculturist* writes in reply to a query that there appears to be no scientific reason why seed from young trees shou'd give rise to progeny inferior to those from old trees, and that no conclusive experiments have been made upon the subject. There is, however, a widespread popular belief to this effect, and as such belief very commonly rests upon a basis of fact, one should use seed from old trees in preference to that from young ones, if both were equally available

A much more important point is the individual vigour and yielding capacity of the parent tree. Seeds selected from trees which give a high yield will almost certainly reproduce the same trait in their offspring, at least to some extent, and this is in itself an excellent reason for rejecting the seed of very young trees.

The Souring of Milk in Thunderstorms.

Everybody is familiar with the fact that milk is more apt to turn sour in stormy weather than at other times. The cause of this has been a matter of considerable mystery, but some light seems to be shed on the situation by A. Trillat, who has shown that minute traces of gaseous products of putrefaction favor the development of lactic ferments Hence, any fall in atmospheric pressure which encourages the liberation of such gases from various sources will indirectly assist the souring of milk, and, for the matter of that, the decay of various putrescible materials. That such liberation of gases does actually occur at times of barometric depression is rendered manifest enough by the characteristic smell which the earth is found to exhale at such times. Mr. Trillat has, moreover, positively confirmed his theory by exposing samples of milk in the neighbourhood of substances giving rise to putrefactive gases. On diminishing the pressure, so as to cause the liberation of the gases, it is found that the milk is apt to turn sour.—*Cosmos.*

Fertilisers.

The modern use of fertilisers is based mainly upon laws laid down by Liebig about seventy years ago as follows:—

(1) A soil can be termed fertile only when it contains *all the materials requisite for the nutrition of the plant* in the required quantity and *in the proper form.*

(2) With every crop, a portion of these ingredients is removed. A part of this portion is again added from the inexhaustible store of the atmosphere; another part, however, is *lost for ever if not replaced by man.*

(3) The fertility of the soil remains unchanged if all the ingredients of a crop are given back to the land. Such a restitution is effected by *manure.*

(4) The manure produced in the course of husbandry is not sufficient to maintain permanently the fertility of a farm; it lacks the constituents which are annually exported in the shape of grain, hay, milk and live stock.

These laws are deduced from the fact that, although plants derive the bulk of their food from the air in the form of carbon dioxide and water, a small but essential portion, *viz.*, the inorganic or ash constituents and most of the nitrogen, are drawn from the soil. In the application of the laws to the fertilising of the soil, it has been held that of the fourteen or more elements which plants require for their growth, only a few, viz nitrogen, phosphoric acid, and potash and sometimes lime are likely to be deficient in ordinary soils and must be supplied in the form of fertilisers. It is for this reason that the commercial value of fertilisers is based entirely upon the amounts of nitrogen, phosphoric acid, and potash they contain.

COMMERCE.

Business Enterprise in India

The commercial enterprise of India during the month of April 1912 may be gauged by the following abstract of Joint Stock Companies registered in that month.

		Rs.
2	Banking and Loan Companies ...	3,70,000
1	Co-operative Association. ...	40,000
5	Trading Companies (other than those specified above) ...	12,00,000
1	Tea and other Planting Companies. ...	2,40,000
9	GRAND TOTAL ...	18,50,090

Motor-cars in India.

The rapid growth of the motor-car in popularity in India is illustrated by the trade return for the past financial year. In 1909-10 the imports of motor-cars and motor cycles were valued at Rs. 47½ lakhs while in the following year the total rose to Rs. 73¼ lakhs. In 1911-12 the figures further increased to Rs. 100¼ lakhs and although the Durbar accounted for a substantial portion of the advance, it is evident that the use of cars is rapidly extending. Of the imports during the last financial year, cars to the value of Rs. 77½ lakhs were shipped from the United Kingdom.

The Lancashire Cotton Industry.

As a reason for the prosperity of the cotton industry of Lancashire, the *Economist* of London points out that the cotton mill owners of Lancashire take special pains to study the requirements of other countries, and they are, therefore, in a position to give the foreign buyer, not what it suits Lancashire's convenience to sell at any particular moment, but what, from long experience and intimate study of the tastes of individual foreign markets, the Manchester export merchants know to be suited to their needs. Whilst the cotton manufacturers of America and Germany have to send out travelling representatives to push the sale of their wares in foreign markets, the buyers in those markets—German, French, Greek, Italian, Portuguese, Spanish, Scandinavian, American, Turkish, Moorish, Persian, South American—have established permanent offices at Manchester for the purpose of buying and exporting Manchester textiles. It is pointed out that by far the largest amount of buying and shipping for India is done by a Greek firm, Messrs. Ralli Brothers.

Forcible Removal from a Reserved Compartment.

A case of some importance to all who are constantly obliged to travel in crowded trains has recently been decided.

The North-Western Railway administration had reserved separate compartments for Europeans and Natives. The plaintiff who was travelling as a second class passenger from Karachi to Hyderabad got in at the City Station into the compartment reserved for Europeans, and was forcibly removed therefrom at the Cantonment Station by the Sergeant of Police acting under the instructions of the Station Master. The plaintiff alleged that the reservation was wrongful and sued the Secretary of State for damages for the annoyance and pain of mind caused to him by the forcible removal.

It was held that the provision, by the railway administration of separate accommodation for Europeans and natives was neither inherently illegal nor prohibited by any specific provision of the Railway Act of 1890, and was not, therefore, wrongful.

That though the plaintiff was a trespasser, the servants of the Railway had no authority to forcibly remove him. The Railway Act confers express powers of removal in certain cases, but gives no such power in the cases dealt with in Section 109 (1) which include, that if a passenger who has entered a compartment reserved for use of another passenger is liable to be prosecuted under the Section and thus by implication prohibits the exercise of such right.

The servants of the Railway having, therefore, acted outside the scope of their authority the plaintiff had no cause of action against the defendant.

Mathradas v. *the Secretary of State*, 5 *Sind L. L.* 141.

INDUSTRY.

Improvement of Industries.

The Secretaries of the National Fund and Industrial Association, Madras, have addressed circular letters to the Presidents of Taluk Boards and Chairmen of Municipalities, to enlist their sympathy and co-operation in forming separate Associations and affiliating them to the Madras Association. They have also asked for information as to "(1) what industry or industries are in existence in your town or Municipality; (2) what steps should be taken to improve the existing industries; (3) what mills exist in your locality for the manufacture of articles or other purposes; and under whose management, so that we might seek their co-operation and help."

The plan which the Committee of the National Fund and Industrial Association at Madras would wish to adopt is that those who are actually engaged in some trade or industry should form themselves into an Association, so that, in each town, there may be different Associations such as Weavers' Associations, Chucklers' Associations, and every trade or profession may learn how best it could improve its position by comparing what it is doing with what others are doing, not only in different parts of this country, but also in foreign countries. A similar letter has been addressed to the District Congress Committees.

Canning Mangoes.

Mr. W. H. Michael, United States Consul-General, Calcutta, writes in a recent report :—

A few years ago a young Hindu named A. B. Sircar conceived the idea of canning mangoes in India. After giving the matter considerable thought he went to the United States to learn the art of canning peaches and other fruits grown in California, and also the trade of tinner, or at least enough of the trade to be able to manufacture tin cans and to solder cans in the best manner when filled with fruit. He spent several years in different canneries in California and also obtained degrees in chemistry and bacteriology. He returned to Calcutta and secured sufficient financial backing to establish a plant at Muzaffarpur, which is about 350 miles from Calcutta on the East Indian Railway. About Rs. 75,000 has been expended on the plant and all the machinery was purchased in the United States. Although just starting in the business, 20,000 cans of mangoes and pineapples were shipped to Europe in 1910, mostly to London, in 1911 shipments aggregated 18,000 cans of mangoes and 12,000 cans of lichis to Europe. At the branch here a case of 24, 2½ pound cans sells for Rs. 42, and it costs Rs. 10 freight to land a case in London. The Company also sells lichis put up in 1½ pound tins.

The process of canning the mango is precisely the same as that employed in canning freestone peaches in California. The mangoes are carefully pared and the stones taken out. Over ripe, bruised or otherwise unfit fruits are rejected. The mangoes thus stripped of their peel and stones are put in cans, which are then weighed and filled with syrup. Then the cap is soldered on to the opening of the can with a capping steel, leaving a vent hole in the middle of the can for driving out the air inside. Steam from a boiler is passed into water in a large wooden vat and the cans are placed in the boiling water in crates suspended from a crane. This is called exhausting. After the air has been driven out the vent hole is soldered up and the cans are put in boiling water. This operation is called processing. After a certain time the cans are taken out and placed in the cooling vat. Some of the cans are put in an incubator and the fruit examined with a miscroscope to see whether it is free from bacteria. Last year the canning plant employed more than 80 persons per day. The common labourers receive 5 to 8 annas a day, and those who peel the fruits are paid by the hundred. It is said that the employees show wonderful adaptability to the work, and at the end of the season were able to do three times as much work as at the beginning. Even persons belonging to high caste families took an interest, and some of them became employees in the cannery. It is believed that plenty of intelligent labour can be obtained.

ECONOMICS.

Money-boxes.

The latest development of official ingenuity for the encouragement of thrift in England, is the provision of money-boxes by the Post Office Savings Bank for the reception of small deposits by youthful depositors. The association of money-boxes with the national system of savings-banks is new, but the money-box itself is as old as the hills. The Post Office, while providing the box, wisely intends to retain the key.

High Prices and Bank Rates.

The following explanation of Mr. J. A. Cobb in a recent issue of the *Nation* on the relation between Bank Rates and high prices will be read with interest.

"Steadily increasing supplies of gold will keep the Bank Rate high. The immediate effect of increased supplies of gold is the increase of currency and of bank credits, which latter depend on the reserve of gold at the banks. This increase of currency and of bank credits causes a rise of prices. A rise of prices increases the profits of most businesses, for it enables goods to be sold at a higher price than that at which they were bought. This increase of profits raises the current rate of interest, and the Bank Rate rises with the rate of interest.

The Bank Rate, under normal circumstances, depends upon the profits which borrowers expect to make by using the borrowed money. Those profits will be greater, and, consequently, the Bank Rate higher, when prices are rising, whether those rising prices are due to an increased supply of gold or to other causes."

The Massing of Capital.

Are combinations, amalgamations, extensions and associations which cause the massing of capital communal benefits? Do they tend to create good or bad feeling among employers and employed? They must to some extent kill out a number of smaller competitors. They must drive a certain number of competitors to swell the labour market and convert some of those who were formerly employers into employed. They bring labour opposition together in larger united forces, and the consequent insistence of labour for more pay and less work is an extra cost for which somebody has to pay. As a fact, the extra cost is bound to fall on the consumer, and as a factor, though only one among others, it operates towards raising prices. An aspiration for improvement in the standard of living is shared universally by all sorts and conditions of men; and if the massing of capital tends to bring the means of improvement within reach of a greater number, it is a distinct benefit

Gold Coins in the Punjab.

We gather from the *Indian Daily News* that an interesting inquiry relating to the uses and circulation of gold coins has been undertaken by the Punjab Government. The inquiry has a two-fold purpose: to ascertain, first, the extent of the circulation of gold coins and next the extent to which gold is either hoarded or converted into ornaments. Mr. Gillan's recent admirable report showed that gold coins were undoubtedly largely in circulation, but it also showed that the absorption of gold was proceeding at a rapid rate. The Punjab inquiry should throw much needed light regarding the issues and receipt of gold and the part it plays as an active medium of exchange. As far as the information available at the Treasuries, post offices and railways is concerned, it should be possible to ascertain with accuracy the extent to which gold coins are utilised for payment of land revenue, and various other transactions of an official nature. The Treasury returns should show, for instance, whether issues of gold have been made in exchange for silver and notes or vice versa. The important thing is to find out how far gold coins are used in the everyday trade of the bazaar. Mr. Gillan's report showed that gold was in demand for making large payments: the present inquiry will show how far it is in demand in the petty business of the community.

CO-OPERATION.

A Co-operative Stores.

The Burma Railways Co-operative Stores, Ltd., is a concern which has been started in Rangoon for the benefit of railway employees. Its capital is Rs. 20,000.

Ten years of Co-operation.

The Labour Department of the Board of Trade has issued a Buff-book entitled "Report on Industrial and Agricultural Co-operative Societies in the United Kingdom, with Statistical Tables" (Cd. 6045). This is a revision and extension of a "Report on Workmen's Co-operative Societies" issued in 1901.

The aggregate membership recorded by distributive and productive co-operative societies of all kinds in 1909 was 2,597,236 an increase of 917,221, or 55 per cent. as compared with 1899. The value of the total trade of all societies (exclusive of banking, credit, insurance, and building society transactions) was, in 1909, nearly 132 millions, an increase since 1899 of 56½ millions, or 75 per cent.

By far the greatest volume of co-operative trading is still done by the group of industrial co-operative societies. In 1909 these societies numbered 1,580 and had an aggregate membership of 2,512,048; their total distributive and productive business amounted to nearly 128 million pounds, an increase of nearly 54 millions, or 73 per cent., over 1899.

The total trade of the retail distributive societies in 1909 amounted to nearly 70½ million pounds, an increase as compared with 1899 of over 25 millions, while the trade of the two wholesale societies amounted to over 33 millions, an increase over 1899 of nearly 14 millions.

The capital of the retail distributive societies in 1909 exceeded 37½ million pounds.

Co-operative Associations for Telegraphists

The question of starting Departmental Co-operative Credit Societies in the larger Telegraph Offices in India is now being seriously considered. One of the reasons for the proposal is that it has been ascertained that a considerable number of the younger telegraphists have got into debt, and it is hoped that by the aid of these Societies such debts may be paid off, and future debts outside the Credit Societies be avoided. A second reason is that the present would appear to be an opportune moment to start such Societies, the security funds having been refunded so that a certain amount of money has thus unexpectedly been made available for the staff to start these Societies which are entirely personal and in no way official.

Co-operation in the Home.

The Rochdale pioneers have immortalised the word Co-operation. Possibly, the close of the 20th century would see the extradinary development of the ideas of Co-operation. Already, Co-operation stands as a menace to swindlers, and smugglers. Before long, the characteristic cheating community is bound to disappear by advanced and wide-spread Co-operation.

That Co-operation is not limited to any particular line of activity can be seen by a notice mentioned in the world's workers column of the *World's Work* for March.

Co-operative work is not restricted. Recently, an attempt was made to promote Co-operation in the home in the shape of the "Co-operative House Keeping and House Service Association."

The association "aims at making housecraft a profession Many a young people will be enabled to marry sooner than they otherwise would, the wife continuing to work at her profession." This seeks to remove "the daily domestic drudgery" which the housewife experiences in small isolated houses.

The association promises to open dining room, hall, and catering department and will pay preliminary expenses if each tenant member purchases at least fifteen 1£ shares.

This is a novel departure from co-operation which was mainly trading. The outstanding features of this Association are the "Abolition of domestic drudgery and the teaching of House-Craft as a profession."

BANKING.

The Title of "Bank."

In view of the remarks of a contemporary which we published last month objecting to the proposed legislation on banking in India, it may interest our readers to know that an agitation has been started in England also to restrict banking methods. In the House of Commons on April 24th Major White rose to move "That, in the opinion of this House, the present state of the law with regard to the right of persons, or associations of persons, to trade under the title of bank, or similar title, is unsatisfactory, and fails to protect the community against fraud in connexion with such trading and more especially those of slender means who are induced to become depositors, or otherwise invest their savings; and this House is further of opinion that legislation is urgently required to check the possibility of fraud with regard to such undertakings." He recalled the circumstances of the Charing Cross Bank failure and the hardship inflicted on many poor and thrifty investors who had lost their savings in past years in similar undertakings.

It might be said, however, that it was very difficult to define the word "bank," and that there was no definition of "bank" available at this moment. But it was for the Government, he said, with the machinery of the Board of Trade behind it, to make an effort to set out a definition. The difficulty was not insuperable.

It might also be said that people were opposed to Government intervention in private affairs or to interference with trade; but the Government was increasingly meddling in the private affairs of the people and even with individual liberty.

In many of the cases, the money of the poor investors was taken for rash gambles or for the man's personal use. It should be provided in any Bill brought in, therefore, that any one receiving money on deposit from the public should give some guarantee of solvency of the institution, and no one should be allowed to use the word "bank" unless there was at least a capital of £500,000, of which 25 per cent. should be paid up. The Company laws of the Colony of Victoria had a provision of this character, and no one was allowed to use the word "Savings," "Savings Bank," or "Savings Institution." To advertise the amount of nominal capital was an offence under the colonial law, and no banking company was allowed to grant advances to directors or officers. He suggested, therefore, that any one receiving money on deposit should publish a balance sheet certified by a member of the Institute of Chartered Accountants or by a member of the Society of Accountants and Auditors. He maintained that his proposals would not in any way interfere with legitimate banking business. In the interests of the poorer classes, in the interests of thrift and national commercial honesty, he trusted the House would accept the resolution, and that the Government would speedily act upon it.

Mr. Cassel seconded the resolution. He asked whether the Government could not see its way to make it illegal in future for any one to use the name of bank unless he carried on a *bona fide* banking business. He threw out for consideration the suggestion that some form of security should be taken from people who desired to start a bank. Life assurance companies had to make a deposit.

Mr. Martin who supported the motion, commended to consideration the system existing in Canada. There, nobody could use the word bank who did not carry on a genuine bank, and a statute of the Dominion Parliament was necessary to constitute a bank.

Mr. Mills said that the suggestions which had been made were, not as to what sort of a man was to carry on banking business, but as to the kind of business a bank was to carry on. It was impossible to invent legislation to prevent people from investing in speculative and fraudulent concerns in order to obtain a high rate of interest, and if they tried to do so, they would almost certainly fail in their humane object and probably cripple legitimate banking business, thereby inflicting a severe loss on the trade and industry of the country.

Mr. Bryce rose to continue the debate, when attention was called to the fact that less than 40 members were present. The House was counted out.

INSURANCE.

New Life Assurance Scheme.

The Standard Life presents a new adaptation of life assurance. At death, of the sum insured one-third is payable, on the balance of the sum insured interest is payable for twenty years at 5 per cent., and at the end of twenty years the remaining two-thirds of the sum insured becomes payable. The advantages of such a scheme are self apparent, says the *Insurance and Financial Gazette*. Ready money is forthcoming when it may be urgently needed; a guaranteed income is provided for a fixed term, and, in a sense, the company undertakes the duties of an administrator for the policyholder. The application and administration of an estate is made easy, worries and difficulties are avoided, and all this is obtained without expense, and with absolute security.

Payment by Cheque.

While it is true that the proper way of paying a debt is to pay it in money, it is also true says the *Accountant's Magazine*, that there may be an agreement, express or implied, between the creditor and the debtor, that it should be paid by means of a cheque sent by post. Very little will suffice to show the existence of such an agreement; the mere fact that a creditor in London requested a debtor in the country to pay his account would probably be held sufficient to show that he had agreed that the money should be remitted by post. Again, a course of dealing between the parties which showed that payments made by cheques sent by post had been accepted by the creditor, would be held to imply an agreement by the creditor that further payments should be made in the same way. But a rather narrow point was put before an English jury recently. A monthly insurance premium had for a series of months been paid by the insured by means of crossed cheques sent by post to the Insurance Company. On one occasion, by inadvertence, an uncrossed cheque was sent, and that cheque was stolen and the endorsement forged by the thief. Mr Justice Hamilton, distinguishing between a crossed and an uncrossed cheque, left it to the jury to say whether in fact the Insurance Company had, by its acceptance of former payments by crossed cheques, impliedly agreed to accept payment through the post by cheques which were not crossed, and thereby undertaken the additional risk of a cheque being stolen and cashed. The jury answered this question in the negative, and the result was that judgment was given in favour of the Insurance Company for the amount of the premium.

Advantages of the Abstainer.

Referring to this subject we find the following in a daily contemporary :—

One of the strongest arguments which can be put forward against the use of alcoholic beverages even in strictest moderation is the differences which life assurance companies make between abstaining and non-abstaining policyholders. Many of the companies in fact quote a distinctly lower rate for total abstainers. That they are justified in doing so, not on account of sentiment, but from a purely business point of view, the statistics of the mortality of the two classes on their books plainly show. The report of the directors of the Sceptre Life Association quoted in the *British Medical Journal* illustrates this well. In 1911 in the general section the mortality was about 77 per cent. of that expected That is to say, there were 105 out of 135 expected deaths In the temperance section, however, only 51 per cent. of the expected deaths occurred, that is 69 out of 135. For the past 28 years in this company the percentage of actual deaths to expected deaths has been over 79 per cent. in the general section as against 52 per cent. in the temperance section. In weighing what these figures mean the chief point to remember is that the comparison is not between the average man and woman, but between insurable abstainers and insurable non-abstainers. Both classes are made up of those in whose expectation of life the examiners have found no flaw. They are in fact the companies' choice of safe, insurable, profitable lives. Granting that they start equally, since all are examined at the time the policies are taken out, and only the fit and strong are accepted, the inevitable conclusion is that abstainers in the race of life last better and go further than do the non-abstainers.

EDUCATION.

Industrial Education in the Philippines.

It appears from the report of the Director of Education in the Philippines for the year ending June 1911, that they are having the advantages of a cheap and yet efficient system of industrial education. There is a school of arts and trades at Manilla with a number of departments, including wood work, iron work, carriage building and repair of automobiles, ceramics, textiles, carriage, etc. But the bulk of this sort of education is carried on in the common schools where a system of industrial instruction is incorporated into the school programme as an essential feature. This experiment seems to have met with remarkable success. It not only serves the primary object of training the mind and character of the pupils and a certain skill in manual exercises, it has also resulted in the simultaneous encouragement and development of a number of home industries on a small and unambitious scale. Baskets are made for fruit exportation, slippers are made ; more than half the desks and tables in primary schools are manufactured by the pupils, who also in a number of cases make their own wearing apparel and head dress. Improved furniture, jellies, jams and embroidery are also among the products of these schools. What is more, over 2,800 schools have gardens attached which supply the market with fruits and vegetables previously rare and obtainable at prohibitive price.

The Berlin Museum of German Industry.

We read in the *Scientific American* that while resembling in many ways the German Museum at Munich, the Museum of German Industry now being founded in Berlin will be based on different principles. So far from containing collections of actual machines and instruments, it will, in fact, comprise vast archives of photographs—plain and coloured—cinematograph films and artistic reproductions, illustrating the whole of modern industry in its various phases and keeping the engineer as well as the man in the street abreast of the latest progress. The production and utilization of raw materials, the operation of metallurgical and machine works, the installation of machine shops, processes and products of manufacture and their uses, as well as all kinds of engineering works (for the utilization of the forces of nature, irrigation, draining and transporting plants, water, gas and electricity supply systems, etc.,) will be illustrated in a most comprehensive and interesting manner. While constituting an excellent means of acquainting the general public with the trend and achievements of engineering, the museum is mainly intended for professional purposes. Its manifold exhibits incidentally constitute an excellent advertising scheme.

Besides these classified pictures representing machines, apparatus, instruments, tools, etc., there will be a central office for supplying all kinds of trade matter. Lectures will be held whenever required.

The museum will be mainly divided into three departments. On the one hand there will be photographs of all interesting objects arranged in about a thousand technical groups and mounted on special tables, in frames allowing of a rapid inspection and exchange. Each of these photographs of standard size will bear a number and the constructor's name.

On the other hand, there will be held periodical exhibitions changing at short intervals—say, once a month—which by their picturesque and lucid documents will appeal to the general public The whole space set apart for these exhibits will be divided into twenty-eight departments in which the various kinds of machines, installations and constructions of interest will be represented by lantern slides and artistic *dioramas*, large-sized photographs plain or coloured and cinematograph films. For instance, the Bagdad railway will be illustrated by a collection of large photographs, showing the machines, tools and means of transport used in connection with such work, while a cinematograph will show this machinery in operation. The manifold operations in a shipyard, the weaving of fabrics in textile mills, the operation of ceramic and metallurgical works, the technical installations of an up-to-date farm inclusive of electrical shearing machines, these and many other phases of industrial life will be presented in a most attractive form. There will finally be a technical theatre to popularize the various branches of industry, inclusive of the latest progress by moving picture shows and lectures.

The Museum of German Industry is shortly to be inaugurated in the form of provisional collections installed at the Technical High School.

ECONOMIC PRODUCTS.

Tailed Paddy.

No description of paddy, the husks of which have what are known as "tails" should be cultivated as the tails cause the grain to break in the husking process.

Human Hair.

In European countries, human hair fetches a decent value. Ladies and grown up girls in Germany take as much care of their hair as a peasant would do of his crops. German women possess hair having a golden brown hue whereas the women of France have hair of a blackish or darkish tint. These hairs are cut for sale at a certain period of the year when agents from different firms from diverse places come in for purchases. In fact the women anxiously await their arrival, as they offer high prices. Ordinarily a woman has about 25 tolas of hair on her head which fetches from 30 to 60 shillings.

It is understood that various things are made from these hairs, such as belts, armlets, lockets, brooches, garlands and chains for watches. Some persons make articles of special taste in token of remembrance of their departed friends and relatives. A much greater use of these hairs is made in the manufacture of artificial beards and moustaches, which are so largely used by theatrical actors.

The hair in the Indians' heads being thicker and harder are not used for the fine works described above but they are to some extent used in the manufacture of blankets combined with the wool from sheep. A recent use of these hairs has found its way in the manufacture of ropes for the sea. Experiment has shown that ropes made of these hairs last considerably longer than the rope made of coir, gunny and manilla as the former can very well stand the action of sea-water even if it is left in it day and night.

Uses of the Castor Bean.

Castor oil (extracted from the seeds of *Richinus Communis*) is used chiefly as a purgative. The oil is frequently administered in combination with various other substances to mask the taste. The *Bulletin of the Imperial Institute* (London) recommends the following methods of preparation among others : mixing the oil with milk and evaporating to dryness ; mixing with salts of casein and milk sugar ; making an emulsion with gum arabic and treating with magnesia and lecithin.

The oil is used a great deal as a lubricant in India ; but on account of its high viscosity, this use is generally impracticable in cold countries. Still it is so used in combination with mineral oils for marine engines and gasoline motors. The high viscosity is an advantage in the lubrication of parts with very rapid rotation, as in motors of aeroplanes.

Soap made of castor oil has high cleaning powers, but it is never used for soap-making except in combination with other fats. The addition of castor oil tends to make the soap transparent.

In making paint oils, the castor oil is sulphurated by treating it with concentrated sulphuric acid at a temperature below 95°F., then neutralizing it with soda or ammonia. The sulphurated oil is also used in the preparation of substitutes for India rubber.

The bean of the plant contains a ferment which splits fats into glycerine and a fatty acid ; this can be extracted and used in the hydrolysis of various fats.

On account of the presence of a poisonous protein—called recine—the seed-cake cannot be used as fodder unless the toxic substance is removed or neutralized. This end can be most readily achieved by coagulating the protein by means of steam or by means of a 10 per cent. salt solution. The use of the seed-cake as fodder has not, however, become very extensive. The material is for the most part used as fertilizer.

In India, the oil is used in the treatment of soft leather, as for thongs ; and the extracted seeds, still containing a considerable amount of the oil, are used not only as a fertilizer, but also for dressing sole-leather, for treating wood to be used in construction and as a fuel.

BUSINESS METHODS.

Hindus as Hotel Managers.

A Geneva correspondent writes to a contemporary that Swiss hotel methods are at present being studied on the spot by a party of Hindus who themselves possess hotels in India, Ceylon, Sumatra, and other places in the Far East. They state that their best clients are English and Japanese and they admit that they have a good deal to learn in order to make their hotels first class from a European point of view.

A German Firm's Device.

During the hearing of a case at Bow-street Police Court some time ago, amusement was caused by the reading of a circular letter which a German firm had sent to their agents in England urging them to increase their efforts to obtain orders for typewriting machines. The letter was headed : "To all our able representatives—a proclamation. England expects every man to do his duty." It went on to say that the Germans were envious and were determined to sell as many typewriting machines as England, France, Austria, Italy, Belgium, Holland, and Switzerland put together. The letter proceeded :

"We must beat the German organisation by hook or by crook. England, the foremost country in the world in all sporting contests, will have to show what she can do, and we feel sure that all our men will set to work with redoubled energy to contribute their share which is necessary to obtain the victory.

It will be a hard struggle, because the Germans hold a firm position. . . . Start with honour and zest ; do your best. England must come to the front."

A representative of the firm admitted, in reply to counsel, that his firm was a branch of a German business.

The Secret of Business Success.

The May *Strand* publishes a symposium of eminent business men, entitled "How Busy Men Work." Mr. Rockefeller says he attaches great importance to routine, and that he owed everything to a love for mastery of details. Lord Strathcona puts as the first essential to success being interested in what you have to do, and after that comes diligence, and then system. Sir Herbert Tree says, "Each man to his temperament. I work, as it were, from hand to mouth." Sir Thomas Dewar says, "Make the head of every department responsible for his department, from the commissionaire to the manager." Mr. Oswald Stoll, the music-hall manager, says the achievement of success is more a question of character than of ability. Determination to succeed is in the nature, and often allies itself with mediocre abilities. Sir Jeremiah Colman thinks that no one can fathom the secret of success, but determination, application and watchful observation are elements, with power and willingness to take advantage of opportunities. Sir Thomas Lipton offers one motto to be impressed on every young man in business, "There's no fun like work." Sir Walter Gilbey attaches great importance to the adage, "Work while you work and play while you play."

System in business.

Systemless merchants suffer an enormous waste through haphazard methods. They never know what they have on hand. They duplicate orders, over-purchase or under-purchase. Their stock is not up-to-date. They are behind the times in styles. They never clean up and start fresh. Everything is in confusion. In a slipshod country store we often hear, when a customer inquires for something : "Let me see, George ; we had that. Do you know what became of it ? It must be around somewhere." And everybody hunts for it, pulling over other goods and getting every thing out of place, until the store is in greater confusion.

Customers have no time or patience for such trading. What wonder that one of the commercial agencies mentions "lack of system" as the cause of failure of thousands of concerns ?

FRAUDS AND FAKES.

Road to Wealth.

A gentleman saw the following advertisement in a paper:—

"The Road to wealth. Send twelve stamps to——."

The gentleman sent twelve stamps, and in return for his outlay received minute instructions as to how to get to the Bank of England from any part of London.

Adulteration of Leather.

Speaking of the adulterants of leather in the United States, the British Consul in Philadelphia mentions that the chief one is glucose obtained from corn starch, which is added to increase the weight. Another adulterant frequently used is Epsom salts, which is stated to make the grain clearer and the material brighter in colour. As much as 12 per cent of the salt is sometimes used. Another way of increasing the weight is to use an excess of the tanning material.

Adulteration of Coffee.

Messrs. T. H. Allan and Co. write from London :—"We have from time to time referred to the adulteration of coffee. In an American paper we notice an advertisement of a new 'Filler,' as they call it. Apparently it is a cereal of some kind; the price is 4½ cents. per pound, but buyers of 'car loads' get it for 4 cents. The makers claim that 60 per cent. to 80 per cent. can be added to coffee 'with good results.' In the same paper there are several reports of prosecutions for selling coffee under false descriptions, such as Santos for Java: this sounds rather like 'Straining at a gnat' etc." Coffee should consist of the ground berry, pure and undefiled. Cheap coffee "essences" which have come under the analyst's hands have proved in many cases to be entirely devoid of coffee, and to be faked up out of chicory, roast rye, acorns, and burnt sugar. In the existing state of the law the use of the word "essence" protects the manufacturer from criminal proceedings. But even in coffees which are charged a good price, some of these adulterants are frequently found. Chicory is the commonest; but roasted rye is also added in order to increase the bulk, and consequently the manufacturer's profit. In some cases, the very chicory is further adulterated with roasted peas, beans, and acorns. In one instance, it was found to contain also scorched dog biscuit!

Cement.

A large quantity of cement is used by Indian contractors. They buy almost invariably the cheaper and lower qualities, the use of high class brands being confined to Railway and Government Engineers. There is thus a demand in India for both high and low quality cement, that for the latter being on the increase. The demand is really for British cement, the products of Continental works being viewed with suspicion chiefly owing to their very variable nature. To get Continental cement on the Indian market, methods are sometimes employed which require explanation.

To begin with, explains a writer in *Indian Industries and Power*, the cement is given an English name. The makers appoint selling agents in London, whose name is conspicuously printed on the label. This label imitates as closely as possible in colour and general get-up those used by British manufacturers. The country of origin is not burnt or stencilled on the casks, but appears in very small type on the label so that it is very liable to escape notice, especially as the word "*London*" under the selling agent's name is in large type and calculated to impress the buyer. One shipment of a continental brand of cement, advertised in Bombay actually consisted of English cement, which the London firm of continental agents exported to various Indian ports under their own label in order to get "their" brand tested and approved. Subsequent orders were, however, placed with various works on the Continent, and now several Government, Municipal and Railway Engineers know that not two consecutive deliveries of this Continental cement can be relied upon as being identical in quality. A good business is nevertheless done in the bazaar. To protect up-country users of cement of the cheaper qualities, the following suggestions are made, *viz.*:—

(1) That the country of origin be conspicuously printed on the label and burnt in or stencilled on the casks.
(2) That the standard specification be raised.

MACHINERY AND INVENTION.

Synthetic Rubber.

Professor William Perkin, of Manchester, lecturing in London on the 17th June, said that English chemists had forestalled German chemists in taking out patents for the manufacture of synthetic rubber. It appears that a Company is being formed for the artificial production of rubber referred to by Professor Perkin.

Making Cloth from Seaweed.

The Bureau of Manufactures in Washington has received samples of cloth made in England, by a process recently perfected, from the fibre of *Posidonia australis*, a species of seaweed found in the southern seas. Experiments made at the Manchester University show that the fibre, after treatment, is soft, pliable, strong, much like wool in its disposition to curl and twist, and easy to spin in its raw state. It takes dye well, except green.

Electricity in Bread and Biscuit Making.

The *Scientific American* states that the electric motor drive lends itself specially well to the operation of the modern bakery. In the making of bread, cake and biscuit, cleanliness and uniformity of product are obtained by the electric motor, and there is the additional advantage of the ability to drive a single machine or group of machines at a time when the rest of the factory is shut down—for example, in the kneading of the dough, which must be done in the "small hours" of the morning. The induction motor gives a reliable power, as this machine will continue to operate even when every part is thoroughly coated with flour settling upon it from the air of the bakery. Among the interesting special machines employed are flour elevators and mixers, egg beaters, dough kneaders, loaf moulders, biscuit and loaf conveyors, cake-icing machines. One plant in a western city of the United States of a capacity of 85 barrels of flour per day, employs an average of 3,000 kilowatt-hours per month and operates electrically-heated ovens successfully in addition to electric motor driven machinery.

A Calculating Machine.

The Business Exhibition at the Agricultural Hall is full of interesting machines and devices, says a writer in *Truth*. "Perhaps I may be excused for feeling a special interest in a beautifully made calculating machine which works with infallible ease and accuracy, and which was invented by the writer of the *Truth* insurance articles. The machines exhibited by the Schooling Calculating Machine Company are for the use of collieries, Railway Companies, and other people concerned with questions of gross, tare, and net. By pulling down little levers the appropriate distance, the gross weight of a truck and its contents is set on the machine; by pulling down other little levers the weight of the empty truck, or the tare, is set on the machine; also, if required, the numbers of the wagons are set in the same way. Then a handle at the side is pulled forward once and pushed back. The result is that the weight of the empty truck is subtracted from that of the full truck and the net weight of the coal by itself is obtained. All four items—the wagon number, the gross, the tare, and the net—are typed (a number of carbon copies being obtained if necessary) and the net items are added up. On another machine the gross and tare items are added up also, but the totals of these are seldom required in practice. Here is an example of what the machine does :—

	Gross.		Tare.		Net.	
Wagon No.	Tons.	Cwt.	Tons.	Cwt.	Tons.	Cwt.
83026 ...	74	13	39	6	35	7
42846 ...	85	11	39	6	46	5
1572 ...	96	19	52	8	44	11
4286 ...	53	10	35	7	18	3
81425 ...	75	8	35	7	39	16
			Total		... 184	2

The operator sets the wagon number and the gross and tare weights, while the machine does the whole of the calculations, as shown in the net column, and types the lot. It seems a good deal to accomplish by one pull of a handle and the machine should save much labour and many mistakes. I congratulate Mr. William Schooling on his ingenuity."

INDUSTRIAL AND ECONOMIC LITERATURE.

Agriculture.

By William Somerville, Home University Library Series, Williams and Norgate: Price 1/ net cloth.

This book is intended for the ordinary general reader and the student, and despite the fact that the reference made in it are to English crops like turnips, swedes and clover, it is very well suited for readers in India because the object of the volume is to discuss the fundamental principles underlying the practice of agriculture. It is essentially an introductory elementary treatise on crops and cropping and contains the sort of information that a farmer should possess who aims at cultivating his fields and manuring his crops intelligently. Agriculture is still the mainstay of the people of India and the growing interest in this important industry ought to secure for the publishers a large sale in this country for this useful little volume.

England's Industrial Development.

By Arthur D. Innes, Rivingtons: Price 5/ net.

This book is a historical survey of the agriculture, commerce and industry of England. As England is now essentially a manufacturing country, it is this aspect of the nation's progress that occupies the latter half of the book. It is a plain story that Mr. Innes has written, without identifying himself with the protectionist or the Free trader, the socialistic democrat or the individualistic champion. Clear and accurate statements and intelligible explanations of the economic phenomena as they occurred, these are the chief merits of the book which will serve as an admirable introduction to the subject.

An Introduction to the History of Life Assurance, *by A. Fingland Jack, Messrs. P.S. King & Son, Orchard House, Westminster, London: Price 7/6.*

We have read with interest "An Introduction to the History of Life Assurance" by Mr. Fingland Jack. The author has taken considerable pains to trace the history of life assurance which has become an event of greatest importance to every human being rich or poor, it being an economic arrangement, for overcoming economic disturbances which the natural uncertainty of life, brings in its train. With the very scanty and scattered materials available for the purpose, Mr. Jack has done his best to give to his readers, an account of the origin and growth of life assurance in the different countries of Europe, since the time of the Roman Empire.

To find funds for one's burial in a fitting manner, seems to be the first conception of the idea of life assurance. So long as the provision of funds for funerals and medical charges was the motive for insurance, no objection was taken to it, under the impression that it was a help towards the performance of a religious duty or charitable act. When it began to embrace other purposes such as family provision, it met with the strongest opposition both from the Church and State, was denounced as a worst form of gambling and declared to be an offence punishable with excommunication, imprisonment and fine. But the advantages of life assurance were so very patent and beneficial that it soon became most popular, and the opposition to it dwindled away gradually in course of time.

Those who have an antiquarian interest will find Mr. Jack's book, pleasant and instructive reading. The author plainly says "Modern era of life assurance hardly concerns us here." It has therefore no attraction for an ordinary and practical man of business.

Books Received.

MATTER AND ENERGY *by F. Soddy, M.A., F.R.S., Home University Library Series, Williams and Norgate: Price 1/ net cloth.*

THE LAWS OF SUPPLY AND DEMAND *by George Binney Dibble, M. A., Constable & Co., Ltd.: Price 7/6 net.*

PRINCIPLES OF ECONOMICS, *by F. W. Taussig, Macmillan & Co., New York, 2 Vols 17/ net.*

HINTS AND RECIPES.

The Use of the Quarter Anna.

It is not generally known in India that a new quarter anna is exactly one inch across and that twelve of them placed in a row make one foot. With twelve quarter annas that are not worn on the edge, it would be possible, with care, to mark off a foot measure that would be very nearly correct.

How to Make Cocoanut Cream.

Obtain one large cocoanut, and in breaking it open, save its milk. Pour a pound and a half of granulated sugar into a pan with the milk of the nut, and heat slowly together until the sugar is melted Then let the mixture simmer for about five minutes. Grate the fresh cocoanut and add it very gradually. Boil for ten minutes after the cocoanut is all in, and stir constantly to keep it from sticking to the bottom of the pot and burning. Pour out upon buttered China plates and cut into squares. This should then be set into a cool place and left for forty-eight hours, as it takes about that time to harden.

Telephone Lines and Lightning.

An inquiry conducted by Mr. Langbuck in Prussia leads him to the conclusion that within recent times there has been a remarkable decrease in the number of accidents due to lightning in certain cities. He attributes this effect to the extended development of aerial telephone lines, and concludes that inasmuch as, at present, the practice of laying underground telephone lines is becoming more and more prevalent, we must expect an increase in the number of strokes of lightning.—*Cosmos.*

Fireproofing of Textiles, Straw, Paper, etc.

(*a*) Sulphate of ammonia, 8 parts ; carbonate of ammonia, 2·5 parts, boracic acid, 3 parts ; borax, 1·7 parts; starch, 2·07 parts; water, 100 parts The fabrics are to be immersed in the boiling liquid. (*b*) Boracic acid, 5 parts; sal ammoniac, 15 parts ; potash belspar, 5 parts ; gelatine, 1·5 parts ; paste, 50 parts ; water, 100 parts. The mixture to be applied to wood, theatre properties, etc. with a brush. Wood-pulp paper, on coming off the machine and before passing to the drying rolls, is to be passed through a solution of 8 parts sulphate of ammonia, 3 parts boracic acid, and 1·7 parts borax in 100 parts of water, at a temperature of 120 deg. Fahr.

Pasteboard to Close Cracks in Machinery, Water Pipes, Glass Tubes, etc.

First prepare a bath as follows : Linseed oil varnish, 7·5 parts; linseed oil, 7·5 parts ; umber, 0·45 part, to be heated. Dip the sheets four times successively in this bath ; then dip the sheets in a second bath made up of linseed oil, 7 5; siccative, 7·5 ; turpentine, 1·5; litharge, 0·75, four times, at intervals of twenty-four hours.

Buttermilk.

Buttermilk as a remedial agent cannot be praised too highly. The lactic acid, the sour of the buttermilk, attacks and dissolves every sort of earthy deposit in the blood-vessels. Thus it keeps the veins and arteries so supple and free running there can be no clogging up; hence no deposit of irritating calcareous matter around the joints, nor of poisonous waste in the muscles. It is the stiffening and narrowing of the blood-vessels which bring on senile decay. Buttermilk is likely to postpone it 10 or 20 years, if freely drunk. A quart a day should be the minimum, the maximum according to taste and opportunity. Inasmuch as gouty difficulties arise from sluggish excretion, buttermilk is a blessing to all gouty subjects. It gently stimulates all the excretory organs : liver, skin, and kidneys. It also tones the stomach and furnishes the material from which to make rich, red, healthy blood. If troubled with gout, avoid meat, sweets, pastry, wines, spices, hot rolls, bread of all sorts, and everything belonging to the tribe of ferments. Eggs, game, fresh fruit, vegetables, especially salads, may be eaten with impunity. If any one has a creaky joint or a swollen and aching one, he should drink all the buttermilk he can relish whenever and wherever he can, but it should be fresh churned and wholesome.

OPENINGS FOR BUSINESS.

[For particulars address the Director General of Commercial Intelligence, new Imperial Secretariat, 1, Council House Street, Calcutta, mentioning the *Wealth of India*].

Hosiery Machines.

A practical knitter of good knowledge in Latch needle machines solicits enquiries from persons interested in hosiery machines—Knitter c/o this journal.

Coir and Kapok.

A London firm desires to be placed in communication with exporters of coir and kapok. (B25)

Jute Sacks.

A firm in London requires the addresses of exporters of jute sacks. (B26)

Rosa Oil.

An Ahmednager correspondent desires to be placed in communication with sellers of rosa oil. (B27)

Marotty Oil

A firm in Cochin desires to be placed in communication with Calcutta purchasers of marotty oil (*Hydrocarpus wightiana*). (B28)

Coir Door Mats.

A limited company in Canada desires to be placed in communication with shippers of coir door mats. (B29)

Mincing Machines.

A large Stockholm firm manufacturing mincing machines desires to be placed in communication with purchasers. (B31)

Coir.

A Consular officer desires to be placed in communication with Calcutta dealers in coir. (B32)

Guns and Rifles.

A firm in Birmingham desires to appoint agents in India for the sale of sporting guns and rifles. (B33)

Cotton Seed Oil Machinery.

A machinery expert in the United States desires to be placed in communication with firms or individuals who may be interested in cotton seed oil milling machinery or kindred subjects. (B34)

Boots and Shoes.

A London firm of wholesale boot and shoe manufacturers at low prices desires to appoint agents in Calcutta, Madras, Bombay, Karachi and Rangoon. (B35)

Aloe Fibre.

A firm in Bombay desires to be placed in communication with buyers in India of aloe fibre (B36)

Piece-goods.

A firm in Amritsar desires to be placed in communication with importers of cotton and woollen piece-goods in Calcutta, Bombay, Karachi and Delhi. (B37)

Gum Tragacanth, Rhubarb and Chiretta.

A Lahore firm desires to be placed in communication with importers of gum tragacanth, rhubarb and chiretta in the United Kingdom, France and Japan. (B38)

Purification of Water and Sewage.

A Manchester firm desires to be placed in communication with firms in a position to handle a product for the purification of natural waters, waste water for re-use, and also the purification of sewage. (B39)

China Clay and Sulphate of Alumina.

A firm in Manchester desires to be placed in touch with importers of China clay and sulphate of alumina. (B40)

Silk Cocoons.

A Government officer desires to be placed in communication with firms in India who spin tussar waste or tussar cocoons, and also with firms who export or purchase *Cricula trifene strata* cocoons. (B41)

Apatite.

A Manchester firm desires to be placed in communication with sellers of apatite. (B42)

Musk.

A Calcutta firm desires to be placed in communication with sellers of musk. (B43)

MISCELLANEOUS.

Commercial Intelligence Department.

It is understood that the Government of India considers that owing to the growth of trade in all parts of India, reorganization of the Commercial Intelligence Department is required. Lord Crewe for the present reserves his opinion upon the scheme in all respects.

Imperial Exhibition.

Arrangements for holding an Imperial Exhibition in London in 1915 are in progress. A general committee of 120 members has been formed, by whom an advisory committee has been appointed. Lord Strathcona has agreed to act as President. The objects of the exhibition are indicated in the title. It is hoped that by it the resources of the Empire will be demonstrated to visitors and to commercial men from all parts of the world, to the advantage of closer commercial relations with the various parts of the Empire and, generally, to the advantage of British trade. The site of the exhibition has not yet been determined upon. Offices have been taken in St. Stephen's

Registration of Firms in England.

On the 26th March in the House of Lords the Registration of Firms Bill was read a second time and referred to a Select Committee. The object of the Bill is to provide for the keeping of a register of the names of individual partners in a firm, the names to be available for the benefit of interested parties on payment of a small fee.

A Grain Dealers' Association.

A Grain Dealers' Association has been formed at Amritsar with Sirdar Dyal Singh, Banker and Millowner as President.

A Commercial Educational Conference.

The leading European and Indian mercantile and trading houses of the Punjab, at the suggestion of the Oliver Commercial School, have deemed it advisable to hold a commercial educational conference in Lahore to discuss the state of affairs that exist in this country regarding commercial education and to discuss what steps should be taken to further its objects and to give it a proper shape. The Director of Public Instruction has kindly consented to be present.

Veterinary Study

The Bombay Government are deputing one of the Indian Veterinary Officers at the Bombay Veterinary College to Europe to go through a course of instruction in bacteriology and pathology at the Liverpool University and the Royal Veterinary College, London.

The Official Year for Railways.

It is understood that the Boards of the Railway Companies at home have decided to adopt the Budget year as their working year from 1913. It will be remembered that one of the most important points considered at the Inchcape Conference in Calcutta was that all Indian railways should adopt the Indian financial year for their accounts and not the calendar year as they do now.

The Bengal Silk Committee.

The Bengal Silk Committee, which has a subsidy from the Bengal Government, have decided to import a European silk expert from Europe, to assist in the conduct of their sericultural operations.

Agricultural Engineer.

It is understood that proposals have gone home to the India Office for the apointment of an agricultural engineer for the Agricultural Department in Bombay and that the selection for the post will be made in England.

Gold Coinage for India.

The Government of India's scheme for the coinage of gold in India has reached the India Office. It is expected that the Secretary of State will take expert advice and consult the Exchange Banks.

Mysore Industrial Survey.

Mr. V. S. Sambasiva Iyer, Secretary, Industrial Section of the Economic Conference, has been commissioned to conduct the Industrial Survey of the State and to report on the possibilities of developing local industries. He will be engaged in this important work from the 1st July and will be given a small staff to help him in his work.

THE
WEALTH OF INDIA

A Monthly Magazine of information and instruction on all matters of material interest.

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No money should be paid to an Agent. All remittances and letters should be addressed to the Publishers, Messrs G. A VaidyaRaman & Co., 3 and 4, Sunkurama Chetty Street, Georgetown, Madras.

SPECIAL ARTICLES.

RELIGION AND ECONOMIC PROGRESS.

[The symposium below is the second instalment of the replies received in response to a request from the Editor as to how far religion is responsible for the slow growth of the material prosperity of India. The replies of Dr. Sir S. Subramania Aiyar, KT., C.I.E., L.L.D., and Diwan Bahadur K. Krishnasami Rao, C.I.E., we published as the first instalment in the June issue.—ED.]

SIR GOOROO DASS BANERJEE, *Kt*, C.I.E.

In my opinion, Hindu religion is not responsible for the slow growth of India's material prosperity, except to this extent that it strongly inculcates the belief that the true happiness of man depends on his spiritual and not on his material progress. But that is a doctrine inculcated more or less by all the great religions of the world, and if it restrains us from pursuing material good as the sole end of life, it is so far for the preservation of peace and order of society, which unrestrained selfishness would have seriously jeopardized. Hinduism encourages action as duty, but discourages action for the sake of its fruits. The truth is, that the temperament of the Hindu mind, which has influenced, as it has likewise been influenced by, our religion, has been the product of other causes as well, namely, our material environments. Kind Nature has helped the people of India to minister to their physical wants without strenuous effort, and that circumstance has fostered the growth of a gentle physical constitution of a contemplative turn of mind. Thus, a variety of causes and

effects acting and re-acting upon one another, have brought about the present state of things. But a beneficent Providence has placed this great Eastern Country under the sway of one of the greatest and best of Western Countries for the true welfare of both, and I may say, of the whole world. This contact of the East and the West will, I fervently hope, help to correct all undue bias of each in regard to spiritual and material pursuits, and enable both to attain real progress. We should always remember that no part of God's creation, whether material or spiritual, can be neglected with impunity, and that each part must receive from man its due share of attention in order that he may fulfil his mission here.

THE HON'BLE MR. JUSTICE
T. SADASIVA AIYER, M.L., DIWAN BAHADUR.
Judge, Madras High Court.

Hinduism was great materially when its followers were spiritually great. Mahomedanism had its Caliphate Empire and its highest civilisation in the first flush and purity of its spiritual greatness. Christianity had its Constantine and other Christian Emperors when it was strong and pure When "spirituality" was weakened by superstition and priestcraft in Europe, the Protestant "spiritual" movement arose and the modern scientific civilisation began "Be really spiritual and all other things will be added unto you", for, Religion is the root which feeds all other beneficial human activities. As a cultured judicial officer (Mr.K S. Ramasamy Sastry) put it in a recent *Indian Review*, "One thing that we should never forget is, that Religion is the social connective tissue," and how could an organism be sound in any part if its connective tissue is weak?

(2) As regards the objection that the "Extreme Spirituality" of the Hindus has not prevented India's poverty, I emphatically deny that medieval and modern Hindus have been and are generally "spiritual." Superstition and priestcraft (the poisonous dry rot of Religion) had sapped the spirituality of the Hindus, though the Ancient Religion itself was the most spiritual of Religions. Idols and *Matathipathis* were honoured, more for the costly jewels worn by them and the paraphernalia connected with them than for their spiritual influence. Under the mask of religion, materialism and materialistic pomp stalked throughout the land. As the *Bhagavatham* puts it, "money alone becomes the test of greatness of all kinds in *Kaliyuga*." Latterly, we had the sharp knife of materialistic scepticism thrust into Hinduism which had already been covered over by the dry rot of "materialistic" superstition and priestcraft. Have we not had learned men saying quite recently that, being a Hindu has nothing to do with the Hindu Religion or the Vedic Revelation on which the Hindu Religion is based? Every Religion bases itself on some spoken or written Revelation or the sayings of its founder or founders including even very recent sects like the Sikh Religion which worships the "Granth Saheb." Hindu Religion alone is said by some Hindus to have no such foundation but such statements are made mostly by those Hindus whose knowledge and interest in the Hindu Religion have not been deep or earnest. One gentleman calling himself a Hindu said that Hinduism is a mere bundle of social rules. Another said that it was blind custom. An acute lawyer like my late lamented friend Mr. V. Krishnasamy Aiyar with his legal bias (if I may say so respectfully) said that a Hindu was one who was governed by Hindu Law, as if Hindu lawyers do not themselves say that Hindu Law is based on the *srutees* and have not been blamed (!) for mixing up Religion with Law. It is merely putting the cart before the horse to put Law or social conventions or economic greatness or political greatness before Religion. If Cutchi Memons and Khojas still follow some precepts of Hindu Law, it is because their recent ancestors followed the Hindu Religion and the Hindu Vedas and the Hindu Law based on that Religion, and the impulse given by the Hindu Religion to their social customs and legal relations is still subsisting, notwithstanding their conversion to Mahomedanism, the new religion having not been able to apply its powerful force thoroughly and taking time to do so. The new Religion has, however, been powerful enough to deprive them of the name of "Hindus" though they still submit to Hindu Law, thus showing that Religion is and ought to be a more potent factor in human affairs than Law or custom or social amenities.

(3) The recent attempts by enlightened Hindus themselves to define a Hindu in some other way than by his religious belief merely shows that we Hindus have been putting matter before spirit and considering the rotten leaf of a tree as greater and more important than its root and trunk Nobody would dream of defining a Christian or a Mahomedan or a Parsi without referring to his religion but it has been made almost a glory (and not a shame) by several educated Hindus that their calling themselves Hindus is not inconsistent with their discarding of the Hindu Vedas as trash and nonsense. This is, however, only the complementary reaction against the materialism of the ultra-orthodox Hindus who consider geographical birth to be more important than belief (as a man not born in India or of Hindu parents cannot be a Hindu according to them) and the physical blood and seed of Hindu parents to be essential. Some orthodox Shaivas go so far as to say that a man who puts on a triangular (111) mark with white earth is a *Pashanda* and not a Hindu and you should not speak to him because he does not put on cow's dung ashes Similarly, the orthodox Vaishnava makes out the orthodox Shaiva to be a *Pashanda*. To put physical ashes and earth above character and belief and *Bhakti* and *Guana*, what can be greater materialism than this? Hence, Hindus have been really materialistic (either superstitiously or sceptically) whatever philosophy and rites they may outwardly profess and practise.

(4) Hinduism based on the Vedas, is no doubt, a very tolerant Religion and allows wide diversity of opinions. Even a Charvaka could be a Hindu if he bases his materialistic philosophy on the Vedas. A Hindu Charvaka usually relies on the Vedic text "Asadva Idam agre Asit—Thatho vai sadajayata" and interprets it as "In the beginning, there was matter. Soul was its bye-product." But it is not tolerance to call even him who repudiates the Vedas as *Pramana* as a Hindu but it seems to me that Hindus will commit religious suicide if they do so. It is tantamount to a person allowing the legs he stands on to be cut off or the heart by which he lives to be plucked out. Don't we see the result of the attempts to define a Hindu without reference to his religion, in the hazy nebulosity and non-entity to which the learned gentlemen have reduced "Hinduism" and the "Hindu."?

(5) Hindu Law is called by Hindu jurists as *Dharma-shastra*. The *Bhagavatam* and every Hindu Religious work say: "*Veda Pranihito Dharmo hyadharmas tad viparyayaha*" (Law is what is ordained by the Vedas. What is opposed to Vedic ordinance is Adharma). The fundamental doctrine of the Veda is the fatherhood of God and the brotherhood of His creatures without distinction of caste, creed, race or sex. How can Hindus be said to have been over-spiritual when they despised and oppressed their women and the depressed classes, were full of caste pride, showed hatred, fear, distrust and contempt towards foreigners and even their own countrymen of other castes, went on carrying the separative principle by creating exclusive sub-castes and sub-sects without end, had no passion for humanity, were utterly wanting in public spirit, were so engrossed in selfishness that they did not care whether Rama reigned or Ravana reigned, so long as they were allowed to live a vegetating life of indolent ease? It is only the adherents of the modern spiritual movements (like the Arya Samaj or the Ramakrishna movement) that are again showing that public spirit and philanthropic activity which fearlessly goes into plague and famine stricken spots (inhabited by even the lowest classes) as ministering angels of compassion.

(6) You may say that I am wandering from

my subject but it is not so—nor does Professor Ramamurti wander from his duty when he attributes his physical endurance and strength to his spiritual exercises more than to his physical. He, at least, does not put the cart before the horse or the effect before the cause. I wanted to show clearly that the parrot-cry that we have suffered through our spiritual Religion and our spirituality is utterly false. We have suffered owing to our material selfishness which made us wallow *in the highly materialistic pleasures of Tamasic indolence* just as some European nations want to wallow *in the materialistic pleasures of Rajasic sense enjoyments.* These European nations are, however, more spiritual than we, for *Tamas is less nearer to spirituality than Rajas.* We put forward falsely our care for higher spiritual things to excuse our indolent materialism just as a Hindu servant falsely puts forward the excuse that he was looking after his master's errand when his mistress scolds him for not having performed the duty which she put on him. So much for the note in page 66 of your journal with which I shall finally part with the remark that our ultra-spirituality has been merely a virtuous cloak for our materialistic indolence and blind submission to custom.

(7) As regards the Reverend Jesuitical Missionary's remarks on pages 132 to 135, I agree in many of his observations but I cannot absolve medieval Roman Catholicism of its crime in having tried to put down spirituality by an overgrowth of superstition and priestcraft. That a Catholic might be efficient in other walks of life, what more signal example do you want than our most beloved Viceroy the late Marquis of Ripon? I don't agree with the Reverend gentleman when he says that the Irish have been stagnating owing "to the narrow-minded bigotry of those Protestant Britons who for centuries have proved the remorseless persecutors of the sister island." It is because the Irish were labouring under materialistic *tamasic* indolence and superstition similarly to the Hindus that they were going down. But both Hindus and Irishmen are learning better and becoming spiritually active and are advancing in all directions. The Reverend Father's dislike of Hinduism, however, comes out in his statement that the Code of Manu and the Hindu Religion must retard industrial progress. I have no time to engage in religious controversy and I will only affirm of Hinduism as he does, rightly, of his great religion, that Hinduism "is a Religion, made for this life as well as for the next."

THE ANAGARIKA DHARMAPALA.

I have read the editorial note with the above heading as well as the reply by the Revd. P, Carty, S.J.in the issues for March and May of the "Wealth of India." To the question "How far religion is responsible for the slow growth of material prosperity of India," I append the following observations after careful study :—Religions in India are many. At one time there was Buddhism holding sway in India under the reign of such great kings as the great Asoka, Kanishka and Siladitya. For a thousand years India has fallen from her high place and has not yet come to the high standard of perfection which she had occupied before the religion of Christ or the religion of Muhammad came into existence. If to-day India is fallen, it is entirely due to the negligence and indifference of the custodians of the religion that held sway when the Arabian hordes entered the north-west gates of India under Mahmud of Ghazni That the people at the time were impotent to obstruct the passage of a savage invader who had come to plunder the country shows that they were at the time inspired by religion. Religion does inspire people to a super-normal extent. Ideals are created by the inspiration that is begotten of the religious spirit which is innate in civilized man. Religion when founded on superstition and fatalism on the contrary doth tend to degenerate man. We have to look to the beginnings of religion to get a knowledge of the times when it was born. A religion may be the outcome of degenerate times, or it may be the result of the yearning of highly gifted peoples.

Religion may also help to degenerate society under certain conditions when its custodians become selfish and indolent looking for the enjoyment of sensual pleasure as the consummation of life. When we go back to the early Vedic period, we have the picture of an infant religion, under the inspiring genius of a society of well developed intellects, holding on the ideals of morality essential to the well-being of man. The day that the ascetics associated themselves for the preservation of a select few, that is to say, for the institution of a body of rules for the exclusive interest of a certain caste, the seeds of future degeneration were sown. We may not go to the dawn of the period when religion began to minister to the wants of the people of India. The day when India came in touch with the cohorts of the Macedonian conqueror may be taken as the starting point of the evolution of the Indian peoples. India was not conquered by Alexander. He left India with the consciousness of his own inability to make any impression on the warlike races of the Panchala. Then came Chandragupta to the throne, and we know what the Greecian ambassadors had recorded about his Court at Pataliputra. After him came the great Asoka consolidating an empire whose influence lasted more or less, keeping the people in independence and not allowing them to go under a foreign power. The vitality of the Indian people was manifest in the power they had continued to maintain from the time of Chandragupta to the time of the downfall of the Pala dynasty. For, with the fall of the Pala dynasty came the extinction of the religion that worked for the welfare of the masses. When the sustaining idea of one's own powerful individuality is crushed, the next step is indifference which hastens the deterioration of conscious development In Europe, religion had crushed the individuality of the people, concentrating all power in a priesthood with a centralized authority, claiming the right to reign as the vicegerent of the Almighty. We know what the people were during the middle ages. A few robber barons holding power keeping the people down in a state of serfdom, education neglected, and the laws of hygiene and sanitation neglected, the priesthood dominating over all. The darkness that reigned over Europe for nearly seventeen centuries was due to the blighting effect of religion. Commerce helped a little to spread a little enlightenment when the little kingdom of Venice was the centre of Commercial activity. The Romans during the time of the Roman Emperors had commercial communications with the people of India and Ceylon and also with China. There was overland communication with China during the time of the Emperor Macus Aurelius. The coins of the Roman Emperors before Constantine have been found buried in ancient Indian sites as well as in Ceylon. After the Roman constitution became christianized came the stagnation that continued until the time of the Crusades when a new impulse drove the barbarian races of Europe to fight with the Saracens of Palestine. It was a time of religious iniquity crushing the manhood of great geniuses who ever dared to grapple with the problems of cosmic phenomena. The dogmas of the papal hierarchy was the *alpha* and the *omega* of science and philosophy. Little did they care for the enlightenment of the human race. In those days the people of the lower ranks lived a life of misery and stupidity. The illumining rays of science had not yet then dawned in Europe, and the anathema maranatha of the Popes was a flaming sword prohibiting the people from making adventures in the domain of scientific investigation. We know what the papal court had done to Galileo to prevent his investigations into the cosmology of science. We know what was offered to Giordano Bruno. Practically it was the few daring people in the scientific field who had helped to bring about the modern consciousness of evolutionary development. Read the "Conflict between Religion and Science" by Professor Draper and his "History of the Intellectual Development of Europe" and along with it, Dr. White's "History of the Warfare between Science and Theology," and you will then see what the potentates of the papal hierarchy had done to

keep the people of Europe in utter stagnation. Science, sanitation, hygiene, electricity, physics, chemistry, astronomy, geology, paleontology, biology, evolution, psychology, and other branches of wisdom were unknown to the people of Rome in the middle ages All that the people can boast of are the few Christian Churches that were built in the period when the popes held temporal power. But the history of European architecture has yet to be written, for, after all, it was the genius of India that gave the impulse to build "temples" to other nations The Venetians who traded with India and China carried with them the germs of civilization that they had seen in India and China. And before that, the Romans who had traded with the people of India and Ceylon saw the majestic buildings of the Buddhists in the form of viharas, dagobas, guhas, gopurams, &c The paintings of Ajanta in India and Sigiriya and Palastipura in Ceylon were in their pristine purity, and these had been seen by the European traders Again, we have to think of the majestic structures that were built in Central Asia by the Buddhists, whose remains are being excavated to-day by antiquarians and explorers like Stein, Le Coq, Tachibana, and others.

The modern development of European races is absolutely due to the progress of science which was brought into existence by the genius of scientific and philosophic thinkers of different European countries. The theocracy idea that had given power to the popes and kings of Europe had been demolished by the advent of Napoleon. The freedom of many of the European races was due to the ideas promulgated by the authors of the French Revolution. Ecclesiasticism is a vampire that sucks the blood of the people, keeping them in ignorance, creating the people into plutocrats and proletariats. It is the elevation of the latter class that science did in Europe, and what Buddhism did for the people of India five centuries before Christ.

Religion based upon science is helpful, religion based upon the dogmas of selfish bloated priesthood is a curse, keeping the masses down as slaves. In India, when the priestly law-makers got power, they passed laws to suit their own selfish tastes and whims. What else could we think of law makers who prevented agriculture, trade, medicine, sea voyage, education and architectural study? In India, out of the 300 millions, only 14 millions are Brahmans and the rest belong to the non-Brahmanical tribes. A class that arrogates all power to its own rank and crushes the individuality of the remaining 250 millions is an abnormal phenomenon in the history of the human race. It was supreme selfishness that made the Brahmans to keep exclusively as a sacred monopoly the power of domination in their own hands. When we read the Griha sutras of Apastamba, Yajnavalkya, Asvalayana, Manu, and Gautama translated by the European scholars, and published by the Clarendon Press under the title of the "Sacred Books of the East," we shudder to think of the tyranny perpetrated on so large a portion of the human race. Here are a few of the dictums of the priestly law makers:—Says Manu: "Whatever exists in the world is the property of the Brahman. The Brahman is entitled to it all." To the Brahman, he assigned teaching and studying the Veda, sacrificing to their own benefit and for others, giving and accepting alms.

"A Brahman who knows the Veda should shun the lowest of the twice born, he should shun him who teaches for a stipulated fee, he who instructs Sudra pupils, he who undertakes a sea voyage, a bard, an oilman, the keeper of a gambling house, a drunkard, a hypocrite, a seller of substances used for flavouring food, an informer, a trainer of elephants, oxen or horses, who teaches the uses of arms, an architect, he who plants trees for money, he who lives by agriculture, a shepherd, a keeper of buffaloes, the husband of a remarried woman,—all these must be carefully avoided." Manu. III, 156-167.

"A Sudra was created by the self-existent to be the slave of the Brahman. A sudra though emancipated by his master is not released from servitude, since that is innate in him who can set him free?" Such are the dogmatics of the

science of slavery created by the priests of India. What does it mean except to keep the 240 millions of the Indian people in perpetual slavery? A religion that keeps so many millions, generation after generation for thousand years in perpetual slavery, could not be called a humane institution. So long as there were feeble minded rulers who obeyed the priests, so long it was possible to keep the millions down in abject fear of the gods on earth. But when invaders of the type of Mahmmud of Ghazni, from the near west, and Clive from the far west, came to India to plunder, the Brahmanical supremacy vanished like a pack of cards, and the Brahman with his bag and baggage has to go. The elevation of the teeming millions of India is an impossible achievement with the priests in power, and it is impossible achievement with the foreign power dominating over the Brahman as well as the non-Brahman. The religion that helps the individuality of the individual Indian, and helps him to advance in the path of individual progress is not to be found in India among the existing religions. A religion that has not helped the development of the individual as a human being for a thousand years, is, I consider, a failure. We want a religion to help man on this earth, not to tell him that he was created by the Almighty to be the slave of another human being who is subject to decay, old age and death, who is actuated by the same emotions as the so-called low caste man. The foreigner who comes to India, who does not believe in the caste system, makes it a tool to work with for his own advantage. In this age of commercialism and scientific industrialism, the white man who ridicules the caste system based on religion uses it for his own gain. The millions of the Sudras created by the law givers of India are, it seems, supporters of the invaders whose progress the law givers had anticipated. No religion has done so much harm to the countless millions as the religion that is built on caste. The modern imperialists are simply incarnations of the Brahman supremacy. Religion of the priests is responsible for the degradation of man, and the religion of science uplifts man as we see to-day in the industrialism of the West. The useless broken bottles of priestly aristocracy have had their day in the West and the scientific industrialism will achieve triumphs which will give happiness to the many instead of the few who arrogate all power to themselves. The religion of Asoka did help man as a whole, and the priests did not like it For a thousand years, India did not make any progress and so long as it runs in the grooves of ecclesiasticism, it will ever remain moribund.

BABU BHAGAVAN DAS.

You ask me for a brief indication of my views on "religion and economic progress" with reference to the editorial and the article printed at pp 65 and 132 *et seq* of your journal. It is only a question of words. The backward condition of India, not only economically, but in *many* other respects, is glaringly patent. Some people would say 'religion' or 'too much religiosity' or 'extreme spirituality' is the cause. I would say 'false or perverted or distorted notions of religion', themselves having their origin in a general degeneration of character, which is the *whole* cause of all the evils we are suffering from, may well be regarded as a partial cause of part of the evil To my mind, as I have endeavoured to show in a book entitled "the Science of Social Organisation; or the Laws of Manu in the Light of Theosophy," what I regard as the true and genuine Hindu Religion makes the best possible provision for the utmost economic efficiency and prosperity in a nation as well as for fulfilling and satisfying all the highest and most refined needs and interests of every one in the nation in the most just and balanced manner.

FRUIT-CANNING FOR INDIA

BY

P. A. VENKATARAM AIYAR.

Fruits form an ideal food for the human body. They not only invigorate and sustain the system but serve as a cheap, simple and effective remedy for many physical ills that beset us At the same time, a regular and judicious use of well-ripened fruits is said to bring about a healthy state of the mind also. Thus it was that India's *Rishis* led in ancient times a long life of plain living and high thinking, subsisting only on fruits with water. At the present day, however, fruits do not play such an important part in the dietary of the Indian nation Consequently, there is not, at the present day in this country, much of what may be termed an organised and up to-date fruit industry. It is rather strange that this should be so, because India is peopled by many races who are vegetarians by instinct and by tradition and what better vegetable food can be had than that afforded by fruits? Not only is there

not in the country a fruit industry, in the corect sense of the term, but one does not notice either a regular fruit trade, except in a very few well-known localities.

The reasons for this are, in our opinion, to be sought for in the following :

1. The general ignorance on the part of the people of this country of the benefits of the use of fruits as an article of the dietary ;

2. the limited supply of fruits available, owing to the small areas in the country in which fruit-cultivation is carried on as an occupation in the most unmethodical and empiric of ways ;

3 the absence of up-to date marketing methods, resulting in the surplusage of crops that may be found in parts of the country being allowed to decay and run to waste ; and

4. the dear prices of fruits ruling in most markets where they are available, which the bulk of the people, being extremely poor, cannot afford to buy.

This is not the place to enlarge on these points now, but we may remark that, in order adequately and profitably to carry on the fruit industry, it is essential that organised efforts should be made to plant orchards and produce fruits on a large scale. India is rich in the variety and wholesomeness of her fruit produce which can be grown in most parts of the country. Secondly, where a particular locality produces fruit in excess of its requirements, the surplusage should be marketed off to places where there is a deficient supply or none and, in no case, should the excess quantity be permitted to rot and waste away. Fruits being perishables and fresh ones being far superior to the dried varieties, the aid of modern science and modern industrial methods must be requisitioned, if the fruit industry in India is to be managed on economic and efficient lines so as to compete with its rivals in America and Europe.

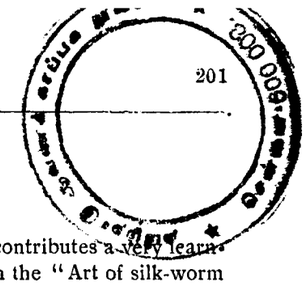
The two methods known to science and practised widely in the West, at once to preserve the surplusage and make it marketable are those of refrigeration and canning or bottling. The canning method is dealt with in this article and we may assure those who intend to set up business, that it is a comparatively easy industry to work and that, with the progress of time, its prospects should prove very bright. There is, at the present day, a large demand for preserved fruit and fruit-products, such as jam, jelly and the like, mostly from the European residents in the country and from the moneyed classes among Indians and, just now, this demand is being met by importations from Australia, United States of America and England. It is obvious that these products, if turned out in India, will commend themselves largely to consumers in India, because of their inevitable freshness and cheapness.

Heat is the all-sufficient, safest and surest steriliser utilised in the canning industry. It is sure death to all ferment-organisms, purifies what it touches and imparts no harmful property or quality. A clear understanding of this principle is essential for the successful conduct of the canning business. It must be borne in mind that success depends on the care taken about every little particular, in filling and sealing the cans and in sterilising them during the process of cooking ; that sound and high-grade fruits only should be used ; and that cleanliness is one of the principal factors of success.

Fruits should be ripe but not too soft All fruits should be handled carefully and it is advisable to pick into small cases, so as to avoid bruising. Upon arrival at the cannery, the first process is that of grading. After the fruits have been graded, they are peeled.

Having graded and peeled the fruit, halved it and removed the stones, pack the fruit in the tins, taking care, while doing so, to place the fruit in such a way as to leave a hollow in the centre of the tin. thus facilitating the filling of the latter with syrup ; the cans should be filled up with syrup to within half an inch of the top. The strength of the syrup should not be less than 30 per cent., that is, 8 lbs. of sugar to a gallon of water. The lids are now soldered down, leaving a small hole in the centre. Place the cans in boiling water for about seven minutes, remove them, seal the holes and cook the contents in boiling water for about half an hour. Then remove the cans and let them cool. After a little time, the tins should be immersed in boiling water that they may be tested. If then the presence of air-bubbles escaping from them is discovered, it denotes a faulty tin which must be removed and the leak soldered up; then re-test the tins in boiling water.

As a precaution, all tins should be washed before packing fruit in them, as there is a certain degree of danger of the presence in them of chloride of zinc and other foreign matter which may prove deleterious. As will be noted, no elaborate or costly machinery is required and the processes are simple of understanding and easy to work out. As a matter of fact, each little fruiterer may carry on the business in his own home.



VIEWS AND REVIEWS.

Cocoanut Fibre Refuse.

Every gardener knows says the *Field*, the value of cocoanut fibre refuse as a plunging material for a propagating bed and a spring or summer mulch for flower beds. It is the light brown sawdust-like refuse from the husks of cocoanuts, the fibre proper being used in the manufacture of ropes, brushes, mats, &c. This fibre, known commercially as coir, has become almost as valuable a product of the cocoanut palm as the nut itself, the average annual yield of fibre per tree being 6 lb. valued at about 8*d*. The best quality fibre is obtained from the husks of unripe nuts. In addition to the fibre, there is what we call the refuse or the gardener's friend, and before the makers of linoleum carpets discovered the value of this refuse, which they grind and mix with oil before turning it by pressure into floor covering, it really was refuse, and gardeners could obtain any quantity of it from the fibre works for the mere cost of carting. Now, however, it has to be paid for pretty dearly, the lowest price that has been paid for it this year being 25*s*. per ton, a ton containing a large percentage of water. The best substitute for fibre refuse that we have tried is peat moss litter, which is cheaper than fibre refuse, and for some reasons even better as a plunging material. Against it is the acid it is apt to contain, some samples being practically poisonous to plant roots on this account. Still, it need not be used as a rooting medium. The fibre refuse, on the other hand, is so clean and wholesome to plants that gardeners are known to use it for rooting cuttings of many kinds of soft-wooded plants, and a heated bed of it is an excellent hospital for a plant whose roots have become soil sick. The pity of it is this cocoanut fibre refuse has become so expensive as to be outside the limits of the garden bill. Sawdust ought to be a good substitute for it, but it is disliked by gardeners because it harbours fungi and soon becomes waterlogged.

Sericulture in India.

Mr. H. Subba Row contributes a very learned and useful article on the "Art of silk-worm rearing in India" to the June number of the *Indian Review*. The writer begins with the statement that, of all countries, India was the first to learn the art of silk-worm rearing from China which is the birth-place of this industry. "India was once the only country which was supplying the whole world with raw silk and now it is one of the best customers of silk products coming from other countries. It was once the envy of the civilised West and now has hardly anything to be envied at. The country which exported 11,000 bales of silk in 1854-55 now exports less than 2,000 bales." Turning to the future, Mr. Subba Row affirms that there is a bright future before Indian sericulture and appeals to agriculturists and the moneyed classes to organise the industry on a sound footing and thus make themselves and the country richer by it ; for, "though there is a slight truth in saying that silk manufactures have declined of late, yet it is quite untrue to say that cheap imitations of the West have turned silk manufactures out of India. Hindus cannot afford to be without silk, because they require silk for their Madis, silk for their Pitambers, silk for their bodies, and pure fine silk for their clothing. As such we cannot neglect this industry."

Of the 10 kinds of silk-worms that spin cocoons of commercial importance, Mr. Subba Row recommends the seven varieties of the Bombycidœ kind for rearing in India : The Bombycidœ variety feeds upon mulberry trees (Morus Alba) and varieties of mulberry. They have one advantage over the rest of the worms and that is the silk can be reeled off the cocoons very easily after boiling the unpierced cocoons in hot water and some strong solvents. A continuous thread of about 900 yards is given out of a good cocoon of Bombyx mori-worm. The record length of thread got from experiments in the Punjab is 4,000 yards.

Hence the rearing of the Bombyx variety is generally followed throughout sericultural centres.

Natural *versus* Synthetic Indigo.

Mr. George Ranking, formerly Professor of Chemistry, Calcutta Medical College, thus states the position of the Indigo industry :—

The Indigo industry is seriously threatened by the advent of "synthetic." I purposely omit the word 'Indigo' after "synthetic" because that product is from the dyers' point of view *not* "Indigo." By this I mean, that whereas natural "Indigo" contains numerous chemical bodies, all of which are important from the point of view of dyeing power, "synthetic" contains only one of them, *viz.*, "Indigotin," which is of any value to the dyer. Planters have been misled by having it drummed into their ears that the value of "Indigo" is to be measured by the percentage of "Indigotin" it contains. Now I have no hesitation in saying that this statement is false. *The value of any dyestuff is to be gauged simply and solely by its dyeing power.* I shall return to this point later. The natural "Indigo" is acknowledged to be "*the most important dyestuff known, owing to its great fastness, a quality in which it is unsurpassed by any other blue dyestuff.*" This is a quotation from the highest authority on dyestuffs at the present day. Now to what does natural Indigo owe this pre-eminence ? Is it solely to Indigotin ? Emphatically, *No.* It is to the other chemical bodies which it contains in company with its Indigotin, bodies, be it observed, which *are* not and cannot be contained in any synthetic imitation of Indigo, which has no more right (if indeed as much right) to be called "Indigo" than Margarine has to be called "Butter." Consequently, any tests of commercial "Indigo" based upon the percentage of Indigotin contained in a given sample, *even if they are reliable*, are absolutely without value in arriving at an estimate of the worth of that sample as a dyestuff. Listen to the words of the leading authority on dyeing. Dr. I. Merritt Mathews, in his *Laboratory Manual of Dyeing and Textile Chemistry* (New York, 1909) says, "In the testing of a dyestuff sample for its money-value, it is, of course, necessary to test it in comparison with another sample of the same (or a strictly similar) dyestuff of a known or established money-value."

Cattle Breeding in India.

The Indian cattle breeder, says the *Indian Agriculturist*, has inherited from his ancestors a great wealth of useful cattle lore, but a good many sensible practices have been gradually transformed into senseless superstitions. Based originally on sound economic considerations, several of these practices are now merely encased in the empty shell of sentiment, and as such, they serve no useful purpose whatever. We have in the dedication of Brahmini bulls to Hindu temples a striking illustration of the degeneracy into useless and empty emotionalism of a practice which, there is good reason for believing, was inculcated by the early Aryan Hindus as a measure of selective breeding, the importance of good, healthy cattle as an essential aid to the agricultural industry, having, even in those early times, impressed itself upon the observant ancients.

One very common mistake is to select bulls simply because of their strength and handsomeness. The fact is either ignored or unknown that bulls imported from other localities may not make good sires, although they may have high intrinsic merits. The best course is to select good bulls from the indigenous stock, as these would be accustomed to the climate, locality and general local conditions, and would thus exist under favourable and familiar environments. Where good local bulls are not procurable—and it is necessary to import—care should be taken to see that the importations possess local characteristics as far as possible, for, experience has shown that the mixing of widely different breeds of cattle has not been at all satisfactory. Good breeding bulls having, in the first instance, been carefully selected with regard to their points, their possession of local characteristics, and their suitability to local conditions, the next point is to insure the regular and steady continuance of the work of improving the quality of the indigenous stock, and this is to be attained by selecting the very best of the young bulls obtained. The necessity of continuous breeding operations from generation to generation is one of the first principles which requires to be inculcated in this country.

Cocoanut Planting.

There is sure to be a 'boom' in the cocoanut in the near future and such of our readers as may like a safe investment may try cocoanut planting. Cocoanuts will grow in any soil, but will not bear in every soil. The best soil is a chocolate loam, and the one to be most avoided is laterite. A white loose sand is unsuitable for cocoanuts, though the low quality of the soil can be remedied by systematic manuring. It is a fallacy to think cocoanuts will not bear well away from the sea. Given a suitable soil and a fair rainfall, they will give excellent results 100 miles from the sea. If the land chosen is low lying, thorough draining must be done. It is as well to clear away all timber, as decaying soft wood is a favourite breeding-ground for beetles.

Only good round smooth husked nuts from trees at least 30 years old should be taken for use as seed. Stick a blade of a pocket-knife into the husk and you will get a good idea of the size of the nut inside, or—better still—have a few skinned. It does not follow that the largest husk has the largest nut inside.

When making a nursery, dig over the soil at least 12 inches deep if the plants are to stay there long. Place the nuts in rows on their sides with the eye end slightly raised and cover with earth leaving the eye and about one quarter of the nut exposed. Planting nuts on end generally gives disastrous results. The protecting cap falls off after a few days and every shower of rain leaves a little water in the cup at the head of the nut. This water is heated by the sun and a portion of it soaks through into the nut and very often rotting results. Opinions differ as to the distance at which plants should be put out. 30′ × 30′ is a good distance. This on the square will give 48 and in triangles 56 to the acre. Holes should be dug—when practicable—at least $2\frac{1}{2}' \times 2\frac{1}{2}' \times 2\frac{1}{2}'$ and filled in with surface soil and ashes to within a foot of the ground level and the nut planted in a hollow scooped out of this earth.

Railway Policy in India.

The following is a summary of the Secretary of State for India, Lord Crewe's reply to a deputation of the London Chamber of Commerce which waited on him on June 10th last :

First, as regards the request of the deputation for more capital expenditure on railways, Lord Crewe said that certain plans submitted to him in regard to this matter were under his consideration, and promised that the differences now occurring between the allotments made and the actual expenditure incured would not be allowed to recur again.

Secondly, as regards the block in traffic complained of by the deputation, the Secretary of State replied that, it was due to (i) the astonishing and extraordinary growth in the export figures from India during December last, (ii) the diverting of a part of the railway system towards the relief of famine in Guzerat and other parts (iii) the coal strike, (iv) the Delhi Durbar, and (v) the carriage of a great quantity of stores for troops and other purposes.

Thirdly, as regards the shortage of wagons, the Secretary of State thought that more siding accommodation was necessary rather than more wagons.

Lord Crewe thus concluded his reply: "I was interested also at the hopeful view which more than one speaker took of the possibility of our tapping Indian financial resources for the purpose of Railway enterprise to an extent which has hardly indeed been attempted before, and so far as it has been attempted, has not proved to be very successful. It is a point I confess in which I have always taken the deepest interest, namely, that those in India who have money should invest it in productive Indian concerns and thereby obtain a deeper and, I also think, a sounder interest in the welfare and prosperity of their country than is

possible for them at present. When I was in India the other day, I visited the great Iron and Steel Works of Messrs. Tata, and it was interesting to learn that, with the exception of quite a few thousand pounds, some 10,000 or so, which was subscribed in London, the whole of those works with a capital running as you are aware into hundreds of thousands of pounds, has been entirely raised in India. I should be very glad if Indian capitalists would take a similar move with regard to Indian Railways, and I confess I see no reason why at some future time they should not turn their attention in that direction."

The Egg Industry.

We commend to fanciers in India and those who may be interested in poultry the following industry for their adoption. Prepared dried eggs, egg-cognac, egg noodles and albumen can be made from eggs.

In German-China this is done and the poor peasants are much benefited. There is no reason why this should not be done in India where so many eggs are wasted. For the instruction of those of our readers who may be interested in this prospective industry, we give below the methods as followed in German-China :—

The eggs arrive at the factory packed in old kerosene oil boxes. They are carefully examined by being held close to a strong electric light which shows the least defect. The fresh ones are washed and passed on to several Chinese boys who open them and separate the yolk from the white. With the aid of a suction pump, the yolk passes through a large pipe into a vacuum in the machine and is dried in 15 seconds. It is then passed on to a large receptacle into which the matter falls in the form of flakes which look clean, have a good colour and a fresh odour. The flake is again passed through a machine and comes out in a powdered form ready for shipment. It is said that this product can be kept indefinitely if stored in a dry, cool place. The whites of the eggs are put in small glass-bottle trays about a foot square and placed on shelves in a room having a temperature of 40° to 55° C. After thoroughly drying, the material is broken up in small pieces and ready for export. These sheets are sometimes powdered or reduced to a crystal form resembling granulated sugar. A market for egg shells has recently been established in Germany where they are used as poultry-feed. To make 10 kilos (22 lbs.) of dried yolks, 1,500 eggs are required ; to make 10 kilos of whole dried eggs, 1,000 must be used ; while 2½ kilos (5½ lbs.) of albumen are made from the whites of 1,000 eggs.

It needs to be noted that the price of the whole dried egg is about § 0·73 Mexican (31 cents United States currency), a lb. of albumen 44 cents and of dried yolk about 24 cents. Shipments are made in tin-lined cases holding 50 and 100 lbs.

The Wealth of India: What is it ?

Mr. Har Dayal contributes a characteristic article on the "Wealth of the Nation" to the July issue of the *Modern Review*: Mr Har Dayal begins thus :

Adam Smith wrote a famous book on "the wealth of nations," in which he expounded the principles of a so-called science of political economy. But silver and gold do not form the chief wealth of nations, nor indeed corn and cattle. We shall discuss in what the true wealth of nations and humanity really consists, and how it should be employed for the destruction of evil.

The enduring wealth of the world, says the writer, consists in the intellect and the character of its men and women. This moral and mental capital leads to all happiness. Its proper investment should be the chief care of all noble souls. Its fruitful use determines the future of the race. Its waste or misuse brings terrible penalties with it. It is the source of our food, our clothing, our medicine, our pleasures, our power over nature, our beautiful social institutions, our imposing fabric of civilisation, our glories of the past, our efforts in the present and our dreams of the future. Material wealth, which supplies the economic needs of society, springs from the conservation and development of this inner horn of plenty. Savage races starve in the midst of vast natural resources in Africa because they are morally and mentally dwarfed, while civilised men live in ease and comfort on the bleak moors of Scotland and in the desolate regions of Canada because they possess the secret of moral and intellectual development to some extent. In proportion as we learn to make a right use of intellect and character, we shall be free from poverty, ignorance. and disease. The subjective masters the objective : the unseen is stronger than the seen : and man's mind and conscience minister to his body even more effectively than the latter supports the former by furnishing their material basis. Man is really one entity, but we are only analysing the different aspects and constituents of his nature in order to understand him better. Hence the true wealth of a nation, which is the source and fountain of all other forms of wealth, including grain and cotton, consists in the Intellect and the Character of the citizens.

Mr. Har Dayal then goes on to say that at present Indian Intellect and Character are wasted in (i) money making ; (ii) metaphysics in which he includes all philosophy and religion and (iii) amusement which term means in Mr. Har Dayal's vocabulary all the fine arts, including the muses of poetry and of song. Curiously enough, the writer ends with this spirited appeal: "Young Men of India, you should turn your back upon all this fatal tragedy. You should see that the Vedas of to-day are the five fundamental sciences of chemistry, physics, biology, psychology and sociology, and that the angas and upangas are their divisions and sub-divisions like astronomy, geology, history, economics, politics, etc., etc. When you feel discontented with the humdrum life of selfish worldliness, go to science and sociology : come to the West, the mother of the arts and sciences to-day. Young Men of India, you should come into line with the world imbibing the modern spirit. Do not skulk in your corner of Bharatavarsha munching stale bread baked by your great-grand parents, and swearing from false pride that it is delicious. Your country is groaning under frightful evils : the whole world is one vast charnel-house and hospital. Turn your attention to sociological studies, and the sciences. Try to concentrate all the energy of the country on the real problems that have to be solved. Ethics, science, economics and politics should be to you in place of all the doctrines of the Vedas."

The Iron Industry in India.

Sir T. H. Holland writing in a recent number of the *Commerce* on the "Iron Industry in India" says that the two fairly prevalent ideas regarding India from the point of view of iron manufacture are (1) that India is rich in iron ore ; and (2) that attempts to introduce European methods of smelting have failed in the past and are likely again to lead to failure. The general idea that India is rich in iron ore is due to the fact that the smelting of iron was a widespread industry throughout the country for many generations before the British occupation. In addition to the smelting of wrought iron by a direct process in small "bloomeries," the natives of India formerly made steel of excellent quality, which had acquired a wide reputation even when Alexander the Great invaded India. The native smelting industry persisted in most parts of the country until the importation and distribution of cheaper European iron and steel became possible by the opening of the Suez Canal and the spread of railways throughout the country. After the European products obtained access to the country, the native smelter found it impossible to live, except in places far from the lines of railway, and thus the old-fashioned furnaces may be found still at work in remote parts of Madras, Chota Nagpur, Orissa, and the Central Provinces.

As regards the future of the iron industry in India, Sir T. Holland thinks that there are fair prospects of success for such ventures as the Tata Iron and Steel Works but he is also of opinion that the European Iron Industry enjoys many advantages, which are bound to prove a serious menace to the development of the Iron Industry in India.

The Quantitative of Money Theory.

Mr. S. P. O'Donnell, I.C.S., has a paper on "Prices and Money" in a recent number of the *Hindustan Review*. His exposition of the quantitative theory of money is worth reading.

The quantity theory alleges that the quantity of commodities offered for sale being given, prices depend on the quantity of "money." But the term "money" requires definition. In the phraseology of the money market "money" means loanable capital. But neglecting this special connotation, the term may be employed in a wider or in a more restricted sense. The essential function of money being that of a medium of exchange, anything that performs this function may be regarded as "money." "Money" in this sense covers not only gold, silver and notes, but cheques, bills of exchange, and other forms of credit. And if this is the meaning to be given to the term in the quantity theory, that theory is irrefutable. Price is the amount of money which has to be paid for an article, and if prices rise, more money must be available for payment. But so defined, the theory while perfectly true is perfectly valueless. It is simply an identical proposition, and in no way enables us to arrive at the conditions which determine the price level. To give the theory any real significance, money must be interpreted in a more restricted sense, and in fact its meaning for the purpose of the theory varies according to the monetary system under consideration. In countries where the gold standard is in force, it means gold; where the silver standard, silver. But it is also held to be applicable to the value of a token coinage or of an inconvertible paper currency. For the purpose of the present discussion, we may neglect the cases of the silver standard and inconvertible paper currencies; not that the principles involved are different, but because their importance at the present day is relatively small. In all the great commercial countries, the gold standard in one or other of its two forms is in force. In one form, of which England is the leading exponent, gold is not only the standard of value, but the only standard coinage, silver being legal tender only for small payments; in the other (France, India, Mexico) while gold is the standard of value, silver is legal tender for any amount, but it is overrated and its coinage is confined to the State.

Quantity of "money" means then quantity of "gold." But "gold" does not include all gold. Gold buried away in hoards has no effect on prices. Only that gold which is in circulation is held to be effective. But again, mere quantity is not the only element to be taken into consideration. The varying circulation of the monetary units has been taken into account. Some coins do not make a single purchase in the year whilst others change hands hundreds of times. The factors determining the value of money are, therefore: (1) the quantity of gold in circulation, (2) the average rapidity of circulation of the gold coins, or their efficiency, (3) the amount of goods on sale; and the formula is that the value of money varies inversely as its quantity multiplied by its efficiency.

Experiments in Paddy Culture.

The following is a summary of the conclusions arrived at by the Mysore Department of Agriculture:—(1) With regard to paddy cultivation, the view that better results can be obtained by ploughing the land immediately after harvest than by leaving the land in stubble and ploughing in puddle immediately before transplantation, appears to be erroneous; (2) deep ploughing has not yielded uniformly better results than shallow ploughing in paddy fields and so cannot at present be recommended. A large body of results of experiments extending over several years more will be necessary before definite conclusions can be reached on this point; (3) Green manuring can be recommended as a cheap and efficient method of increasing the fertility of paddy lands. Where two crops of paddy a year are raised, it is necessary to sow the green manure seed in the paddy some one or two weeks before the harvest to allow for a sufficient period of growth. Both sun hemp and cow pea can be recommended for use as green manures; (4) castor cake has not uniformly paid for itself as a manure for paddy in the experiments described here but a combination of small quantities of it with green manure would probably prove decidedly profitable. Other and cheaper poonacs might be profitably substituted for castor; (5) saltpetre is not a profitable manure for paddy and has produced no decided increase in the yield over unmanured plots. It has been uniformly a great loss; (6) a complete artificial fertiliser composed of saltpetre, basic slag, potassium sulphate, while producing a decided increase in the yield was, owing to the dearness of the manures, used at a great loss; (7) In general, it seems fairly clear that organic manures rich in nitrogen which can be obtained cheaply or at a moderate price are the ones to be recommended for use in paddy cultivation. The results obtained by the use of milled fish in Madras bear out this statement. The use of costly artificial manures which, in the minds of many who have a smattering of information on agricultural subjects, have a special virtue, cannot at all be recommended in the light of our present experience. The use of bone meal as a manure for paddy has been shown to be advantageous in other parts of India and in Japan and might be tried with advantage here, especially in connection with green manures. The use of lime in small quantities along with green manures is also a question which will receive the attention of the Agricultural Department in experiments now being planned; (8) The results of the rotation experiments are not such as to yield definite information. It seems probable, however, that the rotation of paddy with a suitable leguminous crop would be profitable; (9) The salt water method of selecting paddy seed which is widely practised in Japan appears to be a practical method for bringing about a decided increase in the yield which can be applied at very slight expense by any land-holder or raiyat in Mysore.

History of the Indian Cotton Industry.

A very valuable paper on the "History of the Indian cotton industry during the nineteenth century" appears in the April number of the *Modern Review* from the pen of Professor Mr. P. G. Shah M.A., M.S.C.I., of the Forman Christian College, Lahore.

The following extracts are illuminative though painful reading:—

"It is difficult for Indians at present to get a proper idea of the excellence of Indian cotton goods a few centuries ago. It might give some idea of their superiority and cheapness, if it be mentioned that they were a source of terror to all the manufacturing nations of Europe in the 17th and 18th centuries and were generally prohibited by legislation. Owing to the beauty and cheapness of Indian muslins, chintzes, and calicoes, there was a period when the manufacturers of all the countries of Europe were apprehensive of being ruined by their competition. To such an extent did this proceed that, as early as 1678, a loud outcry was made in England against the admission of Indian goods, which, it was maintained, were "ruining our ancient woollen manufactures." This resulted in high duties on the imports of Indian goods and finally, in prohibition by a series of Acts. The first prohibitive Acts were the Acts 11 and 12 of William III, cap. 10 (1700) which forbade the introduction of Indian silks and printed calicoes for domestic use, either as apparel or furniture, under a penalty of £200 on the wearer or seller. But this Act was insufficient to prevent the people from using what was cheap and good and so we find Daniel Defoe complaining bitterly against Indian manufactures in 1708; and had to be followed by various other Acts of increasing stringency. It is clear from the above that the magnitude of the export trade of Indian cotton goods was certainly great.

As a matter of fact, "in 1815, India not only clothed her vast population but sent to England cotton fabrics worth £1,800,000. In 1816-17 the export was worth £1,659,438. But this state of things did not last long: the advance of the British power-loom protected by immense duties on imported Indian goods, soon reversed the balance of trade. The Indian exports to England decreased while

England continued to send large amounts of cotton goods to India. Thus by 1849, India had almost ceased to export cotton piecegoods to England but on the contrary was receiving nearly three times what she exported to all countries. During the above period of about 3 decades, England rose from the rank of nonentity in cotton manufactures to a high position as a manufacturing country. On the contrary, India sank down in the cotton fabric market importing, instead of exporting, large quantities."

The gradual undermining of the cotton manufactures of India, remarks Prof. Shah, shows the disastrous effects of free trade between a dependent country and a well-progressed independent nation.

Prof. Shah in conclusion gives the following reasons as having led to the ruin of the Indian cotton Industry :—(1) The comparative high price of Indian cotton fabrics, which employed manual labour, as compared with that of English goods, manufactured by modern machinery, restricted the use and importation of the former in England. Indian articles were the cheapest in the European market before the introduction of machinery. (2) But in spite of the higher cost of production, Indian goods could be sold in the English market with a profit of 50 to 60 per cent. and heavy duties of 60—70 per cent. were levied on Indian goods to protect the English infant industry. As these duties allowed some kinds of Indian goods to be imported specially for the rich, they were at last prevented from being imported by positive prohibition. Such a prohibition for a country like India whose only market for surplus goods was England, meant an immediate destruction of the industry : if India had been independent, or had any other market open for her, the same result would not have been brought about (3) The demand for Indian goods in the foreign market, even if destroyed, would not have produced effects so great, if the importation of cheap English goods had not also diminished the local demand for Indian goods. Whereas the exportation of Indian goods was subject to high import duties in England, the English goods were admitted in India on paying a nominal duty of 3½ per cent. In this unequal struggle, it was natural to find India losing ground, though it might be said to her credit that in spite of the cotton fabrics being highly taxed in England, Indian yarn was imported in large quantities by the Manchester and Blackburn weavers for use in their factories. (4) However, the disadvantages of the tariff system were surpassed in their evil effects by the treatment given by the East India Company to the manufacturers in India. The Company was required to send goods worth a certain amount fixed from time to time by the Court of Directors : and to get this amount during the year, the Company's servants locally entered into willing or unwilling contracts with the weavers, (at prices fixed by the Company) who were to work in the Government factory to produce the particular patterns required for exportation. These forced contracts were made binding upon, not only the weaver but also his family, by the regulations passed by the Government. Under such troublesome conditions, it cannot be expected that the weavers could continue long in face of the economic and moral degradation nor that the weaving industry would thrive any longer. We soon find that the weavers abandoned their ancestral craft and turned to the cultivation of cotton. (5) This tendency of retrogression towards agriculture was fostered by the commercial policy of England, which regarded India as a colony to which England could export her manufactured goods in return for Indian raw materials. Consequently, every facility was given for the cultivation and exports of cotton of good quality. As late as in 1860, this policy was advocated by the Cotton Supply Association of Manchester : "the true policy of the Government is primarily to legislate so as to drain the raw cotton out of the country, and create a demand for our manufactured goods in lieu of those now manufactured in India." This policy of favouring cotton cultivation while the weaving industry was under stringent regulations, had the desired effect of turning the weavers into cultivators, and thus indirectly destroying the Indian cotton manufactures.

AGRICULTURE.

Sex of Birds.

A specialist states that eggs which produce male birds are always rough at the small end while those from which hen birds come forth are quite smooth from one extremity to the other. If there be anything in the discovery, it will be of great service to fowl keepers, *viz.*, those who wish to raise hens for laying purposes, and those who desire fowls for the table.

The Rearing of Calves.

The Royal Agricultural Society is to carry out experiments in the rearing of calves. The object is to compare the relative values of milk and milk substitutes, no doubt with the view of impressing upon dairy farmers the fact that calves can be reared to advantage upon limited quantities of milk. There is a disposition among dairy farmers to look upon milk selling and calf rearing as incompatible pursuits, with the result that large numbers of calves are sacrificed that could be reared, to the advantage alike of breeders and graziers.

Water Tests For Crops.

Experiments made upon different kinds of crops show that the amount of water required to produce a pound of dry matter varies greatly. The tests indicate that in some cases, 200 lbs. of water will be necessary to produce a pound of dry matter, while in other cases as high as 800 lbs. or 900 lbs. will be necessary. Such a variation is due to the climatic conditions, locality, kind of crop, and kind of soil. In the humid regions, less water is required than in the arid country.

The Pineapple and its Sweetness.

A study of the ripening of pineapples has shown that the sugar content of the fruit is derived exclusively from the leaves of the plant, and does not increase after the fruit has been removed from the plant. Mr. W. P. Kirby, Chemist of the United States Experiment Station in Honolulu, who has been investigating the subject, states that if the pineapples are picked green and allowed to ripen, the sugar content at complete ripeness is the same as it is when the fruit is removed from the plants. Fruits picked too green, therefore lack sugar content and flavour. The cause of this is that the pineapple contains no starch or other material that can be converted into sugar during the ripening process, but procures its sweetness by circulation from the leaves or possibly from the starchy plant stalk. This is in contrast to the banana, which in its unripe state is composed largely of starch, much of which is converted into sugar either before or after harvesting.

International Congress of Rice-Culture.

At Vercelli, chief town of a rice-growing district *par excellence*, and lying conveniently near to other Italian rice-growing districts, there will be organised the Fourth International Congress of Rice-culture to be held in October, 1912.

There will be dealt with vital questions of fact regarding rice-culture and its technique, rural and social economy, hygiene, and commerce, as well as similar subjects relating to irrigation.

The exhibition will be of particular interest in that it proposes to collect all that concerns rice-culture or irrigation, to give an idea of the progress made, and of the present state of affairs.

In the exhibition will be collected as much material and machinery as is necessary for cultivation, harvesting, drying, commercial preparation and working; there will be shown commercial rices, rices selected from seed, rices worked up and destined for export, or for internal consumption, and of products derived from rice ; there will be exhibits illustrative of fish culture in rice districts, of hygiene, of the combating of malaria, of agrarian associations, organisations for collocation of work, for rice-cultural industry, and for technique.

It is proposed to have a show retrospective of the cultivation and industry of rice.

In the exhibition of irrigation, it is proposed to show the various systems of irrigation, of derivation of water, anicuts, wells, lifts, water-measuring, machines applied to irrigation, monographs, etc.

COMMERCE.

Business Enterprise in India.

The commercial enterprise of India during the month of May 1912 may be gauged by the following abstract of Joint Stock Companies registered in that month :—

		Rs.
8	Banking and Loan Companies	2,98,000
4	Insurance Companies	22,000
1	Printing, Publishing and Stationery Company	20,000
8	Trading Companies (other than specified above)	11,00,000
1	Ginning and Pressing Company	3,55,000
1	Tea Planting Company	2,00,000
1	Coal Mining Company	1,00,000
2	Mining and Quarrying Companies (other than specified above)	6,40,000
21	GRAND TOTAL	27,35,000

'Ltd.' for 'Limited.'

It has recently been decided by Mr. Justice Scrutton that the letters 'Ltd.' constitute a legally permissible substitute for, or abbreviation of, the word 'limited' in the name of a company. The Judge based his decision upon the principle that they clearly indicated to every commercial man of any intelligence that they represented the word 'limited.'

Japan's Trade.

The *Japan Mail* states that the Department of Agriculture and Commerce will despatch an expert in August next to India to inquire into the business conditions there, special regard being given to the export thither of *habutae*, cotton knitted goods, shirts, matches, silk fabrics, and porcelain. Where there exists any competition with foreign countries, as with Italy, in the case of silk goods, all available means will be considered to push Japanese goods ahead.

The Trade of Bombay.

The aggregate value of the trade of the Bombay Presidency, foreign and coasting, in 1911-12 reached the unprecedented figure of Rs. 208·83 crores, representing an advance of nearly 8 per cent. This increase, however, is not so marked as it was last year. Though the foreign trade consequent on larger transactions in gold and silver shows an advance of 11 per cent., there was a decline in coasting trade, while the Government transactions contracted by 48 per cent. Both the import and export trades have shown a sustained expansion during the last five years, the average value being 165 crores. Importations of gold bullion into Bombay were valued at £ 74,83,219 and of Sovereigns and other gold coin at £ 14¾ million, the aggregate importation of precious metal being equivalent to 20 per cent. of the total gold production of the world in 1911. A noteworthy feature in the importations of the precious metal is the marked increase in the imports of gold coin. The marked decrease in the imports of silver supports the inference that gold is displacing silver.

The Trade of India.

From Mr. Frederick Noel-Paton's official Review of the Trade of India in 1911–12, it appears that our imports of merchandise rose from £ 86·24 to £ 92·88 millions, and our exports, which are generally on a much larger scale, increased from £ 139·92 to £ 151·83 millions, and our total trade from £ 226·16 to £244·21 millions, or an enhancement of £18·05 millions, or eight per cent. By way of contrast it may be observed that in the case of the United Kingdom, the total trade figures are £ 1,134·84 millions, which means an increase of £ 26·2 millions or 2·36 per cent. The total trade of the United States amounted to £748·22 millions, a rise of £41·57 millions or 5·9 per cent. Germany's turnover was £867·62 millions, the increase here being £61·06 millions or 7·6 per cent. The increase was shared almost equally between imports and exports. The trade of Austria-Hungary totalled £ 230·99 millions and thus shows an increase of £ 11·84 millions. France's share of the world's commerce was £ 573·81 millions, or an increase of £ 37·03 millions, while the total trade of Belgium advanced from £ 286·46 to £ 301·03 millions. It is therefore clear that in the matter of progression (8 per cent.) India compares very favourably with her rivals; but in the matter of total increase of trade (£ 18·05 millions) her account is not so bright, especially when placed alongside of, say, Germany's total increase of £61·06 millions.

INDUSTRY.

Swadeshi Cigarettes.

The *Pioneer* understands that the imposition of tobacco duties has given a fillip to the Swadeshi industry and Indian-made cigarettes are largely in demand. Some enterprising manufacturers are about to start a huge factory in Khargpar and sufficient machinery will be installed to turn out not fewer than three million cigarettes a day, which will be increased to fifteen millions. Our contemporary believes that with a factory of this sort there would be few complaints regarding prompt delivery, while the growing cigarette smoking habit among the people will keep the factory working full time.

Madras Industries.

Out of the total population of 5,18,660 in the Madras City, 48,088 persons are engaged in various industrial pursuits, textiles claiming 11,936, dress industries 5,935, building industries 5,047, wood 4,543, food industries 4,172 and metals 3,849. Of these, 42,219 are men and 5,869 are women, the latter being largely employed in the textile trades, food and clothing industries. In the 67 power factories working in the City, of which 53 are managed by companies, and 13 by individual Indians, there are altogether 24,144 persons employed, of whom 13,611 are skilled and 9,039 are unskilled. Besides this, Mr. Chatterton estimates that the number of artisans working on their own account or in small groups will number roughly about 10,000, the bulk of them being carpenters, metal workers, jewellers and others engaged in the building trade.

Cheese from Buttermilk.

His Majesty's Consul at St. Louis has furnished the following particulars of a method of making cheese from buttermilk, which has been discovered by Professor J. L. Sammis, of the College of Agriculture, University of Wisconsin, from whom further details may be obtained :—To make the cheese, ordinary buttermilk, obtained by churning sour cream, is slowly heated to 130°—140° Fahrenheit; after standing for about an hour at this temperature, the curd is seen to have separated from the whey in a compact floating mass. The curd is removed in a strainer and allowed to drain for about 12 hours, salt is then stirred in and the cheese is ready for sale or consumption. The cheese is packed like butter and will keep fresh for a week or 10 days in a refrigerator. 100 lbs. of buttermilk should produce about 12 lbs. of cheese, which sells at from 5*d.* to 10*d.* per pound in the United States.

Industrial Survey of Bombay.

His Excellency the Governor in Council has had under consideration the question of instituting an industrial survey of the Presidency, in some province, a special officer has been entrusted with the work of surveying the indigenous industries of the province, while the special appointment of the Director of Industries and Technical Enquiries has been created. The object in all cases is to ascertain the obstacles with which the various local industries have to contend, and devise the measures or such other means, as may in each case seem most likely to secure the object in view. Some information bearing on the present state of handicrafts in the Bombay Presidency is to be found in the special monographs which have been compiled in recent years by selected officers, dealing with pottery, cotton, silk and woollen goods, brass and copper, ivory, woodwork and ironwork. The information contained in these monographs, however is far from complete. The Governor in Council is of opinion that the survey must be the work of experts, employed in succession, to examine and report on the position and requirements of each industry of importance. The survey of handloom and leather industries was carried out in 1908 and 1910 respectively. The next survey will be of oil-pressing. Mr. Yashwant Ganesh Pundit, who has acquired considerable experience in this industry, in the United States of America and India, is being selected for the purpose, his six months' engagement commencing from 1st October.

ECONOMICS.

Abraham Lincoln and Protection.

Abraham Lincoln once said, "I do not know much about the Tariff, but I do know this much, when we buy goods abroad we get the goods and the foreigner gets the money, when we buy goods made at home we get both the goods and the money."

The Gold Standard Reserve.

The Secretary of State has accepted the recommendations made by the Government of India that the profits on coinage which are at present devoted to the building up of the Gold Standard Reserve shall not be diverted to any other purpose until the sterling branch of that reserve has reached a sum of twenty-five millions. Hitherto, the accepted standard has been one of £25 millions for the sterling branches of the Gold Standard Reserve and the Paper Currency reserve combined. The Secretary of State has also agreed to build up gradually from interest on securities and from profits on coinage, and to hold in England, the metallic portion of the sterling branch of the Gold Standard Reserve up to the limit of £5,000,000. This decision to raise the sterling branch of the reserve to £ 25,000,000 will be welcomed in India as serving to secure the steadiness of exchange when the balance of trade is against India.

The importance of the official statement regarding the Gold Standard Reserve will be best understood if we recall briefly certain facts in the past history of the reserve. As far back as 1904, Lord Curzon tentatively suggested that a gold reserve of ten millions might be adequate as a defence against a possible fall in exchange. In 1905, Sir Edward Law suggested that it would be desirable to aim at a reserve sufficient to enable the Secretary of State to curtail his drawings by one-third during the period of three successive years, and on that basis suggested twenty millions as the figure that should be aimed at. In the following year, Sir Edward Baker, who was inclined to substitute the proportion of one half, was of opinion that the minimum amount to be kept in view should be 20 millions. These figures were necessarily largely hypothetical as there had been no opportunity of testing by practical experience the amount which should suitably be held. In 1907, it was decided on the advice of the Indian Railways Finance Committee to devote one half of the profits on the rupee coinage to capital expenditure on the development of railways, and a sum of rather over a million was actually utilized in this manner. Almost immediately afterwards however, the great American credit crisis of that year, accompanied as it was by a serious famine in India, caused large inroads to be made on the Gold Reserve of the Government of India and rendered it necessary to reconsider the position. As the result of the experience then gained, it was decided that the whole of the profits on coinage, together with the interest on the investments of the Gold Standard Reserve, should be credited in full to the Reserve until its gold branch, together with the gold in the Paper Currency Reserve amounted to 25 millions. Sir Guy Fleetwood Wilson stated in connection with this decision that while he did not see that even then he could regard the position as absolutely clear, this seemed as much as it was necessary to aim at at the moment.

The present position is that the total of the Gold Standard Reserve now amounts to nearly 20 millions, of which about 2 millions is held in the silver branch, one million in cash is placed by the Secretary of State for India at short notice and 17 millions are held in sterling securities. In the Paper Currency Reserve, about 17½ millions are held in sovereigns in India and 5·7 millions in sovereigns in England. The total amount held in gold and in sterling securities (in these two Reserves taken together) at the present time is, therefore, over 40 millions sterling. These figures are of course entirely independent of the treasury balances of the Secretary of State. They also exclude a small amount of gold, perhaps half a million, held in the treasury balances in India.

The decision now arrived at contemplates that, absolutely independent of the gold held in the Paper Currency Reserve, the sterling branch of the Gold Standard Reserve should be gradually raised till it reaches 25 millions sterling and that of this, five millions should be held in liquid gold in the Bank of England. It will, of course, not be possible to build up the Reserve to this figure immediately, but it will be gradually effected by setting aside from time to time an amount equivalent to the interest on investments (which at present amounts to half a million a year) together with the profits on coinage hereafter received, with the exception of such of these as may be retained in India in order to build up the silver branch of the Reserve from its present figure of 290 lakhs to its standard figure of six crores. It can only be considered that this is a very great step in advance and it should effectually ensure India in future against any dangers that may conceivably imperil the stability of exchange.—*Pioneer.*

CO-OPERATION.

Central Co-operative Purchase Societies in Germany.

From the March number of the *Bulletin of Economic and Social Intelligence*, it appears, that the 27 central co-operative purchase societies which existed in 1909 had a total working capital of 54,000,000 marks, of which 13,000,000 marks was the societies' own capital and 41,000,000 marks was borrowed capital In regard to the business done, it is sufficient to say that they purchased in one year goods to the amount of 52,000,000 zentner in quantity and 147,000,000 marks in value. The principal items were chemical manures (particularly basic slag and potash salts), 25,000,000 zentner; feeding-stuffs, 8,000,000 zentner; seeds, 427,000 zentner and coal 18,000,000 zentner. Besides these goods, the central co-operative purchase societies also deal on a large scale in agricultural implements and machinery, their purchases of which reached in 1910 a total value of 2,700,000 marks.

The co-operative central societies have not only succeeded in reducing the price of requirements, but fulfil also another important function for the protection of farmers by endeavouring vigorously to repress the frauds which are only too easy and too frequent in the sale of agricultural requirements. In a single year, the central societies had more than 32,000 samples analysed. Of these fully 10,000 (that is, one-third) proved to be deficient in content, and the societies succeeded in making the merchants pay about 300,000 marks by way of compensation for the inferior quality of the goods sold. Bearing in mind that these abuses continue to take place on such a large scale even after the central societies have for more than a decade actively endeavoured to extend the facilities for chemical analysis and to promote its practice, it can readily be understood what must have been the extent of the frauds injurious to agriculture which were perpetrated before the central co-operative societies had attained their present importance.

Besides co-operative purchase, the central co-operative societies also undertake the sale of agricultural produce for their members. This branch of their business, although it has not yet developed to the same extent as co-operative purchase, has nevertheless attained a notable importance which gives good hope for the future. In 1909, the central co-operative societies sold on behalf of their members more than 65,000,000 marks' worth of produce, principally cereals.

Although the central co-operative purchase societies do not, of course, make it a primary object to accumulate commercial profits, they nevertheless succeeded, thanks to their skilful management, in closing the year's trading in 1909 with an aggregate profit of more than 1,700,000 marks. Accordingly, though supplying their members with goods at lower prices and of better quality than private merchants, they succeed in realizing substantial profits which enable them to pay a reasonable interest on the capital invested by the members and to increase their own reserves.

BANKING.

An Industrial Bank.

Mr O. A. R. Lutchmanan Chettiar of the Ramnad District, who is the Proprietor of the Negapatam Swadeshi Steel Trunk Manufacturing Company, Tanjore, has opened an Industrial Bank at Vadakanthra, Palghat. The Company undertakes to manufacture locks of all kinds and description, steel trunks, cooking vessels and are prepared to employ 500 to 600 people as workmen. He is trying his level best to purchase a plot of land, about 10 acres, to erect buildings to be utilised for the Company.

Another Bank in Bombay.

It is understood that within a short time, another Bank called the Standard Bank will be started in Bombay, the Board of which will be composed of Parsis, Hindoos, and others. Amongst the Parsis, will be Mr. Hormasji Ardeshir Wadia, Bar-at-law, who has long been connected with the Indian National Congress. The promoters of these banking concerns, writes the Bombay Correspondent of the *Madras Standard*, have a peculiar liking for obtaining as their directors some prominent men connected with the Congress. For instance, the Central Bank of India, started about six months ago, has. on its Board of Directors, the Hon'ble Sir P. M. Mehta.

Banking in England.

Mr. Harry W. Birks' usual comprehensive analysis of the balance-sheets of London joint stock and private banks for the half-year ended December shows that the leading British bank, as regards total working resources (paid-up capital and reserve funds, deposits, and acceptances), is now Lloyds, with £97,603,618, against £91,017,767 in June last. The County and Westminster, which at that time ranked first with £93,112,868, has now fallen back to second position with £95,566,047, followed by the London City and Midland with £91,124,428 against £87,492,496, National Provincial with £68,964,874, Barclay's with £60,655,512 and Union of London with £48,621,092. The total working resources of the 21 banks covered by Mr. Birks' statistics are £719,160,538, against £703,028,147, six months ago. The banks with the largest number of shareholders are the County and Westminster with 23,107 against 22,754 last June, Lloyds 20,791 against 20,472, City and Midland 19,588 against 19,335, and National Provincial 17,987 against 17,545; figures which show the extent to which bank shares are spreading among smaller investors. The average proportion per cent. of cash to liabilities of the 21 banks is 15·23 per cent. against 15·03 per cent. last June, the average of cash at call 13·10 per cent. against 15·56 per cent. and the average of investments 16·54 per cent. against 21·76 per cent. The average proportion of cash, call money and investments together to liabilities (deposits and acceptances) is 52·24 per cent. against 52·35 per cent.—*Investor's Chronicle.*

Dangers Attaching to Partly Paid Shares.

Securities on which part only of the denomination is paid up, leaving a balance for which the holder is liable, are nowadays almost entirely confined to Banking and Insurance companies. The reason for this is to provide a reserve fund which may be utilised in case of necessity for the benefit of depositors or policy holders, but such a reserve cannot be so secure as one set apart out of actually subscribed or earned moneys. Observes the *Finanicial Review of Reviews* on this point "We have always deprecated investment in this class of security because, no matter how good the dividend may be or how remote the contingency may be of the remaining capital being called up, there is always the lurking danger that such a thing may occur, and when disaster comes, it usually comes, especially in the case of banks, quite unexpectedly. The most recent case of the kind is that of the Bank of Egypt, whose shares, only the day before it suspended payment, were standing at a premium of 76 per cent. The next day, they were at the same percentage of discount, and a sinister feature of the outlook for those who had sold, even before the smash, is the fact that by the articles of association of this bank, the seller of shares does not become free of the liability in respect of uncalled capital until twelve months after the transfers."

INSURANCE.

The Life Assurance Act.

The Life Assurance Companies Act will not come into force till the next cold weather as the Act expressly provides for a year for deposit. Meanwhile, the rules are now under circulation and the Local Governments will consult the commercial bodies and thereafter, the rules will be finally considered and adopted. The Government of India have also under consideration the question of the appointment of an "actuary" and this has been referred to the Secretary of State for sanction. The Government of India have so far no intention of delegating any powers under the Act to the Provincial Governments who are administering the Provident Societies Act.

India and Life Assurance.

In exercise of the powers conferred by Section 32 of the Indian Life Assurance Company's Act, 1912, the Governor-General in Council is pleased to declare that the following Life Assurance Companies carry on life assurance business in the United Kingdom in accordance with the Assurance Companies Act, 1909 :—(1) The Phoenix Assurance, Ltd, (2) the North British and Mercantile Insurance, (3) the Commercial Insurance, Ltd., (4) The Standard Life Assurance, (5) The Royal Insurance Co., Ltd., (6) The China Mutual Life Insurance Co., Ltd., (7) The Norwich Union Life Insurance Society, (8) The Northern Insurance Co., Ltd., (9) The Alliance Assurance Co., Ltd., (10) The Gresham Life Assurance Society, Ltd., (11) The London and Lancashire Life and General Assurance Association, Ltd., (12) The City of Glasgow Life Assurance Co., (13) The sun Life Assurance Company of Canada, (14) The Liverpool and London and Globe Insurance Company, Ltd., (15) The York Life Insurance Company.

Life Insurance and Character.

According to *Harper's Weekly*, to imagine a modern community without life insurance is as startling as to imagine the community without bread. Life would be tolerable under such conditions, but it would not be the normal life that civilised men know. Proper insurance is an essential provision for every man, whether for the protection of the family he shall leave behind him or for the comfort of his own declining years, when earning power shall have diminished. A life insurance company well organised and rightly administered stands really in the foremost rank of organisations for social service. For true social service aids men to make the best use of their possessions, enabling them to work more efficiently and spend more wisely. He who has made proper provision for the future of those dependent upon him for support is a far better citizen than he who neglects this obvious duty. Many employers, recognising the stability and reliability that are evidenced by life insurance, make special efforts to see that their employees carry policies proportionate to their earnings.

Insurance Agents.

There is a plethora of agents of all kinds these days, says the insurance correspondent of the *Outlook*. "A rich host once laughingly told the writer that he often surveyed his guests at a dinner-party and tried to guess their business relations, which one drew his commission from the Stock Exchange, which from the wine trade or tobacco trade, and which from insurance: although they might all be ostensibly gentlemen of independent means. The trouble is that a large and increasing percentage of the people you meet in everyday life are either direct or indirect agents for some insurance company. How, then, can one expect the direct representative of an insurance company, a gentleman drawing his entire income from his work, to become anything else but a persistent nuisance? It is true that some men have a genius for following such a business with charm and tact. But to the ordinary man, competition is so keen and the client so busy with other matters that the agent who would carry his point has no option but to sit on the doorstep and make himself a nuisance."

EDUCATION.

The Indian Pottery Industry.

In connection with the Sir George Clarke technical laboratories and studios, a pottery department has been founded by the Government of Bombay, to develop the pottery industry in India by means of scientific research in connection with the materials used in the production, by introducing modern methods of manufacture and by improving the quality of the designs used by potters To carry this out, a small permanent staff is employed. Attached to the department is the school in which students are trained.

Ignorance and Economic Evils.

That education is a potent factor in uplifting mankind may well be granted but it is not a panacea for all the evils that afflict humanity. Says *Indian Education* on the subject :—

The Hon'ble Mr. G. K. Gokhale, in a recent speech, complains that '94 per cent. of the people of India are sunk in ignorance, superstition and squalor, and unable to understand what progress means.' This is a harsh criticism of India- much more so than those for which Anglo-Indians are sometimes censured. It seems to arise out of a theory which identifies illiteracy with the source of all evils. There are many facts, however, which point in other ways. In the Fiji Islands, for instance, 94 per cent. of the Fijian children can read and write very well, but the spirit of progress is even less visible than in India. In fact, it is the illiterate Tamil who stands for progress there, and the Fijian is vanishing before him.

State Technical Scholarships, 1912.

The Government of India have this year sanctioned the award of ten State technical scholarships to the following candidates for a course of training in Europe in the subjects noted against each :—

Madras.—Mr. Tombat Sakharama Rao, electrical engineering ; Mr. D. Sadasivam, practical work in applied chemistry and the manufacture of textiles subject to the production of a medical certificate as to his physical fitness to undergo the course of study proposed ; Mr. D. N. Nagarkatti, paper making, subject to the production of a medical certificate as to his physical fitness to undergo the course of study proposed ; Mr. E. C. Henriques, architecture—he will undergo a training for two years in India and then proceed to Europe for a third year to complete his training.

Bengal.—Mr. P R. Duncan, mechanical and electrical engineering ; Mr. Chandra Sekhar Sarkar, mechanical and electrical engineering.

Punjab.—Mr. Lashmi Das

Burma.—Maung Ba Chit, mechanical and electrical engineering, subject to his passing the B. Sc. Examination.

Bihar and Orissa.—Mr. Bhubanananda Das, mechanical and electrical engineering, subject to his passing the B. E. examination.

Central Provinces.—Mr. K. C. Mitra, electrical engineering.

New Commerce College.

A Bombay Government Press Note states that His Excellency the Governor of Bombay has received the following very generous promises of support towards the establishment of a Government College of Commerce in Bombay :—

(1) Sir Jugmohandas Vurjeevandas—Rs. 2,25,000 towards the founding of a professorial chair to bear his name.

(2) The Trustees of the Wadia Charities—Port Trust bonds yielding Rs. 4,800 per annum towards the founding of a chair to bear the name of Mr. N. M. Wadia.

(3) Sir Chinubhai Madhwal Rs. 1,00,000.

(4) The Bombay Chamber of Commerce Rs. 1,500 per annum.

(5) The Mill-owners' Association, Bombay, Rs. 1,000 per annum.

(6) The Indian Merchants' Chamber and Bureau, Bombay, Rs. 1,000 per annum.

(7) The Bombay Native Piece Goods Merchants' Association, Rs. 1,000 per annum.

(8) The Mill-owners' Association, Ahmedabad, Rs. 1,000 per annum.

ECONOMIC PRODUCTS.

A Use for Petroleum.

Petroleum can be used to advantage as a preservative of wood, though it is not a paint. No coloring matter should ever be used with it. Petroleum penetrates the wood and fills the pores, so that no air or moisture is admitted. Ordinary linseed oil paint forms a coating over the surface, thus excluding the atmosphere.

Uses of Aluminium.

The use of aluminium is being constantly extended into new fields. One of the latest applications of this wonderful metal is in the form of a foil to take the place of tin foil in wrapping up food products, especially chocolate. The making of thin foils of aluminium presented serious difficulties which have been only recently overcome. Aluminium foil is now made about 1,600 of an inch in thickness. Aluminium powder has also been coming into common use. To make aluminium powder, very thin foil is first cut up into small spangles; these are ground in a mill and the powder is then sifted through bolting cloth. The powder is used as a basis for metallic paint and is especially valuable for metallic surfaces that are exposed a great deal. The powder is very soft and adhesive, like graphite.

Banana Cloth.

Banana cloth is the latest idea as a substitute for the dhoti of commerce. At present it is a trifle expensive, a little over three rupees a yard, but this is because it is new. "You take a one year old plantain tree," writes a contemporary, "roll it out and steam it over hot water till soft. Then it is easy to remove the green outer skin and to get the fibre by passing it through a sort of scraper with blunt blades. This is dried and made into yarn and then into cloth. The Chinese found this out and are making the cloth at the above price and it is recommended as a substitute for cotton. The worst thing about it is that is very durable and durability is the worst recommendation in clothes. Do not therefore throw away your old plantain trees but make them into homespun."

Petroleum.

The United States Geological Survey publishes interesting figures regarding the world's out put of petroleum. The report covers the year 1910 and gives the production of 13,755,000,000 gallons compared with 12,528,600,000 gallons in 1909, thus showing an increase of about 9 per cent. The United States are, of course, easily the largest producers with some 8,801,352,000 gallons to their credit in 1910, Russia coming second with 2,954,112,000 gallons, then Galicia with 532,808,000 gallons, Dutch East Indies with 463,302,000 gallons, Roumania with 408,366,000 gallons, and India wit 257,796,000 gallons.

Industrial Uses for Sugar.

In France efforts have recently been made to increase the consumption of sugar, in order to meet the new conditions which have arisen, owing to the abolition of the premium on importation. As a result of this, an immense increase in the industrial consumption of sugars has taken place. Thus, for instance, while in 1904 the total consumption of sugar in breweries in France amounted to 11,940 kilogrammes, in 1910 the figure was increased almost one hundredfold to 1,152,848 kilogrammes. The increase is even greater in the case of denatured sugar (that is to say, sugar to which salt or other material has been added) which is used for feeding cattle. In 1904, 1,122 kilogrammes of this were used. Three years later, this had risen to one thousand times the original figure. As a matter of fact, many more industrial uses for sugar could be found. Sugar is not only an excellent food material, it is also an antiseptic, which might be used for preserving butter, condensed milk and wood ; it is absorbent for lime and could, therefore, be used for purifying phosphatic chalk, zinc mineral, etc. It is a reducing agent which may be used in indigo dyeing, or it may serve to precipitate the oxide in a preparation of chrome leather. Lastly, sugar forms the raw material for the preparation of lactic and formic acids, of certain cements, soaps inks, shoe blacking, etc.—*La Nature*.

BUSINESS METHODS.

The Secret of Success.

"I think our success is due to (1) a wise but bold policy; (2) a good organisation and a staff who all pulled together to carry it out; (3) trying every new thing that might be an improvement; (4) scrapping mercilessly everything that was wrong or out of date."

This is the terse and convincing phraseology given by one of the pioneers of the motor-omnibus.

How a Novel was Advertised.

The publishers of a German novel did a neat thing in advertising. They inserted in newspapers a notice that a certain nobleman of wealth and high position, desirous of finding a wife, wanted one who resembled the heroine in the novel named. Thereupon every marriageable woman who saw the notice bought the book in order to see what the heroine was like, and the work had an immense sale.

Trade Representation.

One of the ways in which trade representation can be obtained is by utilising papers of wide circulation. Experience has shown that if consumers have been made to take an interest in a new product, they much dislike any difficulty in buying it. Consequently, if they find an advertisement with a list attached to it of the shops where the goods can be had, it is to these shops that they will go.

A Floating Export Exposition.

We gather from the *Paper Trade Journal* of New York that a novel method is about to be tried to further export trade with the West Indies, Central and South America and the Far East, which, at first sight, did it not bear the imprint of Government sanction, might not be taken for anything more serious than a somewhat flighty and rather costly experiment.

Arrangements have been completed by the United States Marine Exposition Company, which is a corporation subsidiary to the American Manufacturers' Export Association, to purchase and remodel a steamship to be known as the "Exposition." The vessel will be sent as a missionary of American trade to the Latin American countries, and it is proposed that the work will be a permanent and annual undertaking. The vessel, which will be designed to carry over 1,200 individual exhibits of the most approved and modern outturn from American factories, will have a displacement of 12,185 tons. She will be 580 feet long and have a beam of 50 feet. Her first cruise is scheduled from New York to San Francisco *via* the Straits of Magellan, and she will set sail on or about December 1st of the present year. The ship will fly the American flag, be manned by an American crew, and the projectors of the plan aim that she shall represent "all that is American, both in marine efficiency and trade quality and methods." She will carry comfortably 450 passengers, comprising manufacturers, salesmen and interpreters, and be equipped with a complete international banking institution, under the management of an American banking house. In fact, it is planned to make of the "Exposition" a lively trading mart where every convenience will be found to facilitate business. Every port of consequence, where there might be a fair chance to introduce American goods, will be visited throughout the general itinerary.

What will greatly tend to insure the success of the undertaking is the cordial endorsement it has received from President Taft, who, in a letter to the secretary of the association organising the enterprise, expressed his hearty approval of the plan, and intimated a desire to help it in any way possible. To this end the Assistant Secretary of State Mr. Chandler Hale has instructed the diplomatic and consular officers of the United States to lend their assistance, and it is expected a representative of the State Department will accompany the expedition.

The "Exposition" will certainly be a novelty and excite much genuine curiosity, which it is proposed to turn to profitable account.

FRAUDS AND FAKES.

Food Adulteration.

The following is extracted from a paper on "Municipal chemistry" read by Mr. T. H. Coste, F. I. C., before a recent meeting of the Royal Society of Arts, England. It must be confessed that Mr. Coste's remarks apply equally to the conditions prevalent in the municipal and other areas in this country.

"The quality of the food of a nation, more particularly that of its children, is a matter of the utmost importance, and, unfortunately, the temptation to tamper with it is apparently very great. If gross adulteration is now but little practised, there are, nevertheless, many cases in which the public, if not actually poisoned or starved, is cheated by being given articles which are "not of the nature, substance and quality demanded." There is no doubt that considerable chemical and legal knowledge is at times made use of by those who desire to evade the law. Much of the adulteration of food as now practised is of a very subtle kind, and only to be detected with difficulty, and the public analyst has not the same advantage as the author of the modern detective novel—his part is only to detect adulteration analytically; he has no opportunity of being present at the synthesis of the sophisticated food or drug. The public analyst to-day must, if he is to do his work well, be possessed of chemical and microscopical attainments of a high order."

Hide Trader's Tricks.

Complaints of cattle poisoning are received from time to time from districts in the Madras Presidency. It is alleged that Lubbay merchants who generally deal in hides sometimes resort to such malpractices taking advantage of outbreaks of rinderpest, anthrax, black-quarter, etc. Arsenic and perchloride of mercury which are easily procurable in local markets are distributed among Chamars who go about administering them to cattle that generally graze in the village kavals. Pieces of intestines or other infected materials from rinderpest cases are also given mixed with sugar or other food stuffs. These are scattered over the grass plots where village cattle generally graze. As the symptoms in cattle poisoned with perchloride of mercury and arsenic are more or less the same as those due to rinderpest, the villagers are generally under the impression that their cattle have succumbed to rinderpest. Another trick played by the Chamars is that they take the infected material from animals that have died from anthrax or black-quarter and smear them over pointed sticks and insert them either under the root of the tail or somewhere in the quarter or abdomen of cattle. By the time the cattle return home in the evenings their system is thoroughly poisoned with the morbid material and by early morning they will be found dead in the stalls and the poor raiyat will be under the impression that his animals have died from anthrax or black-quarter.

Swadeshi Cloth.

The reason why Swadeshi Mill-made cloths are not so much in demand now as compared with a few years ago is thus explained by a contemporary. With the pernicious system of paying commissions to Mill-owners on the quantity turned out and its weight, obtaining in the majority of the companies, it is very few who can resist the temptation of increasing their earnings by adding to the weight of the products by all means in their power. It is this system which explains the production of coarse cloth by some local mills and the large proportion of sizing in some local products. The consequence is that people have begun to lose faith in the indigenous products and a distinct feeling of revulsion in favour of foreign goods is again perceptible. The Swadeshi Boom has exhausted its force because some Indian Mill-owners abused the opportunity it afforded them, by turning out bad cloth to reap a rich harvest. They did not look beyond the immediate. The consequence is that even the ardent devotees of the Swadeshi cult have now been openly condemning the conduct of Swadeshi Manufacturers and Swadeshi goods have fallen into disrepute.

MACHINERY AND INVENTION.

Electrical Fermentation of Tobacco.

The *Java Bode* states that an engineer of Sourabaya claims to have succeeded in fermenting tobacco electrically. It is well-known that at present the fermentation process, which is done by the introduction of warm air into the tobacco, lasts a few weeks. With the use of electricity only twenty-four hours are sufficient for the purpose. The great advantage, however, does not lie here. By *electrical fermentation* it is possible for the planter to control and determine the colour of his tobacco.

Imports of Machinery into India.

The imports of machinery into India during the past three years have shown a strong tendency to decline. The decline in 1911-12 was Rs. 47·32 lakhs, the bulk of this being under textile machinery. Machinery is, of course, essential for commercial development, hence it is important to have an increase rather than a continuous decrease under this head. But the cause of the falling away is not difficult to trace and may be safely debited, says, to the *Pioneer*, to the recent severe depression in the jute trade. This cause has now passed away, at all events for the time being, for the jute trade is again doing excellently, and so should the machinery trade during the present year. That the slump in the jute trade was the real cause is illustrated by the fact that the imports of machinery and particularly textile machinery into Bombay and Madras last year showed substantial increases. It must not be forgotten that Madras is now forging ahead in the matter of cotton spinning and weaving; and with her growing supplies of splendid Cambodia cotton, which seems to thrive better in the Southern Presidency than anywhere else, she is bound to make herself heard in the commercial world in the near future.

Chemistry in Commerce.

Sir T. H. Holland in the course of a special article in *Commerce* says:—India at one time manufactured its own metals and inorganic chemicals but with the opening of the Suez Canal and with concurrent improvements in marine engineering, freight charges from Europe became so reduced that the European manufacturing chemist could "dump" his bye-products at Indian ports and from there our growing net work of railways has enabled the importer, either to kill the native industries altogether, or to drive them back to remote parts of the country. In addition to the advantage gained by the economical recovery of bye-products, the European chemist has discovered among his inorganic chemicals, agencies that do work precisely similar to that of the multitude of low forms of organisms which have hitherto given well-governed tropical countries a natural advantage in the growth of many products. There are certain so called catalytic agents, such as platinum, ferric oxide, and copper chloride, which act as brokers in a chemical manufactory; they bring together elements to form commercially valuable compounds, which could otherwise only be made by the expenditure of costly energy comparable to that which we have in the great vital energy of the tropics. Unlike the ordinary middleman, these chemical agents work without commission. The unions temporarily so formed by catalytic agents are essentially analogous to the products of the short lived organisms of the soil, and the manufacturing chemist has thus turned to commercial account in his attack on tropical products what has been aptly termed the chemically loose habits of his reagents.

Match Splints.

Those who may be interested in the manufacture of matches in India will be glad to know that a process for the manufacture of artificial wood from straw or dried grass, now in the experimental stage, was shown recently in London. At the outset it is proposed to utilize the process for the manufacture of matches, for which it is claimed to show considerable economy as compared with the cost of the methods and materials at present employed. For this purpose the straw is passed longitudinally through a pair of crushing rolls, and then between a pair of cylindrical cutters which divide the flattened straw into strips. The surfaces of the cutters are deeply serrated, and are placed together so that the groove of one cutter receives the raised ring of the other. The straw, supplied with an adhesive, is fed to a travelling band, and is enclosed on top and underneath with layers of paper. The layer of straw and paper is passed through a pair of rolls under pressure, and then between a pair of endless chains, one upper and one lower, the links of which form metal moulds, and are constructed with longitudinal grooves, the edges of which meet opposite one another. The moulds are heated, and are pressed together for a sufficient time to enable the agglutinant to harden. After passing between the chains, the straw and paper issue in the form of a layer of round splints, which, after being cut into the requisite length for matches, are dipped into the ignitible composition.

INDUSTRIAL AND ECONOMIC LITERATURE.

Indian Industrial and Economic Problems.

By V. G. Kale, M.A., Professor, Fergusson College, Poona, G.A. Natesan & Co., Madras, price Re. 1. To subscribers of the "Indian Review" and the "Wealth of India" As. 12.

India's industrial and economic problems are many and varied, and though no definite system has been followed in their selection and treatment, the more urgent and important among them find a place in the book, which, as a whole, has thus a sort of unity of its own. In one of the chapters, the author has attempted a realistic picture of the present economic situation in India and the lineaments have been drawn with a careful and impartial hand. In another chapter, the slow but steady progress made by the indigenous industries during the last generation, has been traced, and in another place, the attitude which people ought to take up in the matter of the industrial revival, has been clearly indicated. The paper on high prices sets forth the various theories propounded with regard to that economic phenomenon and states the several factors that are held to be involved. The author is a moderate though a staunch protectionist, and has taken a calm and dispassionate view of the whole question. While he condemns unmitigated free trade as an unsuitable economic policy for India, and puts in a vigorous plea for the protection of indigenous industries by the State, he is careful in pointing out the real scope and limitations of Indian protectionism. The status of India in the British Empire has much economic significance which has been brought out in not a few of the chapters. The author's conclusions are throughout based upon a close study of facts and figures and upon careful deliberation and no effort has been spared to procure and make use of all available information.

The book will assist the student of Indian Economics in the formation of a correct estimate of India's economic situation and of the various complicated questions involved therein.

The Depressed Classes.

Messrs. G. A. Natesan & Co. Madras, price one rupee. To subscribers of the "Indian Review" and the "Wealth of India," 12 *As.*

The book is a collection—comprehensive and representative—of the views of eminent Indians and Anglo-Indians on this very important subject. The lead is given by His Highness the Gaekwar of Baroda.

Books Received.

OUTLINES OF ECONOMICS developed in a series of problems by members of the Department of political economy of the University of Chicago. The Cambridge University Press.

SIXTY YEARS OF PROGRESS AND FISCAL POLICY by *Earl Brassey, G. C. B., D. C.L.* The Free Trade Union, 25, Victoria Street, London, S. W.

HINTS AND RECIPES.

Engine Foundations.

Engine foundations perform two functions; they hold the engine bed rigidly in place and they absorb vibrations. The foundation must, therefore, be heavy and bulky and it must have a substantial and firm bearing in the earth. Concrete is by far the most available and best suited material for this purpose. It is not only a comparatively inexpensive material but it is also exceedingly convenient to handle and to mould into the necessary form. Moreover, with intelligent supervision, the foundation may be built without the use of skilled labor. However, sufficient time must be allowed for the concrete to set before a load is placed on the foundation.

Air Movement.

In an experiment in which eight students were imprisoned in a small chamber holding about three cubic metres of air, and kept there until the carbonic acid gas reached 3 to 4 per cent. and the oxygen was reduced by 16 or 17 per cent., the temperature rose to about 85 deg. F. and although the discomfort was severe, it was relieved to an astonishing extent by whirling the air with electirc fans and cooling the bodies of the prisoners, and the relief was greater still when cold water was allowed to circulate through a radiator. The discomfort was shown to be clearly due to excessive heat and humidity, and not to chemical impurities. Dr. Hill considers that the open fire and open window, by bringing in the cool air and keeping the air moving, have everything to recommend them.

Preserving Tea.

Tea quickly deteriorates by exposure to air and by being kept near strong-smelling goods, such as soap, cheese, oranges, onions, etc. It should be stored in air-tight tins or glass bottles in a perfectly dry, fairly warm place.

Sometimes through carelessness or accident the leaves acquire some objectionable flavour. To remove this, the tea must be spread out on trays or paper, and remain exposed to the air for thirty-six hours. Should tea become damp, and lose its crispness, not an uncommon occurrence at the sea or when carelessly stored, the leaves should be spread thinly on metal trays, and set on the plate rack for four or five hours.

It is important in selecting tea to bear in mind the nature of the water with which it will be made. Teas that suit soft water will usually prove a failure in hard water, and the housekeeper must make sure that all the goodness can be extracted in the water available for use so as to avoid waste of time and money. Strong Assams are usually considered best for hard water, and Ceylons and Darjeelings are suitable for soft water.

Rubies.

Professor Silvanus P. Thompson writes to the *Times*:—Reconstructed rubies are real rubies made by taking small real rubies or particles of ruby dust and melting them together so that they crystallize into one larger gem. Synthetic rubies are manufactured by fusing and crystallizing together the still more minute particles of oxide of aluminium, the material of which the ruby itself consists. It is not a question of colours. To reconstruct a pale ruby, one begins with little pale rubies and fuses them together. To reconstruct a full coloured ruby, one naturally begins with the dust or fragments of full coloured ruby. But, whether pale of full-coloured, the reconstructed ruby is unquestionably a real ruby, fused together, it is true, in the laboratory of the chemist, and not in the underground laboratory of nature's, but none the less real. It is equally hard, equally capable of taking a polish and identical in crystalline form. The expert can distinguish it, it is true, by slight differences in the interior flaws and microscopic bubbles; for the manufactured ruby has usually fewer flaws than the natural ruby, and the microscopic bubbles in it have a different shape from those of the natural ruby. The undoubted fact that the dealers still charge much higher prices for the natural gem than for a manufactured one of equal weight, colour, and clearness does not touch the question of the genuineness of the manufactured article.

OPENINGS FOR BUSINESS.

[For particulars, address the Director General of Commercial Intelligence, new Imperial Secretariat, 1, Council House Street, Calcutta, mentioning the *Wealth of India*. Firms that may like to follow any enquiry should give proper references and restrict themselves to those enquiries only which they are fully and seriously qualified to handle.]

Onions.

A correspondent desires to be placed in communication with exporters of onions. (B44)

Straw Plaits.

A Calcutta firm desires to be placed in communication with continental purchasers of straw plaits for the manufacture of straw hats. (B47)

Akund Cotton, Dhatura Leaves and Aswagandha.

A correspondent desires to be placed in communication with purchasers of the above articles. (B48)

Plant for Degreasing Cotton Waste.

A London firm handling an extraction plant for degreasing cotton waste desires to be placed in communication with engineering firms or dealers in agricultural implements who would be prepared to act as agents. (B54)

Bedsteads.

A British firm manufacturing metal bedsteads is desirous of being placed in communication with buyers in various inland towns. (B55)

Soda Ash.

A British firm manufacturing soda ash desires to be placed in communication with importers and users who would care to receive samples and prices. (B56)

Sporting Goods.

A leading British company of manufacturers of sporting goods and billiard tables desires to be placed in communication with importers. (B57)

"Karanj" Seed.

A firm in Bombay desires to be placed in communication with sellers of "karanj" seed, which is obtained from the leguminous tree *Pongamia glabra*. (B58)

Electro Plate.

A Birmingham firm of manufacturers of electro plate and novelties desires to appoint agents in India who are already connected with the electro plate or jewellery trade. (B59)

Windmills.

A London correspondent who holds the agency for a prize windmill, which works on both the up and down stroke, desires to be placed in communication with importers and users. (B62)

Silk-worm Seed.

A French firm desires to be placed in communication with importers of silk-worm seed in Bengal, Mysore, Baroda and Baluchistan. (B50)

Motor Cars.

A London firm having some 200 Darracq carts or motor cabs, fitted with 10·12 twin cylinder engines, for sale at about quarter price (£ 75 to £ 90 each) desires to be placed in communication with purchasers desiring cars in perfect condition and at a low price. (B64)

Marking Nuts.

A New York firm desires to be placed in communication with shippers or sellers of marking nuts, which are the seeds of the marking nut tree (*Semecarpus anacardium*.) (B65)

Bispath Tobacco.

A firm in Holland desires to be placed in communication with exporters of bispath tobacco. (B66)

Tapioca Roots.

A society in Madras desires to be placed in communication with buyers in India and England of tapioca roots. (B67)

Lac Cultivation.

A landed proprietor of Benares and Mirzapur desires arrangement with a capitalist interested in lac for the development of lac cultivation within certain forest tracts. (B52)

MISCELLANEOUS.

Two Opportunities for a Fortune.

There are two trade secrets at least that the world at large may never learn; but which it is well worth the while of inventors to study. One is the Chinese method of making the bright and beautiful colour known as vermilion, or Chinese red, and the other is a Turkish secret—the inlaying of the hardest steel with gold and silver. Among the Chinese and the Turks, these two secrets are guarded well. Apprentices, before they are taken for either trade, must, swear an ironclad oath to reveal nothing of what passes in the workshop. The apprentices, furthermore, must belong to families of standing, must pay a large sum by way of guarantee, and must furnish certificates of good character and honesty. These secrets have been handed down faithfully from one generation to another for hundreds of years.

The World's Salutations.

The Irishman says, "God save you," the reply being, "God save you kindly."

The Arab says: "May the morning be fine."

The Ottoman: "May God grant you His favours."

The Persian's salutation is: "May your shadow never grow less."

The Chinese says: "Have you eaten your rice?"

The ancient Greeks said: "Rejoice."

The modern Greeks, with their spirit of commercialism, enquire, "What do you do?" or "How is your business?"

The old Roman's salutation was: "Vale! Salue!"

The Italians say: "How are you?"

In Spain they say: "How do you pass the time?"

In France: "How do you carry yourself?"

In Germany: "How goes it?"

The Hollander's well-known interest in navigation is shown in "How do you travel?"

The Swedes say: "How do you feel?"

The hospitable Scotchman says: "How do you live?"

The laconic Russian says: "Be well!"

The Americans and our English-speaking brothers say: "How do you do?"

But of all forms of salutation, that used by the early Christians was certainly the most beautiful, expressing the best of all good wishes: "The Lord be with thee!"

Industrial Progress of Manipur.

In Manipur, in the last official year, active steps were taken to popularise the cultivation of mulberry trees, the use of improved hand-looms, the use of improved methods of sugar-making and the advancement of fruit-culture.

Agriculturists' Representation.

A movement is on foot in Behar to secure direct representation for the cultivating classes in the Provincial and Imperial Councils. A memorial which has been presented to the Viceroy by the members of the Voluntary Village Panchayet Association states that the memorialists have no representatives of their own in either of these assemblies, "the non-official members of which, are either professional lawyers or big Zemindars whose interests, far from being identical with those of your memorialists, are for the most part just the reverse." It is further asserted that the members of the legal profession "who are supposed to be your memorialists' representatives, have hardly seen village life," and an appeal is made to His Excellency for legislation having for its object the establishment of the village panchayet system all over the Province on the lines recommended by the Decentralisation Commission.

Jaggery Making.

The Government of Madras have approved of Mr. Chatterton's proposal for the erection at Singanallur in the Coimbatore district of a small central plant for crushing sugarcane and making jaggery, as an experimental measure during the present sugarcane season, at an estimated cost of Rs. 10,000. The Government have also sanctioned the local purchase of the plant required for the experiment, as it is necessary that the plant should be erected before July in order that the work may be commenced with the commencement of the sugarcane season.

THE

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SPECIAL ARTICLES.

HINDUISM AND MATERIAL PROGRESS.

BY

DR. SIR S. SUBRAMANIA AIYAR, LL.D., *Kt.*, C.I.E.

In proceeding, as I now do, to supplement the attempt made by me in my article in the June issue of this Journal to rebut the view that the religion of the *Sanathana Dharma* is responsible for the backward state of material progress in this country, I begin with the observation that the error of that view lies in the assumption on which it seems to rest. That assumption, of course, is that those undesirable religious notions and practices, which prevail among the people, have their sanction in the religion in question; whereas, in point of fact, the reverse is the case. Though it is not worth while to enter into the minor points bearing on the matter, yet I must not omit to take notice of the charge brought against the cardinal doctrines of *Karma* and *Maya* to the effect that they are unsound and mischievous. Those who make this charge take, I presume, that the popular notions as to these doctrines are in entire accord with their true nature. Let us now examine whether that is so.

I shall now deal with the first of these two doctrines, *i.e.*, *Karma*. Judging by the original authorities, so far as I know, the principle of the doctrine seems to have been taken to be so elementary as to call for no explicit and detailed exposition. Fortunately, for

my present purpose, the subject has, quite recently, been treated with fullness and lucidity in a small work entitled "A Study in Karma." The object of the learned author was, not to compile the texts or the authorities dealing with the subject, but to explain it from the point of view of reason and science and to show how the underlying supreme principle, the law of causation, is to be advantageously applied to the varied activities of individuals, groups of individuals, races and nations In this brief paper, I can do no more than quote a few, out of the many extremely pertinent, passages from the book. They run thus :

"The fundamental conception, on which all later right thinking on Karma rests, is that it is law—law eternal, changeless, invariable, inviolable, law which can never be broken, existing in the nature of things." (pp 3 and4.)

"Karma is natural law in the full sense of the term; it is universal causation, the law of cause and effect. It may be said to underlie all special laws, all causes and effects. It is a natural law in all its aspects and in all its sub-divisions. It is not a special law, but a universal condition, the one law whereon all other laws depend, of which all other laws are partial expressions. The *Bhagavadgita* says that none who are embodied can escape it—shining ones. human beings, animals, vegetables, minerals are all evolving within this universal law." (pp. 11 and 12.)

"A law of nature is not a command, but a statement of conditions * * * * Nature does not order this thing or the other ; she says : "Here are certain conditions: while these exist, such and such result will invariably follow." A law of nature is an invariable sequence.* If you do not like the result, change the preceding conditions. Ignorant, you are helpless, at the mercy of nature's hurtling forces ; wise, you are master, and her forces serve you obediently. Every law of nature is an enabling, not a compelling. force, but knowledge is necessary for utilising her powers." (p. 27.)

"Now Karma is the great law of nature, with all that that implies. As we are able to move in the physical universe with security, knowing its laws, so may we move in the mental and moral universes with security also, as we learn their laws. The majority of people, with regard to their mental and moral defects, are much in the position of a man who should decline to walk upstairs because of the law of gravitation. They sit down helplessly and say : "That is my nature. I cannot help it." True, it *is* the man's nature as he has made it in the past, and it *is* "his Karma." But, by a knowledge of Karma, he can change his nature,making it other to-morrow than it is to-day. He is not in the grip of an inevitable destiny, imposed upon him from outside. He is in a world of law, full of natural forces which he can utilise to bring about the state of things which he desires, knowledge and will—that is what he needs." (pp. 31 and 32)

"To understand the law of Karma is not to renounce activity, but to know the conditions under which activity is best carried on." (p. 26.)

Even a consideration of the above short extracts should suffice to show that the doctrine, if rightly grasped and utilised, cannot but prove a most effective means for the uplifting of the Hindu community. If it fails so to operate, that is because it is grievously misunderstood. How is that a reason for stigmatising the doctrine as it has been ?

Passing next to the other doctrine of *Maya*, its gist, together with the safeguard, which its propounders took care to provide, in order that it may not miscarry in actual life, may quite briefly be expressed thus. With reference to the *Pratyagatman*, the supreme self, unfettered as He is by the limitations of space and time, all phenomena whatsoever are *Maya*, pure and simple. They are projected into existence by His

* Mr. Balfour at the International Congress of Eugenics observed :—"If they were to use language strictly, they ought never to attribute to Nature any intentions whatever but to say certain things happened. Everything else was misleading metaphor"

thought, withdrawn from and deprived of existence by His thought. *Ischa Mathram Prabhu-shristi.* The Lord merely wills. The creation is over, accomplished and perfect. Thus verily, all phenomena are the figments of His mighty imagination. Hence their absolute illusiveness with reference to Him. With reference, however, to all else limited by space and time, the illusiveness of phenomena is necessarily relative. Therefore with reference to every individual self, rayed out by the supreme self, all phenomena, appertaining to the particular *avastha* or state or condition, in which its consciousness is working for the time being, are real and indeed as real as they can possibly be. Only when that state or condition changes, what was real, with regard to it before the change, passes out of existence with reference to the state or condition that succeeds. For example, all one sees, hears or feels in a state of dream is to him non-existent in his waking state and *vice versa.* Take again the favourite illustration of the Vedantin. A rope is seen lying curled in the ground. It is taken to be a snake, feared and avoided. When more closely examined, the snake is gone and the rope is all that exists. Imagination created the illusion. Knowledge dispelled it. As in this illustration the characteristics of one thing were superimposed on quite a different thing, so, upon the divine ray which is the *Atman* or self in man, attributes not inherent in it are superimposed. This process goes on so long as final illumination is unattained. Till then, says the Scripture with all possible emphasis, that the interest of all lies in the faithful and diligent performance of every single duty attaching to their respective stage and vocation in life. For, it is the imperceptible but the all powerful effect, produced by such punctilious performance of duty for its own sake, that indelibly impresses upon the mind the truth that the purpose of the embodiment of the human spirit in matter is the development in the former of the power of generating and guiding spiritual forces for the carrying out of the divine plan of evolution through the medium of the three well-known Gunas of Prakriti—Tamas, Sattva, and Rajas and the corresponding unfoldment of the inherent attributes of the spirit—its will, wisdom and activity. The Kernel of the Doctrine of *maya* is that with reference to *Brahman*, the unmanifest source of all phenomena, the root of matter, *mulaprakriti* is but, as it were, a veil thrown by itself upon itself and that consequently, all manifestations in matter are essentially illusory. It is steadily to keep before the mind that transcendental fact as well as to guard against the uninitiated persons clouding their understanding of the ever free and unsullied nature of their own immortal spirit, by erroneously covering it up with the limitations and imperfections of the mortal vestures in which that spirit is evolving, that the great teachers of Vedanta ever put in the forefront of their expositions the doctrine in question, which, strangely enough, is criticised as false and mischievous. Such criticism can only give rise, in the minds of those who are humble enough to think those teachers knew what they were talking about, the reflection that it has been the immemorial privilege in the world for those who know not, to judge those who do.

Be this as it may, it is but right in bringing my remarks to a close to admit that the actual life of the people is such as to expose their religion, ill-represented by its modern travesty, to unmerited reproach. Dissemination of the knowledge of the fundamental religious tenets may help the cause of reform. But it cannot in the least be served by discrediting a system of philosophy, religion and ethics which is not an insignificant heritage of the Hindu race and which is capable of meeting the respective needs of the different grades of men, those who are immersed in worldly life, others who are striving to rise higher and still others who have risen.

May I now offer a few remarks though they are not strictly called for, by the actual reference to me ? I venture to say that among the causes for the backward state of material progress in question there is, first, a certain

want of enterprise in the people, which is due, not to any intrinsic defects of theirs but to their isolation and political conditions in the past. There is unfortunately also great lack of habits necessary for successful enterprise such as accuracy, punctuality, persistent pursuit of the object in view, ascribable, I believe, to the easy life, attended by few wants, hitherto led by the people and, in a way, tolerated, if not favoured, by the climate. Even a greater cause is the entire absence, till now, of facilities for instruction and training, indispensable to the acquirement of the requisite capacity for carrying on commercial or industrial undertakings on any extensive scale. It is clear, however, that the existing state of things cannot last long. The most hopeful sign of this is the success which has, within so short a time attended the co-operative movement and that, with reference to the strata of society, practically untouched by education. Doubtless, with the spread of the potent force of education, which may now be taken as assured, having regard to the recent Imperial pronouncements on the subject and to the policy adopted by the Government in consequence, as well as with the growth, of the new spirit which is manifesting itself everywhere, material progress in the future is bound to be far quicker than hitherto.

Great industrial progress here on purely western lines may not prove an unmixed good. Though it may be too early for us to embarass ourselves by reflections necessarily suggested by the evils at present affecting the industrial conditions in parts of Europe, yet, one cannot shut one's eyes to the fact that the problem of putting the relation between capital and labour on a really satisfactory footing is baffling even the wisest heads there. May we hope that the solution in the matter that may yet be found by those heads will enable us to save ourselves from the trials and difficuties to which capitalists, labourers and the general public alike there, have had the misfortune to be subject in recent years. !

I must now conclude ! Feudalism has been done with. Individualism is having its play. Collectivism must come in its turn next. The sucesss of this last will necessarily depend upon the amount of self-sacrifice and renunciation which the higher ranks of society will bring to bear upon the carrying out of the experiment. The same more or less was tried ages ago in Peru as some students of ancient institutions know. That alone will constitute the genuine socialism, the one contemplated by the Varnasrama Dharma or the social polity of the Manu of our race. This, the future Manu, is also expected to carry out with modifications and improvements. May the success hoped for with reference to such an experiment attend humanity as a whole, must be the earnest wish of all who are watching the progress of events in the west even at the present time. !

THE INDIAN COMPANIES BILL.

BY

MR. NAYAN H. PANDIA, *M.A., LL.B.*

It is the opinion of so eminent a company lawyer as Sir Francis Palmer that the English Acts alone afford a very inadequate view of the law regulating companies incorporated thereunder, and that the immense case law that has grown on this subject in England under them should for this purpose be also taken into account. The English Companies Act, 1908, is little more than a codification of the law as it previously existed, and practically no attempt was made to embody in the Act the relevant decisions of the Courts which throw a great flood of light on the operation and meaning of the repealed Acts and of the new Act. The Indian Companies Bill, in the words of the Hon. Mr. Clark, follows "with almost a slavish exactitude" the English Companies Act, 1908, and leaves the case law above referred to practically alone. It was probably felt that any attempt at recasting the sections of the English Act in the light of modern decisions might open the floodgates of litigation, but no legislation, were it even framed, as Lord Herschell said, by a "committee of archangels" can escape misinterpretation. It is submitted

that it is not proper to miss the present opportunity to appoint a committee of leading company lawyers to draft the Indian Bill on an up-to-date and progressive basis.

LAW OF CONSPIRACY.

For instance, the existence of promoters of public companies has been only dimly recognised in clause 97 of the Draft Bill, but no attempt has been made to define the term, the existence and importance whereof has been well recognised in commercial communities and Courts of law. Broadly speaking, promoters are those persons who "undertake to form a company in reference to a given object and to set it going, and who take the necessary steps to accomplish that purpose." Now, it frequently happens that the promoters of a company are desirous of getting the public to deal in their shares, and with the view of making a market in them, resort to the following among other practices, *viz*,

(1) employing a firm of jobbers and giving them a put and call option in so many shares at a price, the jobbers then making a market in the shares at a price giving the promoters a margin each way ;

(2) pooling shares, a process whereby the control of the market is obtained in this that the amount of shares to be placed upon the market at any one time can be regulated, and the price at which they are to be so placed, is defined ;

(3) rigging the market, which consists in raising the value or apparent value of the shares at the stock exchange, apart from the dividend earning prospects of the company in question, by buying up the few that are issued at a premium, so as to induce the public to come in and subscribe for the shares under the notion that there is a *bona fide* premium to be obtained by subscribing.

The first two practices above mentioned, if honestly conducted, have been held to be legal, but the third consisting of the fraudulent manipulation of shares so as to send them up to a false price, is held to be a criminal offence in England, and persons combining to rig the market are held guilty of conspiracy. In England, indictments for conspiracy in every possible sort of case are most frequent, but in India, conspiracy except in the cases provided for by Sections 311, 400, 401, and 121A, 402 of the Penal Code, is not a substantive offence at all, but a mere species of abetment punishable only "if an act or illegal omission takes place in pursuance of that conspiracy and in order to the doing of that thing." It is submitted that as one of the avowed objects of the Indian Companies Bill is to "produce a feeling of greater security in the heart of the British investor whose capital we wish to attract to this country," and for that purpose, to assimilate the English law with ours, it is necessary that the criminal liability for conspiracy should be provided for in the Bill.

SECRET PROFITS BY PROMOTERS OF COMPANIES.

An important question and one which has been much debated in England is whether company promoters should be compelled to disclose the price they have paid for the property or rights which they, in turn, are selling to the company under formation. Thus in *Brookes* v. *Hansen* (1906, 2 Ch. 129) the facts were as follows :—"In May 1901, Wheeler agreed to sell certain patent rights to a Syndicate for £15,000. This sum was paid to Wheeler before the end of May. *On June 1st* 1901, the Syndicate agreed to sell the patents to a company for £58,500, and the company issued a prospectus on the same day, which did not refer to the contract between Wheeler and the Syndicate. It was held that Wheeler was not a vendor, and that the contract need not be set out. It was held further that if the £15,000 had not been paid to Wheeler before June 1st, 1901, and the company had agreed to buy from the Syndicate the *benefit of its contract* with Wheeler, then Wheeler would have been a vendor, the test apparently being whether any of the cash paid by the company is paid to the original vendor or not. It has been stated that it would be just as unreasonable to disclose the price paid for a property in a case where the promoter has actually completed

the purchase by providing all the purchase money, as for a trader to disclose the cost price of manufacture of any particular article, when putting it in the market for sale. Having regard, however, to the magnitude of company transactions and to the facts, (1) that the Companies Bill has been framed with the object of giving the investing public the right to have the fullest disclosure possible with regard to the profits made by promoters ; (2) that the distinction is rather fine between price just paid and price about to be paid, and between overvaluation in a prospectus prepared by promoters in consultation with the first directors (who are usually the friends or nominees of the promoters and in name only, the executive of the company, instead of being an independent board as, in theory, they ought to be) and a low price paid by the promoters in respect of the acquisition by them of the rights and property, the subject of the sale, to the company ; (3) that clause 98 of the Bill makes it compulsory on promoters if they have not completely fulfilled the purchase of the property when the new company is formed, to make disclosure of the profit which they have reaped from the transaction ; and (4) that, although influential men of high financial standing ought certainly not to be hampered in the utilisation of their finances and business ability to the best advantage in making profitable bargains, yet in this land the majority of investors are uneducated, confiding, credulous, and apathetic in the extreme, it is submitted that non disclosure in the prospectus of the original purchase price paid by the promoters will open up enormous opportunities for fraud. It may be added that it is not possible for shareholders of limited companies, even if alive to their interests, to discover from an inspection at the office of the Registrar of Joint Stock Companies, the true nature of the contract between the promoters and the company, as the former usually reserve their right to have the fully paid shares allotted to their nominees instead of to themselves, and registration of the agreement as to the allotment of fully paid shares, required by clause 108 may be evaded practically up to one month after allotment.

"Promoters" observed Lord Cairns in Erlanger *v.* New Sombrero Co., (3 A. C 1236), "stand undoubtedly in a fiduciary position towards the company. They have in their hands the creation of the company. They have the power of defining how and when and in what shape, and under what supervision, it shall start into existence and begin to act as a trading corporation." Further, in the words of Jessel, M R in Emma *v.* Grant (11 Ch. D. 937), "the moment a man is in a fiduciary position, however that fiduciary position may arise, he must, before he can obtain a profit for himself, deal with his principal on the footing of making a full and fair disclosure of everything material to the dealing or transaction in which he acts in a fiduciary position." In the case of Leeds, &c., Theatres of Varieties, Ld., (1902, 2 Ch. 813) Wright J. observed, "What were the duties of the respondents to the company which they had projected and promoted? Plainly they were bound to disclose to the company that they were the real vendors, and the *price* at which they had bought and the *profit* which they were to make, and failing such disclosure, the company would have been entitled to rescission of the contract of purchase, and the respondents must then have returned the price paid by the company, if rescission had been possible." Lastly, *in re* Lady Forrest Gold Mine Ld., (1901, 1 Ch. 589), it was observed "They (the promoters) disclosed the fact that they were directors of the vendor syndicate, and thereby necessarily disclosed that they were making some profit. It is quite true that they did not disclose what profit they were making, and in that, as it seems to me, they were wrong and guilty of a breach of duty." It is noteworthy that neither of the two cases last cited was referred to in Brookes *v.* Hansen, which is purported to be followed in the Indian Companies Bill.

BANK PATRONS.

A question of some importance arose recently in Bombay in connection with an advertisement that a new Bank was to be started with a certain number of "patrons" whose names were given. In connection with this term the following questions arose—(1) Whether the principal object or effect of having patrons for a bank was any other than inviting public confidence in the concern over which they presided ; (2) Whether the patrons would be required to possess qualification shares or to keep a stated balance at the disposal of the bank, and whether they would receive any emolument, concession or convenience for becoming or continuing to be members ; (3) Whether the patrons would have any control over or voice in the running of the concern, and whether any rules were to be framed for obtaining their advice; (4) Were the patrons so long as they remained such, to be deemed to hold out any guarantee to the public of the solvency of the concern ; and (5) What was to be the jural relation between the company and the patrons. None of these questions was answered and the universal opinion was that, the Indian Legislature had already found it so difficult adequately to define and regulate the duties and liabilities of managing directors and agents of limited companies, that any attempt at further complication of matters and mystification of the public mind, by the introduction of novel terms of vague import in company nomenclature, was to be seriously deprecated.

SELECTION.

BY-PRODUCTS OF THE PACKING HOUSE.

Perhaps in no other industry has the utilization of by-products been developed to so great an extent or become of such vast importance as in the modern packing house. In times past, before the big packer came into the field, such things as by-products were little utilized, nor were the possibilities in this direction fully realized ; but the complex civilization of the present day, together with keen competition and the expenses of distribution, maintenance and the enormous capital involved have made it necessary, for the existence of the industry, that the field of usefulness for former waste materials be largely extended and this, in turn, has made possible greater development. The success of the large packer of to-day is in his ability to sell the meat from a steer for a less amount of money than the steer cost alive In order to do this, all of the many expenses of killing, refrigeration, shipping and a hundred other items must be met with the proceeds from the sale of the by-products and a profit realized on the investment in the business.

There are two large and general classes of by-products, namely, the edible and inedible. Under the first general heading of edible products are classed the various fats and internal organs. The cattle furnish the packer with his edible tallow, oleo oil, and oleo stearine. The edible tallow is obtained from what is known as "cutting bones," *i.e*, pelvic, rib and blade bones, and also from the marrow, and is used to some extent in the manufacture of high grade white soaps. Of more importance than this fat, however, is the oleo oil and stearine which is obtained from "oleo stock" which is rendered from the ruffle and caul fat. This stock is carefully washed, hashed and then rendered in kettles from which it is drawn off into trucks and allowed to crystallize, when it is put into small cloths and pressed in a power press. The oil thus obtained is one of the highest grades of edible oil and is extensively used by the oleomargarine industry; the residue left in the cloths is the stearine which has the highest melting point of any animal fat, and is of prime importance in the making of compound. Oleo oil is one of the main constituents of oleomargarine, and possibly comes nearest to the ideal fat for this purpose on account of purity and flavour. There are several grades made, all of which show a low percentage of free fatty acids, under three quarters of one per cent., indicating that they have been removed from the body tissue with practically no alteration chemically. The stearine on account of its high melting point is admirably suited for mixing with refined cotton seed oil to give it the necessary firmness for lard substitutes.

The fat obtained from the hog is usually classed as kettle rendered, prime steam, and neutral lard, the latter being the best grade. It is made from the leaf and contains practically no free fatty acids. It is analogous to oleo stock, and like it, finds its greatest use as another one of the ingredients of oleomargarine.

The various internal organs such as tongues, brains, sweetbreads or pancreas, and the heart, lungs, and liver, which are known as plucks, the kidneys and the tripe, need be but mentioned as forming good edible by-products which have always been held in esteem. The various trimmings which include the weasands, ox lips, hog ears; snouts and tails, and the cheek meats are also edible products, some of which are cured Here also we find blood being used for making what is called blood sausage. And we must not forget the pickled pigs' feet. Another valuable adjunct to the list of edible materials which indicates good utilization is beef extract, a product which has found considerable favor for condimental purposes; and with this we shall pass on to a consideration of the inedible products which are of great importance in the industrial world.

The inedible portions constitute the external covering, some of the offal and the skeleton or bones. At first glance, one does not get the possibilities which have been realized with these as a basis. Enormous industries by themselves, such as the leather, soap, glue and fertilizer industries, are dependent upon the use of the above substances. The entire leather business with its many ramifications is one of the instances of the early employment of so-called waste materials. From the hides of cattle the shoe industry has risen as well as the manufacture of leather belting, harnesses, and fancy leather articles of divers kinds. The waste from the leather or from the untanned hides finds use as glue stock, while the tanned leather buffings and trimmings find their way into the fertilizer factories, where their nitrogen content make them valuable after suitable chemical treatment. The hair from the hides goes to the dealers in plastering materials and for fertilizer, hair felt and insulating material. The sheep skins and the hog skins are also converted into leather, although the latter not very extensively. The hog hair and bristles are finding increased use, especially the former, since the rapid development of the automobile business has required many hair cushions and padding. The hair for this purpose is first put through a fermentation process which removes an outer coating; it is then dried and dyed, when it has a value in excess of what it once brought as fertilizer. Screenings from the hair factory can be and are being made into a substance known as retarder, which is used by the makers of plaster of paris to retard the setting time of their product.

Of minor importance in the field of by-products are the pharmaceutical preparations, which in an article of this character deserve description. Perhaps the most important of these is pepsin. This is prepared from the inner lining of hogs' stomachs by digestion with dilute hydrochloric acid; the solution is strained or filtered and evaporated under vacuum to a syrupy liquid which is spread upon glass plates to dry. Its chief use is in medicine in cases of failing digestive powers of the stomach, where it serves the purpose of supplying the natural digestive ferment. Another preparation obtained from stomachs is rennet, which is extracted from the dried stomach of calves. It is used for curdling milk and in medicine.—*Scientific American.*

Cropping Young Trees.

The temptation to allow the fruits which set on young trees to remain is considerable, but in view of future prospects it is most desirable that all should be removed. It is, perhaps, permissible to allow a three-year-old tree to carry two or three fruits, but the first and second seasons after planting ought to be wholly devoted to establishing a proper foundation to ensure satisfactory crops in subsequent years. It may be said always to pay in the long run to pick every fruit off immediately it is formed, until the plant is four years old.

VIEWS AND REVIEWS.

Britain's Trade with India.

Mr. Ben. H. Morgan recently delivered a series of addresses on the Trade, Industry, and Finance of the British Empire at the London School of Economics and Political Science. The subject of his fifth address was "India and the Crown Colonies." By quoting the statistics of the trade returns, he showed how enormous is the trade of Great Britain with India. The external trade has grown from £223,000,000 in 1905-06 to over £246,000,000 in 1910-11. In 1909-10, the value of the total exports of India was £136,500,000 and Great Britain absorbed a great bulk of this. India supplied the United Kingdom no less than 15 per cent, of its total wheat imports. The imports of India in 1910-11 amounted to the value of £86,000,000. The share of the United Kingdom in the import trade of India is gradually declining; in 1906-07, it was 66·8 per cent., but it came down to 61·1 per cent. in 1910-11. Mr. Morgan urged the appointment of British Trade Commissioners in India for investigating the local conditions and suggesting to the British manufacturers the means of expanding business. The knowledge of the business firms in the United Kingdom about this enormous market in India is scanty. The suggestion may help the British merchants, but India observes the *Tribune* of Lahore can expect very little from such a Commission. On the other hand, there is a fear of the loss of Indian industries. In order that Great Britain may find a good market for her manufactures in India, steps must be taken to increase the latter's wealth. Her agriculture and industries must be developed to enable her people to buy ariticles from foreign countries. The relation of the British merchants with India has not been very encouraging for Indian industries. Many industries have been ruined and the new industries started have not yet been able to compensate for the loss. Under unfavourable fiscal arrangements, and owing to the unpreparedness of the people to cope with the new situation, India is not able to compete with other countries. The attention of the friends of India should therefore be directed towards the advancement of her industries and improvement of agriculture and not to the exploitation of the land. The policy of helping India to stand on her own legs will benefit the countries with which she has trade relations.

Lubricants and Lubrication.

In a paper read before a recent meeting of the Calcutta and District Session of the Institution of Mechanical Engineers, Mr. J. M. Caldwell observed that a few years ago, in India, castor oil was the universal lubricant for both internal and external lubrication; but as engineers became more enlightened on the subject of lubrication generally, castor oil for internal lubrication was rarely met with. The principal reason why castor oil has been condemned for internal lubrication is the breaking up of the oil into several corroding acids when exposed to high temperatures.

As a lubricant for external bearings, however, castor oil is still largely used, and the old school of mechanical engineers will not listen to anything against it. A temperature test, however, which any engineer, with a couple of reliable thermometers, may apply to the external bearings of an engine or shafting with castor oil on one bearing and a high grade hydro-carbon engine or shafting oil on another, will very soon show that, owing to the high fluid friction of castor oil, the running temperatures of the bearing lubricated with a hydrocarbon oil will be considerably lower than that with castor oil. Such difference of temperature has, in the author's experience, often been anything from 20 to 63 per cent. in favour of hydro-carbon oil.

Grease has lately been largely used for the shafting lubrication of the Calcutta jute mills. The advantages put forward for grease are its cleanliness and economy. Both of these have of course great interest, particularly in

weaving sheds, where oil dropping from shafting bearings might cause stains on the fabric.

As to economy, in most cases there is nothing saved by adopting grease instead of oil, for, apart from its high fluid friction, the grease costs considerably more per pound than a good shafting oil, and the decrease in consumption will not make up for the increased price. Shafting bearings in textile mills, if not of the ring-oiled patterns, are as a rule lubricated through glass needle oilers, and if these oilers are properly adjusted with needles of suitable thickness, there is no other method, except ring lubrication, which is so economical.

Where hand-oiling of machinery is employed, here often is great waste, quite apart from the fact that hand-oiling in itself is a very inefficient method of lubrication. The best practice, wherever it is possible to adopt it, is to feed oil at a uniform rate, and if not continuously, then at short intervals, and just the quantities required. This will allow the friction of the bearing or frictional part in question to be kept at a minimum. However, where hand-oiling is unavoidable, the best scheme for preventing waste is to close up the oil can spout, either by flattening or soldering on a nipple having a reduced orifice.

Yams.

It is certain, says the *Phillipine Agricultural Review*, that the yam is one of the very oldest cultivated rootcrops, having been grown in India for many centuries; it was also an important crop of the aborigines of Tropical America when the early Spanish navigators entered that region. In fact, it would seem that yams vie with the sweet potato for antiquity in point of cultivation by man,—all these food plants having been under domestication so long that they seldom or never produce seeds. Some species of yams do, however, on very rare occasions produce flower clusters and a few of the domesticated species undoubtedly produce viable seeds under favourable conditions. The yams have broken the regulations, so to speak, for plant reproduction in two ways. A number of varieties commonly produce small, or in the case of the air-potato, large tubers in the axiles of the leaves (a rather rare infraction of the law); further more, they possess the trait of sending out sprouts from almost any part of the surface of the tuber-like root which, however, is not very uncommon in the plant world.

Yams may be cooked in the same way as potatoes, or sweet potatoes. Some varieties are preferably baked, while others seem better boiled. A favourite dish in some countries is made by boiling roots until nearly "done," then slicing and frying in cocoanut or olive oil. Yam cakes, made by mashing the boiled or baked roots, then adding milk, or cream, butter, eggs, and cheese, and then frying, are excellent. Puddings can, of course, be made, as is done with sweet potatoes. Yam flour, made by grinding the dried slices of either raw or partially cooked roots, can be made into a variety of dishes; unfortunately there is a trace of tannin in most yam roots and this usually discolours the slices if in contact with any metal; in fact, it would appear that there is a peculiar substance in the white yams which turns the whole fecula surface brownish within a few hours after exposure to the atmosphere. Flour made from the black, purple, and red varieties is, of course, somewhat objectionable to orthodox housekeepers, but it is interesting in its uniqueness and the flavour is surprisingly good, especially if during the drying process, the slices have neither been scorched nor stained with metallic compounds.

Indian Paper Industry.

The Indian Trade Journal in its issue of July 4, 1912 writes:—It is a mistake to suppose, that the supply of material has not a great deal to do with the profitable manufacture on the part of Indian mills, and it is also a mistake to suppose that the Indian paper trade is suffering mainly from lack of modern machinery capable of a large output. There is, moreover, an impression abroad that Indian paper mills do not require wood pulp because they have an ample supply of grass fibre, and that, as now equipped, they cannot use wood pulp profitably, even if it were available at a low price. The facts are that wood pulp, if it could be obtained at the rates which were in vogue a few years back, would be in great demand. But, owing to the partial exhaustion of the wood pulp forests in Germany and the United States, the price has lately appreciated very considerably, and this is the root of the difficulty. Indian paper mills must have either cheap wood pulp to mix with the more costly grass pulp, or a cheap substitute. There are many excellent grasses to be found in India, but there is nothing to show that they have been systematically tested for pulp, or whether their pulp can be manufactured and supplied to the mills at a cheap rate.

Under present conditions in India, paper prepared from grass pulp alone, or from an admixture of grass and chemical wood pulp at their present prices, can only just compete with imported paper; and, if the cost of pulp rises, it will be unable to do so. The higher grades of paper, such as good notepaper, cannot be prepared from wood pulp without some admixture of stronger and softer fibre.

The manufacture of bamboo pulp will necessitate the erection of special machinery. But at present, it is believed by experts that, even allowing for the outlay, it will be found possible to deliver bamboo pulp at the mills more cheaply than either wood or grass pulp. The problem of manufacturing cheap bamboo pulp, has not so far been thoroughly investigated. Sindall and others have touched it superficially; but their results were necessarily too inconclusive to justify the outlay of large sums on bamboo pulp factories on anything but in experimental scale. The position has been largely modified, however, by the careful and detailed investigations of Messrs. Pearson and Raitt which may not improbably open a new era in the Indian paper industry.

British Empire Trade Mark.

In furtherance of the policy of the British Empire League on the above subject, the Hon. Sir John Cockburn, K. C. M. G. (Chairman, Australasian Chamber, London), moved the following resolution at the Eighth Congress of the Associated Chambers of Commerce of the Empire at the Guildhall:—"That this Congress desires to support the action taken to secure the adoption and registration of an Empire Trade Mark, for the purpose of indicating that the goods to which it is applied are goods manufactured or produced in some part of the British Empire."

In the course of his address, the Chairman said that it was proposed that the British Empire Trade Mark should be a mark of origin, not having any reference whatsoever to quality. A good instance of a mark of origin proving beneficial to trade without being in any way a standard of quality was to be found in the famous trade mark "Made in Germany," which, though merely a mark of origin, had been of the greatest possible assistance to German trade, contrary to the designs of the founder. The mark was not to be an ordinary device such as a lion, eagle, or crown, it was merely to be a stamp, with some such words as: "British Empire Mark"; then in the centre: "British Product"; while a blank space in the centre would be left for the name of the particular country in which the article was made, *e.g.* "Canada," "Australia," &c. It was hardly credible to imagine that this was otherwise than a magnificent thing for Imperial trade. He understood, however, that opposition existed in certain quarters mainly for two reasons. Firstly, that certain trade marks had a world-wide reputation, and the possessors already enjoyed all the advantages which the proposal would confer, and secondly, that there were certain firms who used to be manufacturers in this country but now had ceased to be so, though they still masqueraded as such. They had their goods produced in Germany, or the United States, or anywhere else in the world at the cheapest possible rates; their trade mark was put on, and those goods went out from the firm as if they had been made in Great Britain. Now what a man in the British Empire desired to know when he bought a certain article was

whether he was dealing with his own kinsmen or with foreigners. Sir John thought that if a stop could be put to customers buying goods of the sort just mentioned under the impression that they were buying British-made goods, a very good piece of work would have been done He then quoted the Irish trade mark as a good instance where a mark of origin had worked extremely well. It might be said that the fervour of Irish patriotism helped this mark, but if so, surely there was full evidence of the growth of an intense and larger patriotism in the Empire, admittedly gaining force year by year, which would help to make the Empire Trade Mark also a success.

The resolution being then put to vote was carried practically unanimously.

Refrigeration of Eggs.

An interesting paper was read on the above subject at the recent Vienna Congress by Dr Mary E. Pennington, Chief of the Food Research Laboratory, Bureau of Chemistry, United States Departments of Agriculture.

Eggs, probably more than any other food staple, are dependent upon seasons and conditions for production. The sequence of seasons results in the production of a large proportion of the whole year's lay during the spring months. In the winter months, the production, as compared with cosumption or demand, is extremely small. Hence the necessity of preserving eggs from April until December in a wholesome condition, retaining as much as possible of their freshness of flavour.

Of all the various methods for the preservation of eggs, cold is, so far, the best. Its application to the keeping of eggs, however, must be along definite lines. It is efficacious in maintaining high quality for a reasonable period of time if the eggs are put into the cold room in prime condition. Cold does not make them better, whether of low or of high grade, and when deterioration has already begun, cold does not retard the process to the extent that it does, when the eggs are fresh. The use of cold, therefore, as a preservative of eggs depends very largely for its success upon the condition of the goods when they come to the cooling room or the storage warehouse. The range of temperatures used in the handling of eggs, however, is very small by comparison with that commonly used in handling poultry, and temperatures low enough to freeze the egg, even superficially, are disastrous.

The questions of temperature and humidity and cleanliness are of great importance in the successful cold storage of eggs. The temperature must not permit freezing of even the most superficial kind, yet the colder the eggs can be kept without congelation, the better. Fresh eggs which are thick bodied, as laid by well-fed hens, can be held advantageously at 28° F. (—2° C.) ; on the other hand, thin eggs, or those which have begun to deteriorate, may require 32° F. (0° C.) for safety. It is scarcely necessary to say that the latter will not keep as long as the former. A constant temperature within small limits in long storage is an absolute necessity. The majority of warehouses permit a maximum fluctuation of not more than 4° F. (2° C.) after the stock has ceased coming in. Some maintain even greater exactness than 4° C.

The World's Oil Fields.

The *Outlook's* Financial supplement dated July 6th, 1912, takes a survey of the World's oil fields.

Oil is a mysterious product : we do not know how it occurs, what makes it, or why it should be found in some places and not in others. We have our theories with regard to the deposition of minerals in quartz-veins, and although they may not be strictly according to facts, they are good enough to go on with. But we are hopelessly at sea when we begin to theorise about the occurrence of oil. Experience has shown that it lies in strata. It may be the result of the decomposition of fish or some kind of tropical plant or weed long since extinct, or it may be due to sudden death of millions of little animals like the coral insect. We do not know, and perhaps we never shall know. But this is certain : that every year, oil becomes a more useful product. When gas superseded candles and electric light took the place of gas as an illuminant, a good many people thought that the days of oil were over, for, it was then needed only for refining purposes. Now however oil is quite as much in demand for fuel as it is for either a lubricant or an illuminant.

The explosion engine has completely revolutionised the oil world. Some years ago, it did not pay to extract the petrol, except from oils of the lighter quality. To-day however, even the heaviest oil is refined for the sake of its spirit. The future of oil as a fuel seems vast At the moment, it of course only pays to use oil where coal is high-priced, or *vice versa* where oil is low-priced. But as the chemists improve their methods of refining, so presumably will the price of oil-fuel fall, and as the production of oil increases, fuel-oil will be more and more used. There is no question as to the advantages of oil-fuel. It is easily handled, economically stored, requires infinitely less labour, and gives better results than coal, It is only the questions of price and supplies that prevent everyone from using oil instead of coal. The navies of the world are afraid to drive their battleships on oil because they cannot be certain of a continuous supply, for it must be admitted that many oilfields have very short lives.

The sources of production are Russia, Roumania, United States of America, Mexico, Dutch Indies, Burma, Galicia, Egypt, Trinidad West Africa, Argentine, Peru and Alaska. The output for 1911 was equal to about 50 million tons.

Preparation of Ginger.

The following directions are given by the *Bulletin* of the Imperial Institute, London :—

The rhizomes are known to be ready for digging when the stalks wither, this taking place shortly after the disappearance of the flowers. The rhizomes are twisted out of the ground with a fork or hoe. In performing this operation, great care is necessary, as any injury inflicted on the rhizome depreciates its market value. Considerable experience is necessary in order to lift ginger rhizomes properly.

The " hands " (complete rhizomes and adherent fibrous roots) are broken off, and the soil and dirt removed immediately, as otherwise it is difficult to get the finished ginger white. The rhizomes should not be allowed to lie long in heaps, as they are liable to ferment. The usual plan is, as soon as the rootlets and excess of soil have been removed, to throw the ginger into water to be ready for " peeling " or " scraping. " The operation of peeling, if carried out in a proper manner, is a very delicate one, the object being to remove the skin without destroying the cells immediately below it, since these cells contain much of the oil upon which the aroma of the best qualities of ginger depends. As the rhizomes are peeled, they are thrown into water and washed, and the more carefully the washing is done, the whiter will be the resulting product. As a rule, the peeled " hands" are allowed to remain in water overnight. Some planters add a small portion of lime-juice to the wash water at this stage, at the rate of about half a pint to six or seven gallons of water, in order to produce a whiter root.

After washing, the peeled rhizomes are placed in a "barbecue," which consists merely of a piece of levelled ground covered with cement, on which the ginger is placed to dry in the sun. Where a "barbecue" is not availabe, a " mat " consisting of sticks driven into the ground, across which are laid boards of palm or banana leaves, is used, on which the ginger is exposed until it is dry. Uniform drying of the rhizomes is essential for the production of first-class ginger and to prevent mildew, and to ensure this, they should be separately turned over by hand at least once on the, first day. Careful planters put their ginger out daily at sunrise, and take it in each night at sundown ; conducted in the latter way, the operation of drying usually takes from six to eight days. The ginger if not sufficiently white in appearance has to be bleached by further washing, and after being re-dried is ready to be packed for export.

A Model Steam-Laundry.

What is described below as a model steam-laundry by the *British Trade Review* of June

1912 will, we are sure, be perused with the greatest interest by our readers. Says the *Review* :—One of the most lucrative investments undoubtedly appears to be that of a steam laundry near a growing town or busy port. In England, there are many completely equipped laundries of this kind, the cost of each being estimated at several thousands of pounds. Many are situated on the outskirts of the great towns and near harbours, and so thoroughly well organised and equipped are they with the most modern machinery that they will take all the soiled linen and white wear from the largest hotel or the biggest ocean liner one day and return it the next day, cleaned, finished, and thoroughly well got up. A few general considerations may be of interest to readers abroad who are contemplating the possibility of opening up this industry on less elaborate lines. We may, therefore, point out that in all laundries where steam is employed the principle of working is the same There must be ample supplies of steam, and hence, as a rule, steam is also the main source of power. The steam is employed with water for washing, and as steam alone for heating ironing-machines and for the production of hot air for the drying-rooms. Then, of course, it is also used for driving the washing-machines, the hydro-extractors, fans, and many other appliances. Leaving the drying-rooms, the goods are taken to ironing-machines, many of them up to 8ft. in length, where sheets and similar articles are dealt with, smaller machines on the same principle being used for ironing collars, cuffs, and shirts. In many places, it will be advantageous to have on the premises a disinfecting-machine in a separate building, and this is especially the case in many tropical and sub-tropical countries where such epidemics as enteric, typhoid, and yellow fever may from time to time break out. In such localities, all the linen from hospitals and lazarettos is first passed through the disinfector, in which steam and hot air are brought to bear upon every particle in such a way that all noxious germs are totally destroyed. From this process, the goods go to the washing-machines, which are generally on a rotary principle, water and high-pressure steam with soap being used. The movement of the machine and the action of the hot air and steam result in a cleansing much more effectual, as a rule, than applied by hand. These rotary washing-machines can be had in a number of sizes, from 2 ft. to about 5 ft diameter. From these, the goods are taken to the hydro-extractors working on the centrifugal principle, by which the bulk of the water is removed. They are next taken to the drying-rooms, generally constructed in a series, and fitted with rails carrying frames, upon which the semi-dry clothes are suspended and then rolled into the hot-air rooms. The heat is applied by a special form of heater or from steam coils, and fans are used to send currents of hot air against the clothing. In this way a rapid and thorough drying is ensured, and the next process—that of ironing or calendaring—can be applied. The machines used can be either steam, gas, or electrically heated.

Paper Towels.

America seems to have been the first to appreciate the hygienic properties of paper towels. In many of the schools, in clubs, in hotels, where expense has to be considered, and in many other instances, these towels have been introduced. After being once used, they are thrown away. It is easy to realise the importance of this movement towards individualism. Doctors have readily stated that the custom will do much to prevent the spread of skin diseases and ophthalmia. The superintendents of certain States have requested that all schools adopt these towels. In Sacramento, towels made of paper are introduced by order into the High School, and the School Board of Ottawa, Canada, has put paper towels and cups into all their public buildings. The Superintendent of Public Buildings in New York has issued a similar command, the price of the towels being one-eighth of a penny each. There are also towels, in size 12 ins. by 18 ins., sold at 450 for 1s. 2*d.*, so that the cost of each is infinitesimal.

Germany has taken up the subject with a good deal of care and attention. At a recent congress of the German Public Baths Association, a competition was opened. The feeling was that the frequent washing of hands might be promoted if a cheap and convenient means of drying were provided. A mere glance need be cast at the hands of many people with whom one comes in contact during a day spent in any town, to realise the importance of the application of soap and water. Change must perforce be accepted from hands that have not been touched with water for a longer period than one cares to recognise. Three prizes were recently offered for a good paper towel in Berlin, and the winning specimens will be introduced into schools, railway stations, restaurants; indeed, into all places where people congregate and require some apparatus for drying newly-washed hands. It is impossible to contemplate the treatment accorded to towels in some clubs and many other places where the rules of hygiene might be better understood. Frequently, the linen towel is merely dried and placed again ready for use. In order to induce people to buy the prize towels and use them, each article will bear the name of the maker stamped upon it, so that purchasers may readily find out where to get them. Some may regard it as discreditable to ourselves that Germany should take the lead in a matter of public cleanliness, for English people have hitherto held the palm for regularity in the use of water and soap. Two experts have been told off to deal with the question of automatic distribution, for the articles must be easily obtained. They must be of a nature to allow of convenient handling, strong enough not to tear when used, and of a size that will permit of their being folded, while, of course, they must absorb water without getting soft.

A trial was given to paper cups in London on the occasion of the King's entertainment to children at the Crystal Palace, and they seemed to act very well. America has once more taken the lead in this matter, which seems so natural and so easy of accomplishment The growing demand for cups of this kind has induced the Chesapeake Beach Railroad to order paper drinking cups. A nickel-plated vendor has been put into each car, holding about 100 paraffin paper cups for individual use at the water cooler. The cups are placed inside a glass dustproof tube and are released, one at a time, automatically, by turning a handle. Other railways are taking the matter up, and it is probable that ere long the whole country will use hygienic towels and cups.

Apart from the question of the spread of disease, an immense saving in laundry might easily be effected. Great Britain has not at all lagged behind in the application of paper to practical purposes, napkins, tablecloths, plates, vessels for holding cream, cups for drinking, dishes for fruit or in daily use. An attempt was made to supply milk in paper bottles for the sake of cleanliness, but for some reason, these did not obtain a wide success. The import of paper into England increases steadily, and this year it is reckoned at half a million sterling per month. Sweden, Norway and Germany lead the way in the production of wrapping paper, and most people are aware that the public idea of wrapping parcels has developed enormously in recent years. In 1906, 834,136 tons of paper-making materials were imported, and in 1910, 1,085,542 tons. The import of rags is falling away, and wood pulp is increasing, the total import for 1910 being worth £4,972,487. These figures are significant of the growing variety of uses to which paper in one form or another is adapted.—*Daily Telegraph.*

Kashmir Silk Industry.

The May-June number of the *Hindustan Review* opens with an article on the "Development of Silk Industry in Kashmir" by Mr. Sodarshun Koul. It is well known that the congenial climate of Kashmir and the abundance of mulberry trees which grow almost spontaneously throughout the length and breadth of the valley offer the very best facilities for the cultivation of univoltine silk-worm of commerce—the *Bombyx*

mori. Mr. Koul traces the history and development of sericulture in Kashmir from the earliest times and brings it down to modern days which affords interesting reading.

The following are the present conditions and prospects of the silk industry in Kashmir:—The Durbar has monopolized this industry. Nobody is permitted to rear or reel cocoons privately. The seed or the silk-worm eggs are distributed gratuitously to the zemindars who, in return for the rearing of the worms, are paid about Rs. 15 a maund by the Durbar. To avoid levying of blackmail and other irregularities the Director of Sericulture himself makes the payment, as soon as the cocoons are brought in by the rearers, after being weighed in the presence of his assistants. An ounce of silk-worm eggs produces in Kashmir from one maund to 1½ maunds—and in rare cases 2 maunds. The rearing of silk-worms, from the hatching of eggs to the spinning of cocoon, does not take more than 40 days, and the rearer's labour actually commences during the latter 20 days when he has to gather mulberry leaves. Over 30,000 ounces of silk are distributed annually amongst the rural population, giving employment to more than 75,000 persons, and a sum of 6 lakhs of rupees or more, being the cost of cocoons, is paid to them yearly. This is a great help to the zemindars, and in fact, to some of them, this is the only means of livelihood.

Besides rearing, reeling is conducted on a very large scale in Srinagar. The machinery and the plant have been obtained direct from Europe, and the factory which contains now nine filatures, and boilers for steam power, is considered to be one of the largest of its kind in the world. More than 5,000 labourers are daily engaged for 9 months in the year, in reeling silk, and are paid monthly at fixed rates of wages, varying from 2 annas to 4 annas 3 pies a day. Boys of tender ages, old and young men, may be seen early in the morning with their *batties* in hand, containing food for the morning, running towards the factory. There are two filatures at present worked by electric power, and it is believed that it will greatly economise the factory expenses and increase the revenue of the State. Messrs. Stone and Gupta of the Electric Department are doing their utmost in making the factory run by electricity, and their efforts have so far achieved great success

The silk reeled is sent direct to Europe in its raw condition for sale through some agent, and the price realized is paid into the State Treasury. The silk, it is regrettable to mention, does not compete favourably with that of Japan and France, and it fetches less price than it should. The silk-worm eggs, the factory purchases so far direct from Europe and a large amount is spent for this purpose. Akin and allied to this has been the creation of a Mulberry Department which also does immense good in planting thousands of new trees and in pruning the old ones

It will thus be seen, concludes Mr. Koul, what marvellous progress the Kashmir silk industry has made in the course of a decade and a half. Besides bringing a large income to the Durbar, it gives employment to thousands of people, both urban and rustic, and materially adds to the prosperity of the country. There is still much field for expansion, and with the increase in the number of mulberry trees and the introduction of modern scientific appliances, Kashmir will some day command a great silk market in the world and very much increase the revenue of the Durbar.

The Indian Textile Industry.

The explanations for the slow growth of the Indian textile industry, are, in the opinion of a contemporary, many and varied. Some attribute it to the imposition of excise duties on the products of the Indian mills, some explain it away by the lack of a spirit of enterprise among the millowners. Others, on the other hand, account for it by slack management and lax supervision, whilst there are few who affirm that it is due to the absence of cordial co-operation among the millowners in respect of measures that should be but have not been, organised in connection with the industry. There are also some who hold that dishonesty runs through the *gamut* of the whole industry and the slow pace of the mill industry is due to the crooked methods adopted by many, if not all, in charge of the industry.

AGRICULTURE.

Testing Grains for Hardness.

To test grains for hardness, Dr. F. Stranak, of Prague, pushes a specimen under a very thin saw attached to the scale-pan of a balance. The weight necessary to cause cutting is a measure of the hardness. It is found that grains resist not only insect attacks but also plant diseases in a degree proportionate to their hardness.

Blood as Manure.

Blood is a valuable manure. For use on a small scale, it can be mixed with sawdust on the farm. Another method by which farmers can utilise it is to mix the blood with a small quantity of powdered quicklime. It dries up quickly, and can be easily pulverised, which operation must be carried out before the blood decomposes. On a large scale, the water is driven off, and "dried blood" obtained. Thus prepared, the dried product contains 11 to 12 per cent. nitrogen, 1 to 2 per cent. phosphoric acid, and ½ to 1 per cent. potash.

Manure Under Fruit Trees.

It is usual to apply manure underneath fruit trees as far as their branches extend overhead, but this is not the correct way, writes an authority on the Continent. At an experimental station on the Rhine, a cherry tree 25 years old was dug up, and the roots were found to extend more than 11 yards. The roots of a plum tree three years old were quite two yards long. How extensive, then, must the roots of a fully-grown tree be! From this fact it is clear that the proper plan is to spread the manure, whether farmyard manure or artificial, in a wider circle, and in orchards, where the trees are close together, to distribute it over the whole surface Only in this way, is it certain that all the trees will get the benefit of the nourishment supplied to them.

State Aid to Agriculture.

In Denmark, societies of Rural Economy are the local official representatives of State Agriculture and are held responsible for the agricultural interests of their districts. They act as intermediaries between the Government and the farmer in all matters relating to the progress of agriculture. Their income is derived to a limited extent only from the subscriptions (usually very small) of members and mainly from State subventions. The purposes for which these State subventions are given are very numerous but among them may be mentioned the following: "seed control stations; chemical station for the analysis of fertilisers and feeding-stuffs; butter control stations for testing milk-machines and implements; societies for the cultivation of marsh and moorland; societies for the improvement of seed; premiums for small farms; live stock-breeding; milk-control association loans for small holdings; and the improvement of land and Co-operative Associations"

Cow Keeping.

In connection with cow keeping, there is one fact which deserves to be mentioned here. It is the interval which cows pass in calving. Cows are classed as (1) those calving annually, (2) those calving biennially, (3) those calving triennially. The most prevalent class is that of cows calving annually. In making selection, experienced purchasers invariably prefer triennials, if they find them, and are willing to pay higher prices for them. Both the calf and cow of this class are bigger, better made and stronger than the other two, and the biennials are better than the annuals. The reason of this is obvious. The milking periods of these classes of cows also vary, those calving at longer intervals continuing in milk also longer. Making allowance for good or bad keeping and individual peculiarities, annuals continue in milk from four to six months, biennials from twelve to sixteen months and triennials from twenty-one to twenty-seven months. Calves of the latter two classes are nourished longer upon the mother's milk and grow better. The long period of rest after calving, especially after they run dry, enables them to regain their strength and vigour lost at each pregnancy. Annual cows, which usually suckle their calves from three to six months, are sometimes liable to a double drain, by the calf at the foot and the developing fœtus in the womb, leaving no time to repair the loss.

COMMERCE.

Business Enterprise in India.

The commercial enterprise of India during the month of June 1912 may be gauged by the following abstract of Joint Stock Companies registered in that month :—

		Rs.
6	Banking and Loan Companies ...	8,60,000
3	Insurance Companies ...	60,000
1	Printing, Publishing and Stationery Company ...	1,18,000
3	Trading Companies (other than specified above) ...	5,60,000
1	Tea Planting Company ...	3,00,000
1	Coal Mining Company ...	2,50,000
15	GRAND TOTAL ...	21,48,000

Shipping and Freight.

In 1911-12, 8,858 vessels touched at Indian ports and these had a tonnage of 16,616,435. Of these vessels, 4,785 were British, 375 German, 157 Austro-Hungarian, 188 Norwegian, 123 Japanese, 79 Italian and 61 French. The particular point about shipping is that freights were far higher than they were during the preceding ten years or so. This rise acted severely in restraint of trade, not only to Indian ports, but to foreign countries as well.

The Trade of the Empire.

Mr. Asquith speaking on the Trade of the Empire recently before the Chambers of Commerce of the Empire observed :

"For several years past, nearly one-fourth of our imports into the United Kingdom have been received from our oversea Dominions and Possessions, and over one-third of our exports of our own products and manufactures have been sent to them. Last year, this import and export trade, including bullion, represented a total of no less than 400 millions sterling. To this, of course, must be added, when one is trying to estimate the magnitude of the interests represented here to-day, the large trade which passes between these Dominions and Possessions themselves amounting to probably at least seventy millions more. These are stupendous figures. When we realise that the population of the British Empire may be put roughly at about 420,000,000, the inference is plain. The deliberations which you are about to enter upon and the conclusions at which you will arrive must have the greatest weight with those who guide the destinies of the various parts of the Empire."

Radius Agreements.

Recently, there was decided in the Chancery Court in London a radius agreement case of an unusual nature. The defendant had bound himself to a Mr. Ellis not to engage in a similar business within a five-mile radius for a period of five years after leaving Ellis's employ. The employer sold his business to another firm, yet no new agreement was entered into, and a year later the employee left the new firm and engaged himself to a rival trader in the same town. His Lordship decided that the employee was bound by agreement with Ellis, in spite of the change in the ownership of the business, and he granted an injunction restraining the employee from continuing his service with the rival firm.

Business Wit.

In a "friendly little game"
He who cheats is held to blame,
Men will cease to speak to him,
Pass him by with visage grim,
He is cast from club and home,
Left, pariah like to roam—
Shunned and friendless such as he,
Lacking "poker honesty."

But in business, if your wit
Lets you 'get away with it,"
If you stack your deck and make
Lots of money on the fake,
Those same men who'd cut you dead
Had the game been cards instead,
Say you're "clever, canny," yes,
And a "wonderful success."

Business needs, it seems to me,
Merely "poker honesty,"—
"Play to win—but on the square,"
That's the motto everywhere.
What is 'wrong' when 'cards' are played
Surely isn't 'right in trade.'
Here, then is the remedy—
Stick to "poker honesty."—*Asian.*

INDUSTRY.

Jaggery Making.

Those who make jaggery will do well to bear in mind the following points :—

(1) Cane should be properly ripe when cut; it should be neither underripe nor overripe.

(2) A proper furnace must be constructed to economise fuel.

(3) A proper mill should be fixed to get the maximum amount of juice.

(4) A proper pan should be used to boil juice in a short time and with less fuel.

(5) Canes should not be allowed to remain long after cutting without being milled.

(6) Juice should be boiled immediately after crushing and should be strained properly.

(7) Lime in proper proportion should be added to reduce acidity of juice before boiling.

(8) All the scum must be very carefully removed.

(9) Care should be taken not to boil the juice very briskly over a very hot flame from firewood.

(10) The pan must be removed from the fire-place at the right time.

(11) Jaggery to be made into moulds to suit local taste and market.

(12) Jaggery should be carefully tied into bundles in cane trash for storing, if not, immediately sold.

The Weaving Industry in Madras.

An investigation into the condition of the weaving industry, has brought out some very important facts. We find that the fly-shuttle has a bright future and that the number used is steadily increasing. The fly-shuttle slay is cheaper than the country slay and gives a greater outturn, which varies with the different counts of yarn used and with the experience and skill of the weaver. We find also that the fly-shuttle is easier to work. Mr. Subramania Iyer who made the enquiry has suggested the introduction of some sort of warping mill in places where the fly-shuttle has been adopted, the use of fly-shuttle for weaving broad cloths like turbans, the introduction of dobbies for weaving simple designs, the introduction of the Jacquard machine to weave complicated patterns and the introduction of frame loom wherever it is profitable. These suggestions are very valuable as they are definite.

Java Sugar.

The following special information has reached us regarding sugar cultivation in Java and the export of sugar from that island. "In 1911, the yield of 131,853 H. A. has been grinded against a yield of 126,523 H. A. in 1910. (1 H. A = 2·471 acres). The production of the crop in 1910 amounted to 1,280,300 tons, while that of 1911 has been estimated to be 1,455,260 tons. The export of sugar to British-India during the year 1911 amount to 440,000 tons, to Japan 35,000 tons were exported, and to Port-Said for orders, 520,000 tons."

Potato Flour.

In a recent issue of the "*World's Work*" "Home Counties" describes a potato flour factory and details the process by which potatoes are converted into flour :—

"The first process through which the potatoes are put, resembles that to which beets are subjected. The 'aardappelen' are washed very clean, for the potato factory, like the sugar factory, pays only for nett weights..... After being cleaned and weighed, the potatoes are rasped to pulp. The pulp is sieved through silk, and, in regard to the resulting farina, the task of the factory is to clean it ever more and more thoroughly. This is done by repeated washing and by another sieving. As the farina sinks to the bottom of the shallow troughs, it looks not unlike chalk. When sufficiently clean, the wet flour has most of the water flung out of it by being centrifugaled. It is completely dried on unending canvas rollers. After being sifted and granulated, it is the first quality flour, ("prima.") There are three grades. For the two inferior grades, the pulp or refuse, belched into wide shallow concrete settling tanks in the open air, is dealt with after being kept for about four months. The result is the second quality flour. The pulp from this product is kept for about four months in the settling tanks and is then used in the manufacture of third quality flour."

ECONOMICS.

Division of Labour.

Division of labour of which we hear so much as a factor in success in modern industrial competition has a dark side to it. We hear of the division of labour, and vaguely suppose it means that one man is a carpenter and another a butcher. Professor Commons tells us that in the butchers' gang at a packing house, there are thirty different positions, at twenty rates of pay. One man does nothing but split the back-bone, another removes the hide at the most delicate parts, another cuts where the work is easier, and so on to the man who pulls off the tail—nine different positions in the work of removing the hide alone. In all trades, this specialization is seen, with the result that the workman grows expert at one thing, but is unfitted for anything else. The constant repetition of the same act dulls the labourer, deprives him of pleasure in his work, and often sends him to the saloon to seek relief from the monotony of his toil.

The Cotton Excise Duty.

Professor P. G. Shah of the Forman Christian College, Lahore, thus writes about the excise duty on Indian cotton goods :—

The increase of the cotton mills and of the capital invested in the industry have been often brought forward as arguments to show that the excise duty has not hindered the progress ; but it cannot be denied that the progress would have been more rapid and thorough in its absence, than what it has been in spite of the duties. At least, "the present excise duties on certain cotton goods ought unquestionably to be abolished. Nobody in India, be he European or Native, regards them otherwise than an altogether unnecessary and indefensible sop to Lancashire Apart from political considerations, however, these Indian excise cotton duties form one of the most extraordinay monuments to British economic eccentricity that the whole of the Tariff controversy affords. Whilst, on the one hand, the free-traders of England are never tired of asserting that the protectionist policies of foreign nations can only handicap those nations and that Great Britain with the healthy free-trade principles is absolutely unassailable by such devices, the free-trade cotton spinners and weavers of Lancashire take very good care that India does not impose even 3½ per cent. for revenue purposes on their products without an accompanying and corresponding excise duty ! From the point of view of Great Britain and of the Empire as a whole, the excise duties are unnecessary and inexpedient."

The American Millionaire.

The number of millionaires in America, and the colossal size of some individual fortunes, are facts well known to our readers. Professor Jenks thus expresses the power of a small group of capitalists : It has been said that there are ten men living in the United States who, if they were willing to act together, could, within a short time, control the fortunes of all the great railroads of the country, of the steamship traffic on the Great Lakes, of more than one of the trans-Atlantic and trans-Pacific steamship lines, and of the telephone and telegraph systems. They could likewise direct the policy of by far the largest part of the mining of anthracite coal, of the oil industry, sugar refining, the manufacture of linseed oil, even of chewing gum, and of almost any other one or more industries which they might decide that they wished to control. These same men by combined action now control the most powerful banks of the country and are closely associated with the most powerful banks of Europe. They are ready to make loans to Governments, to finance a nation as they finance a Corporation.

These great fortunes, according to Andrew Carnegie, are the inevitable result of four things: individualism, private property, the law of accumulation of wealth, and the law of competition. These, he says, are conditions under which the best interests of the human race are promoted, but which inevitably give wealth to the few. The problem then arises how is this wealth to be administered ? This he answers: "for the welfare of poor humanity."

CO-OPERATION.

Earl Grey on Co-operation.

Asked as regards his opinion on co-operation as a business principle, Earl Grey told an interviewer on behalf of the *Millgate Monthly*, that co-operation stood for industrial peace and efficiency. Summing up its benefits, he said :—"You will find the Co-operative movement is making not only for thrift and wealth, but for character and the higher qualities of citizenship. As to the effects upon private trading, undoubtedly the Co-operative movement injuriously affects certain trades which suffer under the competition of Co-operative stores. That is an unhappy incident which is the unfortunate result of nearly every improvement. It must, however, be remembered that if a retail tradesman suffers here and there the increased spending power of the members of Co operative Societies gives employment to a very much larger number of workers than the number of private trades displaced, and also, if I am not much mistaken, creates new lines of private trade which would not have existed if co-operation had not increased the purchasing powers of its members by over £10,000,000 per annum." Earl Grey characterised the movement as being the result of free voluntary socialism, owing its success to its having grown up spontaneously from below.

Co-operation in Eastern Bengal.

The Co-operative Credit Societies of Eastern Bengal have been charging interest at rates which vary from 12 to 18 per cent. In some other provinces, this would be considered extraordinary, but still more extraordinary are the conditions on which loans are obtained by agriculturists from professional moneylenders. They charge ordinarily from 37 to 73 per cent., sometimes as much as 150 per cent., and in exceptional cases, a still higher percentage. The last Government review of the work of the Co-operative Credit Societies mentions that in one typical case, a cultivator borrowed Rs. 15, agreeing to pay interest at 7 pice a rupee a month, compounded every three months. After more than three years, the creditor sued him for Rs. 500, relinquishing the balance as a matter of grace, and got a decree which allowed 131¼ per cent. as being the usual rate of interest in the locality. In another case, a creditor, who lent Rs. 15, charged Re 1 a day as interest, and after three years sued for the recovery of Rs 999, relinquishing the balance partly as a matter of grace and partly in order to save court fees. The wonder is that he got a decree for the whole amount claimed.

How to Co-operate.

The following is extracted from a letter addressed by the late lamented Sister Nivedita to an enquirer on the subject :—

"If this is the branch which you are to take up, you will find that the subject has a history and a literature of its own. Read up *Co-operation* in the Encyclopædia Britannica. Write to the Irish Agricultural Organisation Society, 22 Lincoln Place, Dublin, Ireland, for their papers, and for advice and answers to definite questions. Read *Mutual Aid*, a scientific work, by Kropotkin, published by Heinnemann. Study the history of Trade Unions. Study the history of co-operation in Denmark. And study particularly the history of small countries, Norway, Sweden, the Hanseatic League, Motley's Rise of the Dutch Republic, etc. Make a small society for reading and discussing these subjects. Indeed do this in any case. Share your own knowledge, and co-operate in extending and deepening it. Above all, think things out, and put your thought into practice, learning from your own mistakes. Organise a single group of people for some definite aim, and see how you get on. Organise a class for, say, legal aid. That ought not to be difficult. But I think it would be a better experiment to make than organising for a charity, an enterprise which we are all accustomed to attempting and failing in. Organise for a united struggle of some kind, against something definite.

BANKING.

Savings Banks in Burma.

Burma has 271 savings banks as compared with 1,767 in Madras, and 64,464 accounts as against 307,722 in Bengal. The average number of depositors per bank is 160. Burma's average is 237. The average total balance at each bank is Rs. 19,000 and Burma's average is only just short of this. The average balance at the credit of each depositor is Rs. 118. In Burma the average depositor had Rs. 79, in Bombay Rs. 160 and in Madras Rs. 62. What conclusion can be drawn from this? Does this represent the average wealth of each province respectively? In Burma out of 64,464 depositors, 23,901 were what might be called "domestic." 11,700 were made by professional people with a fixed income, and only 2,756 by professional people with a varying income. Three thousand two hundred and thirteen deposits in Burma are commercial; only 518 are agricultural, as compared with 9,134 in Madras; 5,077 are industrial and 18,299 indefinite.

The World's Largest Banking Account.

Britain's banking account is kept at the Bank of England and stands in the names of the Lords of the Treasury, two of whom sign cheques drawn on it.

It is by far the largest banking account in the world, for the whole revenue of England, which exceeds the revenue of any other nation is passed through it.

The moneys collected by the different revenue-collecting departments, such as the customs and inland revenue, are lodged in huge bulk sums to the credit of the Treasury account every quarter, whilst the profits arising from the postal business all over the country are paid into the Treasury account through the General Post Office in London every month.

Millions are always being paid into the nation's banking account, but on the other hand, millions are always being paid out. At regular periods, millions must be paid out of the nation's banking account to the credit of the great spending departments, such as the War Office, the Admiralty, the Civil Service Commissioners, and then, of course, the money to meet the interest on the consolidated and other government funds has to be found the day the interest is due.

There cannot be a day's delay in finding the money to meet these great national liabilities, whilst, on the other hand, there often is a good deal of delay about extracting money from the pockets of tax payers, most of whom defer meeting the tax collector's demands for as long a time as possible.

The result is that the Lords of the Treasury find themselves from time to time in the position of an individual whose banking account is exhausted and whose bankers will not advance him money without security. When the Lords of the Treasury find themselves in this plight, they have to borrow money, just as the ordinary individual might have to do in like circumstances.

The Lords of the Treasury, however, find it easier to borrow money than would most ordinary individuals; they find as a rule that the wealthiest men in the world are only eager and anxious to lend them as many millions as they require at, of course, a price.

Bills are issued by the Lords of the Treasury which are known as Treasury bill for as many millions as are required to meet the nation's immediate pressing liabilities.

The bills are taken up by the great financial houses and are discounted at about three per cent. They are either issued for one, three or five months. If the Lords of the Treasury cannot pay them when they become due, they are renewed by the holders.

The nation pays about half a million a year in discount on bills, the greater part of which would be saved if every tax-payer paid up promptly what he owed.

The money raised on the bills is placed to the credit of the nation's banking account, and the Lords of the Treasury are then in a position to draw cheques on it without fearing that they will not be honoured.

It takes six clerks to look after the nation's banking account at the Bank of England, which is balanced every week.

INSURANCE.

Age, if Living.

An applicant for life insurance wrote under the headings, "Age of father, if living," and "Age of mother, if living," severally 112 and 120.

"Surely," said the secretary of the company, as he read these phenomenal figures, "your parents were not so old, were they?"

"No," was the answer; "but they would be if living."

Insurance as Co-operative Protection.

The Rev. Dr. White, pastor of the First Baptist Church of Hartford, Conn., in a recent address, said, Life Insurance is co-operative protection. That it is administered by a private company which is benefited by such privilege does not alter the fundamentally social benefits that are rendered. Controlled as they are by Governmental regulation and law, the abuses of such administrative privileges are kept within comparatively narrow limits. That this is a vast, social service is apparent to him who thinks of the great amount and universal scope of the insurance underwritten to-day in America and in the world. The value of Life Insurance, none can compute. Multitudes are under the ample folds of its protecting wings, and multitudes to-day are living in comfort upon the fruits of Life Insurance, who otherwise would be face to face with starvation or the almshouse. The pastor witnesses its blessings as he mingles with the lonely stricken families where death has claimed the bread-winner. The bread-winner himself may, if he be spared to old age, take the results of his investments in Life Insurance, and thus secure for himself and his family a well-earned plenty with the honourable thought that he has pensioned himself.

Investment of German Insurance Funds.

According to the Frankfurter Zeitung, too much care cannot be taken in regard to the investment of insurance funds. A German Insurance Company has asked for the Government's permission to invest part of its funds in interest bearing securities of Foreign States, or state guaranted debentures. In principle the Government is said to be willing to authorise this, provided that the amounts to be thus invested are kept within certain limits and that proper measures are taken regarding the selection of such securities. With regard to the latter question, the Government has asked the Berlin Chamber of Commerce for its opinion as to the best method to adopt, and the result of this institution's advice has been the establishment of an Advisory Board which will decide as to the suitability of such foreign investments for Insurance Companies The Government has adopted the suggestion and has asked the Chamber to nominate suitable persons for the Board. The attitude assumed by the Chamber of Commerce towards the question itself is very interesting. It states that the fundamental principle is not to obtain a higher return on the capital invested, but to be able to realise quickly the necessary funds in time of economic crises or war, without loss outside the home market. It is suggested, therefore, that only such securities should be selected as are good in themselves, and have also a free market abroad.

Policies against Rain.

It is stated by a Home newspaper that the novel scheme for insurance against rain risk brought forward in the early part of last year has proved so successful that it will certainly be continued this year, the promoters being helped by all the knowledge and experience gained. The policies are divided into four classes, providing payment for (1) each separate week in which there are more than two wet days, on each of which the rainfall exceeds 0·20 of an inch: (2) every wet day on which the rainfall exceeds 0·20 of an inch: (3) the second and each additional wet day in every week on which rainfall exceeds 0·10 of an inch: and (4) every wet day in any four consecutive days (week-ends, for example) on which the rainfall exceeds 0·20 of an inch. If this system of insurance were adopted in India, the ryots would insure their crops, not against rain, but against drought.

EDUCATION.

Teachers as Postmasters.

Inspectors of Schools in the Punjab have been informed that the Government of India consider the employment of schoolmasters on postal duties with small allowances offers considerable advantages The extra emolument is an attraction, and the additional labour thus involved, while not such as to interfere with their educational duties, tends to attach teachers more closely to their villages and helps to prevent transfers It is urged that the principle of employing schoolmasters more extensively on postal duties should be encouraged. It is a wise measure and we hope it will be adopted everywhere in India.

Vocationalism in the United States.

Vocationalism continues to be the dominant note of educational progress in the United States. Chicago would seem to be the chief centre of the movement to further it. But everywhere it spreads. A resolution passed at the last meeting of the Pennsylvania State Associaton emphasized the need of vocational training for that great majority of children whose educational opportunities cannot extend beyond those furnished in the public schools Whether the formal education of a child were to end on his fourteenth birthday or at some other time before ripeness for college, he ought, said the Association, to receive *the best preparation for efficient life* that can be devised. At Peoria, Illinois, a special organ, *Vocational Education*, is published The Educational Conference of Boston recommended that the department of vocational guidance at Boston should be enlarged and more effectively organized, with a Director of Educational Guidance at its head. Vocational guidance, it will be remembered, aims at fixing the mind of the child, from the earliest possible moment, upon the deliberate choice of a vocation and upon the means of preparing himself for it. The American boy will not, on leaving school, suddenly decide to become, for example, a cabinet-maker. He will have been a cabinet-maker *in spe* from early childhood.

Thrift in Schools.

A special sub-committee appointed by the Hampshire Education Committee to consider the subject of teaching thrift in elementary schools has reported in favour of the establishment in every school or department of a school above the status of an infants' school of a savings bank in connection with the Post Office Savings Bank, with the managers as trustees, all sums deposited to remain untouched to the end of school life and to be used for helping the child when it starts work. Object lessons on thrift and inculcating habits of thrift are also recommended, together with instruction in some special handiwork, with scholarships for technical excellence in handicrafts, and encouragement should be given to attend evening continuation classes At every school, a register should be kept of the occupations which children desire to follow ; assistance should be given to children with regard to the occupations ; and employers should be encouraged to use the school register and to give early information to head teachers with regard to vacancies. Boys and girls for whom suitable employment has not been found should be encouraged to remain at school until employment has been secured.

The Bombay Commercial College.

It appears from a Government Press note that the Bombay income from the donations to the proposed Commercial College in Bombay will amount to about Rs 23,000 per annum, and Government are prepared to contribute an annual grant of Rs. 15,000. The liberal and most gratifying support which the proposed college has thus received will enable it to be established, although additional funds will be required to make the institution complete in all respects and to provide scholarships. Details will now be worked out, and it is hoped that a beginning may be made next year with a staff of two professors (one to act as Principal) and two lecturers. As soon as the necessary arrangements have been made, an Advisory Board will be formed on which the contributing bodies will be represented in order that the courses of study may be kept in full harmony with the practical requirements of commerce and industry. The Governor-in-Council trusts that the establishment of this college, the first of its kind in this country, will in time go far to supply the growing needs of special commercial education, not only of the Presidency, but of India generally.

ECONOMIC PRODUCTS.

Camel's Hair.

Camel's hair is largely used for damping and dusting brushes. as used in photographs for dusting the glass plates prior to laying them inside dark slides and for damping the pages of press copy books so extensively used in merchants' and Railway offices.

A New Source of Sugar.

A new feature of the cocoanut business has attracted some attention recently in the Philippines ; the sap from the flour spathes contains about 16 per cent. sucrose, and it only remains for the organic chemists to devise some practical method of preventing premature fermentation in the "tuba," in order to start new sugar and alcohol industries here. This tuba, writes *Tropical Life*, can be purchased at or about 3*d.* for 10 litres (2 Imperial gallons). One tree will yield 1-1/3 litres of tuba per day ; roughly speaking, then, ten trees will give one kilo of sugar per day and twenty-five trees one ton per year, under (the usually) continuous tapping ; at this rate, if all their force were turned into sugar, the 25,000,000 bearing trees would produce 1,000,000 tons of sugar each year, which is one seventeenth of the world's total production from both cane and beet.

Indian Hemp Fibre and Seed.

The quantities of cotton seed, plantain fibre, sawdust and other useful substances that go to waste annually, owing to the absence of industrial enterprise, says a writer in *Capital*, must be literally incalculable. "In the report before me, I find a singular instance mentioned of what must be considered unpardonable and avoidable economic loss. At Padavedu, there appears to be a good deal of ganja or Indian hemp cultivation, but no attempt is made to extract the fibre from the plants, while, to prevent illicit cultivation, a large quantity of seeds is annually destroyed, from which a useful oil may be expressed. It may be pointed out that the male plants yield the best fibre, but the plants are pulled up and burnt, merely because they produce no appreciable quantity of ganja. Fibre of fair quality can be extracted from even female plants, after they have flowered. In view of the ever-increasing demand both here and abroad for good fibres, is it not lamentable that good fibre should be deliberately destroyed in the manner here referred to ? The question is one which might usefully engage the attention of the Provincial Director of Industries."

Alum.

Alum is soluble in water, but insoluble in alcohol. It may be used for many purposes ; its main action is that of an astringent. Taken internally for any length of time, it coagulates the secretions and impairs digestion. Relaxed mucous membranes are toned up by an alum solution. If a leucorrhea calls for an astringent wash, two drams of powdered alum to a quart of water are sufficient. A smooth piece of alum, the size of a hazelnut, inserted at night near the neck of the uterus helps to contract that organ when it is congested with a tendency toward prolapse. Epistaxis and bleeding piles are often benefited by alum used in solution or in insufflation. The dried powder is escharotic, and is used to destroy granulations, warty growths and granular lids. Alum is used in lead poisoning. Passive hemorrhages, may be benefited by it. In case of hemetemesis it is, well to give a hypodermic and atropine, apply cold to the chest and let the patient suck a piece of alum; the latter keeps his mind employed and may do some good beside. Alum-and-honey is an old and efficacious remedy in croup as it produces emesis and brings up the offending membranes and secretions. For a relaxed uvula, nothing will draw it up quicker than a gargle of alum water. Sweating, painful feet are relieved by bathing them in water to which alum is added.

BUSINESS METHODS.

Advertising Ability.

The theory of Mr. J. Murray Allison, of the *Times*, is that a principal should know all the details of his business and then select the right people to carry them out. In his own words, "*every farmer should know how to plough and yet not plough. His business is to farm.*" Advertising ability he defines as " literary and artistic ability combined with selling sense and common sense. " That is worth remembering; it is far and away the best definition of advertising abilit that has ever been given.

Retail Business.

No retailer likes one of his regular customers to buy anything at a competitor's establishment. The competitor, if he knows anything about shopkeeping, will lay himself out to produce a good impression upon a strange caller, and the first thing that the other man knows is that he has lost a customer. Consequently, retailers will take a little trouble and invest a little money to have their names put on the list, and a very common feature of new proprietary campaigns is extensive display advertising in a paper, with addresses in quite small type classified according to locality.

Business Forecasts.

Business men, before embarking on any venture, generally figure out the probable outlay required, the receipts, expenditure and the profit that may be expected from the concern. But how many of these forecasts approach the figures thus arrived at! The fact is, life, as we see it from the business point of view, consists in a large measure of obstacles, which seem calculated to upset our plans. We grumble and express our angry feelings freely, but they are of little avail, and no obstacle ever yet moved because we grumbled at it. We must put our best efforts to work, and use the best tools, perseverance and determination to effect a clearance, and make an open pathway.

Petty Savings.

Behind every trifling saving and behind every trifling waste in the conduct of a business enterprise looms a fundamental economic principle.

Every shilling that is saved in the management of an office increases the earnings of the company by that amount. A shilling increase in the earnings of a company increases the value of its capital stock by about one pound. Figured on this theoretical basis, the " little savings " in the conduct of an office force assume large proportions; the smaller the concern, the larger, proportionally, do these small economies become. Nothing is too small to be overlooked.

Salesmanship.

One great step to be mastered by the student of the science of salesmanship is that of the tactics of selling. This is a matter that opens so wide a field of comprehension, and yet is so little understood that it is difficult to detail, or even to explain. It is one, which is full of surprises, and offers many inducements for departure from the ordinary beaten track of the effect of the sale. Many difficulties crop up everywhere, and there are plenty of pitfalls to steer clear of.

By the tactics of selling is meant, briefly, the methods adopted by every salesman to induce the customer to buy. Of course, there are some who do not require to be even led, ever so gently, with a silken string, but these can scarcely be taken into consideration at all, for they are so easily handled that a man of ordinary good address and polite ways will find no difficulty in giving every satisfaction. They also carry a reserve fund of good things with them, and the adroit salesman can store them up for future use. They will very probably come again, but it must be made very certain that they will not forget it, and not a small amount of tact is required to bring this end about.

But the tactics of selling, are also of quite another character. They are the methods used to persuade the customer, to draw him into a line of thought which is a fixed desire to buy, and from this, to a determination to give an order. All this is by no means to be considered in the light of an automatic performance, but such stages require very skilful handling and manipulation if full results are to be achieved.—*Dickson's Monthly*.

FRAUDS AND FAKES.

Adulteration of Tea.

Every housekeeper should be on the watch for indications of adulteration in low-priced teas. The leaves are sometimes moistened, warmed, and powdered, colouring matter, such as indigo, Prussian blue, turmeric, etc., being then shaken over and mixed through them. This is done to improve the colour, and may be detected by shaking the leaves in cold water and quickly draining it off into another vessel. The sediment can then be examined, and subjected, if desired, to a laboratory test. Used tea leaves are also often added to give bulk; they can be discovered by analysis.

Frauds in the Leather Trade.

A person need not be an expert to observe that boots are not what they were. They are certainly smarter in form, but, remarks *Science Siftings*, the material from which they are manufactured has a papery appearance as compared with the substantial-looking leathers of a decade or two ago. Fake and adulteration are at the bottom of this change, and it is one that tells hardly against the wearer. Most people are not even aware that leathers are adulterated; yet, it has been estimated by experts that at least half, and probably more than half, of all the leather that comes to market in the shape of boots and shoes, harness, bookbindings, etc., is sophisticated in one way or another.

Adulteration of Leather.

The chief among the adulterants of leather is glucose, a kind of treacle obtained from starch The glucose is applied either by brushing it on or by putting it with the leather into a revolving drum: the object in either case being to add weight. It should be remembered that much leather is sold by the pound, and when loaded with ten per cent. of its weight in glucose, it brings a more satisfactory profit. Unfortunately, the effect of such treatment is to make the leather more penetrable to water, and hence to impair its wearing quality and shorten its life. Where soles and harness are concerned, it works most unfortunately for that habitual victim, the ultimate consumer.

Another common adulterant of leather is Epsom salts, which is alleged, by those who use it, to " clear the grain " and render the material brighter. Any such effect, however, is slight, and the treatment is very harmful, destroying the waterproof quality of the leather. Here, again, the object in view is to add weight, which may be augmented to the extent of ten or twelve per cent.

Yet another method adopted consists in putting into the leather a large excess of tanning material—which, it will be understood, comprises tannin and related compounds, sugars and organic acids. By this means, twenty per cent. may be added to the weight. The effect of the treatment is to make the leather more water-resistant at first; but the superfluous tannin, soon washes out, so that there is no real gain in that respect, while the material is rendered harder, stiffer, and more likely to crack in bending.

The manufacturer, after he gets his leather, too often puts it on an emery wheel and scratches off all the grain; that is to say, the outside surface. This is very bad; for, when the grain is gone, the wearing quality of the material is also gone. The idea in view, of course, is to make the boots or shoes look pretty—the public taste being to buy pretty things, regardless of qualty.

If the footwear look pretty, however, they will sell; and the manufacturer blackens the soles so that the ultimate consumer cannot see whether they are made of leather or paper. As a matter of fact, however, the paper used in boots and shoes of cheap grades goes into the inner soles and counters (the back leather or heel part) ; that is to say, the parts that are least exposed to wear. For this purpose, leather scraps are commonly ground and mixed with paper pulp, to be moulded into the requisite shapes. Sometimes the mixture is treated with oil, rubber, and glycerin, the last named ingredient serving to soften it, while the rubber and oil render it waterproof.

MACHINERY AND INVENTION.

Pocket Telephones.

The pocket telephone is a new device which the municipal authorities in Berlin are using. It appears this new system is greatly favoured as an adjunct to the police system there, for every policeman is provided with one pocket telephone and he can communicate with the head-quarters or other city departments whenever he finds it necessary. Contact devices have been provided in every street at very short distances. They are fastened to the walls, doors, trees, lamp-posts or other convenient places. They are tightly enclosed so that neither humidity nor storms can damage them, and they are thoroughly insulated. The device is so small that it may be carried in a pocket or a handbag. The whole thing weighs 7 oz.

Powdered Milk.

Some interesting particulars are given in a Consular report concerning New Zealand powdered milk, which, it is stated, is gaining considerable reputation on account of its nutritious and keeping qualities, and which has become a formidable rival of condensed milk. The powdered milk is said to be more digestible and more suitable for infants' food than condensed milk, as it is thoroughly sterilised and contains no cane or beet sugar. Powdered milk, as produced in New Zealand, contains about 26 per cent. butter fat, 22·9 per cent. proteids, 42·8 per cent. milk sugar, and 5·6 per cent. mineral salts. It consists of flaky powder of cream colour. Very complete sterilisation is obtained during the process of drying off the water, but little or no alteration occurs in the essential elements of the milk. The milk is dried within two hours of its being drawn from the cow, the cans into which the milk is received having previously been washed in lime water, then in cold water, and finally sterilised with steam. Tuberculosis is guarded against by veterinary inspection of the cows, and also by the sterilisation of the cans, which insure the destruction of all bacilli. One kind of powdered milk is made entirely from skim milk, and is used largely in biscuit factories and in the manufacture of milk chocolates. For that purpose, it is exported to England. Its use by biscuit manufacturers is said not only to improve the flavour of the biscuits, but to add about 15 biscuits to the quantity made from every pound of flour used. The powdered milk sold chiefly for infants' food and for use in tea and coffee is a dessicated milk to which cream has been added. The milk is now recommended by local physicians as superior to any of the imported preserved milk preparations.

Rice Milling Machinery.

Mr. L. G. Meldram, M. E., writes to us :—

I read the article on "Rice Milling in Southern India," written by Mr. K. Surya Narayan Row in the June issue of this magazine with a great deal of interest. Some of the statements made by Mr. Row, are in my opinion, open to question.

The remarks which he has made about Rangoon Shellers, as compared with American Shellers are very one-sided. It is an admitted fact that the Rangoon Type Shellers are procurable from local foundries at a very reasonable rate, but there are other things to be taken into consideration, namely the far larger capacity of the American Sheller and the fact that the Genuine Engelberg Sheller does not require, nor does it consume as much horse power as the Rangoon Sheller does. These two points play an important part in the economical and effective working of a factory.

It is somewhat hard for me to follow his remark regarding the "numerous wearing parts" of the American Shellers. He apparently refers to the one wearing part, namely, the footstep bearing which needs replacing, according to use, at a small nominal cost. The artifical stones have to be renewed periodically in both the Rangoon and American Types, so there is really no foundation for his remarks about the "numerous wearing parts" of the American Sheller.

The cause of failures may be attributed to still other reasons than those explained by Mr. K. Surya Narayan Row—

1. The building of mills where the previously existing mills were consuming the available supply of paddy.

2. The closing down of mills owing to differences of opinion between the partners.

3. Losses due to speculation in paddy.

It is a well-known fact that the buyer in India is very apt to be tempted by the low cost of an inferior article. It will give him more trouble and expense in the long run, which might be avoided if he made his purchase from a reliable firm, at a slightly increased initial cost.

I quite agree with Mr. Row in his statement that the Genuine Engelberg is far superior to all imitations and others, for this has been proved beyond a doubt, but I do take exception to the statement that locally made parts can be obtained at 1/20 lb. of the cost, and are equal in quality and utility to the Genuine parts imported from abroad. There are many reasons for their not being as good, the chief being that they are not replicas of the imported parts.

In conclusion, I would say only one thing more : when buying machinery always go to a reliable firm, even though you have to pay a little more at the beginning.

HINTS AND RECIPES.

Milk Glass Cleansing.

Milk glasses should always be rinsed in cold water previous to washing in hot soap suds, if you wish them to be clean and bright.

Secrets of Toast Making.

The secret of having crisp toast is to cut the bread the night before, so that the surface is dry before it is toasted. Another trick is to stand the slices, when toasted, upon edge —the crust always downwards—in some place where they can be kept hot until they are served. If the slices are placed one on top of the other, they become pappy.

How to Extract a Damaged Screw.

One is often required to remove a screw with one side of the head broken off. The following is a method of drawing out the broken screw with ease and without disfiguring the work : Place the screwdriver against one side of the head, and with a small block, press firmly against the screwdriver, at the same time turning the screwdriver and the block. The screw will come out almost as easily as if the head were intact.—*William Grötsinger*.

Crystalline Coating for Wood or Paper.

A mixture of very concentrated solutions of salt and dextrine is applied as thinly as possible by means of a broad, soft brush to the surface to be coated. When dry, the coating is found to be colored like light mother of pearl and adheres firmly. Glass must, for this purpose, be coated previously with an alcoholic shellac solution. To stained glass, it imparts a beautiful appearance. Paper must be sized, otherwise, it will absorb the solution and prevent the formation of crystals. As salts, sulphate of magnesia, acetate of soda and sulphate of tin are well adapted.

An Improved Cup of Coffee.

A recent German patent has for its object the preparation of a coffee beverage which is perfectly clear and entirely free from any foreign tinge in its taste. The coffee is first boiled up in the usual way with water. The sediment is then allowed to settle on a fine meshed sieve for about six minutes, whereupon the infusion is filtered through this same sediment. The fine particles always present in the infusion of coffee are deposited in form of a slimy film on the surface of the sediment. Claim is also made of a larger yield of the

extract by this method than is usually obtained by any other methods of preparing this beverage. This method (or at least a very similar one) is used in Turkey and Roumania for preparing Mocha coffee.

How to Choose Your Tea.

Do all who drink tea know how to choose the good tea from the bad?

Tea may be judged by the organs of sight, smell and taste. The dry leaves should be well twisted, crisp to the touch, and free from much stalk, for stalk floats on the surface, and imparts no flavour. They should also be free from dust. An expert would be able to tell by smelling the dry leaves, whether in the manufacture, they have been overfermented or burnt by over-firing, and this faculty can be learned by noting the scent of really good tea and comparing it with that of interior qualities. Having carefully observed the dry leaves, an infusion must be made, and care taken to notice whether the tea leaf yields a dull, dark, flat liquor; whether there is much colour, but no taste; whether the liquor is blackish; whether the tea leaves after infusion turn very dark. Any of these signs denote tea of poor quality. Good tea should yield liquor of a reddish gold tint, full-bodied, yet not muddy, it should turn a rich chocolate colour when milk is added, and the used leaves should have a bright brown, not black, shade.

Choice of Linen and Cotton Goods.

To distinguish between linen and cotton material, examine the threads; the linen thread is stronger, flatter and smoother, whereas the cotton breaks easily, is rounder, and has a fluffier surface; often the material has linen threads for the warp and cotton for the woof, so that the threads in both directions must be examined, if linen material is being bought, and careful observation through a magnifying glass is necessary, as cotton is often manufactured to look like linen. To ascertain if the material is firm and close, it must be rubbed between the fingers, when, if good, there is little change in the fabric, and when held up to the light, it must not look thin. If cotton material is bought, both sets of threads must be of good quality, or it is likely to split. Unbleached cotton material is cheaper and wears better. This applies to bed linen, towels, tea-cloths, etc.; and it quickly becomes white after washing two or three times. Unbleached damask for table-cloths and serviettes can be bought by the yard of different widths and cut as required. Table-linen damask should be chosen of a good quality, firm and thick, for it will then last clean much longer, will not crush as easily, and gives the table a better appearance.

Sticky Adhesive with Cold Water.

Mix starch or starchy substances thoroughly with water and heat the paste, for instance, by spreading it in a thin layer on heated rolls, so that, at first, a sort of dough and then a dry mass is obtained, which is removed from the rolls in the form of flat cakes. The rolls, for this purpose, must be heated to 110 deg. Cent. Before or after heating, an alkali or an acid is added to the finely divided or dried starch paste to increase its adhesiveness. Examples: (1) 100 parts of finely ground potatoes are mixed with 0·5 part of hydrochloric acid (specific gravity 1·2) and 300 parts of water, the paste smeared on rolls heated to 110 deg. Cent., and the dried starch mass ground fine. The starch paste can also first be changed into the doughy form at 750 deg. Cent. and then converted into dry form at 110 deg. Cent. (2) 100 parts of starch flour are thoroughly mixed with 500 parts of water, then heated, in thin layers, on steam-heated rolls to 120 deg. Cent. The dried mass is finely pulverized and 2 parts of pulverized sodium carbonate mixed with it.—*Farben Zeitung*.

To Preserve Grapes.

Several recipes for preserving fresh grapes have appeared from time to time, but the simplest of all is probably that being now practiced in parts of France. It consists in hanging a bunch of ripe grapes in a jar of water to which has been added a little charcoal dust and a pinch of sea-salt, or a few drops of brandy in place of the ingredients named. Several bunches may be placed in the same jar, but they must not touch one another or the jar. A separate flask for each bunch of grapes is said to be preferable, in which case a hole is drilled in the cork, which is then cut in halves, the stalk of the bunch of grapes being then fitted between the two halves and the whole fitted to the neck of the flask, which is then turned upside down and put in a hole in a specially prepared shelf in a dark room. The free end of the stalk is waxed over to prevent too much evaporation, and the temperature of the room is kept as constant as possible. By these means, it is claimed that bunches of grapes may be kept fresh for a considerable period.

OPENINGS FOR BUSINESS.

[For particulars, address the Director-General of Commercial Intelligence, new Imperial Secretariat, 1, Council House Street, Calcutta, mentioning the *Wealth of India*. Firms that may like to follow up any enquiry should give proper references and restrict themselves to those enquiries only which they are fully and seriously qualified to handle.]

Tinned Fish.

An Aberdeen manufacturer desires to appoint agents in Calcutta, Bombay, Madras, Karachi and Rangoon for the sale of Scotch tinned herrings in tomato sauce, haddocks, cod, etc. (B53)

Spraying Machines.

A London engineer desires to be placed in communication with importers or users of spraying machines for use in lime washing, disintecting and spraying liquids of all kinds. (B68)

Rosa oil.

A company at Lahore desires to be placed in communication with sellers of rosa oil (B68).

Tin Boxes.

A concern in the Punjab desires to be placed in touch with manufactures of tin boxes suitable for tooth powder. (B69).

Indent Business.

A limited company in Birmingham desires to enter into communication with native agents who may be in a position to secure indents for hardware, metals, general merchandise and other kinds of goods. (B71).

Sheep Skins.

A firm in Hongkong desires to be placed in communication with shippers of tanned sheep skins. (B72).

Rice, Jute Bags and Tea.

A firm in Trebizonde desires to be placed in communication with exporters of rice, jute bags and tea. (B73)

Butter.

A firm in St. Petersburg is desirous of being placed in communication with Calcutta importers of high class tinned butter. (B74)

Sesame Oil.

A Calcutta joint stock company desires to be placed in communication with sellers of sesame oil. (B90)

Indian Produce.

A firm in Trieste desires to be placed in communication with shippers of oilseeds, groundnuts, hides and skins, jute, mother of pearl, shellac, myrabolans and rice bran. (B91)

Sesamum Seed.

A Dacca firm desires to be placed in communication with sellers of sesamum (jinjili) seed in large quantities. (B92).

Salt.

A Bombay concern desires to be placed in communication with firms in a position to secure orders for a Spanish salt mine. (B93).

Soda Crystals.

A limited company in England desires to be placed in communication with importers of soda crystals in Calcutta. (94).

Nut Galls.

A concern in Japan is desirous of being placed in communication with exporters of nut galls. (B95).

Bauxite and Steatite.

A Punjab correspondent desires to be placed in communication with sellers of bauxite and steatite. (B96).

Agar-Agar.

A correspondent in Italy desires to be placed in communication with sellers of agar-agar (*Gracilaria lichenoides*). (B98).

Hair and Bristles.

A Hamburg firm desires to be placed in communication with shippers of horse, cow and goat hair and bristles. (B100).

Cotton Yarn.

A firm in Bolton desires to be placed in communication with firms requiring buying agents for carded or combed cotton yarns, from 20's to 200s, on cop, or in bundles, cheese, ball warp or beam, in grey, bleached, mercerised or dyed state. (B101).

MISCELLANEOUS.

Population of Calcutta.

Curious facts with regard to the population of Calcutta are brought to light by the report of the last census. The total population is given as 8,96,067 of which 6,07,674 are males or more than two males to each female. Another peculiar feature is that only 22 per cent. of the population are children under 15, whereas in Bengal, the percentage is 38. The growth in population in the last ten years has been 48,271, of which figure, 41,701 are males of working age, 15 to 50 years. This is due to large immigration into the city of working men. This is further shown by the fact that, during the last ten years, there have been in the city 2,87,673 deaths but only 1,60,485 births, leaving a balance of over 1,26,000 to be made up, so that there must have been at lowest estimate 1,74,459 immigrants. The effect of this on the death-rate, it is pointed out, is considerable and the death-rate for 1911 should have been 31·5 not 27·2, figure returned. In the same way, the birth rate is affected and should have been 28 1 instead of as returned 22·7. The whole increase of population in the last ten years has been among the Hindus, every other class having diminished. The increase among the Hindus amounts to 57,649. The number of European British subjects has not increased.

British National Debt.

The British National Debt at the end of last financial year was £724,806,428 or £8,266, 182, less than at the beginning of the year, according to a recent parliamentary publication. The debt stood at over 846 millions in 1846, and did not fall below the eight hundred millions until 1868. Another score of years passed before the debt entered upon its low water mark period of six hundred odd millions. That period lasted down to 1903 when the minimum figure of £635,333,300 having been touched in the previous year, slight increase occurred, prefacing a return to the seven hundred millions era. In three years the debt increased roughly by 98 million but has since steadily declined.

Commercial Failures in the U.S.A.

According to the report of the British Consul-General, the commercial failures during last year in the United States numbered 13,441, with a defaulted indebtedness of £38,212,838, as against 12,562 insolvencies for £40.351,419 in 1910. The opening quarter of the year showed the heaviest failures, the middle six months showed an improvement, but during the last quarter, the rates again rose sharply. Banking failures numbered 107, the liabilities being £5,102,321.

The Dacca Muslin.

Now that the Governor is going to pass nearly two months at Dacca, will His Excellency, urges the "*Patrika*" be pleased to make some enquiry into the history of the famous muslin of Dacca, the manufacture of which has now practically disappeared from that town? Is it possible to revive the industry? From an official report published about three years ago, it gathers that even when the decline had commenced and when the trade was in the hands of the East India Company, in the beginning of the last century, the value of the exports of Dacca "malmal" was estimated at £120,000 yearly.

Water Power in the U.S.A.

A report, compiled by the United States Department of Commerce and Labour, on the important subject of water-power development, has been made public. It contains recommendations to President Taft, urging that the Government should preserve their title to the remaining power sites and develop them, to prevent, if possible, the monopolisation of public utilities. It directs attention to the increasing affiliation of water-power concerns with public service agencies, such as electric railways, lighting corporations and often Banks as well. Such a connection, the Department regards as of serious public significance, and declares that ten great groups of interests with the General Electric as the most powerful, control, or strongly influence, 60 per cent. of the developed water-power of the United States.

THE

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SPECIAL ARTICLES.

ROMAN CATHOLICISM AND ECONOMIC PROGRESS.

BY

THE RIGHT HON'BLE SIR HORACE PLUNKETT, K.C.V.O., P.C., LL.D., F.R.S.

In the May issue of the *Wealth of India*, Rev. P. Carty, S.J., complains that in my book, "Ireland in the New Century," I referred to the Roman Catholic religion as "non-economic", or even "anti-economic"; and in disproof of my statement he proceeds to show that certain Catholic nations are among the most prosperous of European communities.

Father Carty's complaint is, I venture to think, due to a hasty reading of the passage on which he comments. All Christian religions are non-economic so far as their teaching is merely that of the Gospel. The Gospel is not concerned with the laws which govern the production and exchange of wealth—these, the essential subject matter of economics, lie wholly outside its scope. To say that the Roman Catholic religion is non-economic is one way of saying that it is a Gospel religion; with this appreciation Father Carty should find it hard to quarrel. Furthermore, the Gospel, in one aspect of its teaching, may be said to be anti-economic. It discourages the accumulation of wealth, extols contentment with mere

necessaries, makes the renunciation of property an act of supreme merit. All these ideals are contradictory of the qualities which the economist regards as the basis of national prosperity and may therefore be described at least as uneconomic. Now no Christian Church insists on these uneconomic principles of the Gospel with the same emphasis in theory and the same effect in practice as does the Roman Catholic. On this ground, the epithet "uneconomic" may be applied to the Catholic religion in a sense in which it is not applicable to any other Christian creed. Father Carty will not regard this as a reproach. Neither do I.

What I have been saying does not imply that a people which is wholly or predominantly Catholic may not attain a high degree of material well-being and be counted among the opulent nations. Influences, for which, in the paragraph quoted by Father Carty, I specially allowed, intervene to limit the range and circumscribe the application of what I have described—I hope without disrespect—as the uneconomic teachings of religion. This has happened in the case of those prosperous Catholic countries which Father Carty enumerates and which, he failed to observe, I had already mentioned in my book. It did not unfortunately happen in Ireland. Here fortitude under suffering and patience in poverty were the natural virtues which, above all others, the Church was called on to inculcate. But times have changed and the way is open for the Roman Catholic Church to exercise in Ireland the same economic influence it has exercised in Lombardy, Belgium and many parts of Germany. I doubt whether Father Carty and I differ at all in our view on this question, which is outside our respective religious faiths. It is certain that many of his brethren in the priesthood agree with me and are acting upon their belief by supporting an economic social movement in which I work.

THE PLANTAIN AND ITS PRODUCTS.

BY

PROFESSOR MANINDRANATH BANERJEE, F.C.S., LONDON.

IMPORTANCE OF THE INDUSTRY.

Like the cocoanut, the plantain forms one of the useful articles in India. As an English friend of mine has rightly observed, where there are enough of cocoanut palms and plantains, there is every chance of securing a fruitful and lucrative field of industry.

PLANTAIN—ITS EASTERN ORIGIN.

The *plantain* and *banana* belong to the tribe of *musacae*. The name of this family of plants being derived from *Musa*, it sounds quite classical which misleads some writers to forget its true oriental origin. The name undoubtedly comes from Arabic "Mouz" or "Moz" and Sanskrit "Mocha." This is now applied to the genus which produces the fruits commonly known as *plantain* and *bananas*. From the writings of Theophrastus, Pliny and Garcias, we can reasonably conclude that this plant was known by description to the Greeks and Romans. There are several species of the genus of the natural order of *Scitaminæ*. Some writers make a limit of it to twenty, several of which are regarded as mere cultivated varieties. Kurz, in his two famous articles on the plantain, describes eighteen Indian species and refers to the cultivated forms as nine only. For all practical purposes, however, the many varieties of *banana* and *plantain* may be included under the name of *Musa Sapientum* as distinguished from *Musa Textilis*, which yields the manila hemp of commerce.

GEOGRAPHICAL DISTRIBUTION.

The species of *musa* are found in hot and tropical parts of the world. From the Philippine Isles, it extends to the Indian archipelago, thence northwards as far as Japan, China along the Malayan Peninsula to Chittagong and the valleys in the South of the Indian Peninsula and of the Dindigul mountains. In the interior, it is extensively cultivated. It is abundant in the Malabar, Bassein, Broach and according to Dr. Helfar, the plantain is to be found in the highest perfection in Tennasserim, especially in the province of Amherst. The wild type grows along the jungly base of the Himalayas, having a suitable climate as far as 30° of North latitude. A particular variety is found in Nepal, but the fruit of this is full of hard-seeds. Major Munro observes that he has seen the wild type grow at as great an elevation as 7,000 feet above the sea. In Guiana, Demerara, Jamaica, Trinidad, and other principal colonies, many thousands of acres are planted with the plantain.

THE UTILITIES OF THE PLANT.

The utilities of this most valuable plant may be enumerated and briefly described thus :—

I. *The Fruits*:—The ripe fruits of some of the edible varieties of the plant are very sweet, delicious and of nice flavour. They form a splendid article of food, both for the foreigners and natives. The Europeans have a special liking for the fruit. The bunches of this type sell throughout the country in all seasons at a tolerably high price which alone brings in a profitable return to the planter.

The fruits of the edible varieties therefore form a staple kind of food. To the Negroes in the West Indies, this is invaluable and like bread to the European. It is by them denominated the staff of life. Not only does the plantain supply the place of bread and serve as delicious fruit but it is also used in a preserved state as dessert.

Flour:—The farinaceous parts of the fruit may, moreover, be separated in the form of flour. This is done by taking off the scales of the raw plantain fruit, then slicing it into pieces and drying in the sun after which it is powdered. The flour is as nutritous as *rice*. Prof. Johnston analysed this and found 27 per cent of nutritive matter while potatoes contain about one-fourth their weight of nutritive matter. M. Bousingault says that he has reason to believe that in nutritive value it is superior to the potato as, by practical experience, he has found that 2 pounds only of the dry-meal sustained the health of hard-working men perfectly well. The following is the composition of rice, potato and plantain.

		Rice.	Potato.	Plantain.
1.	Starch ...	86·9	65·0	78·4
2.	Sugar, Gum, etc. ...	0·5	15·0	7·6
3.	Fat ...	0·8	1·0	0·5
4.	Cellular Fibre ...	3·4	8·0	5·6
5.	Protein compounds, (On which the sustenance of the muscles chiefly depends).	7·5	8·0	5·2
6.	Ash ...	0·9	3·0	2·7
		100·0	100·0	100·0

These numbers clearly show that, in composition, the plantain nearly approaches rice as has been said before. In South America, the fruit is used as an article of internal trade besides having its flour separated and cooked or made into biscuits. A distinguished authority, Dr. Forbes Royle, M.D., F.R.S., observes "The composition of the ash of the plantain also bears a close resemblance to that of potato. Both contain much alkaline matter, potash and soda salts and in both there is nearly the same percentage of phosphoric acid and magnesia. In so far, therefore, as the supply of these mineral ingredients is concerned, by which the body is supported as necessarily as by the organic food, there is no reason to doubt that the banana equally with the potato, is fitted to sustain the strength of the animal body."

FOOD FOR INFANTS AND INVALIDS.

A Bengali Gentleman has already established a concern in this article and is selling this flour as "Paul's Banana food." The banana flour which has been pronounced by eminent medical men as having first class medicinal properties, forms an excellent food for infants and invalids.

II. *Minor Products*.—The shoots and the tops of the young plants are occasionally given as *fodder* to sheep and cattle generaly, and are described by some people as a most delicate edible article for these animals. The leaves in the dried state are used for *thatching* and *bedding*. The raw leaves are used throughout the tropical countries as *dinner-plates*. In large festivities and in other social celebrations, even in the houses of the wealthiest people, these leaves serve the commonest, the most decent, plates to eat on.

The raw fruits are used as vegetable. The flower of the plantain forms an excellent

variety of vegetable food in Bengal, one flower selling from two to four annas in the Calcutta bazaars. They are boiled and made into a dish with spices. Again, the *pith* of the plantain stem is easily saleable, being an edible article. Every Indian market abounds daily with these vegetables and they sell at moderate rates. In Calcutta, these are rather costly vegetables owing to the large demand and consumption.

USE IN COUNTRY MEDICINE.

Various kinds of medicines in the Ayurveda are being prepared from the different parts of the plantain as they form potent remedies. The sap of the plantain and the ash of the leaves, etc., form with the villagers an ordinary material for washing clothes. The sap is also used in tanning leather. The village school children in India know very well how to prepare their ink from the plantain sap and iron filings.

The uses to which the plantain is put are innumerable, and from these alone the value of the plantain as an industrial article could be easily ascertained.

III. *Fibre.*—The next product of the plantain is its fibre. As the cultivation of the plant is done primarily for the fruits, leaves, etc., the fibre forms a sort of bye-product. For the up-keep of the plantain plantation, a large number of trees require to be cut annually after they have borne fruit. The stems of these may be fully utilised for the manufacture of fibre which forms the most important product of the plant. For various reasons, this industry is totally neglected by our plantain cultivators but it is time now to move them so that they may interest themselves in this, one of the most lucrative lines of business in India.

THE VALUE OF THE PLANTAIN PLANT.

The plantain and banana, therefore, are highly valuable; their products--the leaves, the petioles the stalks, the pith, the fruits and the flowers in fact every part of this valuable plant can be easily turned to commercial gain. Such being the commercial and industrial value of the *banana* and *plantain*, the illustrious Humboldt long ago remarked that this plant is for the torrid zone what *cerelia* are for Europe and westeren Asia or rice for Bengal and China. He also observed by accurate calculations from practical experience that the same extent of ground when planted with this valuable plant will support a far greater number of people than when planted with wheat.

The method of extracting fibre from plantain stalks will be described in detail in a subsequent issue.

TRADE IN THE TWENTIETH CENTURY.

In an article in the *Daily News*, Mr. L. G. Chiozza Money gives some interesting particulars about the unprecedented trade progress which has taken place during the first ten years of this century. Here are the figures :—

THE RISE IN IMPORTS FOR HOME CONSUMPTION.

(Twelve months ended December in each case.)

Year.	United Kingdom mill. £	United States mill. £	German Empire mill. £	France mill. £
1900	460	173	283	188
1901	454	183	266	175
1902	463	202	277	176
1903	473	207	295	192
1904	481	216	313	180
1905	487	246	350	191
1906	523	275	394	225
1907	554	296	430	249
1908	513	288	377	226
1909	533	307	419	250
1910	574	326	423	270
Increase in 10 years	114	153	140	82
Increase per cent.	24·8	88·4	49·4	43·5

THE RISE IN EXPORTS OF OWN PRODUCTIONS.

Year.	United Kingdom mill. £	United States mill. £	German Empire mill £	France. mill. £
1900	291	301	227	164
1901	280	298	218	160
1902	283	277	230	170
1903	291	304	247	170
1904	301	297	257	178
1905	330	333	282	195
1906	376	369	313	211
1907	426	395	337	224
1908	377	360	315	202
1909	378	354	324	229
1910	430	381	367	240
Increase in 10 years	139	80	140	76
Increase per cent.	47·7	26·5	61·7	46·3

Here Britain and Germany made the chief advances both actually and proportionately. Curiously, both countries gained as nearly as possible £140,000,000, in exports in the ten years, but as Germany started from a lower level, she made the greater proportionate gain.

In this connection, the following tables extracted from the *Commerce of the World in* 1910 published by the Foreign Trade Bureau, Commercial Museum, Philadelphia, United States of America, will be read with interest :—

Imports into leading nations—by countries—1910.

VALUES GIVEN IN MILLIONS OF DOLLARS.

Imports from	Argentina.	Australia.*	Austria.	Belgium.*	Brazil.	Canada. (c) (d)	Chili.	China.	Cuba.	Denmark.* (b)	Dutch East Indies.*	Egypt.	France.	Germany.	Great Britain. (b)	Holland.*	India.	Italy.*	Japan.	Mexico.	Russia.	Spain.*	South Africa.	Sweden.*	Switzerland.*	United States.
Argentina	...	...	4	62	20	2	5	...	...	...	...	...	56	85	141	21	...	24	...	...	...	6	4	2	5	32
Australia	...	...	2	23	...	1	3	...	...	...	...	...	35	67	188	1	4	3	...	...	...	...	...	...	12	14
Austria	...	3	...	3	3	1	...	...	...	...	...	...	16	181	37	1	9	60	...	...	...	...	8	1	19	18
Belgium	...	5	10	...	11	3	2	...	...	...	1	4	91	77	94	116	17	14	5	4	...	...	4	2	7	37
Brazil	...	9	12	8	...	1	1	1	...	3	...	...	29	66	85	16	17	5	4	...	1	...	...	2	3	104
Canada	...	2	...	4	1	...	...	...	...	...	...	...	2	3	125	2	...	1	...	...	...	...	...	3	1	103
Chili	...	...	3	11	...	...	...	...	...	...	...	...	14	36	26	6	...	2	...	1	...	...	...	...	...	20
China	...	...	.3	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cuba	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Denmark	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dutch East Indies.*	...	...	...	1	...	1	...	4	...	...	...	...	8	37	96	1	31	...	...	...	...	2	...	...	...	10
Egypt	...	...	6	1	...	...	...	...	...	...	...	...	2	45	19	...	...	...	...	...	...	...	...	...	...	1
France	...	2	7	1	22	11	7	2	6	4	1	13	56	102	102	2	1	7	64	3	...	2	1	5	6	13
Germany	...	2	22	108	22	11	7	...	...	...	...	...	8	13	215	11	7	64	3	9	30	1	1	6	5	122
Great Britain	...	16	256	95	37	10	26	14	7	69	15	4	174	121	300	298	16	98	22	12	227	20	17	57	103	166
Holland	...	152	46	88	1	110	34	47	12	31	6	36	15	182	...	118	245	95	47	12	79	36	97	42	17	271
India	...	2	4	55	...	2	1	29	...	4	35	6	6	61	90	41	3	6	...	1	10	9	3	1	2	31
Italy	...	1	43	32	7	1	3	...	...	...	5	1	5	15	208	4	5	19	1	1	9	2	4	1	35	43
Japan	...	3	26	7	...	2	3	51	...	...	1	5	1	2	31	4	11	5	...	...	9	...	...	...	1	49
Mexico	...	...	2	3	...	...	...	...	...	...	...	...	1	1	11	1	...	...	...	...	...	...	...	...	2	74
Russia	...	...	33	2	...	...	...	11	...	22	...	...	6	4	223	21	...	41	...	...	...	...	...	8	16	61
Spain	...	10	2	9	2	1	1	...	9	...	...	...	3	14	31	3	...	6	...	3	...	...	...	1	2	13
South Africa	...	...	2	1	...	...	...	...	...	16	...	...	...	3	57	1	2	...	...	...	...	...	...	...	...	20
Sweden	...	2	2	5	...	...	...	...	...	...	...	...	2	3	47	1	1	2	...	...	...	...	...	...	...	...
Switzerland	...	...	17	6	3	2	1	17	55	23	2	1	1	6	72	16	12	76	27	61	38	21	13	13	11	8
United States	...	47	24	58	30	286	18	17	15	20	35	23	1	23	467	63	39	47	21	2	45	26	17	11	12	26
All other	...	16	26	75	31	23	10	7	...	...	...	...	16	...	...	...	...	...	...	...	...	...	...	...	...	164
TOTAL ...	839	249	579	715	235	461	109	306	104	194	104	116	1,005	2,126	3,301	1,261	406	600	231	107	497	184	171	164	320	1,563

* 1909 values. (a) 1 Hongkong. (b) General trade. (c) Year ending March 31st, 1911. (d) Inclusive of specie and bullion.

Exports from leading nations—by countries—1910.

VALUES GIVEN IN MILLIONS OF DOLLARS.

Exports to	Argentina.	Australia.	Belgium.	Brazil.	Canada (c)	Chili.	China.	Cuba.	Denmark.* (b)	Dutch East Indies.*	Egypt.	France.	Germany.	Great Britain.	Holland.*	India.	Italy.*	Japan.	Mexico.	Russia.	Spain.*	South Africa.	Sweden.*	Switzerland.*	United States. (b)
Argentina	...	...	17	12	3	1	...	...	...	...	...	31	57	93	5	...	30	...	...	...	9	...	1	4	43
Australia	...	...	3	...	4	...	...	...	...	6	...	1	15	134	1	13	1	3	...	...	...	...	1	1	32
Austria	...	2	5	...	...	...	...	...	...	1	7	8	195	19	1	24	31	...	...	25	1	...	1	14	16
Belgium	...	29	7	6	...	3	4	...	...	...	...	186	93	58	116	38	7	2	...	34	6	3	4	4	39
Brazil	...	17	2	...	...	...	1	...	...	...	...	13	29	80	1	...	3	...	...	...	...	...	...	2	25
Canada	...	3	...	2	...	...	...	...	...	...	...	3	9	96	...	...	2	...	...	...	1	...	...	3	242
Chili	...	...	3	...	...	...	...	...	...	...	...	4	15	26	...	...	...	...	...	...	...	...	...	...	10
China	...	...	4	...	...	...	(a) 71	...	...	3	2	...	16	44	...	27	...	...	2	1	9	...	...	1	16
Cuba	...	1	1	...	2	...	...	...	...	...	...	3	5	9	...	...	...	...	...	...	1	...	...	...	58
Denmark	...	1	2	...	...	...	...	...	...	...	...	2	5	27	...	11	...	...	...	14	...	...	12	...	13
Dut East Indies	...	...	1	...	...	...	1	...	...	...	...	4	53	20	6	35	1	...	...	2	...	...	...	1	3
Egypt	...	1	...	...	...	...	...	...	...	1	...	10	12	42	1	11	8	22	...	48	...	...	1	1	1
France	...	...	7	...	3	5	26	2	...	7	12	...	77	109	7	46	40	22	4	201	42	9	10	23	116
Germany	...	36	15	26	2	25	9	4	36	15	72	147	262	180	514	64	61	6	4	162	52	250	26	51	258
Great Britain	...	41	96	36	132	46	12	11	89	38	6	238	119	...	201	167	34	13	17	101	10	...	42	36	551
Holland	...	78	141	73	1	2	5	...	...	26	...	12	21	62	...	9	3	1	...	...	...	...	4	2	85
India	...	4	79	15	...	...	3	...	...	...	...	3	77	224	1	...	5	9	...	39	8	...	1	3	8
Italy	...	1	60	...	...	...	7	...	...	...	...	63	77	61	...	26	...	...	...	...	...	...	...	16	53
Japan	...	10	5	2	1	...	41	...	...	8	4	2	21	49	...	47	...	...	...	...	2	...	1	1	27
Mexico	...	1	7	...	1	1	...	...	...	...	...	7	11	12	...	...	...	...	...	...	1	...	...	1	64
Russia	...	4	12	...	1	...	51	1	...	3	...	15	127	60	5	5	6	3	1	4	...	...	4	7	18
Spain	...	10	7	...	2	1	...	...	...	...	...	27	17	24	2	6	2	...	...	...	2	...	2	3	22
South Africa	...	...	2	...	...	...	...	...	...	...	...	3	18	94	...	3	...	...	...	5	2	...	1	...	11
Sweden	...	1	2	...	...	...	...	...	11	...	...	2	45	83	6	...	43	1	...	...	...	...	...	1	6
Switzerland	...	...	7	...	...	...	...	...	...	...	6	73	107	16	...	43	54	72	106	10	11	...	6	29	...
United States	...	1	21	112	104	23	129	...	8	7	10	82	151	158	40	48	54	37	1	67	13	2	4	7	147
All other	...	35	46	18	16	7	17	4	13	77	15	...	172	375	33	126	30	...	...	...	...	7	12	...	...
TOTAL	569	316	542	310	274	116	251	151	163	182	143	936	1,779	2,095	986	666	360	227	139	713	178	271	126	211	1,846

* 1909 values. (a) Hongkong. (b) General trade. (c) Year ending March 31st, 1911.

SELECTIONS.

INDUSTRIAL SCHOOLS IN GERMANY.

The following information is gleaned from a circular issued by the Bureau of Education, Washington :—

In considering the specific causes of German educational success in detail, the first point which astonishes one is the heavy investment made in industrial education. Nearly every small village has at least one industrial school, and often, in small cities, several are found. In Henau, a place not much larger than Madison, there are five industrial or commercial schools, including an industrial art school and also what is practically a mechanical engineering school. The equipment of some of these schools is very complete and costly, but in most instances is very economical and surprisingly simple. The buildings are well adapted to the work in hand. Some idea of the investment can be obtained from the fact that the little province of Wurtemberg, which has a population less than Wisconsin by at least one-fourth of a million persons, and which is on the whole a poor, hilly country, with very poor transportation facilities, has, besides its splendid system of elementary and secondary schools, about two hundred and fifty industrial schools in its towns and villages, one knitting school, three weaving schools, two industrial workshops for actual practice in weaving, two technical schools for textile and mechanical work, a large State University, technical University, a royal building trades school, a great commercial college, several commercial improvement schools, a great agricultural school, many farming schools (similar to county agricultural schools here), an art trade school for industrial art, a pure art school, and many miscellaneous schools of all kinds for workmen of various grades, evening schools, continuation schools, &c., including schools in domestic economy for women. The investment made by this little province is tremendous. In one of the industrial schools in Munich are equipment and workshops in the following work : Electric motive power, electric lighting, locksmith and machine forging, book printing and lithography, cabinet-making, stucco work, carving, chain making, metal work, plumbing fittings, tinsmith work, and photography.

Almost without exception there is in Germany a correlation between the industrial conditions in the cities or towns in which these schools exist and the industrial schools. In fact, it is impossible to define exactly a German industrial school. Each city meets the problem differently. Each tries to adapt the teaching to its own needs, and sometimes the curriculum in a school in a certain village is entirely different from that in any other community. The schools are a striking reflex of the industrial conditions of the communities in which they are found. The reason for this can no doubt be found in the gradual growth of these schools and in the masterly way in which they are made to meet the wants of the great masses of the people Instead of starting with a few costly trade and technical schools, the Germans have encouraged a gradual growth in the entire field of industrial education, and they have put the emphasis upon the average man of an industry and the teaching of the average workman at the bench or at the machine. They have realized that the success of an enterprise depends in the long run upon the men in the ranks They are now putting as much strength into building up the average man—the average workman—as in building up the higher education, although the investment in higher institutions is great. The technical schools of collegiate grade are splendid, yet it is to the miscellaneous continuation schools that Germany owes a great measure of her success.

It is the German industrial continuation school which especially deserves study. The German continuation school is made possible by the fact that practically every one is compelled to go to school until he is fourteen

years of age. From fourteen to eighteen, he is compelled to go to school a certain portion of his time. This would average perhaps a day in a week. He may go to school in some places from 4 to 6 in the afternoon ; in other places and other trades two mornings a week, and in still other places (and this is the popular way) he may go to school for one day in a week ; but he must go to school.

Another great element in the success of this work is the kind of teachers employed. Every means has been used to get the right kind of teachers. Very wisely indeed the Germans have paid the teachers in this work higher wages than for similar grades in the other schools ; they have laid the stress and emphasis upon this work. In almost every place, one sees men teaching in these schools who are really artists in their work. The committees of manufacturers and employers see to it that this is the case. Special inducements have been held out for good workmen. Private rooms have been furnished in the schools where they can carry on their researches ; every man has a studio. Recently, special schools for teachers in industrial teaching have been founded, where men and women are specially trained.

Above the continuation course are a great variety of schools—lower industrial schools, middle industrial schools, higher industrial schools and special schools of all ranks and descriptions, apparently not strictly classified and differing in standard and curriculum from city to city and from division to division of the empire, making a whole great irregular democratic educational system, fitted to the needs of the different localities in a wonderful manner and meeting the conditions much better than if they were regularly classified and standardised. Moreover the Germans have established, almost universally, local committees of businessmen, manufacturers and workmen who control these schools wherever they are. The result is that the manufacturers and the working people take the utmost pride and interest in these schools and watch closely their development.

RICE MILLING.

In India, paddy cultivation is an important staple industry and there are several agriculturists who are asking within themselves whether a rice mill may not pay in their neighbourhood. By all such, the following description of the process of milling paddy in Rangoon will no doubt be read with interest.

"Rough or cargo rice consists of grain partly husked, say 20 per cent. unhusked to 80 per cent. husked, but of course the percentage of unhusked grain can be reduced, if required, at an enhanced cost. Rough rice is shipped largely to Europe and in smaller quantities to America and Australia, the greater portion being milled into white rice for human consumption. Protective tariffs and methods of treating the grain peculiar to each country doubtless account for the export of so much rough rice. Cleaned or white rice is rice fully husked and has also the outer skin of the grain milled off. There are five qualities recognised in the Rangoon rice trade, and these vary in whiteness according to the colour of the grain and milling they receive, as also in the proportion of broken to whole grains, say from 25 per cent. broken in the best qualities to 55 per cent. in the lowest qualities.

Briefly, the process of milling consists of cleaning the paddy of all extraneous matter, so far as is possible by means of sifts. The husk is then removed from the grain by a system of hullers, fans and sifts, in which process a certain amount of breakage occurs, varying according as the grain is regular or irregular in size, more particularly as regards length. The husked rice is then milled to the required whiteness in cones, in which process a proportion of the grain is broken and what is known as rice bran is taken off. After being put through polishers to remove any particles of a floury nature, the surplus broken rice is sifted out until there remains only the quantity recognised in the quality of rice being produced. The proportion of broken rice and bran varies with the quality of rice, the percentage of course being highest on the best qualities. The broken rice is sifted into several grades, varying in size and colour. Some are shipped to India, Ceylon, and the Straits Settlements for human and animal consumption, and some to Europe where they are manufactured into foods, starch, etc. Rice bran is the outer skin of the husked grain reduced in the process of milling to a mealy substance. After leaving the cones, it is cleaned on special machines, packed in bags, and as a rule shipped to Europe, where it is largely used in the manufacture of cattle foods."

VIEWS AND REVIEWS.

Fowl-keeping in Bengal.

A writer in the July number of the *Modern Review* gives some valuable hints in regard to poultry-breeding.

In purchasing fowls for breeding, only those should be chosen that are young, sportive, of good size, short-legged and of full breast. The breeding fowls should have three feeds a day :—(1) The morning feed should consist of kitchen refuse and rice-dust, (2) the midday feed should consist of cooked rice and cooked pulse seasoned with a small quantity of salt and pepper powder, (3) the evening feed should consist of dry grains such as paddy, buck-wheat, oats, &c. Brooding fowls are found unmindful of taking any food. Care should be taken that such fowls are particularly encouraged to go to their food at least once a day. Let it be borne in mind that both under-feeding and over-feeding are injurious. One more essential thing is that good drinking water should be constantly supplied to the birds. For this purpose, each compartment should have one wooden or metallic trough to hold water. It should be daily cleaned properly before water is poured into it. In the rearing of fowls, one thing most essential is cleanliness. The entire house with the shed should be thoroughly swept clean every morning and the shed and the yard should be sprinkled with ashes every fourth day. Chicken come out after incubation for three weeks. The new chicken and their mother should be confined to a coop for a fortnight or so in order that the chicken may be reared by their mother and that they may learn shortly to pick up food for themselves. Hourly feeding of new chicken for the first seven days is essential. The wholesome food for new chicken is a boiled egg mashed with finely sliced stale bread. This food may also be given with barley to the hen. After a month or so, the chicken may be given broken rice and boiled rice. As soon as they are one month old, the chicken should have a separate compartment.

Indian Excise Duties on Cotton Cloth.

At the Eighth Congress of the Chambers of Commerce held in London in June last, this question came up for consideration. In view of the importance attaching to the resolution on the subject brought forward by the Upper India Chamber of Commerce, and perhaps having regard to the known opposition of the Manchester Chamber, it was understood that speeches would not be limited in this case. The resolution was as follows :—

"Whereas the duty of 3½ per cent. *ad valorem* levied on cotton goods imported into India is in no sense protective, and is levied solely for revenue purposes ; and whereas the class of cotton goods manufactured by Indian weaving mills does not compete in any material degree with imported fabrics ; this Congress is of opinion that the Excise duty imposed on cotton cloth produced by Indian power looms is inequitable and should be repealed."

Mr. S. W. Johnson (Upper India) maintained that there was no competition between imported cotton cloth and cloth manufactured in the Indian power looms. As there was no competition, the duties did not countervail. The duties were unjust because they were imposed on one particular industry and could not be passed on to the consumer. Furthermore, they were retarding the industrial development of India. The dividing line between coarse and fine cloth in India was reckoned to be 30 counts. Of the 593 million pounds of yarn produced in India, 574 million were under 30 ; 462 millions were 20 and under. Of these 593 million pounds, 215 millions were made into cloth on power looms, and the remainder went into the hand-loom industry. That is to say, 97 per cent. of the output was coarse, or 80 per cent, if they took the dividing line at 30. There were no statistics available classifying the imports of cotton into India, but they were almost entirely of fine cloth. Both power-loom and hand-loom cloth sold in the same market, and the 417 million pounds of hand-loom cloth ruled the price

of the 215 million pounds of power-loom cloth. Since the duties had been introduced, there had been an increase of only five and a half millions sterling in the value of woven fabrics produced, and in a country which produced its own raw cotton and had to clothe 300 million inhabitants in cotton, there ought to have been an increase of many times this amount.

The resolution was opposed by the Bombay Chamber of Commerce, on the ground that it was purely a question between Lancashire, the Home Government, and India, and not one on which the rest of the Chambers of the Empire were competent or sufficiently interested to give a vote. They in Bombay were opposed to asking the Government of India to give up this revenue at a time when it was faced with the loss of revenue caused by the suppression of the opium trade.

Mr. Langdon (Manchester) said Lancashire recognised that the prosperity of India was that of Lancashire, and the two interests ran on parallel lines. But this was a class agitation of the rich men in India; that was evident from their desire to pass on the duty to the consumer. An industry which had been paying 5.7 per cent. on an average during the last ten years could not be called a decaying industry.

Sir Algernon Firth moved the previous question, on the ground that this was a question between India and Lancashire, and not one on which they should ask the opinion of the representatives of the Empire.

This was carried, only the four Upper India representatives voting against it.

Industrial Openings.

The following suggestions taken from *Capital* are well worth study. Banana meal, is regarded in many countries, and especially in Germany as a nutritious breakfast food. It is in fairly steady demand in those parts of the world where bananas do not grow and are, therefore, a good deal more costly than they are in India. The surplus crop of bananas in this country is believed to be sufficient to allow of a plentitul supply for conversion into banana meal. Yet no great progress seems to have been made with this new industry. In one of the experiments it appears the trouble was to dry the bananas adequately, particularly in the monsoon; but a similar difficulty is experienced in parts of Africa and is overcome by the use of a reasonably cheap and efficient drying and pulverising apparatus. Presumably, the moisture difficulty is not unknown in the West Indies, where this meal industry has made great strides. Perhaps it will make headway in India some day, but not while the would-be pioneers are appalled by obstacles of a very ordinary nature.

But there are many possible minor industries in India that are only waiting for a commercial Napoleon to lead them on to victory. For example, we import fish to the tune of over twenty lakhs of rupees annually, and all the time, have far better fish in the Bay of Bengal, and along our coast. Here is scope, vast scope for a fish canning, salting and smoking industry on a large scale, which could perhaps be combined with the abundant supply of salt water fish to Calcutta and other places as well, and could work with the assurance that there would not only be a ready market in India for preserved fish of the right quality, but in all fish-eating countries as well. Some day an industry such as this or several of them will be paying handsome dividends and the shareholders will probably wonder why such a paying concern was not started a hundred or more years earlier. But whoever enters this field must do so on right up to date lines with all the necessary machinery and appliances and a skilled staff.

Another industry that will come some day on a larger scale than now will be that connected with fruit canning. Unlike the preceding one, here is a venture that can be started on a fairly large scale for a song. All that is required is really sound fruit picked just before it is quite ripe, a few odds and ends in the shape of labour saving appliances, the use of high grade sugar for syrup-making, and a strong sense of scrupulous cleanliness in connection with every detail of the industry. There is, for instance, a readymade market in many parts of the world for mangoes preserved in syrup and also for crystallised mangoes, but it is largely met by the shipment of raw mangoes to England, to be prepared there. Similar goods made from selected fruit here on the spot, would beat the London article hollow, always provided that the skill displayed in manufacture is equal in both cases. Hitherto, the balance has not been equal in this respect and the result is that the shipments of mangoes to England increase yearly, instead of shipments of mango preserves.

Still another simple industry that awaits development is that connected with the exploitation of the several high grade natural mineral waters to be found in India and more particularly perhaps in Eastern Bengal and Assam. A sort of bulletin was published some time ago drawing attention to these, and would-be investors are apparently still wondering whether it would pay. There must certainly ought to be some profit in pure water at a rupee a bottle, which is about the rate at which imported natural mineral waters are retailed here, and a very large trade is done in them even at that price. Indian mineral waters would be fresher and presumably more palatable than those from the spas of France and Germany, such as Vichy, Contrexeville and Kissengen, but, to enable a suitable start to be made, it requires a man endowed with considerable push to annex one or more of the Indian mineral springs and then, by what is called "hypnotic" advertisements, persuade the people that a course of the waters is good for them.

What Jute Means for India.

An elaborate article on the Indian jute industry appears in the August *Indian and Eastern Engineer*. We give below some valuable information contained therein:—

The very conspicuous position occupied by jute in respect of the economic development of India is indicated in unmistakable terms in the excellent review of the trade of British India with foreign countries recently issued by Mr. Frederick Noel-Paton, the Director-General of Commercial Intelligence. Among the raw materials and unmanufactured articles exported during the year 1911-12, jute held the third place, following raw cotton and seeds—the development as compared with the preceding year amounting to no less than £4, 713,000 or 45 per cent., while the quantity rose by 27 per cent. Among exports of Indian manufactures, jute goods now represent over 45 per cent., the value of manufactured jute exported last year having been £10,673,300. Last year, however, as is well-known, was one of marked depression in the jute industry, and this fact was reflected in the imports of machinery used in the production of the finished article. Bengal, the seat of the industry, imported during 1911-12 textile machinery to the value of only £301,000, as against £516,000 in the previous year; whereas Bombay, which has many advantages in cotton and none in jute, imported similar machinery, valued at £518,000, as against £510,000 in 1910-11. Even Madras, which is also concerned mainly with the cotton industry showed a moderate increase on the year, while Sind, which in 1910-11 figured at £15,700, during the following year increased her imports of textile machinery to £26,000. The world's annual demand for jute is now estimated at from 8,500,000 to 9,000,000 bales of 400 lbs. India, to all intents and purposes, is the sole producer.

A New Method Of Testing Coal.

A writer in the *Scientific American* gives particulars of a new method of testing coal.

As a test of the value and character of fuel, the discovery of the amount of volatile matter in coal is unquestionably of the very greatest importance. This is estimated by finding the loss in weight of about fifteen grains of a sample, by bringing it to a high temperature in a platinum dish. This simple procedure really gives more information than any detailed chemical or calorimetric analysis. However, the complete accuracy of the test is not always possible. The weight, length, breadth, and intensity of the flame and the heat, as well as the platinum receptacle which holds the sample, the sort of gas and burner, the distance, time, and other conditions, all have some effect upon the results, that is, upon the residue left and the volatile matters driven off.

Now Dr. R. Lessing has announced to the London Society of Chemical Industry a novel apparatus and plan, which will give a more correct estimate of the difference in the coke produced from various coals, and which will account for the process of carbonization in all cases. It will show a qualitative distinction between the various types of coal, and eliminate the fallacies of the old method, the platinum dish test.

Dr. Lessing's simple device also serves to identify the individual differences of each kind of coal. Any particular kind of coal will give at all times, when treated under the same conditions, a coke identical in all respects with another specimen produced from the same sample.

The Tata Iron Works.

A writer in the *Commerce* has some encouraging words to say on the future out-look of the iron industry in India in general and of the Tata Iron Works in particular.

It is an illuminating fact, says the writer, showing as it does the backward state of India, that the amount of pig iron produced by the company, which has already been sold, is less than five per cent. of the total consumed in the country. Japan is at present the company's biggest customer and it is as much as the works can do just now to supply the demand from this quarter. The works are now capable of a monthly out-put of 5,000 tons. If this rate of progress continues, it seems fairly certain the Tata enterprise will be the means of resuscitating the ancient Indian industry of iron and steel making, which was lost in the crush and pelt of succes sive invasions; for the scheme will be almost sure to create imitators in other parts of the country. At present, metal goods make a beggarly display among the exports of Indian merchandise.

That India is exceptionally rich in iron ore as well as in coal is a matter of common knowledge. Previous unsuccessful attempts to introduce European methods of smelting are also generally known. These failures have been the stepping stones for the present success and future developments; for, the iron ore supplies of this country are wide in extent and of surpassing richness, both in the British Provinces and in the Native States. In the Salem district of Madras, the ore appears on a scale of unparalleled magnitude, entire hills being apparently made up of the mineral in the purest varieties to be estimated only in thousands of millions of tons. There is a hill near Dewalgaon called Khandeshwar 225 feet high, which is believed to be entirely composed of iron ore. In the Central Provinces, the mineral exists in abundance; at Ranigunj in Bengal, in Sind, in the Gwalior State, other valuable deposits find a place in the records of the Geological survey.

The Rise in Prices Problem.

A writer in the August issue of the *Commercial America* attempts to solve the problem of the rise in the prices of food-stuffs and combats the widely-prevalent theory accounting for it, *viz.*, the increase in the population.

In the discussions as to the cause of the high cost of living that are to be found in newspapers, magazines and Governmemt reports, there is heard occasionally an echo of the old Malthusean refrain that the cause of much of the misery in the world is due to the fact that population increases faster than food. Assuming, as is generally conceded, that population increases at an average rate of about one per cent. per annum, it will be seen by what follows that the leading food products increase at a much more rapid rate. So says the writer and gives figures for each principal food product. We extract below the figures for Rice:

"Rice which is the food-product of so many millions of people in Asia, has increased from an average annual production of 95,000,000,000 pounds in the five years from 1900 to 1904 to an average of 120,000 000,000 pounds from 1906 to 1910, a yearly average increase during the last five-year period of 25,000,000,000 pounds, or 26 per cent. This does not include China, for which no statistics are available."

A knowledge of these facts, concludes the writer, should eliminate from all discussions on the cost of living the question as to whether the world is producing enough food-products to supply the increasing demand arising from the growth of population. The great expense arises more from the fact that a large part of the population of the world is living on a higher scale than it did in former years. This is seen in the increased demand for wheat, many families that formerly never ate wheat-bread now demanding it for every meal. The same is true of meat-products; many who never had meat oftener than once a week now use it daily. It is the cost of high living, not only in food products, but also in the improvement in the clothing and character of the homes of millions of people, that has brought the high price of food, clothing and other necessities of our modern life.

Dyeing of Leather.

The production on a large scale of dye-stuffs, mainly from coal tar, says a writer in the *Leather Trades Review*, has placed a wide range of colouring matters at the command of the leather dyer. Formerly, leather dyeing was effected by the use of vegetable colouring matters, the shades being varied somewhat with suitable metallic salts. By these means some very good and lasting colours were obtained, which for depth and body cannot now be surpassed, or in many cases equalled, by using artificial dyes.

Before sumaching, a preliminary washing for a few minutes in 1 per cent of borax solution is recommended to clear leather to be dyed with basic colours. Then, after retanning in sumach, the leather is treated with a ½ to 1 per cent. tartar emetic solution which effectually fixes the tannin and thus prevents precipitation of the basic dyes. No acid is used with these colouring matters except in cases where the makers state that a small percentage of acetic or lactic acid added to the dye-bath is beneficial.

Leather is dyed in drums where large quantities of the same shade are required, sufficient hot water being placed in the drum to enable the leather to turn without being the drum entangled and forming a ball. The skins are then thrown into the drum and the door secured. The dye in solution is poured at intervals into the revolving drum through the axle-box. The temperature will rise as the machine is in motion, and care should be exercised that with vegetable-tanned leather it does not exceed 120° F. About half-an-hour in the drum will be sufficient for leather of medium thickness, while less time is necessary for very light skins The drawback to the use of drums for dyeing is that the skins may not be examined during the process to see how the shades are developing, without stopping the machine. This may often result in unequal dyeing if there still remains much unabsorbed dye in the water; hence paddles are sometimes preferred. The paddle should not be connected direct to the shafting by a belt, but should receive its motive power from gearing, which, in turn, is connected to the shafting. By this means the revolutions of the paddle-wheel are steadier, and the skins are in regular motion, thus ensuring equal dyeing.

Mission Industrial work.

We are indebted to a contemporary for the particulars below regarding a paper on "Mission Industrialism and Commercialism." written by the Rev. H. Kuhner. The great point of this paper is said to be the emphasis laid on the fact that industrial work without business principles will not be successful. Accordingly, Mr. Kuhner would not call a Mission industrial establishment a *School*, but would call it, a "workshop or establishment." To make industrial work a commercial success, which alone in the end will turn out to be truly beneficial both to the Mission and to the employees, the following hints are given.

1. No one should be the head of an industrial school who is not thoroughly equipped in his trade. This enquipment must be accompanied also by a good general education.

2. The person in charge must, however, be quite a Missionary inside and outside. He must be recognised fully by his Society as one

of Dr. [illegible]ed Missionaries, recognised as a co-worker, receiving all the allowances as others.

3. He must have the capacity for dealing with men, especially he must be largely endowed with patience.

4. Commercialism should not be hindered from developing itself on a sound and honest basis, but it should never be allowed to prevail over Missionary principles.

5. The Industrial establishment should exhibit the utmost honesty in every dealing within and without the establishment. Workers must know that honesty and justice prevail in the establishment, and customers should know that they could nowhere deal with greater confidence regarding material and price.

6. In dealing with customers and with competitors, the manager must take the utmost care not to give cause for complaint. It is tremendously hard to see customers go to competitors. Yet, no round about ways should be allowed. Anything which may cast a slur on the Mission should be avoided. Honesty, quality, price, and promptness should be the weapons against competition.

7. Although making profit for the Mission is a very laudable thing, it should never be the primary object and aim of the manager, for, this will drive mission interests to the back ground The money-making capacity must be subjected to higher principles.

8. The main object of every Mission industrial establishment, large or small, must always be to keep the direct Mission work in establishing the Kingdom of God. All other interests must be subjected to and guided by this principle.

In conclusion, Mr. Kuhner recommends the methods of the Basel Missionary Society, which would not be what it is to-day without commercialism and sound business principles. With more Mission industrial establishments than there are now in Southern India, the Christian community would probably be nearer self-support, and certainly would have a greater influence upon the non-Christian industrial and commercial community. Among Mission methods of work, commercial industrial work is indispensible both among the educated and the depressed classes. Missions have not done enough in this direction in India, and India offers a special field for Mission work, and for Mission Industrial establishments.

Another Successfull Swadesi Concern.

In the June issue of the *Wealth of India*, we gave a description of the Bengal Chemical and Pharmaceutical works, of which the guiding spirit is the celebrated Chemist, Dr. P. C. Ray. We have now great pleasure in giving publication to an account of the Alembic Chemical Works Co., Ltd. which owes its existence to the genius of another distinguished Indian Chemist, Prof. T. K. Gajjar, the consulting Director of the Alembic Chemical Works Co. Ltd. This concern is under the patronage ot H. H. the Maharaja Sayajirao Gaekwar. Prof. Gajjar requested the University Inspection Committee which recently visited Baroda to pay a visit to the Alembic Chemical Works. The committee which consisted of Dr. Mackichan, Dr. Harold Mann, Father Sierp, Major Hutchinson, and Mr. Bhabha were kind enough to accept the invitation. They were first taken to the Library and Fermentation Laboratory where experiments on yeast culture were being carried on. The members were shown under the miscroscope the culture of pure yeast. As yet the distillers do not know that fermentation is the soul of the Alcohol industry. The committee expressed their satisfaction at seeing that the problem was being solved by the Alembic Company. The Library also contains a good collection of books on Alcohol manufacture, Pharmacy and Statistics.

From the Fermentation room they were taken to the Chemical laboratory where the members were shown how analysis of Mahudas was being carried on to estimate the percentage of sugar which can be converted into Alcohol. They were also shown how the yield of Alcohol on a large scale was being controlled by

Laboratory experiments. The fermented juice was being distilled in the laboratory to find out the percentage of Alcohol so that it can be checked whether all the sugar was being converted into Alcohol and whether any was being wasted. They were also shown the Revenue still by which the percentage of alcohol in Tinctures and other spirituous products was being estimated. From the Chemical laboratory they were led to the gold chloride room where gold chloride was prepared from gold on a commercial scale for photographic purposes. They were also shown how the glass tubes were being sealed by a man specially trained for the purpose. From this room they were led to the packing room and they were shown a still where perfumes and essential oils were being distilled. After seeing the still, they came to the Pharmacy Hall where mechanical appliances for different Pharmaceutical purposes are set up. All of them were shown in working order, *e.g.*, the Tablet Machine, the Vacuum still, the Vacuum chamber and Emulsifier. Then they passed to the main portion of the factory, the Distillery. All the members were highly impressed with the working of the French still which has been specially ordered out by the Company and which was set a working by Professor Gajjar, who has trained many graduates to work this complicated still. The most striking feature of the Distillery is that pure yeast is prepared in the factory which possesses the most recent apparatus for yeast culture. Dr. Mann examined the rectified spirit prepared by the Company and he expressed his entire satisfation when he saw that the Company had successfully grappled with the problem of entirely removing the smell of the Mahudas. This was a standing problem in the whole of India and this has been solved by the Alembic Chemical Works. Dr. Mann particularly remarked that the Distillery was conspicuously clean and he did not feel the stench of the Mahudas or any other bad smell, although a large quantity of about 800 maunds of Mahudas was being daily used. Lastly, they were shown the State office and depot where alcohol was being tested by the Excise officer in charge for assessing the duty. We are glad to hear that Dr. Mackichan remarked that such large Chemical Works with many varied and elaborate operations were efficiently conducted by young Indian graduates without any initiative or guidance from European experts.

Religion and Economics.

With reference to the symposium on "Religion and Economics" that is being published in this journal, the following remarks of a writer on "material civilisation in the Mahabaratha period" in the Bhadarpada number of the *Vedic Magazine* will be read with interest :

In the Ramayana period of Indian History, the Brahmanic element was predominant in national life and consequently the pursuit of luxuries and sensuous delights was looked down upon. In course of time, however, the wealth of the country accumulated, the spirit of territorial aggrandisement and of the exploitation of the resources of foreign nations proceeded apace at a terrible rate and the result was at first military ascendancy and then, what invariably follows, conquest, extension of commerce and the commercialization of morals.

The writer is of opinion that material prosperity if not interpenetrated with spirituality brings on ruin. Some of our people think that the salvation of India lies in mere material advancement ; Not so. In the darkest period of Indian History – when adultery, gambling, drinking and breach of faith were condoned by society – we had attained to the utmost heights of material progress and this material progress was the cause of our ruin. Swami Dayanand may be quoted in this connection with profit. Says the great sage :

"It is also a law of nature that the accumulation of wealth in a community out of all proportion to its needs and requirements brings in its train indolence, jealousy, mutual hatred, lustfulness and neglect of duty which put an end to sound learning and education, whose place is usurped by evil customs, manners, and

practices like the use of meat and wine, child marriage and licentiousness. Besides, when people acquire perfection in the military science and the art of war and the army becomes so formidable that no one in the whole world can stand it on a field of battle, pride and party spirit increase among the people who then become unjust. Thereafter they lose all power through mutual dissentions."

Dry Farming.

There is an interesting article on the above subject in the May number of *Tropical Life*. "Dry Farming," applicable to half the lands of the globe, has been in practice in its crudest form from time immemorial, and it looms largely again on the horizon to-day. Considering the world's increasing population and its growing needs, it would, indeed, be passing strange, with the vast areas of semi-desert lands yet awaiting cultivation, were no effort made to render such areas serviceable to mankind.

"Dry Farming" is, in the first place. a misguiding term, leading to the inference that only in countries of scanty rainfall is it practised. Such is only half the truth, for, all countries, irrespective of aggregate rainfall, are subject to the methods of this system if the rainfall be unsuitably distributed for its proper utilization by the crop. The system is intensive, and, in brief, consists in so cultivating the soil as to obtain and retain the maximum possible amount of precipitation for the use of the crop, in cultivating only those crops which are drought resisting and acclimatized to a semi-arid environment, and, in general, by the most suitable implements, the best methods, and by scientific management, directly and indirectly to reduce to a minimum, the baneful effects of drought In the Western States of America the system is perhaps most intensive and extensive. There, as soon as the crop is removed, the land is doubly disc-harrowed and deeply ploughed. This process is immediately followed by the use of the fluted roller or subsoil packer which pulverizes and packs the under-surface of the furrow, while leaving the upper surface rough. Harrowing then following reduces this upper rough surface to a dust mulch. The shorter the time taken to accomplish these operations the better, so as to minimise evaporation. Level cultivation, to expose the minimum surface, and the maintenance of a surface mulch to break capillarity, are the surest means of obtaining the end in view. Frequent harrowings, especially soon after rain, are necessary to maintain this fine-surface condition. Seeding is generally in the autumn, and ought to be deep, so that the seed lies at least an inch in the moist soil Thereafter periodic cultivation must be given until further operations would damage the growing crop. Now since all plants transpire a large amount of water through their leaves, it is evident that under this system of farming a smaller amount of seed must be sown, the quantity depending partly on the amount of accumulated moisture. In the drier districts it is necessary to summer-fallow frequently, meantime stirring the soil at intervals with the double aim of maintaining a mulch, and of checking the growth of weeds which would otherwise consume and dissipate the coveted moisture Though he may have a sufficiency of fertility in the soil for his present needs, the far-seeing farmer recognizes that, without making compensating returns to the soil to maintain this fertility, he is living upon his "capital," and those who do so may leave but poor exhausted land for their heirs to succeed to However, it is now generally recognized that it pays to adopt good methods of cultivation coupled with the judicious use of fertilizers, and of stable and green manures in conjunction with rotation crops, and these are now largely adopted in districts where possible.

The writer concludes: Regarding the system of "Dry-Farming" much has been done to encourage its adoption of late years. A careful and world-wide search has been made for drought resisting economic plants, and these, when found, are experimented with to discover the most useful The study of soil properties, the best implements to use, the best methods to pursue, the best rotations to adopt, the selection of seed, and the acclimatizing of crops have all received and are receiving serious and successful attention, with the result that vast areas of semi-desert lands have been converted into broad acres of crop-producing soil. Still, much has yet to be done. A closer, more concentrated, better systematized, and more extended study of crops, seed selection, rotations, and methods of moisture conservation are required. Economic plant breeding on disease resisting and drought-resisting lines, the peculiar climatic conditions of particular localities and selection of crops for same, methods of obtaining and maintaining purity of seed and a general scheme of Dry-Farming returns, all need and should receive further attention.

AGRICULTURE.

Sheep Breeding Experiments.

It is proposed to carry out a series of sheep breeding experiments in the United Provinces. The object is to ascertain if there is any possibility of establishing a permanent improvement in the quality and quantity of the fleece of the indigenous flocks, and to obtain an accurate estimate of how far operations in this direction are likely to be successful, if carried out on such a scale as would be necessary, if wool production in India is in future years to be regarded as an economic resource.

The Moon and the Growth of Plants.

Experiments are being conducted in France in order to find out if there is any truth in the popular superstition that the moon exercises an influence on the growth of plants. In the latest trials, planting at the time of the new moon gave the greatest yield in twenty-eight cases, planting in the first quarter in twenty-nine, planting at the time of the full moon in twenty-eight, and planting in the last quarter in twenty-seven. This shows that no material difference in the yield can be attributed to the influence of the moon.

Grass and Fruit Trees.

Near Darmstadt, Mr. Goethe observed several plum trees, planted in soil which was very sandy on the surface, that were in a bad state of vegetation. Two of them, which were in a meadow, were uprooted, and their roots were found to be very little developed and superficial; some of them were brown in colour, and, when cut, presented a reddish brown section. A tree in a neighbouring field, of the same species and nearly of the same age, was, on the contrary, in an excellent state of vegetation, although the soil was of the same nature. It had, however, been tilled, instead of being left in grass. Mr. Goethe thinks that the marked inferiority of the first mentioned trees was due to the soil being covered with grass, and he suggests that the soil round fruit trees should be tilled and grass never allowed to grow. There is an accumulation of evidence that on light soils, the growth of grass under fruit trees, especially in the case of young trees, is very injurious.

Farmyard Manure.

Farmyard manure is often spoken of as a "General" manure, because it is useful for all crops, and supplies plant food of all kinds. It is therefore regarded as a typical manure; but it is not a perfect manure, because the plant food is not always in the most suitable proportions. This may lead to waste of one constituent, especially when an excess is used to make up for the deficiency of another. Potash, for instance, is not always wanted on heavy soils, though it is more useful than was at one time supposed, especially on grass. Dung contains a lot of potash, and in this way, the latter may be somewhat in excess of requirements, when, say, nitrogen and phosphate are what the land wants. Especially will this be so if the dung has been badly preserved, and a heavier dressing is in consequence put on, because potash is less easily lost than nitrogen, and it will remain in relatively larger quantity than the latter.

Fish Guano.

An interesting account of fish guano, which is now being manufactured on the Malabar Coast appears in a local paper. The substance sold as fish guano is made from sardines from which the oil has been extracted by boiling, and it contains from 9 to 10 per cent. of both nitrogen and phosphoric acid. The advantage of converting raw fish into a concentrated and portable powder, comparatively free from moisture, was first realised in a practical sense by M. Rohart in 1862, the Norwegian cod being requisitioned for the purpose; and the same process is being resorted to in Malabar to-day.

Biphosphate.

Another new fertiliser of which probably a good deal will be heard in the near future, is called "biphosphate." It is a by-product of the nitrate of limes produced at the Notodden Nitrate Works, in Norway, land will be put on the market, it is said, at alow price. It will compete with superphosphates and basic slag.

COMMERCE.

Business Enterprise in India.

The commerical enterprise of India during the month of July 1912 may be gauged by the following abstract of Joint Stock Companies registered in that month :---

		Rs.
2	Banking and Loan Companies ...	40,00,000
5	Insurance Companies	6,60,000
1	Printing, Publishing and Stationery Company	10,000
12	Trading Companies (other than specified above)	22,15,000
1	Rice Mill Company	25,000
1	Tea Planting Company	10,00,000
2	Planting Companies (other than specified above)	15,75,000
24	GRAND TOTAL ...	94,85 000

Empire Trade and Industry.

Recently, the Royal Colonial Institute appointed a representative committee of commercial men to encourage and facilitate Empire trade and industry. It is understood that the work of the committee has received the support and co-operation of the Governments of the various oversea possessions. Since its formation, the committee has devoted attention to such subjects as the unformity of company law, the work of the British Consular Service, through bookings of goods, and the development of British trade with India and the Crown Colonies by means of trade commissioners, as has already been done in the case of the self-governing Dominions. The representations which the committee have made in some of the foregoing matters appear to have already met with a measure of success.

Sugar in India.

From the *Review of the Trade of India*, it appears that the consumption of imported sugar in India in 1911-12 was 8,268,000 cwts., in addition to which we manufactured 3,000,000 tons. India is therefore the largest producer and also the largest importer of sugar in the whole world. Practically all our imported sugar comes from Java and Mauritius. The people of India have quite failed to cultivate a taste for Continental beet sugar, and hence 97·5 per cent. of our imports are cane sugar. It is a healthy sign, however, that for the first time since 1902-3, our imports of foreign sugar show a decline—a substantial decline, too, of 2,397,313 cwts. valued at Rs. 119·88 lakhs. This fact should give heart to the small band of workers who are, and have been for years past, endeavouring to compel India to be self-supporting in the matter of sugar. At the moment, inferior cane, antiquated ideas of cultivation and wasteful methods of manufacture stand in the way ; but a start has been made and there should be no turning back. There is plenty of scope for a forward movement as the taste for sugar is rapidly growing in India, and during the past few years, the consumption per head of the population has risen from 1·96lb. to 6·79lb.

Debentures.

The following extract from *The Standard* is important to debenture holders. "A company issued certain 'A' debenture stock and by a trust deed specifically charged the repayment on the freehold and leasehold property then held by the company, and as a further security, the deed contained a floating charge on all the other assets of the company present and future. Subsequently, the company acquired other freehold and leasehold properties which came within the floating charge given to secure the 'A' stock. The company then raised further money by the issue of 'B' debenture stock and by a second deed specifically charged all its freehold and leasehold property to secure the same and also gave a floating charge on its other assets to secure the stock. The point to be determined was whether the 'A' stock was a first charge on the properties acquired between the first and second trust deeds, or whether the 'B' stock had the prior right. The Court decided that the 'B' stock holders had the first claim, seeing that the second trust deed gave a specific charge on all the freehold and leasehold property then held by the company, whereas the property acquired between the two deeds was subject only to the floating charge given to secure the 'A' stock.

INDUSTRY.

Fruit Industries.

The Government of New South Wales proposes to establish fruit-canning, vegetable-canning, and jam-making factories in the Burrinjuck irrigation area on the Murrumbidge. At these factories, the produce of the settler will be handled at moderate rates and, subsequenty, the factories may be taken over by the settlers themselves, under a co-operative arrangement. The experiment will be carried on by the Department of Agriculture. The fruit growers will be encouraged to plant only the best varieties of fruit, and will be taught how to specialize in those varieties that are most useful for canning purposes. A similar proposal is under consideration in Victoria, in the well-known and fertile Bacchus Marsh irrigation district. The Commissioner is endeavouring to induce landowners in that district to sub-divide their properties for intensive cultivation, and suggests that a canning department be added to one of the district butter factories, for preserving the fruit raised by the settlers. Why not the various provincial agricultural departments do something of the kind in India ?

Bleaching Powder as a Substitute for Soap.

Dr. G. F. Sacher, in an article in *Soziale Medizin u. Hygiene*, recommends the use of bleaching powder as a cleansing agent for the hands of the working man as a preventive against metal poisoning. Workmen handling metals, such as lead, mercury, antimony, arsenic, bismuth, zinc, chromium or manganese, either in metallic form or in the form of compounds are constantly exposed to the danger of poisoning, through imperfectly cleaned hands. Small particles may thus be transmitted to the mouth in eating or smoking. To completely remove metallic impurities from the hands is not always an easy matter ; soap alone is in most cases well nigh useless, as it forms insoluble compounds with most of the metals. Bleaching powder, however, is an ideal material for the purpose stated. It has no injurious effects on the hand or the blood, and may, therefore, be used even on chapped hands. It forms a lather like soap, and acts chemically as well as mechanically, thus removing any metallic impurities or compounds in the shortest time possible. It further has the advantage over soap of having strong disinfecting properties.

Some Industries for India.

In the course of a review of the trade of India during 1911-12, the *Pioneer* has some very interesting remarks on the possibilities of opening certain new industries in India. It observes :—

Notwithstanding the talk there has been of Swadeshi enterprise in India, our imports of hardware and cutlery still amount in value to 13·4 per cent. of our total import trade, and yet India has been manufacturing cutlery of sorts for hundreds of years. The fact is, India has been marking time in this line of trade while other countries have been forging ahead. We have all the facilities for cutlery manufacture in this country ; all that is necessary is the right sort of men to make the most of them.

When the price of copper is high, as it was last year, the imports of enamelled ware are always heavy. The increase in this line of imports last year was 32·8 per cent. Just now, the bulk of this trade is done by Austria-Hungary ; it could be equally well carried on by a properly managed Swadeshi company, for there is nothing particularly difficult about it.

In a similar way, iron and steel constitute 7·3 per cent. of our import trade, but this percentage is more than likely to be materially lessened, now that the Tata Iron and Steel works are well under way. This is the greatest enterprise yet started in India ; and, as we recently showed, it is already making itself powerfully felt. In course of time it is to be hoped other industrial concerns will be making their influence felt in other lines of commerce. The sooner the better for India, for it is a wasteful, almost idiotic, process to go to foreign countries for articles that could be manufactured much cheaper here.

ECONOMICS.

Trade Unionism.

An American writer puts the case for Trade Unionism thus:—

I do not wish to assert that trade unionism is perfect, or trade unions or unionists, infallible. Trade unionism is not a panacea for all the ills of life, and neither the unions nor the unionists constantly live up to the true principles of unionism. Labour conflicts evoke many unwise acts from both parties to the contest, and even in time of industrial peace, workmen err as do employers. I do not deny that trade unions and trade unionists have occasionally committed grave errors, serious indiscretions, and even actual crimes. But to build upon these failings a charge against the whole trade union world, or even against "trades unionism as at present conducted" is very unwise. The evil that trade unionism does lies upon the surface ; the good is less apparent, buried deep in the grateful hearts of millions of men, who have been aroused by it to a new life and to higher and nobler aspirations.

The Cost of Living.

Mr. Asquith speaking on the increased cost of living observes :—

"It is well that we should appreciate exactly what the facts are, and perhaps it may be interesting to point out that, taking as your basis the year 1900, which is a convenient year, and treating the price of food and drink in that year as a normal price and the rate of wages in that year as a normal rate, giving them both the index number of 100, when you come to 1911 that 100, in the case of food and drink, it has risen to 111·6, and in the case of wages it had only risen to 100·3. So that there is a very substantial additional percentage in the rise in the prices of the necessaries of life, as compared with the rise in the rate of wages. But one ought not to give a misleading impression. People do not always extend their view quite far enough backwards or forwards. If you go back, say, to the year 1881, you will find that there has been a very substantial diminution in the prices of food and drink The figure for that year was no less than 189, while there has been a very substantial increase of wages, for the figure for that year for wages was 84·7 as compared with 100·3 last year. . . . If you are looking at the experience of a generation, therefore, you will find that there has been a diminution in the cost to the necessaries of life and a very substantial increase in the rate of wages"

The Hindu Joint Family System.

The Hindu family, 'joint in food, worship and estate, is the economic unit of Hindu society. The family consists of the man himself, his sons, grandsons and great grandsons, who live in peace and harmony and share the common chest or purse. Founded on the virtues of affection and self-control, this system tends according to Mr. Radhakamal Mukerji, to develop a spirit of self-sacrifice, and mutual control and dependence which are quite opposed to the competitive individualistic spirit —the key-note of modern industrialism. Indeed, the sentiments which it fostered and the economic effects it produced have led to certain fundamental differences characteristic of our industrial life clearly distinguishing it from that of Europe and America. Thus, while in the West, it is the individual's own scale of wants, his standard of comforts and of activities which regulates the growth of population, in India the family mode of enjoyment or standard of life is the main factor. Marriage in Hindu Society is compulsory at a particular age, so the fluctuations in prices of the crops have no effects as in Europe, on the number of marriages. The members of the family are assured maintenance for themselves and as many children as they choose to bring into the world from the property ordained to be the hereditary source of maintenance for all. In Europe the check to the increase of population is the struggle for food and competition and its law, - 'If a man will not work, neither shall he eat,' is enforced upon the individual by the society. In India, the rigour of the law is mitigated in its operation by the family. The family protects the young wife, the helpless orphan or the decrepi grandfather. Thus State Medical Aid or old age pensions are unnecessary.

CO-OPERATION.

The Co-operative Credit Conference.

The Co-operative Credit Conference, which all Provincial Registrars will attend, will open at Simla on the 28th October, Mr. Maclagan, Secretary, Revenue and Agricultural Department, presiding.

Co-operative Credit.

In their annual report on small holdings in England and Wales, the Commissioners state that special attention has been given during the past year to the question of the best means of extending the system of co-operative credit, with the object of enabling small holders and allotment holders to obtain, on easy terms as regards interest and repayment, the loan of capital required to carry on their agricultural operations. There are now 44 registered Credit Societies in England and Wales, and the number in operation is slowly increasing. The 31 societies which submitted returns for the year 1910 had 663 members, and the net assets amounting to £1,924, including reserve funds representing the accumulated profits of their working amounting to £270. During the year they had granted loans for productive purposes to 119 members, averaging £12 per loan, the rate of interest charged being generally 5 or 6 per cent.

As to the future, the Commissioners say :—

"The Board and the Agricultural Organisation Society are engaged in spreading among communities of small holders a knowledge of the advantages to be derived from the formation of credit societies, and are assisting in the formation of new societies. It is also hoped that, as a result of discussions which have been carried on for some time between the Board and some of the leading Joint Stock Banks, the latter will be willing to afford such societies active encouragement by allowing their local managers to assist in the formation of credit societies, to audit the accounts, and, if satisfied as to the security offered by the joint liability of the members, to advance money at a favourable rate of interest to the societies."

Agricultural Co-operation.

A writer in a recent issue of the *Muslim Review* points out that the Co-operative Credit System came to be introduced into India because of the failure of the Agricultural Loans Act to blot out the *sowcar* evil from the everyday life of the poor Indian peasant.

The Co-operative Credit Societies have primarily two aims : (1) to provide the peasants with facilities for borrowing at a low rate of interest for agricultural purposes and (2) put a check to the growing tendency on the part of the peasants to contract improvident loans for unproductive purposes. Apart from economic facilities, the societies have great educative influence. They encourage thrift, self-help, and co-operation amongst agriculturists, artisans and persons of limited means. This is what Professor Nicholson says on the point :— "Such a society forms a centre of local progress and reform. In Italy, the mere possibility of joining a society has reclaimed men from drunkenness and extravagance and has given an impetus to sobriety, industry and education. It has a steady educative influence in matters of thrift, association and self-help and a tendency to develop high forms both of individual capacity, of public life, and of national character." In Bengal the educative influence of the societies is being felt. The Government Resolution says :—"Their interest in education, sanitation and the well-being of their villages, the healing of party feuds and the employment of their *Punchayets* in the settlement of local disputes are indications of the very valuable functions which Co-operative Societies may one day perform in village administration."

The writer states that if co-operative spirit is to be made a living force in India, efforts will have to be made to extend the principles of co-operation to productive and, more urgently, to distributive societies. Agriculture is a productive calling and as such has to depend entirely on the market and this market could in no way be better approached than through Co-operative Distributive Societies.

BANKING.

Banking Progress in England.

In replying to the toast of "His Majesty's Government" at the annual dinner of the Central Association of Bankers and Association of English Country Bankers, Mr. Asquith mentioned that less than forty years ago the clearing figures of the banks were five thousand millions, while during the last two years, the figures were fourteen thousand millions; during the same time, the deposits have risen between four and five hundred millions; and again during the same period, using round figures, the number of banking offices in the United Kingdom had risen from three thousand to eight thousand five hundred.

To Avert American Panics.

A writer in the *Investor's Chronicle* points out that the proposed National Reserve Association of the United States is a step in banking and currency reform intended to avert recurring financial panics, largely due to the absence of a centralised banking system. Dissatisfaction with existing conditions had been growing for many years, when in May, 1908, Congress provided for a Commission to report "what changes are necessary or desirable in the monetary system of the United States, or in the laws relating to banking and currency." After nearly four years' study, the Commission has devised its plan. That reform is necessary is clear from the annual report of the Comptroller of Currency for 1911, which shows that during the twenty years' period 1890-1910, nearly 400 American national bank became insolvent. During the same period nearly 1,400 State and private banks and trust companies had the same fate. That is, an annual average of about 90 failures. The mortality expectation among American banks is on the average one failure every four days, losses to depositors averaging about $ 1,000,000 a month.

England has not always been immune from financial panics and bank failures. One hundred years ago, during the Napoleonic wars, it suffered greatly in that direction. In 1825 there was another panic, and 63 banks failed. The last panic occurred in 1866; previously, panics occurred about every ten years. Since 1866, however, there has not been a single general breakdown of credit facilities.

The United States Monetary Commission does not recommend a central institution, which would do for that country what the Bank of England does for the British Empire, but it recommends the creation of a "National Reserve Association." This will deposit and pay cheques, issue currency, buy and sell gold, exchange and loan money, but will not be privately owned, a competitor of the banks, as a central bank would be. It will not accept general deposits, as a central bank would, but only deposits of the Government and of the banks. It will not be run to make money, but will be exclusively an agency of the banks, to perform certain functions for them which, unorganised, they cannot perform, but are necessary if they are to perform their part in conducting the business of the country continuously and adequately. It will be a clearing house, but broader and more useful. Membership will be open to all National and State banks and trust companies which comply with certain reasonable requirements; each must subscribe for an amount of the capital stock equal to 20 per cent. of its own capital. This stock can be obtained only by members, and is nontransferable, so that a controlling interest cannot be acquired. When a cash capital of $ 100,000,000 has been received, the association may begin business.

In the proposed new banking system, the unit of organisation is the individual bank. These individual banks are to be united into co-operative organisations, called local associations, of at least ten subscribing banks located in contiguous territory. In ordinary times, these local associations will steadily promote good banking methods, thereby reducing or eliminating the danger of banking failures. In times of stress, the local associations will enable the banks to co-operate for mutual protection, and secure aid from the National Reserve Association.

INSURANCE.

Mortality of Hand-fed Infants.

Statistics showing the comparative death-rates in Hull, England, show that in the third quarter of the year, during a five year period, there were 991 deaths from diarrhoea of infants fed on a mixed diet, as against only 190 deaths, from the same cause of infants entirely breast fed. The Berlin statistics for a number of years show the definite relation of hot weather and method of feeding to infantile mortality. Invariably, the death-rate of both classes of infants go up about normals during the hot weather, but the increase in mortality among the artificially fed is greater—out of all due proportion—than the increase in the mortality of thy breast fed.

Advice to Insurance Agents.

Mr. Thomas A. Buckner gives the following advice in the *Bulletin* which all insurance agents will do well to read, mark and inwardly digest as it may help them to effect more business.

1. Study your man.
2. Select your policy.
3. Study your case well.

1. Find out all you can about your man in advance, his business, his income, his family, his tastes, his leisure hour.

2. Select, after careful thought, the policy which you are convinced is best suited to his needs.

3. Then study that policy over and over, carefully each time, so that you can present it in a quick, interesting and comprehensive way. Go over it again and again in your room alone, until you are sure of yourself. Don't trust to luck.

Now when you can properly present the policy, ask yourself, as the attorney does who knows that he must meet the opposing counsel in the morning, what objections this man can possibly raise against the policy. Put them down on paper with your pencil, so as to impress them on your mind.

Work out the answer to every one of these possible objections, and put these also down on paper. Go over your answers carefully, and correct and memorise them, until you have everything well in hand.

You will also need tact and energy. That goes without saying. But the man who is armed for the fray has the big advantage. In other words, prepare your case with the same care that an attorney prepares his case before he goes before the jury, studying out every possible objection, equipping yourself thereby to meet and overcome them.

Endowment for Girls.

Most people, says the *Englishman*, are aware of the hardships enforced upon the Kayasths, who form the bulk of the clerkly caste in Bengal, by the custom which enforces a large dowry with every daughter that is given away in marriage. It is not unusual to demand a dowry of ten thousand rupees with a girl whose father only draws a salary of thirty rupees a month. If a man cannot pay the dowry and his daughter remains unmarried after a certain age, social degradation of a particularly shameful kind overtakes the family. It is no wonder that, in these circumstances, the birth of a daughter is often looked upon as a calamity in a Kayasth family, and that so many clerks live a life of poverty and debt that their European employers hardly realise. Of course, it may be argued that the remedy lies in the hands of the Kayasths themselves. They can by common consent break the fetters of caste obligation, or men with unmarried daughters can join the Brahmo Samaj and laugh at any social disqualifications that may be imposed on them by their brethren. But it is easier to talk of breaking through the fetters of caste than to do it. A remedy of a new kind has recently suggested itself to the members of the community, who have induced several of the Swadeshi assurance companies to offer a form of endowment assurance for girls. For a premium paid monthly, the companies promise to find the dowry for the girl when she attains the requisite age. In the event of death, of course, the premiums are lost. It is understood that the companies promising this form of assurance are doing a great business.

EDUCATION.

Technical Schools in Ceylon.

It is interesting to note the varied courses that are offered by the Ceylon 'Government Technical Schools'; there is a Railway Course, a course for Postal Learners, an Inspector's Course, a Painting Class for Ladies, courses in Chemistry and Physics for Teachers, and others. Science work is largely developed.

Electrified Children.

To ascertain the effect of electricity upon the development of school children, a series of very interesting experiments have just been concluded in the schools of Stockholm. The walls and ceilings of a school room were lined with a coil of wires through which a high frequency current was passed. The children in the room were thus in the position of an iron core in the centre of a magnetising coil.

Fifty children were kept in this room, while fifty others of the same average age, size and mental development were kept in an adjoining room without electrical treatment. At the end of six months, the children under electrical treatment showed an average growth of two inches, while those without electricity grew only $1\frac{1}{4}$ inches.

The electrified children showed an increase in weight and other forms of development in proportion to their height. The electrified children also showed an average proficiency in their studies of 92 per cent., and fifteen of them showed 100 per cent. The unelectrified children, on the other hand, were only 75 per cent. proficient on the average, and not one of them reached 100 per cent.

It is added that the electrified children appeared to be much brighter, quicker and more active. They were prompter in attendance and much less subject to fatigue. The teachers also showed superior working capacity in the electrified room. While there was an odour of ozone in the room, it was held that the presence of ozone would not account for the results obtained.

Technical Education.

We extract the following from a very interesting speech made by Professor G. C. Sen, M.A., F. C. S.:—

It may be said that industrial development is impossible without technical education. It is absurd and ridiculous to think that a country with any self-respect can perpetually depend upon other people for its expert knowledge. Now the problem is, who is going to employ our technically trained men? It is a question that is engaging as much attention in England and Germany as here. I admit there are many openings for these men in England and Germany. But from my personal knowledge of those countries, I know that great congestion exists. There are more trained men in those countries than the existing industries can reasonably be expected to absorb. Every year technical industries send forth to the world thousands of trained young men who have to fight their way against much competition. In spite of this congestion, however, it is never suggested for a moment that the splendid institutions like the University of Leeds, the Manchester School of Technology, the Bradford Technical College, the London Polytechnic, the Glasgow and West of Scotland Technical College or the Scharlottenburgh Polytechnic should be closed down. On the contrary, they are increasing their scope of work and extending their operations every year. In India, our great drawback is that we have very few technical institutes which are well equipped and well financed. It is a bad proposition that India should have industries first and technical education afterwards. The two things must go hand in hand. The suggestion that one can jog along without the other is a myth. An instance of this is found in the history of British commerce. There was some alarm in England at the rapid growth of industries on the Continent. The cause of this rapid growth was attributed to the earnestness with which Continental countries were pushing forward the cause of technical education. The Associated Chambers of Commerce at Glasgow, Leeds, Manchester, Birmingham, Wolverhampton and other centres of industries sent their representatives to consider this question. They resolved that efficient technical institutions should be started in different centres of industry to improve the position and to protect local industries against foreign competition.

ECONOMIC PRODUCTS.

Cellulose.

According to the Special Paper Expert attached to the Forest Research Institute, Dehra Dun, it would seem, says the *Civil and Military Gazette*, that the manufacture of cellulose which is used for paper-making and many other purposes is very largely monopolised by Scandinavia and North America, where, however, the spruce and pine forests which have hitherto formed the chief sources from which supplies have been drawn are rapidly being exhausted. These spruce and pine forests take 40 years to reproduce, so that these countries are squandering their capital when they lavishly cut down their forests for this purpose, and there is a very general opinion that the cellulose industry must eventually migrate to tropical regions where the raw material of the industry grows under conditions which permit of rapid natural reproduction. In bamboo and in many other kinds of fibrous annual grasses, India possesses an almost inexhaustible supply of such raw material, and the investigations which the Forest Economist has carried out indicate the vast reserves of raw material suitable for the economic production of cellulose contained in Indian forest and waste lands in forms which have hitherto been regarded as waste or unutilisable products.

Banana flour

Mr. William Fawcett, B.Sc., F.L.S., writing in the *West India Committee Circular*, says that banana flour can be obtained under the name of "Bananine," of which the *Lancet* speaks highly in the following terms: "There can be no doubt of the nutritious character of banana flour, and the starch in it is peculiarly easy of solution and digestion in the alkaline digestive juices of the body. Banana flour is readily dissolved, for example, by the saliva. Our analysis of 'Bananine' gave the following results: moisture, 14·60 per cent.; mineral matter, 2·20 per cent.; proteid, 19·22 per cent.; fat, 2·00 per cent.; and carbohydrate, 61·98 per cent. The flour has the peculiar flavour and odour of fresh banana fruit. We have received also a sample loaf, made with 'Bananine' flour. The flour proves to make a very acceptable loaf, uniform in texture and permanently moist, and of a golden colour. Contrary to that which has been stated, banana flour is much richer in proteid than is wheat flour, and it also contains more fatty matter. Accordingly, its nutritive value is decidedly higher than is that of wheat flour." At the meeting of the British Medical Association in July, 1910, Dr. Eric Pritchard recommended the use of banana flour in infant feeding in the proportion of 1 ounce to 1 pint of hot milk. He stated it was cheap and wholesome, rendered the milk more digestible, and possessed a high nutritive value.

Soap Stone

In a recent number of the *Geological Survey Journal*, an account appears of a discovery in Idar States of a huge deposit of "steatite"—that curious soaplike chalk, a form of talc or "French chalk," of which tailors' clothes-marking chalk and similar articles are made. The Geological Department's report says this material in Idar is apparently fairly uniform in composition, and of pale blue grey to pinkish grey colour by reflected light. It is moderately hard, free from foreign minerals, and readily cuts up with a saw into slabs and pencils. The latter take a good point and on slate or blackboard yield a clean, even, white line of good brilliance. It may be said to be of very fair quality, but so far as present surface outcrops show, is not of first-class quality suitable for the finer trade requirements. There are indications of a still softer, more cream-coloured variety in small amount. From similar indications there are also harder and darker grey rocks and some dark green rock of still harder character that would carve into durable ornaments. Here is another chance for the industrial capitalist. There is plenty of material. Says the report, "calculating on the 200 feet basis for thickness over a length of one mile, to a surface depth of only 20 feet there appears to be over 2 million tons within sight and within easy reach."

BUSINESS METHODS.

Appearance of Goods.

It is often assumed that design is nothing more than the pictures on a poster. Business men conclude that if a product is practical, the item of looks can be left to take care of itself. But looks go really deeper than that, according to a writer in *World's Work*. They grow out of study of the market, and thorough understanding of demand and the human uses of goods. The manufacturer who has the best sense of design is usually the one who has got closest to the public.

It is just these minor points of looks and utility that turn sales now-a-days, and the manufacturer who has come close to his public is finding it out. New tendencies exist in the consuming public to-day. Honesty in the manufacture of goods; lower cost of retail distribution; identification of goods so that maker and seller can be held responsible by the purchaser for shortcomings; more direct and intelligent dealing all round—these things are in the air everywhere.

Design is an immensely important item in this changing basis of demand. The consumer may not always be able to formulate his wishes, but he recognises good looks in merchandise when he sees them, and the manufacturer who embodies sound design in his product has something that works for him automatically, puts him above competitors and compels sales.

Good Advice.

Rise early, retire early, and fill your day with work.

There is little time to think now-a-days. It's the man who acts that gets ahead.

You either advertise and get business or don't advertise and lose business. Which?

Resolve to have each day's happenings make you stronger than the day before.

The only thing that comes to the advertiser who waits is what's left.

With advertising you can make a name; without advertising you cannot.

The advertiser who is up and doing is the man who gets the plums.

Cleanliness prevents rust; the best cared for machines last the longest.

If your attention is a first mortgage on business other than your own, the receiver will foreclose later.

"Big-men" are not superior beings nor demi-gods; they are mortals, men who had the courage of their convictions, they broke loose from hide-bound restrictions and stepped about twenty paces ahead of their fellows.

It's no use waiting and thinking there's a better time coming. Advertise now; the better time will come quicker.

Never scatter your energies—devote your time to one thing—have the indomitable energy of a Napoleon; make the most of time, talent and opportunity.

The business world is a great magnet that draws to it men of true steel. Wooden men are not affected by its influence.

The man who thought that business would come without advertising has a twin brain to the man, who, when he went out to milk, sat down.

They say that opportunity has hair in front but is bald behind—therefore, when you see him coming, don't step aside, but take him by the forelock and hold on hard.—*Dixon's Monthly.*

Some Conditions of Success.

A man should stand on his own legs and be true to himself. "To thine own self be true, and then it follows as the night the day, thou canst not then prove false to any man."

Men who have made great successes in the world are frequently those who have taken a chance. They have always been optimists and have never looked at the shadow. When the door of opportunity is opened, that is the commencement of the battle only, it must be kept open while you walk right in.

Be always loyal to your employer. If it is good enough for you to take his money at the end of the week, it is worth working for. The man who loafs when he should work is a thief.

FRAUDS AND FAKES.

Adulteration of Food and Drugs.

The Madras Government are said to have addressed a memorandum to municipalities asking if legislation is necessary in order to prevent the adulteration of food and drugs. In the United Provinces, a Bill has been introduced in the Council and is likely to be passed at an early date. The question requires the attention of the authorities in the Punjab also.

Cotton Frauds.

Flagrant fraudulent practices are, it is said, carried on in Berar and the Central Provinces in connection with the damping of cotton for the purpose of increasing the weight of the bales. The Government are now watching this matter and are already endeavouring to stop the watering of cotton by means of a hose-pipe. The spinners will do well to carefully examine all cotton coming from India as to any excessive damp and to report such cases to the officers of the International Federation if possible, stating the district where the cotton has been grown. The use of saltpetre and seed-cotton for weighting the bales in the north of the Madras Presidency is another fraud practised in the trade.

The mixing of different kinds of cotton *before* ginning is another very serious matter because it is not only that the spinner is deceived in his purchase, but the seed of of two or three different types becomes mixed and is then sold again for sowing purposes. It is this latter circumstance which is much more serious than the first. On the one hand, the Government are spending large amounts of money to keep the seed pure and improve the cotton cultivation, but on the other, the Government are allowing the ginners to counter-act the benefits resulting from the efforts of the Department of Agriculture.

The mixing of various cottons and of waste-cotton from the spinning mill, such as is carried on at Hubli, is yet another matter, which requires attention. It must necessarily create a bad reputation for the Indian cotton. It should be considered a criminal offence to sell a certain kind or quality of cotton which has been intentionally depreciated by the admixture of inferior kinds and dirt.

Adulteration of Ghee.

Of all articles of food, nothing is perhaps worse adulterated than *ghee*. It is very extensively used for culinary purposes both by Europeans and Indians. But as a rule, *ghee* in the bazaars is never free from adulteration any where. Its price has been going up higher and higher and yet the genuine article is seldom to be had. Lard, ground-nut, sesame and linseed and other vegetable oils which may be easily assimilated with *ghee* are added to it and the adulterated commodity is passed in the market as pure. A recent method of aduterating *ghee* has been detected which is likely to bring disastrous results on those who consume it. Petrol jelly or Paraffin wax is now mixed with *ghee* without being easily detected. This jelly is obtained from mineral oil and is practically odourless. It is reported that a very large quantity of this petrol jelly was recently imported in Calcutta, evidently for the purpose of adulterating *ghee*. It appears that the greater amount of this adulterated *ghee* was exported from Calcutta to other places. The adulteration of *ghee* has a most baneful effect on the digestion and most cases of dyspepsia and other diseases of the digestive organs may be attributed to it. It is imperative that the Government should restrict the importation of petrol jelly for only medicinal and lubricating purposes. This new system of adulteration has not yet been largely introduced and if stringent measures are adopted as in the case of cocaine, the abuse may be checked in time. The adulteration of *ghee* cannot be wholly avoided unless greater attention is paid to rearing cattle and dairy farms are opened by honest people. The entire business is at present in the hands of unscrupulous men who adopt all vile processes of adulteration so long as there is a profit to be made. Upon the purity of the food-supply depends the health of the country and the matter should engage the serious attention of all.

MACHINERY AND INVENTION.

Fish Preservation.

Preserving fish by carbonic acid gas instead of ice is the latest invention, which promises to revolutionise the fishing industry. It is claimed for this new method that it will, besides costing only about an eighth of the price of ice, effectually prevent putrefaction, an effect which the present method fails to produce. The new method has been invented by a Cheltenham solicitor, Mr. H. T. Randolph Hemming, and briefly, the system adopted is to force all air out of the fish. This is done by placing the fish in a tank and pumping in carbonic acid gas—the CO^2 of our school boy days—at a pressure of 60 lbs. to the square inch, four times the ordinary atmospheric pressure. Successful demonstrations were carried out recently at the request of Mr. F. L. Rawson, consulting engineer of the Icelandic Government, which has secured from the inventor an option of purchase—*Ice and Cold Storage.*

A New Rice-Reaping Machine.

It is reported that a new rice-reaping machine has given highly satisfactory results in Italy and was awarded a prize of 5,000 lire in the international competition for rice-reaping machines promoted by the Farmers' Association of Vercelli. It consists essentially of a reaping mechanism driven by a small gasoline engine and mounted on a large wooden wheel and on a hollow cast iron skid. This skid is placed as far below the centre of gravity of the machine as possible, and also is made ingeniously to serve as a reservoir for water for cooling the motor, and further, by the fact that it is partly filled with water, to add an important gravity action. The lower surface of the skid is placed two or three inches above the lower rim of the wheel. In this wise, any tendency of the wheel to sink in soft earth is checked. One of the most important functions of the skid is due to the fact that it is partly filled with water. When a hillock, hummock, or furrow is to be crossed and the forward part of the skid rises, the water runs towards the back of the skid. By the same token the water runs forward when the forward part of the skid is depressed after a hillock is passed and adds a useful downward impetus to the machine. The reaper has amply demonstrated, it is stated, its ability to reap over seven and a half acres of rice in ten hours.

Human Energy as Motive Power.

An article under this heading in *Cassier's Magazine* enters minutely into the economy of the human system regarded as a heat machine, producing power, and shows that although the economy of man as a heat engine is superior to that of steam engines, his fuel is more expensive and the cost of his installation, if much power is required, is prohibitive. Some of the figures quoted shew why human labour of certain kinds has been superseded by mechanical power.

A labourer climbing a ladder or stair carries his own weight, 143 lbs., *plus* 40 lbs. of load, at the rate of six inches per second. The total load lifted is 183 lbs., and the work he does per minute is $183 \times 30 = 5{,}490$ foot pounds. But in order to raise the forty pound load he has to move an additional weight of 143 lbs. or nearly 3·6 times as much, which does not count in the work being done, in fact only 22 per cent. of the weight he lifts is effective. If the same man were raising weight by means of a good winch, his work would be equal to 1,400 foot pounds per minute, or $2\frac{1}{2}$ times as much as if he carried the material. If material has to be transported horizontally, the load may be increased per man, but he has still to carry his own weight, whereas if he could put the load on wheels on a good road, his effective value might rise to 8,200 foot pounds per minute. When the surface is too irregular for surface haulage, an air line of rope may be used from which the material may be suspended and carried with a minimum of labour. For short distances that are not in a straight line, manual labour will always be in demand, but an experienced director of labour should always be ready to see any opportunity for the introduction of labour-saving appliances.

HINTS AND RECIPES.

Filtering of Very Fine Precipitates Suspended in Liquid.

Grind down in a mortar shreds of filter paper and then mix with plenty of water. Allow the coarser fibers to settle, then add the turbid water to the filter. Very fine precipitates, such as mercury sulphide, may thus be filtered.

Rat Trouble.

Landowners troubled with rats or mice might try a method of destruction which has been followed with success in Faridkot. An ordinary brazier (angithi) is provided with a dome shaped cover in the centre of which is a small funnel. To the funnel is attached a piece of flexible tubing and to that again an iron pipe. Sulphur is sprinkled on live charcoal in the brazier and the fumes are carried by the pipe into the mouse-hole. They ramify through the holes and kill the inmates. Neighbouring exit holes should be blocked up as far as possible.

To Bleach Straw.

Pour boiling water over the straw, allow it to stand for 24 hours, and repeat this operation several times until the water is only faintly tinged. Then follow three hot over-pourings, each allowed to stand for 24 hours and each consisting of 100 parts of water and 24, 16, and 12 parts of soda, respectively. Rinsing with boiling water follows, a bath of chlorine, a bath of sulphurous acid, and a washing out. By this treatment, the straw is rendered perfectly white, and remains completely pliant and flexible.—*Kurrer.*

Electrically-produced Cold for Making Ice Cream.

The ordinary method of freezing ice cream by ice and salt is a striking example of economic waste. Every 100 gallons of ice cream requires a ton and a half of ice and 800 pounds of salt; and the salt is not recovered and the ice melts very rapidly. Electricity is now conserving these materials by producing artificial refrigeration and applying it to the manufacture of ice cream. Electric motor drive is used to turn the freezers. Statistics show that in the five years from 1906 to 1910 the consumption of ice cream in the United States advanced from 55,000,000 gallons to 100,000,000 gallons. Last year about 120,000,000 gallons of this delicacy were eaten by Americans—an average of five quarts per capita.

Reference Catalogues.

A railway contractor was in the habit of buying a great many kinds of things from different manufacturers. It was necessary, therefore, for him to carefully preserve their catalogues and keep them in his files arranged in such away that he could easily refer to any of them, both by the name of the manufacturer and the article he wished to purchase. Each catalogue was given a number and they were filed numerically. A small cross index was kept, classifying the catalogues according to the different articles each one of them covered. As the catalogues were received at different times, of course, those listing any one article were widely separated in his files because they were filed in numerical order.

He found this a very inconvenient arrangement, because, when he wanted to buy an article, he was compelled to look in a great many different places in his catalogue file to get together all the catalogues covering the article required.

He easily removed this objection, however, by changing his system of numbering the catalogues. He gave a separate number of a consecutive series to each group of articles. For example, number one was given to explosives, and number two to ironmongery.

Catalogues of the various groups were also given an additional number of a consecutive series for each individual catalogue. Thus the first catalogue in his file covering explosives would bear the number 1-1, the second catalogue, 1-2, and so on.

This arrangement brought together in his files all the catalogues of each of the different groups of articles he was buying. At the same time this numbering system distinguished each particular manufacturer's catalogue, so that he was not only able to pick out from his files the catalogues issued by each manufacturer, but could also select all the catalogues on any one particular subject—*System.*

ECONOMIC LITERATURE.

Forest Products.

A most valuable collection of information on the forest resources of this country has been issued in book form under the title *Commercial Guide to the Forest Economic Products of India*. It is compiled by Mr. R. S. Pearson, F.L.S., Economist at the Forest Research Institute, Dehra Dun. The primary object of this publication is to illustrate for the benefit of firms and persons interested in such matters the uses, value and possible yield of the various forest products in the different provinces of British India, and also to indicate the official designations and addresses of the officers to whom enquiries should be directed concerning the purchase of such products. The book is divided into three chapters. The first one contains a short resume of the distribution and classification of the many types of forests found in British India, together with a note as to the outturn and value of timber, fuel and minor products. Chapter II deals with eighty of the more common timber trees of India and Burma, briefly explaining the distribution, quality and uses of the timber, its approximate value and yield in various localities and to whom enquiries should be directed for further information on the subject. The final chapter deals with the minor products such as fibres and grasses (other than oil-grasses), distillation products, oil-seeds, tans and dyes, gums, resins and oleo-resins, rubber, drugs and spices, edible products, bamboos and canes, animal and other miscellaneous products. The book is provided with a map showing the general distribution of the forests, besides several half-tones in the body of the work illustrating some of the better known species. It is invaluable to merchants as a work of reference and may be procured at the Government of India Press, Calcutta, for one rupee.

Stocks and Shares and Shipwrecks.*

O hearken, business men and those
  Who dally in disaster,
And note the change that shipwreck brings
  To Stocks and Shares and such like things :
They do not fall as you'd suppose,
  But only rise the faster.

Now take the good ship Delhi. She
  Was done for in December.
She struck the wild Moroccan Coast,
  And people, mails and parcel post
Were dragged from the relentless sea,
  And rescued, you remember.

The good ship Delhi, then, was wrecked ;
  Yet rumours were presistent
And soon matured to common "gup"
  The Stock was twenty-nine points up !
Now who could possibly expect
  Results so inconsistent ?

The Stock maintained a steady tone
  And Bears were unsuccessful
Until the Oceana sank
  With all the Specie in the Bank :
Of details grim the "Daily Moan"
  Of course, was more or less full.

But inconsistency as strange
  Was still the Stock's behaviour ;
It rose some sixty points until
  The Bulls had had their greedy fill :
One wonders how the Fates arrange
  This Stock's successful saviour.

The maxim seems to me quite plain :
  It you would roll in riches,
Just buy a ship and issue shares,
  Encourage Bulls and frighten Bears,
Then fill with all the scrip you gain
  The pockets of your br...s.....

Upon some dark and stormy night
  You then arrange to sink her;
And when she sinks, the stock will rise
  While you need only blink your eyes
And sell to all who think you re right
  And curse you, for a thinker.

TIDYMUS.

* The Delhi was wrecked on the 13th December and a fortnight after a rise in the P. and O. deferred stock of 29 points was announced. The Oceana was sunk in collision on the 16th March and the following week the deferred stock rose to 810.—*Pioneer*.

OPENINGS FOR BUSINESS.

[For particulars, address the Director-General, of Commercial Intelligence, new Imperial Secretariat. 1, Council House Street, Calcutta, mentioning the *Wealth of India*. Firms that may like to follow up any enquiry should give proper references and restrict themselves to those enquiries only which they are fully and seriously qualified to handle.]

Lamps and Ornaments.

A limited company in Holland desires to appoint agents in Calcutta for the sale of gasoline and petroleum lamps and electricity and gas ornaments. (B102).

Cutlery Polisher.

A London firm desires to place on the Indian market a knife and silver cleaning machine driven by electricity, illustrations of which may be seen at the office of the Director-General of Commercial Intelligence, Calcutta. (B108).

Cigarettes.

A firm of cigarette manufacturers in Holland, who are agents for the cigarettes and tobacco of the Roumanian Regie, desire to appoint agents in India for the sale of cigarettes and cigarette tobacco. (B104).

Live Birds.

A firm in the United States desires to be placed in communication with shippers of live birds having attractive plumage. (B105).

Kapok.

A firm in Antwerp desires to be placed in communication with shippers of Kapok (B106).

Cuban Tobacco.

A firm in Santiago de Cuba desires to be placed in communication with importers of Cuban tobacco. (B107).

Ground-nut Oil.

A Government Officer in the United Provinces desires to be placed in communication with buyers of ground-nut oil (*Arachis hypogæa*). (B108).

Fish Manure.

A firm in Japan desires to be placed in communication with exporters of prawn and shrimp manure. (B109).

Ochre.

A firm in Liverpool with extensive connections in the levigated ochre trade is desirous of being placed in communication with shippers of that article. (B110).

Saltpetre and Borax.

A Bombay correspondent desires to be placed in communication with suppliers of pure saltpetre and borax for glass-making. (B111).

Iron Rails.

A firm in the Deccan desires to be placed in communication with buyers of second-hand 20 feet double headed iron rails. (B112).

Soapstone.

A correspondent desires to be placed in communication with buyers in India of soapstone. (B115).

Salt.

A Bombay concern desires to be placed in communication with firms in a position to secure orders for a Spanish salt mine. (B116).

Ivory.

A Government officer, having elephant tusks for sale, desires to be placed in communication with purchasers. (B117)

Eruca Sativa Oil.

A Calcutta firm of chemists desires to be placed in communication with sellers of Eruca Sativa (*Brassica eruca*) oil, the vernacular name of which is *Taramira tael*. (B118).

Rectified Spirit.

A limited company manufacturing rectified spirit in India desires to be placed in communication with purchasers. (B120).

Cotton and Woollen Hosiery.

A manufacturer in India of cotton and woollen hosiery desires to be placed in communication with purchasers. (B121).

Woollen and Cotton Yarns.

A concern in the United Provinces desires to be placed in communication with sellers of woollen and cotton yarns of counts suitable for the manufacture of hosiery. (B122).

Old Copper.

A firm in the Deccan desires to be placed in communication with sellers of old copper. (B125).

Cotton Doublers.

A firm in England desires to be placed in communication with cotton doublers who are not also cotton spinners. (B126).

Sugar, Coffee and Cocoa.

A firm in the West Indies desires to be placed in communication with importers of sugar, coffee and coca. (B127).

MISCELLANEOUS.

Wood Distillation.

The Government of India are prepared to consider proposals for the establishment of a wood distillation factory in India by private enterprise.

Indian Sugar Industry.

In connection with Government measures for the improvement of the Indian sugar industry, a special investigation is also being made into the palm sugar industry of the country at the Agricultural Research Institute at Pusa.

Sericulture in Bengal.

The Bengal Silk Committee which have a subsidy from the Bengal Governmeni have decided to import a European Silk Expert from Europe to assist in the conduct of their sericultural operations.

Indian Agricultural Service.

It is understood that proposals have gone to the India Office for the recruitment at Home of an officer for the Indian Agricultural Service specially trained in agricultural bacteriology. The selected candidate will be attached to the Agricultural Research Institute at Pusa.

Steam Laundry in Calcutta.

A private firm in Scotland has approached the Calcutta Corporation with a view to starting a steam laundry in Calcutta. The matter is under consideration.

Agricultural Engineer for Bombay.

Proposals have gone home to the India Office for the appointment of an Agricultural Engineer for the Agricultural Department in Bombay. The selection for the post will be made in England.

The Sugar Industry.

The Secretary of State has sanctioned the deputation of Mr. J. H. Barnes, Principal of the Punjab Agricultural College, Lyallpur, and Agricultural Chemist, Punjab, for a period not exceeding eight weeks, to collect information on sugar industries in Hungary and Egypt. Mr. Barnes, who is at present on leave in England, will return to India *via* Hungary and Egypt, in order to prosecute his enquiries.

Similarly, Mr. Keatinge, Director of Agriculture, Bombay, at present at home on leave will, it is understood, visit Honolulu, Formosa, and Java on his way back to India, with the object of studying the methods of sugar cultivation pursued in those countries.

Irrigation in India.

From the annual review of Irrigation in India for 1910-11, we gather that the total area irrigated was 22½ million acres. The value of crops raised is roughly estimated at 62·25 crores. The total area irrigated by productive works amounted to 15,175,000 acres. Towards this total, the Punjab canals contribute 6¼ million acres, Madras 3½, the United Provinces 2 and Sind 1·15 million acres. In Bengal an area a little short of 900,000 acres was attained. The return of capital is the highest in the Punjab, where the canals yielded 13·16 per cent. The next Province in this respect is Madras, where a return of 12·6 per cent. was realised, excluding the Kurnool and Parur systems, the expenditure on which is charged to revenue. In the United Provinces and Sind, the returns realised were 7·01 per cent. and 6·21 per cent., respectively.

Scientific Agriculture.

Sears, Roebuck & Co., of Chicago, have offered a million dollar gift to the Council of Grain Exchanges, a body composed of the twenty or more leading exchanges in America. This sum will be expended by the Committee in charge of soil and crop improvement. The first instalment of $ 100,000 will send an expert into each of 100 counties. This man, a graduate of an agricultural school, will devote his time to teaching the very latest data on soils, grains, seeds and so on. The method is to bring this new evangelist into intimate contact with the farmers of his territory. The experiments are to be tried in various parts of the country. They mean an extraordinary opportunity for the rural communities. The results will be awaited with interest by every metropolitan hard pressed by the cost of living. The head of this firm is the famous Jewish philanthropist, Julius Rosenwald, already well known for his generous gifts.

THE WEALTH OF INDIA

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No money should be paid to an Agent. All remittances and letters should be addressed to the Publishers, Messrs. G. A. VaidyaRaman & Co., 3 and 4, Sankurama Chetty Street, Georgetown, Madras.

SPECIAL ARTICLES.

MANUFACTURE OF ALIZARINE DYES.

BY

F. MARSDEN, M. SC. PH. D.

Tinctorial Expert.

[In reply to a query from a correspondent about the manufacture of Alizarine Dyes, Mr. F. Marsden, M. Sc. PH. D., Tinctorial Expert, has kindly sent us the following abstract for which we gladly make room. ED. *W.I.*]

Referring to the request of your correspondent Mr. Asharfilal for information respecting the manufacture of Alizarine, I would point out that the question is a very wide one, owing to the interdependence of this manufacture upon others, and although the minute details which are required to be known for the successful working of the processes are obtainable only in the works where the operations are carried on, sufficient information is obtainable from the published technical literature to permit of the course of the manufacture being understood.

As this literature may not be available to him, I may give the following resume.

Alizarine is now manufactured from Anthracene, a hydrocarbon contained in coal tar.

Coal Tar, the primary raw material of the colour industry, is obtained in the manufacture of coal gas, accumulating in the hydraulic mains, condensers, and scrubbers of the gas works.

Coal tar is a black viscid liquid of sp.gr. 1·1 to 1·2. It is a very complex mixture, containing, together with finely divided carbon, a great

number of bodies (hydrocarbons, phenols, bases, etc.), of which the following are some of the most important.

	Formula.	Melting point.	Boiling point.
Benzene	... $C_6 H_6$	6°	81°
Toluene	... $C_7 H_8$	Fluid	111°
o-Xylene	... $C_8 H_{10}$	„	142°
Styrene	... $C_8 H_8$	„	146°
Naphthalene	... $C_{10} H_8$	80°	218°
Acenaphthene	... $C_{12} H_{10}$	95°	277°
Phenanthrene	... $C_{14} H_{10}$	100°	340°
Anthracene	... $C_{14} H_{10}$	213°	above 360°
Methylanthracene	... $C_{15} H_{12}$	210°	„
Chrysene	... $C_{18} H_{12}$	250°	„
Thiophene	... $C_4 H_4 S$	Fluid	84°
Pyridine	... $C_5 H_5 N$	„	116°
Aniline	... $C_6 H_7 N$	„	182°
Quinoline	... $C_9 H_7 N$	„	239°
Acridine	... $C_{13} H_9 N$	107°	above 360°
Phenol	... $C_6 H_6 O$	42°	188°
p-Cresol	... $C_7 H_8 O$	36°	198°
a-Naphthol	... $C_{10} H_8 O$	94°	280°
b-Naphthol	... $C_{10} H_8 O$	123°	286°

The proportions of these constituents vary greatly with the kind of coal employed and with the temperature to which the gas retorts are heated. Usually the aromatic hydrocarbons greatly predominate. Of the many constituents of coal tar, the chief ones which are at present employed in the colour industry are benzene, toluene, xylene, naphthalene, anthracene, phenanthrene, pyridine, phenol, and cresol. Gas tar contains about 1 per cent. of benzene and toluene, 8 to 10 per cent. of naphthalene, and ½ per cent of anthracene.

In order to isolate the valuable products, the tar is first submitted to a preliminary distillation from large wrought-iron stills, capable of holding from 10 to 40 tons, by which it is separated into the following portions :—

(*a*) First runnings } — up to 110° / 110 to 210° } 3 to 8 per cent. of the tar.
(*b*) Light oils }

(*c*) Carbolic oils—
210° to 240° 8 to 10 per cent.

(*d*) Heavy or Creosote oils—
240° to 270° 8 to 10 per cent.

(*e*) Anthracene oils—
270° to 400° 16 to 20 per cent.

whilst a residue of pitch remains behind in the still (about 50 per cent.)

The last portion of the coal tar distillation, the so called " anthracene oil " is a thick, buttery, greenish mass, which contains anthracene, phenanthrene, methylanthracene, diphenyl, acenaphthene, naphthalene, methylnaphthalene, pyrene, chrysene, retene fluorene, carbazole, acridine and other bodies. For the extraction of the anthracene, the oil is cooled and the anthracene which separates out mixed with other hydrocarbons, is freed from the oily mother liquor by pressing or centrifugating. The greenish gray mass thus obtained, which only contains from 10 to 12 per cent of pure anthracene, is then submitted to a pressure of 200--300 atmospheres in hydraulic presses heated by steam ; by this means a large part of the phenanthrene and other impurities is removed, and the anthracene value of the product is raised to from 25 to 40 per cent. For further purification, the crude anthracene is washed with " solvent naptha " or with light petroleum spirit, in which the anthracene is more sparingly soluble than the accompanying phenanthrene, etc. The anthracene thus purified usually has a value of from 50 to 60 per cent. and is sufficiently pure for the preparation of anthraquinone. Recently pyridine bases or a mixture of these with " solvent naphtha" have been very successfully employed for the washing of anthracene, as by this means the carbazol is more completely removed, and the value of the product in anthracene is raised to about 80 per cent. To obtain chemically pure anthracene, the commercial product is ground up with a mixture of caustic potash and lime, and submitted to distillation, after which it is again washed with solvents and finally sublimed.

The next process is to convert the crude anthracene into anthraquinone.

Finely powdered commercial anthracene, containing 60 to 80 per cent. pure anthracene, is stirred up with a boiling solution of sodium or potassium bichromate (1 mol. of bichromate to every mol. of true anthracene present.). A dilute solution of sulphuric acid (containing 4 mol. of suphuric acid to every mol. of bichromate used) is then very slowly run in, the operation occupying 9 or 10 hours; the mixture is finally boiled for some time to complete the oxidation, and the crude anthraquinone is filtered off, dried and ground. The product, which also contains the phenanthrene, carbazole, acridine, etc., present in the crude anthracene, is purified by heating it with 2 or 3 times its weight of concentrated sulphuric acid at 110° for some time, and then pouring into water. By this treatment the impurities are converted into soluble compounds (sulphonic acids, etc.,) which remain in solution whilst the anthraquinone is unattacked and precipitates as a nearly white crystalline powder. After washing with soda, it is filtered off and dried. It contains 90 to 95 per cent. of pure anthraquinone, and is employed at once for the preparation of alizarine.

To prepare alizarine, which is a di-hydroxy-anthraquinone, the almost pure anthraquinone must first be sulphonated. This is done by treating with fuming sulphuric acid (containing 15 per cent. sulphuric anhydride) at a temperature of 150° C. The b.—sulphonic acid is thus almost exclusively produced and it is important that other sulphonic acids should be absent as far as possible, otherwise other dyestuffs will be produced in the subsequent operations and contaminate the alizarine.

The anthraquinone b.—sulphonic acid is now fused with caustic soda for 2-3 days at 200° C., sodium chlorate being added to the melt, and when the fusion is completed the mass is poured into water and hydrochloric acid is added to precipitate the alizarine. This is then washed and standardised, *i. e.*, sufficient water is mixed with the yellow paste to ensure that the mixture shall contain a definite proportion of real alizarine.

You will see from this short abstract that the operations in the manufacture of alizarine are manifold, and that a wide knowledge and high degree of technical skill are required to ensure the production of a material which will meet the requirements of the dyer ; for there are closely allied compounds produced which are by no means of the same dyeing quality and which will seriously interfere with the shade which is produced in dyeing. The dyer therefore, knowing the effect of these other products, generally insists upon obtaining what is called " Alizarine for blue shade," that is, pure Alizarine paste.

THE INDIAN COMPANIES BILL

BY

THE CHAIRMAN OF A COMPANY.

The main object of the Indian Companies Bill now before the Government of India is to revise and consolidate the Indian Law on the subject of Joint Stock Companies on the lines of recent legislation in England. Considering the commercial relations that happily exist between India and Great Britain and the fact that joint stock companies are among the institutions borrowed from England and mainly worked according to the principles of British Law, it is desirable that the Indian Law should as far as possible be in harmony with the English Law. The ever increasing number of Joint Stock Companies in India, calls for greater vigilance on the part of the Government over their working. The early introduction into this country of the safe guards found to be necessary in Great Britain, is advisable.

Some Indian Companies in Northern India, especially in Bengal, publish in their advertisements, names of certain well-known gentlemen as patrons or extraordinary directors. It is believed that most of them are not even shareholders. Their powers, privileges, and responsibilities are not defined. The object of publishing the names seems to be to attract public attention in a marked degree. The law has made ample provision for appointment

of Directors and other office bearers. There should be no office in connection with a company unrecognized by law. Either these patronships and extraordinary directorships should be declared illegal or their rights and responsibilities should be specially defined in the Act.

Section 10. Clause 3 of this section, rightly prohibits the naming of a company in such a manner as to indicate the sanction, approval or patronage of the Crown or the Government of India or a Local Government. The prohibition should be extended to the use of the name of a deceased sovereign or of the name of the Governor-General or of a Governor during his tenure of office.

Section 20. Clause 2 states that "all money payable by any member to the Company, under the memorandum or articles shall be a debt due from him to the Company." Share money is called in parts by the resolutions of the Directors according to the exigencies of the Company's business. Often, these calls receive no response from a large number of shareholders. The adoption of stringent measures to recover them, is not only very expensive but also leads to unpopularity. The consequence is that unpaid calls accumulate and remain uncollected until the time for winding up begins. The law of limitation prescribes 3 years from the date of the call for a suit to recover the amount called for. If the winding up takes place more than 3 years after the date of a call, the claim of the company to the amount of unpaid calls, becomes barred. The only and real sufferers will be the creditors of the Company. As the primary object of shares is that their value should be forthcoming at the time of liquidation, no limitation should apply to the recovery of share money. The fact that Directors neglected to enforce the payments of the calls, ought not to prejudice the creditors of the Company who have no control over the Company or its Directors or shareholders. It cannot be too strongly urged that no period of limitation should apply to the claim for the recovery of the unpaid share money *during liquidation*, notwithstanding any calls made by the Directors more than 3 years prior to the commencement of the liquidation proceedings. The addition, at the end, of the following clause :—"And shall be recoverable until the final liquidation of the Company notwithstanding any provision of the law of limitation to the contrary" will be of very great benefit.

Section 30 (clause 2), section 31 (clause 4), section 44 (clause 4), section 50 (clause 2), section 52 (clause 2), section 61 (clause 2), section 70 (clause 3), section 73 (clause 1), section 74 (clause 1), section 78 (clause 2), section 79, section 86 (clause 6), section 112 (clause 2), section 134 (clause 4). These sections propose to punish both the Company and its Directors for certain omissions and irregularities. The punishment of both for one and the same act or omission is unnecessarily harsh and not warranted. In cases where the Directors are found to have wilfully committed any offence, they alone should be liable to punishment; and the Company should not be punished. For all unintentional and *bona fide* omissions or irregularities of the Directors, the Company may be punished. The punishment of both the Company and its Directors for one and the same infringement of the law is not right in any case. The object of punishment is to compel compliance with law. This will be amply secured by the punishment of either the Company or the Directors. Punishment of both partakes of the nature of vengeance.

Section 85. This clause deals with the inspection of the Register of members. The words "other person" in clause 1 of this section should be so qualified as to prevent a perfect stranger from claiming inspection or copy of the register of members for purposes of idle curiosity or mischief. Probably these words were introduced to cover the cases of the heirs of shareholders and creditors of the Company who may have good ground for seeking inspection or copy. The omission of these words and addition of an explanation or proviso to secure to the heirs of shareholders and creditors, facilities for obtaining the

requisite information or copy would protect all interests without giving room for the satisfaction of idle curiosity.

Section 68. This runs :—"A limited liability Company may by special resolution determine that any portion of its share capital which has not been already called up shall not be capable of being called up, except in the event and for the purposes of the Company being wound up, and thereupon, that portion of its share capital shall not be capable of being called up except in the event and for the purpose aforesaid." The company's natural power of cancelling or modifying a special resolution once passed is not probably taken away by this section. If the special resolution mentioned in this section, be not liable to cancellation or modification under any circumstances, the result will be that the Company may find it difficult to meet unavoidable or desirable charges which may become absolutely necessary in the prosperous working of a solvent Company, such as the purchase of improved machinery and the like. A proviso should be added to the effect that by a further special resolution approved by a Court of law, or the Local Government, the resolution in question may be cancelled or modified. The sanction of the Court or the Local Government will be a guarantee for the original resolution not being set aside or modified in the absence of sufficiently strong grounds.

Section 80 states that "any shareholder shall be entitled to be furnished with a copy of the balance sheet and the auditor's report at a charge not exceeding two annas for every hundred words." Along with the notice convening the annual meeting of the shareholders for the purpose of considering the balance sheet, a copy of such sheet with the auditor's report is now freely circulated among all of them. This section probably refers to copies of balance sheet and report passed by the general meeting. It is not unusual that some modifications are made at the meeting. When such modifications are made, copies of modified balance sheet are also supplied free to all shareholders. As a matter of right, each shareholder should receive free of charge, the finally passed balance sheet. Copies supplied on application, other than those abovementioned, may be charged. The wording of the section should be so modified as to remove the doubt that may be raised as to the right of the shareholders to receive the first copy of final balance sheet and annual report free of charge.

Section 81. Clause 8 of this section, relating to the statutory meeting of the company runs:—"The members of the Company present at the meeting shall be at liberty to discuss any matters relating to the formation of the Company, or arising out of the statutory report, whether previous notice has been given or not, but no resolution of which notice has not been given in accordance with the articles may be passed" This clause will prove a handy weapon in the hands of a few obstructionists and will tend to prolong meetings to the detriment of actual business. The shareholders have under section 83 of the Bill, the right of calling meetings. Those who desire any particular resolution to be considered, discussed and passed may call a special meeting instead of wasting the time of the meeting especially as under the clause as it now stands, no new resolution could be passed at the meeting. The discussion contemplated will be purely academical and serve no practical purpose. Discussions on resolutions not before the meeting should be ruled out of order, in the interests of despatch of business.

Section 83. Clause 2 of this section fixes the minimum number of members entitled to call a meeting at 5. This may be good enough in the case of a Company consisting of less than 30 members. But there are Companies whose members are counted by hundreds. Where the number exceeds 30, half of the members subject to a minimum of 20 members, may join in convening a meeting. The occasions for calling such meetings should be as few as possible and the number of persons who call it, must be such as to indicate that the action taken, has the approval of a decent number of shareholders. Clear provision on the lines indicated will be of great advantage.

Section 172 provides that "no award made on any arbitration in accordance with this Act shall be set aside for any irregularity or informality." The words "irregularity or informality" may or may not be construed as including corruption or gross partiality, for which, under the Code of Civil Procedure, awards of arbitrators are liable to be set aside. It cannot be the intention of the legislature that corrupt and partial awards should be upheld. The wording of the section might be so modified as to leave no doubt regarding the invalidating effect of corruption or gross partiality on the award.

Section 174. The words "where the Courts think fit" virtually give to Courts an unlimited discretion to enforce or refuse the enforcement of agreements, references, arbitrations, or awards. It would be a great boon if some general indications are given in the section, as to the circumstances under which this enormous power is to be exercised, especially as Courts other than the High Court have jurisdiction over these matters. It is hardly necessary to add that correction of errors by an appeal is very costly and dilatory; and that clearness and definiteness will minimise unnecessary litigation and expense.

Section 202. Clause 3 of this section speaks of the remuneration of official liquidators by means of a percentage. The percentage is not specified. It may be fixed at a rate not exceeding 5 per cent. of the amount distributed among the creditors and contributors.

Section 221. Clause 2 of this section which relates to the power of the Court to order public examination of Promoters, Directors etc., empowers the Local Government to decide whether the employment of a legal practitioner to assist the official liquidator is necessary. The Court, under whose orders the liquidation takes place, will be in a much better position to decide this point. The matter is not of such an importance as to justify the Local Government to interfere. In criminal cases Courts appoint Vakils for defence. They may be very well asked to decide whether the liquidator requires any professional assistance.

Section 240. Clause 3 virtually empowers one party to appoint the arbitrator for his opponent where the latter fails to appoint one himself. It will be more satisfactory that such an appointment is made by a Court.

Section 250 relates to applications to the Court by creditors of contributories for winding up a Company when such Company is being voluntarily wound up. The application for winding up *by Court*, should not be allowed if it be made almost at the conclusion or after the close of voluntary liquidation, except on grounds of absence or inadequacy of notice, corruption or gross partiality. The heavy cost of liquidation and presumption of fairness which arises from the absence of grounds abovementioned, point to the necessity of restricting as much as possible the right to make such application.

Section 261. Dealing with preferential payment in a winding up, rents due to zamindars and landholders by the Company in liquidation on lands held by it, which under the law is a charge on them, must be included in class (*a*) next after the dues of the Crown and Government. The section as it stands, seems to ignore the statutory right of the landlords to priority of payment of the rent due and charged on the land held by the Company.

SELECTION.

TECHNICAL EDUCATION.

REPORT OF COMMITTEE OF INQUIRY.

Lieut.-Col. E. H. de V. Atkinson, R.E., and Mr. T. S. Dawson, who were appointed by the Government of India to conduct an enquiry with a view to bringing technical institutions into more practical relations with employers of labour in India, have presented a comprehensive report. It shows that they have gone very fully and thoroughly into the whole question of technical education, and have given special attention to the question of how best to bring technically-trained young men into touch with those who are able to offer them employment. In a foreword with regard to the general object of the inquiry, they say :—

DEMAND FOR TECHNICAL EDUCATION.

During recent years there has been a continuous and insistent demand from all parts of India for an extension of technical education, and proposals for the establishment of institutions for teaching the most varied subjects have been made. The examples of England, America, Germany, and Japan have been freely quoted as possessing numerous colleges and schools, and as affording various facilities for technical education and scientific industrial training. It seems to be forgotten, more often than remembered, that these countries possess a wealth of manufactures, factories, and workshops, which India does not possess, and in them the growth of manufactures, factories, and workshops, preceded the establishment of technical schools and colleges. Nevertheless, a large portion of articulate Indian opinion seems to understand that if only a sufficient number of technical institutes are established, and a sufficient number of men are trained to take up appointments as managers, foremen, etc., the establishment of manufacturing concerns must follow, and the industrial regeneration of India will be assured.

If it is admitted that in every other country technical education has followed the organization of industries, or grown up alongside with them, and may be said to be the necessary complement to industrial efficiency, it is obvious that in a country where few industries are established, the wholesale education of Indians could only result in an excess of young men trained up for posts which do not exist, and for whom no suitable occupation can be found.

CONDITIONS.

The question whether technical education is of any assistance at all depends firstly on the general aptitude of the subject for this line of work. It is useless training a man in mechanical engineering who will not take off his coat and work, whose physique will not stand the strain, or whose social customs make manual work repugnant. Secondly, the question depends on the general business aptitude and energy of the race, whether capital and commercial confidence is forthcoming to start enterprises, and perseverance and grit in the application of technical knowledge to ensure a successful outcome for these ventures. Captains of industry are not turned out mechanically in technical institutions, and every technically trained student must be prepared to start on the lowest rung of the ladder, show his superiority by hard work and technical knowledge, and having made himself indispensable and a commercial asset to his employer, he will then rise by the natural laws of supply and demand.

As regards the position in England at the present day, Professor W. C. Unwin recently remarked, "a very great obstacle to the progress of technical education in this country has been the want of any definite aim, and the unsuitable character of our secondary education."

It is therefore necessary to have a definite aim before us in any scheme for technical education.

EVILS OF OVER EDUCATION.

It is generally admitted that higher literary education in India can be overdone, the result being the production of a large number of educated men who cannot find employment commensurate with their qualifications. In the same way technical education may prove a curse instead of a blessing, if it turns out a number of men who cannot obtain employment, either owing to the inefficiency of the education, to the fact that it has been conducted on wrong lines, or because suitable and remunerative employment does not yet exist.

OBJECTS OF THE ENQUIRY.

In order to bring the technical institutes of India into closer touch and more practical relations with employers of labour, and to study the existing requirements for technically trained Indians, together with the probabilities of an increased sphere of employment for them in various trades and professions, we were deputed by the Government of India to enquire into the following points :—

(*a*) What openings exist for the employment of technically trained Indians, and what further openings are likely to be available?

(*b*) What type of man and standard of education and training do employers of labour demand in the various industries?

(*c*) Have these demands been met by the existing technical institutions?

(*d*) If not, how should these institutions be altered or added to, in order that they

should be in a position to meet these demands?

(c) What arrangements can be made for systematic co-ordination between institutes and employers of labour, in order that they may work in with each other for their mutual benefit and for the good of the country?

The last point is perhaps the most important of all, and it may be noted that even now it is a burning question in the complex industrial organization of the West.

THE PLACES VISITED.

We were directed to visit the different centres of industry, interview the various employers of labour, and the staff of large industrial concerns, whether controlled privately or by Government, and to obtain the opinions of all who could give any information which would enable us to formulate some definite proposals for submission to Government.

The scope of our enquiry has covered Bengal, the Central Provinces, Bombay Presidency, Madras Presidency, the United Provinces, and the Punjab. In each of these provinces all the principal workshops and industrial concerns have been visited, the Managers and heads of departments have been interviewed and their opinions obtained.

GENERAL RECOMMENDATIONS.

The result of our enquires shows that there is an almost universal demand among employers of labour for technically trained Indians who comply with the conditions stated. To fulfil these conditions a practical apprenticeship is indispensible, and that the facilities for obtaining this apprenticeship will be readily afforded in sufficient numbers is evident from the promises of support detailed in Part II. To keep this whole system working satisfactorily will be the duty of the controlling authority recommended in paragraph 45.

The following general recommendations are based on our enquiry:-

(1) The existing system of training for the Civil Engineering profession in central colleges is the most suitable one for the requirements of India.

(2) Apprenticeships for one year on practical work in the Public Works Department should be granted, if possible, to every student passing out of a Civil Engineering College.

(3) There is practically no opening at present for the employment of high grade mechanical or electrical engineers whose education is mostly of a theoritical character.

(4) There is a very large opening for the employment of men in mechanical and electrical engineering, who, after training in a properly equipped Institute, are willing to gain their practical experience by apprenticeship on a living wage, work with their hands, and observe factory hours and rules. This employment is open to Indians of every caste or creed, grade of social position or education, provided these conditions are observed; and the height to which they can rise depends on their individual characteristics.

(5) The best method of training men in mechanical and electrical engineering to meet the existing demand is by a course at a well equipped Institute, followed by an apprenticeship in works. Institutes should not grant any certificates till this apprenticeship is satisfactorily completed.

(6) The education given in the Institute should be essentially practical: be capable of being applied commercially, and not of such a high scientific character as is often considered necessary in the West.

(7) Large mechanical and electrical Institutes are, at present, only necessary in those provinces in which industrial development is well advanced. Minor Institutes should be properly endowed, equipped with adequate staff and apparatus, and placed under proper control as regards their courses and certificates.

(8) The staff of all Institutes should be carefully selected, and consist of men with the necessary theoretical attainments and extensive practical experience. To keep in touch with the various industries, the staff should be permitted to take up consulting and advisory work as opportunity offers.

(9) The scheme recommended for technical education for the mining industry is detailed in a separate paragraph.

(10) Apprenticeship after a course at an Institute as detailed in recommendation 4 and 5 are equally necessary for technical education in the textile industry; in which the courses in spinning and weaving should be separate ones.

(11) Afternoon classes for textile jobbers and mistris should, if possible, be instituted in suitable centres if a satisfactory demand exists, to give practical demonstrations in the vernacular in the theoretical side of their work.

(12) Arrangement should be made for the permanent co-ordination of the relations between institutions and employers of labour by the appointment of a controlling officer, and the establishment of an employment bureau.

VIEWS AND REVIEWS.

Dairy Products.

An interesting article appears in *The Elgin Dairy Report* of the U. S. A., dealing with the utilisation of dairy by-products as food. It is estimated that, for each 100 pound of whole milk used in butter making, there are obtained as by-products 84 pounds of skim milk, containing 2·85 pounds of protein, 0·25 pound of fat, and 4·28 pounds of milk sugar. Considerable use is also made of skim milk for the preparation of casein used in the manufacture of various articles and this use is gradually increasing. Skim milk is also used in the manufacture of cheese, but it is safe to say that large sums of money are annually lost to factories by the inferior use or actual waste of butter milk and whey. Whey, the residue from cheese making, contains on the average 1 per cent. of fat; the whey may be run through a separator, and the fat made into whey butter. To secure the maximum yield, it is necessary to save the drippings from the milled curd. It is believed that from 20 to 30 per cent. of starter improves the flavour. Whey butter is apparently a little softer than the regular creamery butter, but a number of tests showed this was not due to excess of moisture. The quality of whey butter is fair and possesses fairly good keeping properties—in fact, it is equal to average creamery butter when the whey was pasteurised; but that made from unpasteurised cream and allowed to ripen naturally was poor in quality, and went off in flavour badly in six months. The grain and colour of the pasteurised lots seemed to improve on keeping. There is no doubt that the softness may be overcome by the addition of 1 to 2 per cent. of skim milk powder.

Manuring with Iron.

Mr. J. G. Turnbull writing in the *Agricultural Economist* observes that iron is present in all or nearly all soils in a natural condition, but perhaps it has occurred to few agriculturists that it is being daily added to the soil from wear and tear of implements. At first sight this may sound almost fantastic, but calculations have been made which seem to place beyond doubt the fact that a considerable amount of iron is being yearly added to the soil from this cause. Alderman Mechi called attention to the fact many years ago, and estimated that on his farm, which included 55 tons of piping as well as 12 tons of other iron, the weight of iron consumed per acre yearly was 28 lb. over 170 acres. This was allowing for decay at the rate of 3 per cent. per annum. He informs us that in France the subject has also received attention, and that the average there works out at 16 lb. per acre. Something will depend no doubt on the stony nature or otherwise of the land, but an average has been arrived at in another quarter also, for an old estimate by Garrett & Sons goes into details of the loss of iron incurred by wear in the different implements of a 200 acre mixed soil farm of average quality. This amounts to 1 ton per year, or 11½ lb. per acre. Steam engine and threshing machine account for most (6 cwt.), and ploughs easily come second with 3 cwt., harrows coming far behind. It is only fair to say that iron hurdles account for 2 cwt. and miscellaneous iron for a good deal more, and that portable engines and carts are included, but the bulk of the waste must remain somewhere on the farm so that this form of contribution is possibly an appreciable one.

Artificial Rubies.

At the present day, writes the *Popular Scientific Journal*, there are four different kinds of rubies on the market; it has now become almost an impossibility, even for expert jewellers, to distinguish the natural from the artificial variety. This is due to the fact that success has been achieved recently in manufacturing true rubies. The four kinds of gems are, (1) Real natural ruby; (2) Reconstructed ruby; (3) Synthetic ruby; (4) Imitation ruby.

Chemically, the natural ruby is composed of aluminium oxide (*Alumina*, $Al_2 O_8$) with a

trace of some metallic oxide such as *chromic oxide* which gives the colour.

Reconstructed rubies are real rubies formed by fusing together in the intense heat of an oxyhydrogen flame a number of small fragments of natural ruby, or ruby dust, so that they crystallize into one larger gem.

The synthetic stones are built up of alumina powder fused in the inverted oxycoal-gas blowpipe devised in 1904 by Prof. A. Verlium. The red tint of the ruby is obtained by adding a small percentage of chromic oxide, the depth of the tint depending upon the amount of the oxide. Stones weighing as much as 10 carats when cut and of excellent colour and to all appearance clear and flawless, are easily prepared, and a considerable industry in the manufacture of rubies has sprung up in Paris. The molecular arrangement is exactly the same as in the natural ruby; other physical qualities are therefore identical, but the origin of the artificial stones is invariably betrayed by tiny air bubbles and faint curved markings that are seen in the interior with the aid of a lens.

The imitations are usually made of colored glass or paste (a composition of pounded rock crystal melted with alkaline salts and colored with metallic oxides).

The Joint Stock Enterprise of the World.

The extraordinary economic development that has taken place all over the world during the last ten or fifteen years is well illustrated by some authoritative statistics that have just been published in the *Bank-Archiv* by Herr Zimmerman-Braunschweig, representing the most recent labours of the International Statistical Institute. Since 1895, this body has devoted itself among other things to compiling and checking the statistics of capital issues subscribed in the principal countries of the world, and now publishes a complete set taken over periods of five years from the end of 1870 to the end of 1910. These indicate no very extraordinary progress until the last five years of the nineteenth century, but since then, the advance has proceeded at an astounding rate. During the quinquennium 1871-5, the world's total of fresh capital subscribed amounted to £2,250,000,000, during the next (1876-80) to £1,555,000,000, and during the next (1881-5) to £1,205,000,000. The high level of 1871-5 it ascribes to the after effects of the Franco-German War, which meant a great leap forward in German industrial and commercial activity, while France had to make strenuous efforts to recover lost ground. For each of the next two periods, 1886-90 and 1891-5, new issues represented a value of £2,020,000,000. After that begins an era of extraordinary activity. During 1896-1900 new issues of capital were made to the amount of £3,000,000,000, during 1901-5 to the amount of £4,185,000,000, and during 1906-10 to the amount of £5,500,000,000. The part which America took in this call for fresh capital is noteworthy. In 1894 it accounted for only 5·4 per cent. of the new issues, and in 1898 something under 7 per cent., but in 1902 American issues were 17·7 of the total, in 1904, 26·4 per cent., in 1905, 38·8 per cent., in 1906, 20·47 per cent., and in 1908, under the influence of the "sunshine movement" after the panic of 1907, as much as 42·45 per cent. The Institute sets down the face value of the paper securities in circulation throughout the world at the end of 1911 at from £22,800,000,000 to £24,000,000,000.

Land Development.

In the July number of the *Contemporary Review*, Marcus Woodward gives the world a paper on 50 years' continuous corn-growing on the same soil with amazing results, brought about by giving scientific chemistry a share in the business of agriculture. The gist of the matter is that chemical analysis is brought to bear on the substances which a plant requiries, and what the soil affords, and deficiencies are made up by the application of the necessary chemical manures. It then becomes a simple matter of economics to know if the out-turn—the cost of it and the quality—makes the venture pay.

In regard to corn-growing on the land in question, it appears that out of 8 substances the crop needed, 3 required to be added; the rest were contained in the soil 6" deep in an

abundance sufficient to supply crops as follows:—

Phosphoric Acid.	171	Crops.
Potash	272	,,
Lime	5,476	,,
Magnesia	1,391	,,

Calculations showed that enormous quantities of plant food were contained in only 6" of clay land. As regards out-turn, the following table is put forward, which, if found accurate, shows what India might do if a scientific system could be introduced and financed:—

The Farm 450 acres	Bushels per acre.
Hertfordshire	35
Germany	25
France	18
United States	13½
Argentine	13
India	12 (!)
Australia	9
Russia	8

Corn-growing is stated to be not only a question of climate, but also chiefly one of producing, on a given soil, in a given climate, the most suitable variety of wheat in the most suitable way. The world is searched for samples of wheat; hundreds are grown, but only two or three maintain their high quality in England.

In the Punjab, the average yield per acre is, observes a correspondent in a Bombay paper, stated at about 15½ bushels for irrigated land!

On the Hertfordshire Farm, the cost of cultivation is put at £6-8-0 per acre including rent, rates, taxes, interest on capital, manures, etc., harvesting, threshing, marketing and seed. With wheat at 31/9*d.* per quarter and straw at 48/4*d.* a ton, the profits have been £3 per acre, notwithstanding the agricultural depression incident to a manufacturing regime.

Here then, says the writter, seems to be matter for digestion and assimilation by our Local Governments. Germany, works on good scientific lines, and the results of her corn-growing per acre prove her second only to the Hertfordshire experimental farm in out-turn per acre. Doubtless chemists have had some hand in this good result.

It would be easy for Local Governments to start chemical departments for the use of the agriculturists, and even if fees had to be paid for analysis of soils and produce, it might pay handsomely in the end.

Apparently, the corn-crops are not the only ones which might benefit from the scientific treatment tried in England. There is room for experiment in every direction, and in a way which would benefit the whole agricultural population, if a *modus operandi* can be found for financing and conducting the business.

It has often been pointed out how the land in India could be made more productive, and how the railways could be used for transport of the necessary manures, etc., and the increased produce, with considerable profit to Government. In the correspondent's opinion, here too is a direction in which the educated youth of India could find an out-let for their energies. It might be found that occupation in connection with every field would arise, in consulting with the cultivators and making analysis of the soils, etc. Co-operation between the Government and the Agricultural interests everywhere is needed, to start improved conditions of crop-growing which should not be limited to mere leaflet distribution by a Central Bureau.

In many cases the tiller of the soil may not have the means to get the information he requires or the cash to buy manures. These should be made available to him under some local arrangement of advances to be repaid when the crop is reaped.

The World's Gold.

A writer in the pages of the June issue of the *British Trade Review* discusses the world's production and consumption of gold. American experts of the United States Mint have published an account of the production and distribution of gold throughout the world for the 21 years commencing 1890, and extending to the beginning of 1911. It is during these two decades that the discovery of the South African gold-field and the development of the cyanide process of extraction has added so greatly to the world's output. During 1910 the

output was £94,583,000, compared with £23,541,000 for 1890, and the production increased steadily except for the setback caused by the South African war. The distribution and absorption of the gold is as follows: Among European banks, American banks, industrial consumption, circulation, absorption in Asia and in Africa, amounts taken by new and developing countries. Taking the more recent period first, the 11 years from 1900 to 1910, both inclusive, the total output is estimated to reach £841,040,000 and the following schedule shows how it has been distributed, omitting fractional amounts. The second schedule for the years 1890 to 1900 shows a total of £408,227,300 —

1900 to 1910 :—	£	£
Industrial Consumption		199 583,000
European Banks		179,833,000
Banks and Treasury, U. S.		151,416,000
Absorption of India		90,208,000
Bank of Japan		14,375,000
COLONIES :—	£	
Banks and Treasury of Canada	17,854,000	
Banks of Australasia and South Africa	19,916,000	
Absorption of Egypt ...	30,415,000	
		68,185,000
SOUTH AND CENTRAL AMERICA :—	£	
Conversion Funds of Argentine and Brazil	71,458,000	
Banks of Mexico	5,937,000	
		77,395,000
Other Banks and Circulation		60,041,000
Total. ...		841,036,000

For the first decade, 1890 to 1899, the distribution was as follows, also omitting fractional amounts :—

	£
Industrial Consumption	118,750,000
European Banks	143,083,000
Banks and Treasury of the United States.	54,166,000
Canadian, Australian and South African Banks	12,437,000
Egypt and India	40,625,000
Other Banks and Circulation — ...	39,166,000
Total ...	£408,227,000

The most important point brought out by a comparision of these schedules is the increasing absorption of gold by India. During the first period, 1890-1900, the amount absorbed by India and Egypt, given together, amounted to £40,625,000; whilst during the second period, 1900 to 1910, the amount for India alone reached £90,208,000. India in its relations with Europe has always had a favourable trade-balance, which had to be settled in the precious metals, but until recently the principal medium has been silver. During recent years the trade-balances have been growing larger, as a result of increasing exports and the higher prices received for them, and whilst India continues to take the same amount of silver as formerly, it is also taking large sums in gold. For the 10-year period 1890-1899, the net imports of gold into India plus the country's own production, were £28,300,000 and for the 11 years 1900 to 1910 they reached £90,375,000. For the year ending March 1911 they amounted to £18,850,000, or about equal to one-fourth of the world's production after the industrial consumption had been provided for.

Ivory and its Substitutes.

Discussing the trade in ivory, a Home contemporary refers to the fact that, at the present time, the demand quite exceeds the supply; but modern ingenuity, it points out, has provided numerous imitations and substitutes; and some of the factitious ivory is difficult to distinguish from the real substance. The real ivory, being a modification of dentine, shows, in transverse sections, lines of varying shades running in arcs and forming minute lozenge-shaped spaces. These markings, which exist in every portion of any transverse section, enable the expert to recognise true ivory as distinct from every other kind of tooth-substance, and from bone and all factitious "ivories." Among ivory substitutes, vegetable ivory is one of the most curious and interesting; since it is the product of a plant and yet resembles ivory more completely than the majority of animal substitutes. The *Phytelephas macrocarpa* is a native of South America, and the fruit of this palm-like plant is of the size of a man's head and contains numerous nuts rather smaller than hen eggs. The kernels of these, which are commercially known as Corozo nuts, furnish the vegetable ivory so extensively used in the manufacture of buttons, umbrella handles and trinkets. Two or three millions of Corozo nuts are now imported annually, the bulk of them being used by the Birmingham turners. Only a small proportion of the ivory of Ceylon, India, Burma, Cochin China, and the Eastern Archipelago reaches Europe; the bulk of the ivory of European commerce sold in the great markets of London, Liverpool and Antwerp, is African, and it is brought from the interior by almost every route communicating with the coast. But the tusks of many thousands of elephants slain annually in Africa never reach the coast; for ivory is greatly in demand by the chiefs and headmen of the interior for the embellishment of their dwellings and for the decoration of the tombs of their distinguished dead. African ivory has superior density and whiteness, and it is most highly valued by manufacturers; so that the present enormous slaughter of African elephants promises to bring about, ere long, a serious shortage.

Ivory is valued according to the size and soundness of the tusks. There are three grades of teeth – 60 lb. and upward, 40 to 60 lb. and between 20 lb. and 40 lb. Whereas a good average price for West African teeth may be said to be £50 to £60, selected specimens for billard balls, for example, may command twice that price. The quantity annually imported into Europe averages 12,500 cwt.; and to procure this, together with the proportionately small amount used by Eastern manufacturers, some 40,000 elephants must be slaughtered.

Indigo as a Manure.

Baron Schrottky writes to a Ceylon contemporary :—When the Indigo plants are about 4 feet high (which will be about four months after sowing) they should be cut down with a pruning knife, leaving about 6 inches of the stalk in the ground. The cut plant should be evenly gathered and made into bundles to carry them conveniently to the manure pit. A manure pit for 4 acres cultivation should be about 30 feet long, 15 feet broad and 4 feet deep; it should be lined well with clay, to make it as water-tight as possible. The pit ought to be near water, or a small well be dug alongside. The day before the plant is cut, 2 feet of water should be put into the pit, by a hand pump or other convenient means. All the 4 acres ought to be cut in the morning on one day, the bundles taken to the pit, opened out and the plant evenly put into the pit. Small bamboos, the breadth of the pit (15 feet) should be put over the plant, one foot apart, 5 thick bamboos (30 feet long) should then be put lengthways over the smaller bamboos, two close to the sides of the pit, the other three at equal distances from each other, and these should be tied on to the smaller bamboos to make a sort of framework over the plant. Heavy stones should now be put in each corner over the framework and some in the middle. More water must then be put into the pit, until the plants are all covered, and fermentation allowed to proceed for 48 hours. After this, the stones and frame work of bamboos should be taken out and the fermented plant be covered with 2—3 inches of soil. In about two months, the manure can be dug out and either be used at once, or kept heaped up for future use. The pit will thus be ready to take in another lot of Indigo plant, which meanwhile will have grown big enough for a second cutting.

Three to four cuttings can be obtained during the year, and the Indigo manure thus obtained should have a money value of about R100 to R150 per acre cultivated in Indigo, according to the quantity of leaves cut.

The Indian Currency Question.

There is a lucid article on the subject in the September issue of the *Modern Review* from the pen of Mr. N. C. Mehta, B.A. (Cantab.)

Since 1873 practically all the important countries except China have adopted one of the following three forms of currency: (i) the gold-standard, (ii) the 'limping' standard, (iii)

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the gold-exchange standard. The first has been adopted by countries like England, Germany and Japan; the second by countries like France and the United States of America; the third by countries like India, the Philippines, Mexico and Panama. In purely gold-standard countries only gold is the full legal tender and has unlimited coinage; in the 'limping' standard countries, gold and silver are both unlimited legal tender, but only the former has the unrestricted coinage. The gold exchange standard is practically the 'limping' standard plus the added feature of partial redemption, it can exist without having any gold in circulation at all.

The following advantages are claimed for the gold exchange standard as against the others:—

First, it economises the use of the metal as is obviously the case with the rupee whose bullion value is only 10*d*. Secondly, "The limping standard without the gold exchange attachment may at any time break down, if the silver (or whatever else the over valued money may be of) should become so redundant relatively to trade, as completely to displace gold. As soon as all gold is driven abroad, parity with gold ceases. But with the gold-exchange system this catastrophe is avoided...So long as the Government is willing and able to maintain the price of bills of exchange with a gold country, it *ipso facto* maintains approximate parity with gold." Thirdly, the gold-exchange standard enables a poor country like India to posssess small silver coins of suitable denomination without at the same time hindering the course of foreign trade. Its only weakness like all delicate machinery consists in its dependence on the skill of the operator.

In conclusion: the existing system is based on the most scientific principles of economics and besidesproducing the economy of the metal, etc., introduces a certain kind of elasticity not available in gold-standard countries. The only safeguard that the Indian public has to take against the dangers to the currency is to be ever watchful as regards the personnel of the finance department and the system with £ 18,000,000 to support it is as strong as any currency could be, so long as the reserve is maintained in a fairly liquid form or invested in easily realizable securities.

The Fallacy of the Oil Boom.

Under the above heading, a writer in the pages of the September *Financial Review of Reviews* warns would-be investors of the dangers ahead in store for them who would rashly buy by the oil booming up of oil companies' shares. The condition of the world's market for oil as revealed in this article cannot but prove interesting to those among our readers who are interested in Burma oil shares. Says the writer:—We are into another Oil boom and unwary investors are as certain to lose their money as they did when rushing into the Rubber boom, and as they always do when gambling in gold shares. Oil mining is not a gamble, but a proper though not always a profitable industry. The flotation of oil companies, however, is a gamble because it is ventured on the credulity of the public, not on the stability of the industry. Oil of all descriptions (except motor spirit) was sold at such a low price last year that they would all have had debit balances had it not been for the high price they were able to obtain for sulphate of ammonia, which is not a product from the oil but from the shale from which the oil is distilled. This material is not possessed by the petroleum producers whose operations are being extended all over the world. And the low prices at which oil was sold last year were due to the excess supply. More oil was being produced in both hemispheres than the world had the capacity to consume.

Oil is an illuminant we have had always with us from the days of the patriarchs—or even the cave men. And when mineral oil was not obtainable, or was not known, there were other oils. But petroleum oil for modern urban lighting as a substitute for coal gas is less likely than electricty generated by water power. Even the rise and fall of the tide can be utilised to produce lighting power if coal fails or the use of it becomes more objectionable than it is. But where the use of oil may

displace coal has been generally supposed to be in the propulsion of steamers. And the hopes of the promoters of innumerable oil ventures have been, avowedly or otherwise, in the universal, or at all events the general, adoption of oil fuel by steamers. And this is the cardinal fallacy of the boom, for oil fuel will never be generally adopted by steamers—at all events in our time. Similar are the prospects before the oil being used as a propelling agent and for marine motors.

The conclusion of the whole matter is this. That the consumption of mineral oil for industrial and marine purposes will increase is admitted, and the actual increase already has been large. But there are more limitations on the further increase of consumption than there are in the production. Petroleum oil or oil share can be and is found in almost every part of the world—and so is coal. Nay, there is probably more petroleum oil in the bowels of the earth than there is of coal remaining in its veins, but while we have the coal at command we have not the oil. And the quantity of oil that is being produced and feverishly prepared for is far more than the industrial and marine world can possibly consume. That position was startlingly revealed to the trade two years ago. It will be more startlingly revealed in less than two years hence. And this is why we call the oil rush a gambling boom.

A Farmer's View of the Rise in Prices:

A writer in the pages of the *Agricultural Economist and Horticultural Review* propounds his own view of the phenomenon of the growing rise in prices in modern days and thus unburdens himself.

Price is the amount of money given for a unit amount of any commodity and the unit of money is a fixed weight of gold. Prices express ratios, the ratios of the values of all other commodities to that of gold. A general advance of prices, therefore, means that the value of everything else has become greater in proportion to that of gold, and is simply explained by saying that it is gold which has changed in value and not other commodities; gold has, in fact, depreciated. Gold may thus depreciate either by being too plentiful or by being used too frequently.

An appreciation of these facts is sufficient to prevent our ascribing the present rise in prices to any local or political cause. It is a world-wide phenomenon, and although there are factors which modify it in different places, its main features are constant. On the whole it is not an evil phenomenon. It creates a trying situation for workers because salaries and wages lag behind food and clothing in the advance, but trade is stimulated and productive effort encouraged by the change. It benefits debtors at the expense of creditors and thus tends to level up the financial burdens of mankind, but the process of adjustment entails hardship to those whose incomes are fixed. Producers and distributors of commodities, however, are not so much affected because higher prices paid may be counterbalanced by higher prices received.

What is wanted is a rapid means of adjustment so that wages may be brought into line with prices by scientific means instead of by the wasteful and inhuman methods of the strike and the lock-out.

Roman Catholicism and Economic Progress.

The Rev. P. Carty, S. J., writes:—

It was with much satisfaction that I read, in the *Wealth of India* of September, the Hon'ble Sir Horace Plumkett's own explanation of the words, quoted from his book in your March issue, which gave rise to the present enquiry. Since he has so kindly told us the purport of his words, he will not object, I am sure, to my briefly examining his explanation.

In explaining why he called Roman Catholicism "*non-economic*", Sir Horace writes: "To say that Roman Cotholicism is non-economic is one way of saying that it is a Gospel religion; all Christian religions are non-economic so far as their teaching is merely that of the Gospel." I should first observe that, this explanation amounts practically for your readers to changing the whole question. For it is not merely Roman Catholicism but all Christian religions that should on this ground have been termed non-economic, even though we take into con-

sideration the further remark that the Roman Catholic Church gives to the uneconomic principles of the Gospel a greater emphasis than the other Christian Churches. Had this been said from the first, I should have had no reason to write any vindication of Roman Catholicism In the second place, I do not think it quite correct to say that the teaching of the Gospel is non-economic. Economics, I take it, implies whatever contributes to material progress ; it extends beyond the mere teaching of "the laws which govern the production and exchange of wealth"-the latter being properly chrematistics. As an illustration of my meaning, I might suggest that Sir Horace himself is an invaluable "economic" factor for Ireland, and this he is chiefly through those essentially economic principles which he lives up to after imbibing them from the Bible : "Bear be one another's burdens and so you shall fulfil the Law of Christ." (Ga. 6. 2.). "Going up to him, He bound his wounds pouring in oil and wine" (Lc. 10. 34), etc.

Sir Horace proceeds: "the Gospel, in one aspect of its teaching may be said to be *anti-economic*. It discourages the accumulation of wealth, extols contentment with mere necessaries, makes the renunciation of property an act of supreme merit." To a Christian reader the statement may possibly not appear very objectionable because of the Christan knowledge he already possesses and which make up for what has not been explicitly formulated. But I think it incapable of correct interpretation by a non-Christian mind. To a Hindu thinker this is the logical conclusion it will suggest : if Christianity—the Gospel religion—is what you have just described it to be, then Christian nations must either abandon their religion or give up economic progress, for you yourself observe that "these Christian ideals are contradictory of the qualities which the economist regards as the basis of national prosperity." But, plainly, it is not so. The Gospel no where condemns the accumulation of wealth as such, nowhere imposes the renunciation of property; it forbids solely an *inordinate attachment* to riches going to the sacrifice of one's own eternal interests. The higher principles of perfection suggested by Sir Horace are a matter not of *precept* obligatory on all, but of *counsel* freely accepted by the few. Writing for Christians, Sir Horace did not need to lay stress on this point, but it is indispensable that the distinction should be clearly expressed here. Thereby we make clear what is that "one aspect of Gospel teaching which may be said to be anti-economic." It is mostly circumscribed within the *cloister* and has little to do with the Christian life of *nations*—which is the point of interest to us now.

In his last paragraph, Sir Horace tells us with marked sincerity and sympathy that "what he has been saying does not imply that a people wholly or predominantly Catholic may not attain a high degree of material well-being and be counted among the opulent nations." And he explains it thus : "influences intervene to limit the range and circumscribe the application of what I have called the uneconomic teaching of religion." But this explanation, I am sorry to say, leaves us under the impression that if Catholic countries are opulent and prosperous, they are so ultimately *in spite of* their Gospel religion whose uneconomic teaching has (happily) been limited by other influences favourable to economic progress. This is dangerously near to saying that, thanks to such influence, the more Christian countries become prosperous the less Christian they are.

Finally, speaking of Ireland, Sir Horace remarks that if these influences were unfortunately not felt there up to this, "times have changed and the way is open for the Roman Catholic Church to exercise in Ireland the same economic influence it has exercised in Lombardy, Belgium and many parts of Germany." But what, it may be asked, are the economic influences exercised by the Church which, it has been urged, give the greatest emphasis to the uneconomic principles of the Gospel? Whatever they be, so long as they encourage the accumulation of wealth, which, it is alleged, the Gospel discourages, we should conclude that they are anti-Christian. This conclusion, I hasten to say, is not mine, nor likely Sir Horace's ; yet it follows, apparently from the premises he supplied. I do not think we need appealing to such influences to explain how it is that some Catholic countries are prosperous and to reconcile this economic position with their Christian or Gospel religion. The Gospel, we know, contains precepts and counsels, the former obligatory, the latter optional. Renunciation of wealth is a matter of counsel, accumulation of wealth is not against precept and Catholics are in economics, much on the same plane as other people, subject to one restriction : "What doth it profit a man if he gain the whole world and suffer the loss of his own soul ?"

This is the broad platform, but the only one on which "many of my brethren in the priesthood can agree" with Sir Horace, and "act upon their belief by supporting an economic social movement" in which he works so splendidly and so successfully.

AGRICULTURE.

Revolution in Cheese-making.

The discovery of a Rotterdam farmer is likely to make a revolution in cheese-making. Cheese must be preserved many months before it can be placed on the market, but the Dutch farmer has found that by passing an electric current through the cheese blocks they can be "matured" within twenty-four hours. Recent experiments in Switzerland have been very successful.

Availability of Phosphoric Acid in Bones.

The rate at which the phosphoric acid in bone meal becomes available depends upon the amount and the character of the soil humus and the bacterial activities occurring in it. The fineness of division of the bone plays an important part in relation to the bacteria ; the finer the particles, the more intimate their contact with the bacteria and their products. The phosphoric acid of finely ground bone meal becomes much more quickly available than that of coarsely crushed bone, because the former presents a much greater surface of attack to the soil bacteria. Bone meal may be made more effective as an available form of phosphoric acid by composing it with cattle manure, which, with its vast numbers of bacteria, its organic matter undergoing decay, and its large amounts of carbon dioxide, hastens the solution of the insoluble phosphates. Similarly, it becomes more rapidly available when used in conjunction with green manures. Conditions favourable for the rapid increase of bacteria and bacterial products are created in the soil by green manure and therefore also for the comparatively rapid conversion of the insoluble posphoric acid of the bone into available forms.

Testing the Soil for Lime.

Unless there be available lime in soils, says the *North British Agriculturist*, crops rarely grow to the best advantage. A convenient method of testing a soil for lime is to take a few spadefuls of soil from different parts of the field or orchard, and dry, pulverise, and mix them thoroughly together. Then take a few ounces of the powder and reduce to ashes on an iron shovel over a fire. Put these ashes when cool into a glass tumbler, and mix them with as much water as it will take to cover them. Stir this with a glass rod or wooden stick, but not with anything metallic. To this paste add 1 oz. of hydrochloric acid, which is commonly sold as muriatic acid or spirits of salts, the mixture being stirred all the time. If a fairly brisk effervescence takes place, it may be taken for granted that the soil contains a fair percentage of lime, but if little or no effervescence takes place, the soil contains little or no lime. If there is not lime enough in the soil, it must be acid, therefore needs liming.

Agriculture and Poultry Keeping.

It may not be a matter of common knowledge, writes P. A. V. in the *Tropical Agriculturist*, that keeping poultry helps to improve the fertility of the surrounding land. It may strike one as impossible ; and no wonder, since no systematic attempt is made in this country to conserve poultry manure and apply it on the land. But there can be no doubt that this is so, as will be evident from a perusal of the interesting Report of the National Poultry Organisation Society of Belgium compiled by Mr. Edward Brown, F.L.S. and published not long ago. Mr. Brown has met with the most noticeable proof of this in what is known as the Campine District, which, at one time was an arid, sandy plain, covered with fir-trees and incapable of cultivation. But it appears that poultry-keeping was taken up by the peasants thirty years ago on a somewhat extensive scale and by the careful utilisation of the manure produced, much of the land has been so enriched that it has been brought into use for market gardening. Signs of prosperity, it is stated, are evident on all sides, both in the appearance of the people and their dwellings. The villages have grown considerably and Mr. Brown observes that he has not met with, "a more striking instance of the place occupied by poultry in respect to increasing the fertility of the soil and advancing the prosperity of the rural population."

COMMERCE.

The Eyes and Ears of Commerce.

We live in an age of competition. The struggle between nations is one not of arms, but of trade ; and it is to Chambers of Commerce, the eyes and ears of our national commercial system, that we turn for help and guidance. They it is who can collect and promptly distribute information, stimulate the home manufacturer towards meeting the wants of the consumer, watch over and protect their local interests, and bring to the solution of the vast and complex problems of international trade, their knowledge, experience, and counsel.—*H. M. King George.*

Duties of Auditors.

There is a good deal of misconception on the part of the commercial public as to the duties of auditors with regard to stock, says the *Manchester Guardian*. In the recent appeal case Mead *v.* Ball, Baker & Co., an interesting decision was given on this point. It had been sought to make a firm of auditors liable for having failed to discover certain frauds which had been going on for some years in connection with the over-valuation of stock and the suppression of liabilities. Judgment had been given for the defendant auditors, and the Court of Appeal dismissed the appeal without calling on the respondents. In the course of his judgment, Lord Justice Fletcher Moulton said that "although it is clear that it is not the duty of an auditor to take stock, one cannot say that it may not be his duty to call attention to suspicious items appearing in the stock sheets which are put before him." The Court held that, in this case, there was nothing in the accounts to arouse suspicion, and that the auditor had not been negligent. This decision confirms the previous decisions on the point--*viz.*, that an auditor is bound to use reasonable care and skill in the performance of his duties, but that he is entitled to accept statements (such as stock sheets) vouched for by trusted servants of the business, the accounts of which he is auditing. As Lord Justice Lopes said: "An auditor is a watch-dog, but not a bloodhound." He is not to suspect everybone of dishonesty, but once his suspicions are excited, he must report the matter to his employers and probe it to the bottom.

Responsibilities of Directors.

The *Economist* has some unsparing observations to make on directors of companies who do not understand the work and therefore discharge their duties inefficiently. Our contemporary's remarks deserve a careful perusal by all in a like position in this country :—Are directors justified in sitting on the boards of companies that they do not understand, and accepting fees for work that they cannot efficiently carry through ? It would not be reasonable to expect detailed technical knowledge from every member of a board. Indeed, the common theory of a director is that he acts more or less like the head of a Government department, bringing a sound general knowledge of business to the conduct of a particular concern, taking the advice of permanent officials, but deciding broad questions of policy for himself. The theory as it stands is not a bad one, but it is easily over-done, and there is still a feeling that directorships call for no particular skill or knowledge, and that anyone with a reasonable amount of application may fill a seat in a board with credit and respectability. The real truth is that a good director is almost as rare as a good Cabinet Minister. He must have an assimilative mind ; he must have high business capacity, and above all, he must have the courage to stand up to his expert advisers. If he is incapable of sound general judgment, or has not strength of mind enough to resist his subordinates on matters of principle, then he may find himself led and no one can lay the blame anywhere but on his shoulders. Directors are not paid for nothing. They are paid to take very heavy responsibility, and that responsibility they overlook at their own peril.

INDUSTRY.

Portland Cement in Bombay.

The names of Sir Sassoon David, the Hon'ble Vithaldas Thackersay, Sir Shapurji Broacha and other prominent Indian industrial men of Bombay appears at the head of a large new industrial undertaking namely the KatniCement and Industrial Company, Limited. The prospectus states that it is formed primarily with the object of establishing an industry for the manufacture of Portland cement, roofing and other tiles, sanitary glazed pipes, bricks and China clay at Katni, Central Provinces. The soapstone industry near the marble rocks, Jubbulpore, is also being taken in. The capital is twenty lakhs. The imports of Portland cement during the year ending March 1911 aggregated 1,26,644 tons of the value of forty-six lakhs. The venture is undertaken with the advice of English engineers, one of whom has been engaged as the head of the works. Messrs. MacDonald and Company of Bombay, a mixed English and Indian firm are the Agents.

A Trade and Industry Committee.

The Trade and Industry Committee of the Royal Colonial Institute, England, was started in 1911 with the following objects in view: (1) To facilitate, encourage and arrange industrial conferences or meetings to be attended by men of affairs from any or all parts of the Empire, in order to discuss questions of common interest with a view to regulating and co-ordinating the conditions of Empire trade and industry, (2) To encourage and facilitate Empire trade and industry, *e.g.*, by arranging for the reading of papers and delivery of addresses on financial, industrial, and trade subjects by authorities before the Institute itself and before Chambers of Commerce, trade bodies, and like institutions in the leading industrial centres.

The dominant note of the Royal Colonial Institute's work is concisely described in its motto, "United Empire." The Trade and Industry Committee exists to foster, stimulate, and assist British commercial and industrial interests, with special regard to their Imperial aspect as elements and factors of Imperial union. It is, therefore, auxiliary to and not in conflict with other organisations working for the development of British trade-interests. It was the above considerations which brought into existence the Institute's Empire Trade and Industry Committee, of which it was, and is, the purpose to place at the command of British captains of industry and of British merchants, the most up-to-date information regarding the economic progress of the overseas Dominions, of the Empire's important Eastern Dependencies, and of those of the Crown Colonies.

Industries of South India.

The Madras Board of Revenue has compiled for the year 1911, a statement of industries carried on in South India by private concerns, which do not come under the operations of the Factories Act. These industries are divided into two classes, namely, those worked by mechanical power, and those which are not so worked. In the first class, there were 7,943 operatives employed in work which comprises coffee, pepper, ginger and cardamom curing, cotton ginning, cleaning and pressing cotton, spinning and weaving, oil pressing, rice mills, rope works, tile factories and printing presses. In the industries of the second class, in which mechanical power is not used, there were 10,397 operatives employed in practically the same class of work in addition to fish-curing, mica-splitting, tanning, cigar-making and palmyra fibre extracting. The tanning industry is a very important one in South India, and is carried on from Vizagapatam in the north to Trichinopoly and Coimbatore in the south, the greater number of the tanneries being situated in the North Arcot and Chingleput Districts. A comparatively new industry is that of the extraction and cleaning of palmyra fibre for export to Europe and America, where there is a certain demand for it for the manufacture of brooms, coarse brushes and the numerous other purposes to which the fibre is now being put. That the indigo industry is not quite dead yet is shown by the fact that, in Godavery and Kurnool, no less than 1,160 people are still employed in the factories and vats. The returns for South India are not complete however, as information regarding Travancore has not been included.

ECONOMICS.

Material Progress and Mental Improvement.

Does material progress always cause mental improvement? A writer in the *Socialist Review* for September asks the question and answers it thus: There is much evidence to prove that, after a certain stage in the possession of tangible wealth is reached, in given conditions, mental and moral decay sets in. This applies to both individuals and nations. No nation has yet been a survivor of this force.

Undoubtedly, says the writer, there are many men and women who, though they own large amounts of wealth, retain their mental agility. Such a category includes the Edisons, the Balfours, and many professors, writers, tutors, philanthropists, and so on, who work for work's sake and its general consequences. On the other hand, too much wealth has a demoralising effect on the owners. This is quite obvious in the cases of young people inheriting big fortunes. Without any effort of their own they receive a lot of wealth, and they have no reason to fight for more. Therefore they find no progressive uses for their minds.

Free Trade or Protection.

Under the heading "Fiscal Freedom and Protection for India," Professor V. G. Kale M. A. of Poona, discusses in the July number of the *Indian Review* the vexed question of Free Trade *versus* Protection.

So far as theory goes, it is difficult to make any useful contribution to the discussion as the question has been looked at from every point of view and all conceivable arguments have been exhausted. The proposition that Free Trade must ever be good for all countries is no longer accepted as Gospel truth, and the decision of the question in any particular case turns upon whether a policy of let alone and free competition or of Protection is best suited to the given conditions. Political, social, and national considerations play an important part in the practical discussion. Advanced economic theory also justifies the adoption of a Protectionist policy by nations in certain stages and circumstances. Protection is not certainly a panacea for all industrial and social backwardness, and may exercise deleterious influences upon nations going in for it. Free Trade may, again, be calculated to promote the best interests of a people. The balance of advantages is, however, likely to lean towards a Protectionist policy and it is on this ground that it is being followed by the United States of America, the countries of the European continent and the British colonies. Indian advocates of Protection desire to profit by their own past experience and the example of other countries. They take exception to the doctrine which has swayed the policy of the Imperial Government in this country, *i.e.*, that because Free Trade is good for England it must be equally good for India. They plead for liberty to their Government and to themselves to decide whether Free Trade or Protection is needed in India and what form either policy should take. It is a matter which must be considered on its own merits and dogmatic Protectionism would not be less injurious than theoretic Free Trade has been.

Classification of Irrigation Works.

For the benefit of readers not immediately in touch with the subject, it may be well to note that irrigation works in India are devided into two main classes—major and minor, the former being either (*a*) productive public works, the capital of which is usually provided from borrowed money, or (*b*) protective works, designed as a protection against famine, the capital of which is provided from current revenues. Minor works are constructed from funds provided out of the current revenues of India, and, broadly speaking, consist of irrigation systems which are not sufficiently important to be treated as major works. Some of them are old works extended or restored by the Indian Government; others were originally provided by private or communal effort, but the State has been obliged to assume control of them, owing to disputes between the parties interested or their inability to maintain them in a state of efficiency. Productive public works are expected to yield within ten years of their completion sufficient revenue to pay working expenses and the interest on the outlay expended on their construction; and no project is now sanctioned as such work unless it can be shown beyond reasonable doubt that when fully developed it will fulfil these conditions.

CO-OPERATION.

The Madras Co-operative Conference.

Arrangements are in progress for holding the first Madras Provincial Conference. An Executive Committee has been appointed consisting of a President, two Secretaries and a Treasurer with five other members for organising and making all necessary arrangements for the holding of the Conference. The date of the Conference has been provisionally fixed for December, within the first fortnight.

The Madras Bulletin of Co-operation.

The management of the Madras Bulletin of Co-operation has been handed over to the Triplicane Urban Co-operative Society, Limited. Government will be prepared to subscribe at the rate of Re. 1-8-0 per annum for every Government officer who is supplied with a copy of the bulletins issued. But no payment should, as a rule, be made for the insertion of any matter which the Registrar wishes to have printed. Government, on the other hand, will not claim, as a right, to insert free of charge any matter which the management of the bulletin does not wish to print. The Board of Revenue has been requested to submit to Government an exhaustive list of officers to whom copies of the bulletin should be supplied.

An Agricultural Co-operative Association.

Particulars of a draft scheme have been published under which an Agricultural Co-operative Association will be establised at the Headquarter station of every Revenue Inspector in the Pudukottai State.

The objects of the association are to enable the cultivator to get good seed-grains at their actual value, and to pay for them after the harvest time with interest at a low rate, without being at the mercy of a money lender, to use agricultural implements for which he will have use only for a few days during the year, and which he cannot conveniently buy for himself, to try chemical and other imported manures in his fields and generally to teach the members the habit and benefits of joint action, saving and thrift.

The capital of the association will consist of an undetermined number of shares of Rs. 5 each and of the profits, loans and deposits and the liability of each member is limited to the value of his share. The immediate control and management of the affairs of the association will vest in a managing Committee consisting of :—The Revenue Inspector who will be the ex-officio President (2) the Monigar or (Karnam) of the Headquarter Vattam who will be Secretary and (3) seven other members including a local Mirasidar who will be Treasurer.

Co-operation in England.

The 45th Co-operative Congress began in the Portsmouth Town Hall on the 27th May. Fifteen hundred delegates from all parts of the country attended, and also representatives from France, Germany, and Holland. Mr. W. Ophenshaw of London, in his presidential address said that the past year showed in membership, capital, and turnover a substantial advance on any previous period. There was an increase in members of nearly 100,000. The share capital of members had increased by 1¾ million, the reserve fund by £420,000, the sales by 4½ millions, and the net profit by nearly one million, while the societies had invested 8½ millions sterling in house property which remained the property of the societies, or in advances to members to purchase or build their own houses. At all points there had been a gradual and sure strengthening of the bonds which united them. What other movements to a large extent sought by more or less contentious agitation to obtain from others, co-operators sought to win for themselves by peaceful methods. Their movement had for its main purpose the establishment of a new system of industry and commerce which should eliminate the bad old methods, and instead of making merchant princes of the few, should secure competence and comfort for the many. Never was there greater need to press forward in productive enterprise. That they should not only produce for themselves all the things they needed, but also employ their members in the process, must ever be among the foremost of their ideals. The international co-operative relations which they were cultivating offered year by year increasing opportunities for this work. Not the least of the results of such efforts would be a substantial increase of help towards the amelioration of the labour troubles which had recently manifested themselves.

BANKING.

Oriental Banks.

Eastern banks have not yet acquired the habit, now grown common in the West, of dispensing with half-yearly reports, an interim distribution for the first six months and a full report at the end of the year being the rule with all British banking concerns with but one exception. Barclay's and the Capital and Counties publish their annual statements at the end of June. Otherwise there is only one important corporation—the Union of London and Smith's Bank—which adheres to the old form in treating its accounts.—*Commerce.*

The Bengal Credit Bank.

This concern is being floated with a capital of Rs. 2c,00,000, divided into 2,00,000 shares of Rs. 10 each. The directors include the Maharaja Jogadindranath Roy of Nattore and Raja Narendra Lal Khan of Narajole, Midnapore. The Bank is to be incorporated not merely to do the routine work of opening current accounts, receiving large fixed deposits or small sums for the Savings Bank Department; but also to foster, revive and help in resuscitating any manufacturing business or concern, agriculture or mining, by advancing loans on reasonable interest and security.

The prospectus states that the need for such an industrial Bank is obvious in a country like India where joint stock enterprise has yet to ripen and where capital for a speculative and unproved business or industry is not easily forthcoming. In nine out of ten cases of recent failures of indigenous manufactures, lack of sufficient working capital was the principal factor. It is the intention of the Directors to carefully consider every proposition for advance on its own merits, to consult experts, to appraise the value of the security of stock or factory or land, as the case may be, and then come to a decision as to the amount to be advanced and the interest to be charged. The shareholders will thus have a twofold opportunity, of reaping the benefit of the Bank's cautious and well-considered investments, as well as fostering or resuscitating indigenous manufactures or industries, without the risk of sinking money in mushroom joint-stock ventures or being liable for the uncalled shares.

Indian Banks.

At the annual meeting of the Indian merchants' Chamber in Bombay, the Chairman, Mr. Manmohandas Ramji in the course of an address of a general character, touched upon the question of Indian banking in the following words :—The increasing number of Banks in this city is causing apprehension to some minds. I do not share this apprehension, for, I believe that there is yet a large field for the working of the banks. It is truism to say that banks are taking the place of the shroffs and shahukars of old. If then they are to take their place adequately, they must be in every town and village just as the shroffs and shahukars are, just as the banks are in the West. I think that the existing number of banks is insufficient to meet the country's requirements. To my mind, the danger is not in the increasing number of the banks but in the injudicious working of the banks, by interested persons. The responsibility of the banking institutions is great and it should be undertaken only by those who are capable and honest enough for the work. I am surprised that the attention of the commercial public is not still drawn to the real want of our people, which is that of smaller banking institutions to cater to the needs of middle class artisans, traders and agriculturists. The existing banks are principally confined to accommodate and lend to manufacturers, merchants and traders in a large way. We want banks like the Industrial Banks of Japan and the Credit Lyonnais of France which advance sums as small as 2*s.* and 5*s.* to traders and agriculturists. The banks have done much by drawing out the hoarded capital of the country and are expected to do still more good but they must be conducted on fair and judicious lines.

INSURANCE.

The History of Medical Examination.

There are those, and they form a by no means inconsiderable number, who consider that too much importance is attached to the medical side of life assurance. This recalls the interesting fact that the medical examination was not always an essential element—indeed, it never entered into consideration in the primitive days of life assurance. Dr. Williamson, in a recent lecture at Aberdeen, recalled the absence of any classification of lives in those early days. State of health, conditions of life, family history, these never entered into the question; everyone paid the same premium and everyone shared equally in the benefits. Then followed a simple statement on oath that the applicant was in good health and suffering from no serious illness. Personal appearance before the board of directors, who used their own judgment, was the next development. It is quite a question whether this was not a more trying ordeal than the regular medical examination of modern times as the directors at the board table are apt to be an uncertain quantity, and bound to contain one or two querulous and tactless souls. In those days it appears a gouty tendency was a point to which special attention was directed. A report from the applicant's medicial attendant was followed about the middle of the last century, by the present system of medical examination by the office's own medical adviser.

Insurance Education of the Public.

The Hon. J. A. Lougheed, Leader of the Senate to the Ottowa Life Underwriters Association, recently delivered an impressive address reported in full by *Office and Field.* It is mainly a plea for the education of the public in the principles of life assurance. He advocates the teaching of thrift in public schools, as well as the advertising of insurance in the newspaper Press. "Forgetting for the moment that I have been speaking as a Member of Parliament, let me," he suggested, "play the *role* of the man in the street, and the gentle critic, as to what Life Assurance Companies are doing, or rather, not doing to advertise the benefit which they are to the public. In this I think they fall short of any other branch of commercial enterprise. There seems to me to be no systematic endeavour along the line of educating the masses to a proper consideration of the benefits of Life Assurance.

"There are probably in the Dominion of Canada thousands of newspapers, and yet I doubt very much if one took up every daily newspaper between the Atlantic and the Pacific he would find an advertisement by an Insurance Company *explanatory of the necessity, the benefits and the feasibility of the poor man purchasing life assurance.* You will find advertisements of the Head Office of the Company being on a certain street in a certain city, of their assets, of the amount of insurance in force and of where their Branch Offices may be found, but not a word that would be *educative* of the great principles involved in life assurance. Notwithstanding the thousands of agents that are abroad endeavouring by their individual efforts to induce people to insure, *nothing is done by the* Insurance Companies in their *collective capacity* to educate public thought and sentiment along the lines favourable to the adoption of insurance."

Men must be taught as if you taught them not,
And things unknown proposed as things forgot.

Cattle Insurance in Baden.

In 1910. cattle insurance was undertaken by about 1,000 local societies in the Grand Duchy of Baden. In addition, a central Institute, with headquarters at Carlsruhe, organised as a Mutual Society and subventioned by the Government, reinsured the risks of quite 426 of these societies, contributing to make good their losses in the years in which they are largest, and, inspecting and controlling the work of the individual societies, both as regards their management and their technique. This reinsurance institute was founded in 1893 with 83 adherent societies, with 29,231 head of cattle, while in 1910, as we have noted, the societies reinsured were 426 and the number of animals reinsured amounted to 143,570. This reinsurance institute is not merely a precious centre of information for the societies in everything relating to the technique and organisation of insurance; it may also facilitate and regulate the formation of new societies furnishing their promoters with model rules, indicating to them the criteria for the formation of their tariffs, and helping them to overcome the competition of other insurance businesses.

EDUCATION.

Technical Education of Indians.

The *Indian Textile Journal* states that the education of young Indians who desire to follow engineering or any of the allied trades has been handicapped by a ridiculous and contemptible notion that once they assume the name of "students" they are entitled to have their path smoothed and to escape the degradation of working as workmen among workmen. They and their friends have tried hard to find a short cut that will lead direct from school to a position of responsibility and good pay, and they will not recognise that this attitude has set many employers strongly against them. While the friends talk, write and agitate for the multiplication and spread of useful industries, the student avoids that special training and experience that gives the European such an advantage in the economies of manufacture. Once they are out of India and away from local prejudice, they go heartily to work in college or factory, and their chief fault is then a disposition to divide their attention among too many things rather than seeking to qualify soundly upon one subject, which is both safer and less laborious.

Vocational Training in America.

According to a writer in the *Education* of Boston, the mental and physical limitations of children under fifteen years of age effectively restrict the possibilities of trade instruction, but instead, furnish an opportunity for a preparatory training which will add more to the efficiency of the future workman than would actual trade instruction during the same years. The absence of the qualities which this preparatory training should develop cannot be fully compensated at any future stage of life. Hence it seems a reasonable conclusion that the most practical benefit to be derived from vocational training in the grades will be found in developing those qualities which will be valuable to every one who engages in any form of hand work. While manual training has demonstrated that these qualities may be developed, these results have been an incident, and not the object of the work. The most important vocational ideal for students of grade school ages is that each student shall acquire the greatest possible degree of the ability necessary to conceive, recognize, and execute true form. This ability is limited in the poor and average mechanics, and possessed to a high degree by the first class workman. A system of vocational training in the public schools should include special trade instruction in the high school, or in an institution, especially for this purpose, in which should also be taught the mathematics, literature, and sciences which are a part of the high school curriculum; these should be adapted to bear directly upon industrial problems. The entire course should be such that the average student completing it, would be qualified to enter the shops upon the basis of an ordinary workman, and as his instruction should have covered, by theory or practice, the entire field of his trade, he should make rapid progress into the ranks of the highest skilled workmen.

Libraries in Baroda.

The latest idea in the go-a-head Native State of Baroda is the formation in every village of free public libraries, and to this end, the Government of the Gaekwar have issued rules providing for a total annual grant of Rs. 100 to each village which has inhabitants sufficiently public-spirited to raise the like sum annually among themselves. It is also provided that "when the citizens of any village shall raise, by subscription, donation or other means, the sum of Rs. 25 and shall pay the same to the Central Library Department, the same Department will present them with Vernacular books of the value of Rs. 100 selected by a Committee of three gentlemen appointed by the Dewan." Similar rules provide for town libraries and Prant (district) libraries. Other rules relate to the control and supervision of the libraries which, of course, are to be free.

ECONOMIC PRODUCTS.

Imported Hair.

In France during the last seventeen years the import of hair has gone up by leaps and bounds. In 1894 some 150,000 lbs. weight of hair was imported. In 1899 the imports had more than doubled, and the increase continued until last year. France was importing over a million pounds weight of hair, mainly from China and Japan. It is true that not all of this is for home consumption; a fourth is re-exported. Still, the figures are formidable.

India as the Home of Cotton.

"India has been regarded as the seat of origin of the cotton manufactures, the cultivation of cotton and its spinning and weaving having been the national industry of the natives of India from time immemorial. The Rigveda, the Mahabarata, the Ramayana, the Puranas, not to mention the later Sanskrit writings, are full of references to the cotton goods; during the Buddhistic period the export of Indian cotton fabrics was of world-wide importance. Herodotus (445 B.C.) wrote that cotton was the customary wear of the Indians: "they possess likewise a plant which instead of fruit, produces wool of a finer and better quality than that of sheep: of this the Indians make their clothes." (Herodotus Bk. iii, 106.) Tavernier (17th century) mentions the "white calicuts woven in several places in Bengal and Mogulistan; ..... some of these are so fine you can hardly feel them in your hand, and the thread, when spun, is scarce discernible; ..... there is made at Seconge a sort of calicut so fine that when a man puts it on, his skin shall appear as plainly through it, as if he was quite naked." India produced large quantities of such cheap and elegant cotton fabrics coveted by merchants of various nations till the beginning of the 19th century.

Banana Wine.

Ligon, in his "History of Barbados," A. D. 1657, gives the following account of the preparation of a fermented drink from the banana:—"But the drink of the plantine is farre beyond all these; gathering them full ripe and in the height of their sweetness we peel off the skin and mash them in water well boiled, and after we have let them stay there a night, we strain it and bottle it up, and in a week drink it; and it is very strong and pleasant drink, but it is to be drunk sparingly for it is much stronger than Sack, and is apt to mount up into the head."

Dampier, in his "Voyages," tells how banana beer was made in Jamaica:—"When they make drink with them, they take 10 or 12 ripe plantains and wash them well in a trough; then they put two gallons of water among them; and this in two hours time will ferment and froth like wort. In four hours it is fit to drink; and then they bottle it, and drink it as they have occasion; but this will not keep above 24 or 30 hours. Those, therefore, that use this drink, brew it in this manner every morning. When I first went to Jamaica, I could relish no other drink they had there. It drinks brisk and cool, and is very pleasant."

Speke mentions that plantains in Central Africa yield "a wine resembling hock in flavour."

Stanley in "Darkest Africa" relates that:—"Two large troughs—equal in size to small canoes—were stationed in the village, in which the natives pressed the ripe fruit and manufactured their wine."

Dr. Parke, in his "Personal Experiences," says:—"Nelson treated us to some *pombe* (banana wine) to-day; it was really very good, although made from bananas which were not at all ripe. This beverage is prepared by cutting two or three bunches of ripe bananas into pieces of half an inch in length, adding two gallons of water, and leaving it to stand. On the third day it is really a delicious drink. At first it has a sweet tart taste, which after four or five days becomes very acid. In a day or two more it changes to a fluid, having qualities very like those of vinegar."

BUSINESS METHODS.

Losing Concern.

When a business is not making fair profits, or is actually losing money, it is time to search for the reason. Usually the trouble is wholly or in part a financial one. The first step is a clear diagnosis. Too often this is not made because the men who run the business have not specialised enough to know.

Success in Retail Business.

The greatest factor in the success of any retail business is the courtesy and enthusiasm of the salesman. "Men talk about the saving effected through their system of buying, and all that, but we don't depend on the wholesale merchant for our patronage. It is the public that buys from us—the public whom we must please—and our only way of pleasing the public is through our salesman."

Competition in Business.

There is no royal road to fortune. Indians must recognise that in order to share in the profits of manufacturing, they must make up their minds to enter the lists as fully equipped as manufacturers in other countries. For, nowadays the trading world is one great whole. Every means of making money is subject to universal competition and the easiest and the most profitable fields have been already occupied.

Packeting Goods.

One of the little items in a retail business that saves the time of one or more assistants, does away with overweights, stops bickering of prices, and cuts down paper and twine expense, is the method of putting up goods in packages of standard sizes. A London merchant, says *System*, figures that he can sell ten shillings' worth of merchandise where he has sold five shillings' worth, merely by packeting his goods as much as possible.

How to Clear up Old Stock in Boots.

A boot dealer uses a successful plan to clear up his stock of winter boots before the arrival of the spring lines. He advertises in the local papers that "*Your Old Boots are Worth a shilling*" and allows customers that amount for their old boots, to be applied on the price of a new pair if purchased immediately. The pile of old boots on display in front of the shop soon after the scheme was inaugurated gave convincing evidence that the scheme was a success.

Advertising.

Advertising has attracted an enormous amount of attention during recent years, for it has proved to be the prime lever in extending and maintaining trade. Advertising means more business, more profits, and more of the luxuries of life. Advertising therefore represents to the progressive business man more than any other word in the English vocabulary. There are so many instances known practically to everyone in which men have made fabulous fortunes by advertising that it has come to be looked upon as the one source of power by which modern business can be successfully conducted. When understood and applied in its entirety, advertising produces more wealth than the richest gold mine ever known. This is the observation of an adsertisement expert.

Extension of Business.

When a man in business desires to extend his house and lays plans for its enlargement, he should first of all direct his attention to the house which he has got hold of and set it in order. Each and every section of it should be placed under a head so that he can depend upon them working in harmony together. This will have to be thoroughly tested so that he can make sure that it is so. Then he, relieved of departmental worry, may begin to plan. As soon as he does so, the others will execute his plans for him, and by this means he will see that all is carried out according to his wishes. He will in this manner wax richer, because, being free to plot and to plan, he will devote himself thereto and never trouble about the smaller things which go on around him.—*Dixon's Monthly.*

FRAUDS AND FAKES.

Swadesi Cloths.

Science and Industry points attention to a complaint that has been raised about the wrong markings on cloths produced in some Bombay mills. The shortage varies from ¼th to 1¼th yards in pieces of 24 to 38 yards. In the case of the Ahmedabad Mills, the shortage is greater still. Dhoties marked 12 yards measure onle 10½ yards.

Water and Canning of Fruits.

The United States Department of Agriculture has just issued a bulletin addressed especially to canners of fruits and vegetables, laying down the rule that the addition of water where this is not absolutely necessary is adulteration. Cans of tomatoes, for example, must not contain any water. Cans of peas may contain only sufficient liquor to fill the interstices between the peas, which must of themselves fill the can.

Manipulations in the Leather Trade.

There are several ingenious manipulations in the leather trade. For instance, a bull's hide is commonly split into half a dozen thicknesses—these being used to counterfeit various kinds of leather, from kid to alligator skin. What is known in the boot trade as "box calf" is split leather of this sort, and is widely employed as material for foot-gear of cheaper grades. Pigskin is likewise imitated very successfully to split leather. For instance, "pigskin" leggings are often made of split leather, stamped by special machinery in such a way as to imitate the grain of pigskin. Even the little holes where the bristles grew are counterfeited. No wonder the average customer is not able to detect the fraud! However, it is always possible to decide the matter by examining the leggings on the under side, which will show the bristle holes if the article is veritable; otherwise, not.

By the use of stamping machinery, split bull's hide is made to counterfeit with great accuracy almost any kind of leather. Nearly all the alligator skin bags one sees carried by ladies are of this material. Where the imitator is least successful is with cordovan, which is used in the manufacture of a superior grade of shoes, and for certain other fancy purposes. This kind of leather is non-porous, smooth as glass, and has no grain at all. It is obtained from the horse; and is not the hide of the animal, but a layer of compact muscle tissue cut from under the skin of the hip. Its non-porous quality renders it particularly desirable for shoes, which, when made of it, are waterproof, and the real article retains its smoothness until worn out, whereas the counterfeit "fuzzes up" and roughens.

Bogus Bargains.

Readers of Indian newsparers are familiar with advertisements offering goods of various kinds at previously unheard-of prices. One thing is sure; the purchaser will be cheated, for he must pay in advance; and the dealer in Europe is too far off to be attacked in the law courts. It is otherwise with the bogus dealer in his own country as described in a recent issue of the *Ironmonger* as follows:—

The sentence of nine months' hard labour passed at the Central Criminal Court recently on a commercial traveller for fraud in connection with the sale of cycles and gramophones should do something to discourage a form of dishonesty which has been extremely rife of late. The method adopted by the person in question was to advertise under various assumed names, offering ten and twelve guinea goods at about one-third their value, the pretext for selling at such a supposed sacrifice usually being that the owner was going abroad and must realise promptly. At the hearing of the case, several witnesses testified to receiving shoddy cycles and worthless gramophones instead of the high-grade articles described in the advertisements, and the best plea that the counsel for the accused could urge in mitigation of punishment was that people had no right to expect to get twelve guinea goods for three or four pounds, and that if they parted with their money they had only themselves to blame. Bargain hunters of this type deserve to burn their fingers, but the sharpers who seek to profit by the existence of such credulity must not expect to be let off lightly when caught.—*I. T. J.*

MACHINERY AND INVENTION.

Paper Bags for Milk.

Dr. F. H. Joseph, a dental surgeon of Southampton Row has invented a bag for holding milk. It differs from previous inventions of the same kind in that the contents cannot be tampered with. Dr. Joseph is taking out a patent for his invention, which will be placed on the market by a syndicate. "The paper milk-bag," he said to an *Express* representative, "will supersede all existing contrivances for holding milk. It is far cheaper than cans or bottles. It is compact, airtight, and easily closed and opened. It is manufactured from casein, a preparation of cheese, and is completely sterilised. The material is tough, but flexible, and folds into a small space. The bag inflates on the concertina principle when the milk is poured in. The mouth is then hermetically sealed, so that adulteration or tampering by vendors is out of the question. Above all, the paper milk-bag is clean. It will be used only once and then thrown away. The insanitary milk-can will soon be a thing of the past when the paper milk-bag arrives."

A New Industrial Process.

Mr. J. N. Fraser writes to a contemporary:—During a recent visit to Australia I came across an Industrial process which I should like to make known through your paper. At the Sydney Technical Institute I met Mr. E G. Adames, one of the instructors, who has made a speciality of the action of acids on various materials. These materials include stone, glass and metal, but what I wish to draw attention to is his work on wood. By adapting the process to the nature of the wood. Mr, Adames is able to produce brilliant and permanent colours on ordinary woods, which may be utilized to render any sort of lettering or pattern. Thus, many articles may be produced varying from ordinary sign-boards to fine works of decorative art, *e. g.* a floral or other pattern may be produced for the top of a table. It appears possible that if characteristic Indian patterns (such as those in the Government Port-folios), were reproduced there would be a sale for these both in and out of India. The process, once learned, is cheap, but it must be in the hands of some one who is both a draughtsman and a chemist. Mr. Adames is willing to teach the wood-work application of it for £ 10 ; (and the whole for £ 40). He thinks it would be possible to give correspondence lessons, but obviously a visit to Australia would be desirable. If any one is further interested, I should be glad to show them specimens of the work at Elphinstone High School, Bombay.

Wasted Smoke.

In most instances, a smoky stack indicates inefficient operation, but the loss results not so much from the failure to realize the heat represented by the solid particles of combustible matter in the smoke as from the escape unburned of certain gases that usually accompany the smoke and may, under some conditions, represent 20 per cent. of the calorific value of the fuel used. The plant owner or operator, however, is not the only one to suffer losses from smoke emission. The increased expenses for laundry work, cleaning, and illumination, as well as the destruction or depreciation of merchandise, may all be considered as smoke losses. A professor in the Leeds University has stated that the smoke cloud cuts off 40 per cent. of the sunlight in that city. This decrease of light and sunshine, according to recent investigations, is one of the factors contributing towards the destruction of many varieties of plant life. In some cities, owing to this cause and to the deposit of soot upon the leaves, it is impossible to grow certain trees and plants and others are grown with difficulty.

The result of all this is manifested in the following ways : (1) improved design of furnaces and mechanical equipment, (2) a growing realization that the proper firing of fuel requires intelligent supervision, and that conditions in the fire-rooms should be such as to attract and keep such a class of stokers, (3) an increasing public sentiment in favor of smoke abatement and smoke prevention, and (4) organized efforts to bring about the enactment and enforcement of statutes to control the emission of smoke.

HINTS AND RECIPES.

To Remove the Smell of Cocoanut Oil.

The smell of the cocoanut oil may be got rid of by steeping some orange rinds into the oil and exposing it to the Sun for a few days. This method is said to have been tried with success.—*I. L.*

Paint as a Protection Against Rust.

According to a note published in *Cosmos*, the German chemists Liebreich and Spitzer have been conducting some experiments with regard to the protection afforded to iron against rusting by a coat of paints. They have come to the conclusion, which is somewhat surprising at first sight, that better results are obtained by the application of a single coat than by painting with two or more coats. The explanation which they offer forth is a somewhat remarkable observation, in that a single coat is more elastic and less liable to scaling off or cracking than a donble coat, and thus affords more perfect protection from atmospheric influences.

An Artifice in Rinsing Bottles.

The rinsing of bottles is always an unpleasant task and it takes up a lot of time, especially if bottles are required during fractionation. The most time is consumed in letting the rinsing water flow out of the bottle, a process that is lengthy in narrow-necked bottles. H. E. Schaumberg of Vienna states in the "Chem. Ztg." that this process can be accomplished in about a third of the time taken for ordinary rinsing if it is performed in the following manner. The bottle should be taken hold of by the bottom and swung, neck downwards, several times in a small circle so that the axis of the bottle always remains parallel to itself. Hereby the water revolves quickly and accumulates on the sides of the bottle leaving a canal free by which air can enter freely. When the rinsing water stands just above the curve of the sides the bottle is slanted lightly and the rest of the water flows out quickly.

Hints about Eggs.

To keep new-laid eggs fresh, rub the shells over with a little olive oil or pure glycerine.

To test eggs, hold them up to the light (gas or lamp light). Good ones will appear clear with a dark spot in the centre.

To boil eggs for invalids or children, boil the water, then remove the saucepan from the fire, place the egg in it, and allow it to stand for five minutes. It will then be perfectly cooked and easy to digest.

A Cure for the Opium Habit.

Professor D.Gilmore, who,while on a visit to Myitkyina, came to know of the cure for the opium habit, successfully tried by Dr. Picachy in the local hospital on some ten Cachin patients, gives publicity to the following in the columns of the Rangoon *Life Line* :—

Of the dried herb *Combretum Sundaicum* take one and-a-half ounces. Put it in two pints of water, and boil for about four hours or until it is reduced to twenty-four ounces. Put twelve ounces in a bottle marked A, and the remaining twelve ounces in a bottle marked B. In the bottle marked A put also as much opium as the patient has been in the habit of taking in one day. When it becomes necessary to administer a dose, give the patient one ounce from bottle A, and immediately fill up bottle A from bottle B. This must be done every time a dose is given. The frequency with which a dose is given will depend on the severity of the case ; it will range from two or three to six or seven times a day. The idea is to give the medicine as often as it is really necessary to relieve the patient's distress, and no oftener. When bottle B is exhausted, go on giving the patient doses from bottle A until that is also exhausted If by this time, the patient is not yet cured, prepare a fresh quantity of the decoction, and repeat the process. The cure should be complete in twelve days. Dr. Picachy lays stress on two points : the success of the cure will depend largely on the sincerity and strength of the patient's desire to be cured, and there is nothing in the cure to prevent the patient from re-acquiring the habit later on.

ECONOMIC LITERATURE.

Industrial Education in the Punjab.

Committee's Report.—The report of the Committee on Industrial Education for the Punjab has been published. Mr. W. S. Hamilton has offered a note of dissent, and Mr. Godley, President, has also contributed a supplementary note. The following are the views and recommendations of the Committee :—

While favouring the development on sounder principles of the industrial schools maintained by local bodies and private agencies, the Committee think that industrial schools of a more specialised type should be instituted experimentally by Government in selected localities. These schools of special industries should, they think, be placed under the charge of expert European artisans, who would probably be obtained on a salary of Rs. 350 rising to Rs. 500, or of Indians trained in Europe or America. Only industrial instruction should be imparted in these schools, and no fees should be charged. As a rule, there should be a primary school attached as a feeder to these specialised schools, in which ordinary general education should be given up to the Primary standard combined with elementary manual instruction, the object being to attract children of the artisan classes. These specialised schools of industries should be open to all classes ; boys should not be admitted below the age of ten and should have completed, if possible, the Primary course of general education. The localities suggested for the establishment of such schools are : Sialkot and Rewari for metal-work ; Ludhiana, Lahore, Hoshiarpur and Amritsar for weaving ; Kartarpur, Amritsar and Jullundur for wood-work. The members of the Committee who visited Sialkot have formed the opinion that an expert English tool-maker in charge of a school of metal-work might prove of much assistance to the local industries. The establishment of a school of pottery may also be eventually advisable ; but for the present the Committee recommend that the Pottery section of the School of Art be developed on the lines of industrial experiment. The Committee think that schools of special industries on the lines suggested above should be entirely financed by Government and that they might suitably be controlled by the Department of Industries, assisted in each case by an advisory Committee of local employers. The inspection of these schools should, as far as possible, be carried out by experts. The Committee consider that the aim of the training imparted in the existing industrial school, which is to afford literary instruction of a simple character, combined with hand-and-eye training and elementary industrial work, is a sound one. They doubt, however, whether general education beyond the Primary standard is necessary for boys of the class which it is desired to attract to industrial schools. As such instruction tends to make pupils disinclined to follow their hereditary callings, they recommend, therefore, that in the case of new industrial schools, Middle departments for general education should not be instituted, and that such further education as is desired should be optional and imparted, when possible, in evening classes. The defects noticeable in the existing industrial schools are mainly due, in the opinion of the Committee, to unintelligent teaching on the industrial side ; and to insufficient equipment and to inadequate supervision and guidance. Only competent teachers should be employed, and they should be paid a higher salary than they can otherwise earn in the bazaar.

In order to raise the standard of industrial schools maintained by local bodies and missionary societies, the Government should offer liberal grants-in-aid to schools which reach a standard approved by Government ; and by making adequate arrangements for efficient instruction in crafts, it is hoped that private schools will thus be induced to raise their standards so as to earn these grants. The Committee also consider that the Mayo School of Art should develop its teaching department with a view to a supply of specially trained teachers. As regards the incentive to good work, pupils should be allowed to receive the sale-proceeds of such work as can be disposed of, less the cost of material.

OPENINGS FOR BUSINESS.

[For particulars, address the Director-General of Commercial Intelligence, new Imperial Secretariat, 1, Council House Street, Calcutta, mentioning the *Wealth of India*. Firms that may like to follow up any enquiry should give proper references and restrict themselves to those enquiries only which they are fully and seriously qualfied to handle.]

Rice.

A firm in Santiago de Cuba desires to be placed in communication with exporters of rice. (B128).

Chiretta, Gum Tragacanth, Cardamom Seeds and Rhubarb.

A Lahore correspondent desires to be placed in communication with American purchasers of these articles. (B129).

Second-hand Clothing.

A London firm desires to be placed in communication with importers of second-hand clothing. (B130).

Harmoniums.

A manufacturer of harmoniums in Calcutta desires to be placed in communication with selling agents in Western and Southern India and also in the Colonies. (B131).

Diamond Wire Drawing Plates.

A concern in Paris desires to be placed in communication with importers of diamond wire drawing plates, used for drawing metallic wires, including those of gold and silver. (B132).

Milk Powder.

A firm in Holland desires to be placed in communication with importers of milk powder. (B138).

Potato Flour, Dextrine and Moss Litter.

A firm in Holland desires to be placed in communication with importers of potato flour, dextrine and moss litter. (B139).

Rectified Spirit.

A limited company, manufacturing rectified spirit in India, desires to be placed in communication with purchasers. (B140).

Builders' Hardware.

A London firm desires to appoint agents in India for the sale of all kinds of builders' hardware. (B136).

Machinery.

A Glasgow firm desires to appoint agents in Rangoon for the sale of gas and oil engines, suction gas plants, marine motors, motor boats and electric lighting sets. (B135).

Caustic Potash.

A Calcutta correspondent desires to be placed in communication with sellers of caustic potash. (B137).

Steatite and Corundum.

A Calcutta firm having large concessions for mining steatite and corundem desires to be placed in communication with large purchasers of those minerals. (B145).

Caustic Potash.

A Calcutta correspondent desires to be placed in communication with sellers of caustic potash. (B146).

Poultry.

A Breeder in England desires to be placed in communication with buyers of high class poultry. (B148).

Kapok.

A firm in New Zealand desires to be placed in communication with shippers of kapok. (B149).

Hand-Saws.

A firm in Sheffield desires to be placed in communication with importers of hand-saws and other tools. (B150).

Felspar and Quartz.

The owner of an estate in Ajmere is desirous of being placed in communication with purchasers of felspar and rose and blue quartz. (B151).

Milling Machinery, Stones and Accessories.

A London firm desires to be placed in communication with firms requiring milling machinery, stones and accessories (B154).

Almonds.

A firm in Palermo is desirous of being placed in communication with importers of unshelled almonds in other cities than Bombay (B155).

MISCELLANEOUS.

Heat and Energy Consumption of the Human Body.

On an average a man dissipates about 2·5 kilowatt hours per day. This is spent partly in muscular action, partly in the production of heat in the maintenance of the body temperature against radiation. There is thus a continual power consumption of about 100 watts or one-seventh of a horse-power. About one-half of this is spent in maintaining the body temperature. The human body has about the same heating effect upon the surroundings as a 16 candle-power carbon filament lamp.

Elephants in Assam.

The employment of elephants in Assam as a substitute for manual labour has necessitated the provision of huge vehicles on the Assam-Bengal Railway for their conveyance, and we are told that the railway is converting two of their ordinary high-sided goods wagons into vehicles suitable for their conveyance.

Cornell's Seven Wonders.

The Physical Department of the Cornell University was asked some time ago to name seven wonders of the modern world selected from a list of fifty seven outstanding inventions and structures. The faculty, graduates and seniors in the Physics Seminary balloted, the award of the voting going to Wireless Telegraphy, Synthetic Chemistry, Radium, Anti-toxins, Aviation, the Panama Canal, and the Telephone.

Cattle in the Punjab.

Excluding animals used for breeding, there are in the Punjab roughly 4½ million bullocks and male buffaloes available for ploughing, working wells, threshing corn, drawing carts and working sugar, oil and flour mills. Camels are used for ploughing to some extent in Hissar and Ferozepore districts, and in Rawalpindi a donkey or cow is sometimes seen yoked with bullock. The milch kine of the province are returned at 3,384,000 cows and 2,241,000 female buffaloes, and the young stock at 3,820,000. Female buffaloes are more valuable than cows and are displacing them in popular favour. Roughly speaking there are thus 14¼ millions of horned cattle depending for natural grazing on 18 million acres of waste, much of it of poor quality, which they have to share with 4 million sheep and 5½ million goats. The large areas of waste are found in a few districts, mostly in the west and in the hills. In the plains districts the waste, is not usually equal to more than 20 per cent. of the cultivation. The products of the waste are supplemented by those of the fallow and by grasses and other plants weeded out of the cropped fields. It follows that a very large acreage of the province must be devoted to raising fodder crops for cattle, and though broadly speaking the Punjab is now secure from widespread food famines, fodder famines can still inflict enormous losses on the people.

An Indian Steamship Company.

More than one effort was made in Bombay last year or so to establish an Indian steamship company to run steamers to Europe. Another company of this kind is now being floated under the title of the "Indian Peninsular", the Board of Directors being wholly Indian and the proposed capital being 50 lakhs. The plan is to provide ships with cooks and equipment making them suitable for the special requirements of Hindus. The scheme also proposes the establishment of Indian hotels in Europe.

The Marwari College.

Recently Sir Ashutosh Mukherjee, Vice-Chancellor of the Calcutta Uuiversity, laid the foundation stone of the first Marwari College in Calcutta. The Marwaris have raised nine lakhs of rupees for the purpose, out of which two lakhs have been spent in purchasing the land to be built upon and two lakhs will be spent for the building. One special feature of the college will be the imparting of commercial education, namely, to teach young men how to manage business, to give them a practical training in banking, to float joint-stock companies and kinderd subjects.

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SPECIAL ARTICLES.

THE COTTON EXCISE DUTY.

BY

B. VENKOBA RAO.

In the discussion that is being carried on in the public press and platform on the question of abolishing the excise duty on Indian cotton goods the interest of the handloom-weavers in India seems almost a neglected factor. The Indian mill-owners and their representatives in the Legislative Council seem to take into account in the course of their argument only the broad fact that the cotton industry in India is in a nascent condition, that it cannot successfully compete against the well organized and powerful mills in Lancashire, and that the unrestricted import of yarn and woven fabrics is not only seriously interfering with the development of the mill industry in India, but is proving a heavy drain on the resources of the country. All these statements seem good enough, only they do not take into account that there is a large section of people in the country who have been peacefully employed in their own way in meeting the wants of the people in the matter of clothing without unduly trenching on their purchasing power, and whom the power looms are displacing and throwing out of the means of honest livelihood. On the other hand, the Manchester spinners and weavers seem to consider that the interests of a few capitalists in India who have invested money

in mills cannot reasonably form the sole ground for a change in the manner indicated by the Indian mill-owners and their chosen representatives, that the interest of the general consumers in India who have been gradually accustomed to a cheap supply of cloths during the last century or two, are of paramount importance and that it would be unwise and impolitic to accord any special protection to the Indian cotton industry at the expense of the Lancashire manufacturers. The Britisher seems to imagine that he has special claim to the gratitude of the Indians, in that he has invested his blood and treasure in opening up the country and securing it against domestic trouble and foreign invasion and that he must have at least an equal treatment with the Indian in the matter of the excise duty. The Indian mill-owner wants the duty to be taken off his manufacture and heavily imposed on the imported articles of foreign manufacture, while the Manchester man, the ardent advocate of free trade policy, wants that the duty should be abolished altogether both on Indian and English production. Neither party seems to be satisfied with the attitude of the Government of India with whom the immense loss of revenue is a point of considerable import. They are unwilling to make a sacrifice of this revenue in the interests of either party, and they even justify their attitude by special reference to the economic conditions of India. The student of Indian Economics who has been carefully following the arguments on either side cannot but be struck at the utter absence of recognition of the position of the Indian hand-loom weaver and the conditions which have been brought about by the import of Manchester goods under which he feels depressed. If the Indian handloom weaver had excited the sympathy of anybody, it was that of the Government of India and the local administrations who have occasionally been pressed, as it were, by the importunities of both Indian and English mill-owners, to express a solicitude for the welfare and material advancement of this class of Indian people.

The fact is that the Indian weaver is illiterate, and he is steeped in ignorance. He has no foresight, cannot look ahead and above all, cannot understand the past and the present history of his economic condition. He has, it is not surprsing, no organization of his own, cannot make his voice heard in proper quarters, and does not know where to look for redress of his grievances. Such of those of his community who have received the benefit of English education have chosen to follow in the footsteps of the Brahmins with whom they are competing for a share in the Government service and in common with the Indian politicians of the day are content with raising a hue-and-cry against the maintenance of the excise duty on the Indian cotton industry, regardless of the fact that their own brethren of the community would be seriously affected by the proposition being carried out. The Indian weavers from a large section in India, and in the Madras Presidency, they number about 12 lakhs including spinners and sizers. What is to become of this population and how are they to be otherwise employed are questions that suggest themselves at the outset and require a satisfactory solution, if exceptional facilities are to be granted to mill-owners as prayed for. The immediate effect of the abolition of the excise duty will, we can fairly presume, be to reduce the price of cloths by at least the amount of duty so taken off and to enter into an unfair competition with the handloom manufactures. As things are at present, the hand-loom weaving industry is already labouring under a serious depression, and there can be no two opinions that, as the net result of the abolition of this duty, the industry will be crushed out of existence altogether much sooner than may be expected. If the duty were abolished on the Indian production, and retained on the imported foreign goods, it can be taken for granted that the Lancashire manufacturer will retaliate in the best way possible. It is open to him to raise the price of yarn as he is gradually slowly doing at present in order to undermine the hand-loom weaving industry in India, and destroy it out of recognition, for it is notorious that the Indian mill-owner is unable to spin higher counts and that for the counts largely used by the Indian weavers from 40 S to 160 S, they are absolutely dependent on England for supply. If this supply is cut off or its cost raised beyond the level at which the Indian hand-loom weaver can afford to purchase yarn for his purpose, he will be rendered helpless in his struggle against his rival, the power-loom weaver in India. It is equally true that the cotton grown in India and used in the Indian mills is not adapted for spinning such higher counts and that until long staple cotton is successfully grown in the country the Indian mill-owner will be unable to run to the rescue of the hand-loom weaver in the likely event of the Lancashire manufacturer raising the price of his yarn. From the writings in the press, it is impossible to gather what exactly is asked to be done in the matter of the protective duty proposed against Lancashire. While we know that the Indian mill-owner wants that no kind of duty should be imposed on his production of yarn and cloths and on his exports, it is not exactly intelligible whether he wants that the duty should be imposed on the spun yarn and retained or even possibly enhanced on the woven fabric imported into India. On the other hand, it is certain that if the Indian hand-loom weaver can assert himself and make his voice heard, he would want that no duty of any sort should be imposed on yarn produced locally and imported from abroad, and that he would want that a protective duty should be maintained on all woven fabric both local and foreign. It is clear therefore that the Indian mill-owner and his countryman the hand-loom weaver, stand on different bases, each requiring consideration from two different aspects. It has also to be noted that, under existing conditions, the Lancashire manufacturer is not competing with every line of the Indian mill productions. The competition is only in respect of lower counts of yarn spun and cloths woven, and it is only to this extent that the Indian mill-owner can with propriety claim protection and no more. A satisfactory settlement of the duty question, were the Indian interests given special consideration, would require that the import of yarn of above 40s counts should be duty free while the manufacture of cloths of all counts, both Indian and English, should be protected by duty. In this settlement, partial help is given to the Indian spinner and weaver. The Lancashire Manufacturer will have no duty to pay on a large bulk of his production, the spun yarn of above 40s counts, the Indian mill man has the satisfaction of having the sting of competition taken off in a protective duty imposed on yarn 40s counts and below and on all woven fabrics imported into India, while the Indian hand-loom weaver can contemplate on the possibility of holding his own against Lancashire and the Indian mill-owners. This would perhaps be his dream, possibly outside the range of practical politics, but those who feel interested in the Indian hand-loom weaver cannot afford to overlook the point altogether without raising a word of protest against a possible combination of the interests of both the Lancashire and Indian mill-owners to the gross prejudice of the hand-loom weaving industry. It would be unwise to neglect his community altogether and allow them to go to the wall in such an important matter in which English and Indian Mill-owners are fighting against each other.

The Indian consumer is not likely to be affected by the above arrangement. The duty can be so adjusted as not to unduly press on any one section or give scope for underselling one another. Most of the Indians are accustomed to hand-made cloths and experts tell us that with the use of fly-shuttles and other small appliances in hand-loom weaving, the cost of production can be considerably lightened, and that cloths so woven can be offered at the prices at which mill-made cloths are put up in the market. If the duty can be so rated as to bring the price of mill-made goods to the level of hand-made fabrics, the power-loom weaver and the hand-loom weaver can stand on equal footing and compete with each other in raising the quality and finish of the cloths. That will indeed be

a satisfactory arrangement to make instead of attempting to throw overboard a very large section of the people. From a social point of view also, it would seem undesirable to place any difficulty in the way of the hand-loom weavers pursuing their trade. We have enough of social troubles created by certain other classes of the people being disturbed from their peaceful occupations, and it would be unwise to add to these troubles. Hand-loom weaving is now being given a fresh start in life, and is likely to develop in the near future. It is expected to supply the means of livelihood to the depressed Pariahs, to the juvenile and adult offenders, to the strays and waifs of the cities and towns, to the unpassed Brahmin youths against whom the portals of Government service have been closed, and if the new Bill now on the Legislative Council to afford protection to the minor girls and the reclaimed women of the lost community is not to be an abortive measure, we shall soon have to create a home industry in hand-loom weaving for every one of these fallen creatures. No Indian can be so far unpatriotic as to require that he should be exempt from payment of an indirect tax which is equired for the welfare of a large section of the community, and that despite all sufferings which the import of woven fabrics may inflict on the artisans of his land, he should have *the facility of buying cheap in the market.* The hand-loom caste weaver and every one else who may take to the profession have every claim on the general public for a fair consideration of their circumstances, and it would be unfair to let the question to be decided by about a hundred capitalists who have started mills for weaving in Bombay and elsewhere. Nor would the general public be justified in making a few Textile Kings and let millions of people perish in the struggle unable to stand against the combinations of the few mill-owners.

FRUIT BOTTLING FOR INDIA.

BY

P. A. VENKATARAM AIYAR.

In a recent issue of the *Wealth of India*, I treated in a general way of the great possibilities before the fruit-industry in India and also gave detailed instructions as to the means of preserving fruits by the process of canning. In this article, I propose to write of another process by which fruits are preserved, *viz.*, Fruit Bottling.

At the outset, it may be remarked that, like fruit canning, Fruit Bottling also is an easy task and any ordinarily intelligent person may successfully bottle fruit in his own home and on a small scale. Fruit Bottling, be it noted, needs no patent steriliser, costing a large sum of money. All that is required is a large sauce-pan, kettle or some similar vessel in which water can be heated.

BOTTLES.

It is absolutely essential that the bottles should be air-tight. An imperfectly-fitting rubber-ring or cover will be sufficient to cause failure after perfect sterilisation. The same bottles may be used repeatedly until broken.

SYRUP.

Syrup is not necessary though many think it is ; pure water is as suitable as syrup and, being more transparent, adds to the beauty of the fruit after sterilisation. Moreover, a thin syrup spoils the natural flavour of the fruit Sugar, therefore, should not be used at all or, if used, should be at the rate of half a pound (and more) to one quart of water. Raw sugar should not be employed, as it renders the syrup cloudy ; white lump sugar, however, leaves it tolerably clear.

RIPENESS OF THE FRUIT.

The degree of ripeness has a considerable effect on the appearance of the fruit, after the bottling process is completed. Fruits should be slightly under-ripe for bottling, as the skin does not then so readily break during the process of sterilisation ; with ripe-fruit this can hardly fail to happen and the appearance is apt to be spoiled. In this respect, under-ripe fruit will bear a higher temperature, without injury, than ripe-fruit but, in no case, need the temperature of the water in the kettle rise higher than 200° F. and, in practically all cases, 190° F. is sufficient. A thermometer is required to ascertain the temperature of the water.

QUALITY OF THE FRUIT.

The fruit should be sound without speck or injury of any kind. It is best gathered dry, but if it be damp or wet, it should be sterilised a little longer. All stalks, etc., should be removed and fruits of equal size should be placed in the same bottle. Mixed fruits and large and small sizes placed together in the same bottle, do not sterilise well and do not present a good appearance.

FILLING THE BOTTLES.

This is an important operation as, if the bottles are imperfectly filled, the fruit after sterilisation will rise and leave a large space at the bottom without fruit. A stout stick or piece of wood about a foot in length blunt at one end and rather pointed at the other—is very useful in arranging and gently pressing the fruits into position in regular layers. The fruits should be selected of nearly equal size and then arranged in the bottle systematically, they being pressed into place by means of the sticks when necessary. The bottle should be filled to the top of the neck, using a little force in packing, if necessary. As the fruits are placed in the bottle, it may be filled up to within half an inch of the rim with clear water or syrup made by dissolving half a pound of loaf sugar in one quart of water, when they will be ready for sterilising. In the case of bottles with screwed caps, the latter may be placed on loosely and partly screwed down, in order that they may be very readily screwed down tightly directly the sterilising process is complete.

STERILISATION.

The sauce-pan or fish-kettle should be deep enough to take the bottles up to the shoulder in water. A board about half or three-fourths of an inch thick should be placed at the bottom of the kettle to prevent the bottles coming into direct contact with the kettle and so causing their breakage and a little straw should also be placed between the bottles to prevent fracture ; in the absence of straw, three or four folds of paper may be placed round each bottle. It is important to remember that there is a difference in temperature between the water in the kettle and the liquid in the bottles ; if the temperature of the water has been raised rapidly, there may be as great a difference as 40° or 50°. F. The temperature both of the water in the kettle and the liquid in the bottles should, therefore, be raised slowly to the desired maximum. The caps, rubbers and screw tops of the bottles having been placed in position, the bottles should be immersed in cold water up to the shoulder and the kettle placed over the fire or gas and gradually brought to a temperature of from 165° to 190° F. The temperature necessary will vary with the kind and ripeness of the fruit ; but a lower temperature than 165° F. is quite unreliable and higher than 190° or 200° F. is unnecessary. Immediately the highest temperature has been attained, the kettle may be partly withdrawn from the fire and the screw-caps should be screwed down as far as they will safely go. The temperature should then be maintained for 15 or 20 minutes at about 165° F and 190° F for larger fruits; in the case of the smaller ones, 40 minutes at a temperature of about 165° F to 170° F will answer.

The slightest access of air to the interior of the bottle may nullify the whole work and care should, therefore, be taken that this does not occur. It may be added that fruits in bottles filled with water keep as well as fruits bottled in thin syrup.

SELECTION.

BRISTLES AND BRUSHES.*

A wonderlul city of 400,000 mixed racial population leaps into existence every year, exists for forty-three days, from July 29 to September 10, and then disappears. This wonderful " fair " city, Nishni Novgorod, Russia, is a first centre of distribution of many important materials entering into the manufacture of brushes. Several times a year at Leipsic, Germany, are held similar " fairs, " at which brush materials are offered from Russia and distant points, and to Leipsic at these fairs the world goes for a large part of its supply of European bristles and other brush materials. Many other articles from a distance are sold there at these times, and the public squares and streets are lined with booths and temporary stands for their display and sale, making a very interesting sight to the tourist. These two places are the great mercantile starting points of brush materials, other than Chinese bristles, which come from Tientsin, Shanghai and Hankow.

Everyone must use brushes. Some use them for comfort, health or adornment only. Artists, artisans, mechanics and many professions use them for livelihood. Few articles are in use so generally by all as brushes are, and there is almost a complete lack of information in regard to them by everyone. The first thing of which an expert thinks in connection with

*A Paper read before the Master House Painters' and Decorators' Association of Massachusetts, by Lew C. Hill,

brushes is bristles, from which nearly all good brushes are made. Bristles, more than any other articles, create the brush industry. Hogs in most countries do not produce bristles of commercial value. As with furs, nearly all bristles which are of use to brush makers come from cold climates. The United States, a great pork producing country, contributes hardly anything to the world's supply of bristles, the reasons being that animals end their careers young, while bristles are short and worthless, and improved breeds produce few bristles.

Russia and China supply nearly all the bristles used in brushes, and they are all used for brushes. Other raw materials are used for many purposes. Bristles are limited to one industry, which has difficulty in obtaining enough for its requirements, with values constantly rising. Bristles are only a by-product, as hogs are never grown solely for their bristles. The supply of bristles is less each year, while the demand for brushes is greater. There is no perfect substitute for bristles, but other materials are used instead of bristles, which always make less desirable brushes.

A vegetable fibre from Mexico called "tampico" is the substitute used most largely for bristles; but its character is so evident that few are deceived by it. It costs very little compared with bristles. Horsehair is used very largely in brushes in combination with bristles. Its appearance in some kinds of brushes is deceptive, and generally where used it injures the quality of brushes more than it cheapens the price. In hair brushes and other kinds of toilet brushes, split quills are used to cheapen quality. There are not many other articles used as substitutes for bristles. Brushes are made of other substances, but they are generally named properly, and users are not deceived. There is not a large number of substances which can be used as substitutes for bristles in brushes, and they are not very deceptive to those familiar with brushes.

Of first importance to the brush industry are Russian bristless, which country supplies many kinds of bristles and all the long, stiff bristles necessary for best brushes. Good toilet brushes and other kinds with stiff bristles, paint brushes and other kinds with long bristles, depend on Russia. Bristles are white, yellow, gray or black. For actual wear, the color makes no difference when stiffness is the same, but white sells at the highest price. Here is a bundle of good quality white Russian bristles called "okatka," and here is a like bundle which has been separated into its different lengths by a process called "dragging." Its bristles appear to be 6½ inches long, but "dragging" it develops sizes about 1.5 inch apart and down to the bottom length, which is only 4½ inches long. As different lengths of bristles have different values, you will realize from this exhibit how important it is to the brush manufacturer that a cask of bristles does not have too many short bristles mixed with others. If he buys a six inch length stock, he cannot afford to have it loaded with a large percentage of short bristles.

The next great bristle producing country to Russia is China, and China sends only black bristles. A brush made of Chinese bristles will not wear as long or do as good work as a brush of equal elasticity, size, etc., made of European bristles. Chinese bristles are more brittle, not nearly as tough as other kinds, and have a hard, polished surface, which is not desirable in brushes.

Germany is third in importance in the production of bristles. The amount produced by all other countries than those named is very small. Perhaps India sends as much as any of the small producing countries.

France produces a limited quantity of fine white bristles, which are of much value in making varnish brushes and artists' brushes. Chinese bristles have elasticity equal to other kinds, but wearing qualities are much poorer.

Much could be said in regard to bristles that would be understood by experts in the business, and of little interest generally. A few facts in regard to their characteristics and what is done to them are enough out of the ordinary to be of interest. Rubbing a bristle between one's finger and thumb shows that it will always move toward the larger, solid end, and never toward the split, soft end. This enables brush manufacturers to re-arrange and have butts of bristles all at one end of a bundle, when they have become mixed and disarranged. Rubbing a mass of them makes the bristles move in each direction, as they may be headed and when they have travelled full length the two separated parts are placed together with ends as desired. A paint, varnish, artists' or similar kind of brush needs the soft or "flag", the soft ends to get desired results, and rubbing a bundle of bristles by end over a flour sieve pulls out the few harsh butt ends sometimes found misplaced. The first-named process changes the bristles end for end when the mass is generally disarranged, and is of great benefit in enabling manufacturers to recover sweepings from floor, and bristles which would otherwise

in their disarranged condition not be adapted to general use in brushes.

Generally, when received by brush manufacturers, the condition of bristles is little changed from that in which they leave the original sources They must be washed clean and dried in such a way as to keep them straight and in condition for use. The colors are separated, and then the lengths are "dragged," as it is called; that is, separated into brush makers' sizes of about one-fifth of an inch to a size.

Separating bristles into lengths is done by pulling out of a bundle the long lengths, arranging them in about one-fifth of an inch sizes, each length by itself. Afterward, different kinds and lengths of bristles are mixed together to get the proper stiffness and other required features which brushes must have for different purposes. For example, bristles for paint brushes are very different from those used in varnish brushes, and also from those in artists' brushes and from whitewash brushes. Therefore, a very important feature of making brushes is to use for each kind of brush the bristles best adapted.

The most important feature in the manufacture of brushes is making them of good quality bristles of different kinds properly blended You cannot make a paint or similar brush out of all stiff bristles, nor of all soft bristles, nor of bristles all the same length. There must be a perfect blending of different kinds and lengths of bristles. This is the high art of brush making, and is why no novice ever succeeded.

Here is an illustration of the composition of bristles entering into a good quality paint brush. This collection shows the various sorts and lengths used for this particular size brush. You will notice that there are seven kinds used. This other bundle shows these kinds of bristles mixed ready to be put into a brush. The knowledge of what kinds of bristles to use and the ability to mix them thoroughly are of first importance. You can buy things that look like brushes, which contain only trouble for you, but to get a paint or similar brush that will suit you, you must get one that has good bristles properly prepared.

A marked characteristic of bristles is that they are bent, or bow-shaped. None is perfectly straight. This "bend," as it is called, must be taken into consideration in brushes used for painting, varnishing and like purposes, and which must be made with the bend tendency towards centre of ends; a brush for these uses must be so made as to have the bristles hang together, and not spread like feather dusters.

Red sable hair used in artists' painting brushes is the most valuable hair put in brushes. It is not plentiful, and is sometimes as valuable as gold. It has the rare combination of fineness, great toughness, wearing out slowly, and has wonderfully soft ends of hairs, with great elasticity. This is the hair which makes possible miniature painting and the finest work by artists

There are hairs from other small animals, which have some of the features of red sable. No other kind of hair has all its desirable ones. Camel hair brushes (made of squirrel hair) have softness of ends and fineness only. Fitch hair brushes are elastic and in a degree tough, but become harsh as worn down. Badger hair is tough and coarse. Other kinds all lack some features desired, so that artist and brush-maker pay a high price to get red sable hair, a product of cold Siberia. The unpopular skunk is a producer of hair for varnish brushes, and is used in large quantities. In a brush it is re-named fitch hair. Ox hair and bear hair are to other kinds largely used in making varnish brushes.

The appearance and construction of the first brush has not yet been discovered, nor do we know what the first brush was used for. If used for making signs, symbols or writing, a reed, quill or other small tube had hair or fibre inserted in one end to make a brush. Brushes so made are used for lettering, writing and other purposes now, and are undoubtedly the same in every respect as they have been for an indefinite time. If the first brush was used to spread color on the surface of anything, probably it was made of a bunch of vegetable fibre tied with bark, the handle being a later thought. Among uncivilized tribes and countries, brushes are used now, which are only bunches of vegetable fibre tied with bark or horse hair. At present in parts of Mexico and Central America, the only brushes used by natives are so made; all kinds have the same shape; a paint brush, a whitewash brush, a hair brush, a scrub brush, or other kinds is a bunch of vegetable fibre varying in stiffness and coarseness, according to the purpose for which it is used.

If brushes have been found in the excavations of Egypt, Greece and ancient countries, it has not come to the knowledge of brush manufacturers. Brushes were certainly used, as pictures show artisans with them. In many museums a great variety of articles used in the daily life of ancients are preserved, but brushes are absent.

When you buy brushes, you serve your interests if you buy those having brands with

which you are familiar, and which are stamped with the manufacturers' name. There is not a first-class brush manufacturer, who will change the quality of his brushes when stamped with his own name. What is done when otherwise stamped is not so sure, as responsibility is divided.

The growth and improvements in brush making have been very great and the form and shape of brushes are now adapted to every purpose. From the single shape of near-by Mexico to the thousands of sizes and kinds made by some manufacturers, the industry has become an important one. Brush making and shoe making, a century or more ago, were household industries Present methods have changed their manufacture to factories.

Previous to 1865, all paint, varnish and similar kinds of brushes were made with bristles through entire length of ferrules which means that the length of a brush, including ferrule, was the actual length of bristles used. At the time Mr. John L. Whiting originated the idea that it was unnecessary for bristles to go the entire distance of the ferrule, but that a disc of wood might occupy a portion of the distance beyond the butts of bristles without impairing the fastening of the bristles in a brush. Previous to using this idea of plain wood filling, he invented a better method of using wood discs having peg projections which entered the bristles. These two ideas have saved more money to users of brushes than any other invention in the brush industry. These ideas, now used by brush manufacturers everywhere, reduce cost of brushes to users, as the saving in weight of brushes used, as well as shorter length, is of great value. The prices at which bristles are sold depend on length as well as color, and as brushes are made with exact weight for each brush, the use of shorter bristles saves on price of bristles, and also weight.

Pratically all brushes at the present time, as made by every manufacturer, are strongly made and will not shed bristles, or fail under any usage, for which a brush should be employed. The holding parts of brushes are now perfected, so that brush users have very little cause to complain. The number of brushes which fail is very few and manufacturers always assume all responsibility when they are at fault. They do not feel at fault, if bristles are burnt in using a brush. They object to assuming the loss when they are in no way to blame. They cannot make brushes stand usage as hammers, they cannot prevent water from swelling wood and then shrinking when dry. A few things of this kind occur, but not many. Manufacturers find that brush users are reasonable, and know, if they have hurt brushes by hard, improper usage, they do not do it again.

Brush users must not expect to get as much wear out of brushes made of Chinese bristles as out of Russian bristles, and they must not expect Chinese bristle brushes to do as good work as Russian bristle brushes. The brush manufacturer is not to blame, if Chinese hogs do not have as good bristles as Russian hogs; undoubtedly the Chinese hogs do their best, but their climatic environment, or something, prevents them from growing the best quality bristles.

Something in a reminiscent way about brushes may interest you. I have known some of you a good many years, ever since the time when you used hardly any but round paint brushes, sash tools and oval varnish brushes, and later when you commenced to try flat super wall brushes. We all remember the time when a combined brass and leather binding for wall brushes was made and prevailed for quite a while before you would give metallic bound, flat wall brushes favorable consideration. It is not so long ago since you required a great deal of coaxing before you would buy a brass-bound wall brush. Leather was what everyone wanted for binding. At the present time, as a rough guess, I think our house sells about one thousand times as many metallic bound wall brushes as it does leather-bound. Then, again, think of the change from white bristles to black bristles in brushes. Black Chinese bristles are not as good as white European bristles, and will wear out more quickly, but they are used very extensively. A few years ago not a painter would have them. Not many years ago if we offered black bristle brushes we were charged with trying to sell "whalebone" brushes. I suppose some of us who have passed the half-way point are inclined to think of the old days and the old-style goods as the best, but it isn't so as regards brushes.

Brush manufacturers who have lived as business houses are, I think, all making to day the same style and brands of brushes as they made fifty or more years ago, with the same kinds of bristles. They are making a whole lot of other kinds in addition, but if you want a 5 Okatka round paint brush, you can get to-day just like the one you bought in 1865, and the price is about the same. I took occasion, not long ago, to compare our selling prices of 1875 with present prices, expecting to find great changes, but did not find a very marked difference between prices then and now on identical lines.

VIEWS AND REVIEWS.

The Color of the Yolks of Eggs.

Is there any connection between the color of an egg-yolk and its nutritive qualities? The general popular impression is that the darker yolks are the richer, but there seems to be no exact experimental evidence either for or against this view. Two recent opinions are quoted by the *Revue Scientifique*. Says this paper: "Every one has noticed how the coloration of the yolks varies from one egg to another, —shading from very pale yellow to reddish orange. The literature treating of hen's eggs is very large, yet few writers have been attracted by this question of coloration. Noticing, several years ago, that the observed differences of color are without any effect on the intrinsic qualities of the yolk, which remains equally nutritive and equally valuable in reproduction, Morris attributed the initial cause of the color to the nature of the food. "Starting with the fact that it is paler in winter and with hens living in unscientific quarters, he inferred from this that the more intense coloration of the yolks of eggs laid by hens living at liberty was due to the coloring-matter of the green plants, and of the insects that these fowls eat in large quantities. After complex chemical transformations, these pigments from the foodstuffs reach the ovary, whose fatty cells fix it, owing to a special affinity. . . . Consequently hens should be placed in better conditions of life, by giving them spacious grassy runways, and, during the winter, supplying them, in the absence of fresh food, with grain, salad, cabbage, beets, and carrots, crushed or finely chopped."

Scientific Management.

A correspondent writes in the *Nation* (London):—A good many years ago an American mechanic stated publicly that if he could have one-half of all he could save in the management of engineering and other works of which he had knowledge, he would, within twenty years, become the richest man in the world. Since then another American—Mr. Taylor—has developed the same idea, and has produced a system which, he terms "Scientific Management," under which he claims that, by the mere application of certain formulæ and rules, the cost of production of commodities can be diminished down to almost vanishing point. This has been achieved by discovering experimentally what may be termed the line of least resistance in the production of each commodity, and relentlessly pursuing it.

This system means an enormously greater output per man and per machine. It is merely the application of common sense to the methods of manufacture, and the carrying out of the fundamental principles of economic production. The object of Mr. Taylor's science is to enable the employer to secure a much larger return from each workman and machine than at present. Consequently, the present annual output of each factory will be obtained with fewer hands and at a greatly reduced cost. The general adoption of "Scientific Management" must, therefore, result in a wholesale discharge of operatives in all industries. This is, of course, the logical end of the continued application of science and invention to production, *viz.*, the elimination of the human factor in production. From the standpoint of economic production, Mr. Taylor is eminently right, for the aim of economic production is to achieve the greatest possible result with the least possible expenditure of energy.

But economic production is, after all, but a means to an end. What is this end? Selfish individuals will perhaps regard it as the mere making of profits, and no doubt under our present economic system this end is fully attained. On the other hand, the economist, the statesman, and the humanist must take a very different and broader view. Looked at from the standpoint of social well-being, the essential object of production is the maintenance and well-being of *all* the members of society rather than of the few. Now, it is very certain that this object will not be attained under present conditions by the new

"science." On the contrary, the existing inequality in the distribution of wealth would be greatly augmented.

The Manufacture of Bangles.

The manufacture of bangles out of the shells of the common chank or conch (*Turbinella rapa or T. pyrum*) is an industry now carried on extensively in Bengal and Assam, the supply of the shells being derived chiefly from Ceylon but partly from the Madras Presidency also. Though Ceylon supplies about three-fourths of the demand, the shells of the Madras Presidency are more sought after for all work of the best quality, on account of the purity of their colour and the high vitreous polish of which they are suscentable. The local demand for these chank bangles or bracelets has of late been increasing, owing, it is stated, to the fact that they have again become a favourite ornament with caste Hindu females who, a few years ago, were rapidly discarding them as being fit only for the use of low caste people. The prejudice against the use of glass bangles of foreign manufacture appears to have stimulated the demand, and this has been helped by a marked advance in the artistic quality of the bracelets turned out. The first process in the manufacture of bracelets is the cutting of the shells into sections of recognised gauge, and it is these sections that are handed over to the artisans for the manufacture of bracelets. This cutting or slicing is now carried out in Bengal in a most primitive and laborious manner by means of a semi-lunar hand-saw which requires great skill to work and is slow in operation. The Superintendent of Pearl and Chank Fisheries, Tuticorin, reports that in European and American lapidary shops, a variety of fine tools suitable for slicing the most delicate material can easily be obtained, and that, if such tools were used, the cost of the bracelets to the manufacturers could be considerably lessened. He also states that, besides the manufacture of chank bangles, the waste products obtained in the process, and small or wormed shells unsuitable for bracelets, might be utilised in the manufacture of buttons, studs, etc., a valuable subsidiary industry being thus provided.

Agricultural Associations in India.

In the organisation of agricultural advance in any country or under any conditions whatever, it has ultimately had to be recognised that the bulk of the work must be done by the farmers or cultivators themselves. A government, an agricultural department, a body of state servants, may point the way, may suggest the lines,—but until the people can be interested and become enthusiasts themselves, the advance will be slow, will be looked upon with suspicion, and will be more apparent than real. It is this fact that has made most of the far-seeing leaders in the development of agricultural departments in India very insistent on the necessity for developing local bodies composed of cultivators themselves or of others interested in agriculture,—who should be committed to advanced methods, should show them in action on their own land, should act as local emissaries of whatever in changed methods has been proved to be good.

The question may however be asked: Cannot the Agricultural Department communicate directly with the cultivators? Is not such communication with, and helpgiving to, individuals of equal value to work done by and through a local association of any kind whatever? Dr. Harold H. Mann writing in the *Agricultural Journal of India* answers it in the negative. While this *can* be done, while it is *possible* to deal direct with every cultivator in the districts, it is becoming more and more clear that this is not generally the best or most economical way of proceeding. A local organised body is a far more efficient agent for the introduction of improvements than the few officers of the agricultural department, working individually, can ever be, for, being a body or local men, it carries considerable local influence if composed of the right people, the members can and do mutually encourage one another, while its educative value in combined work and co-operative effort is, if properly organised, greater than can be realised. Even if the same end can be gained, so far as the introduction of an improvement is concerned, without a local association, a better final result can often be attained if a local body, as such, takes a share in the matter; as tending to increase the co-operative spirit of the people and hence the likelihood of permanent advance.

Success with such associations can, however, only be reached by following certain lines which, Dr. Mann considers, can now be laid down with some approach to certainty. However organised, it is necessary that (1) every local association should have a definite work to do, and the members should feel responsibility for taking a share in it. (2) A local association should be composed of men who are really interested,—and practically interested,—in agricultural improvements in the area in question. (3) The work of a local association should be regularly inspected, criticised and the association called together. (4) The members of a local association must, even apart from inspection, be made to feel that the agricultural department is interested in them and their work. It is wonderful how regular correspondence, prompt attention, and general evidences of interest and support encourage both the individuals and the associations of which they are members. If local agricultural associations are to be a success, this must be arranged for at any cost.

A Bureau of Farm Power.

Among the departments of the Government of the United States devoted particularly to the interests of the farmer, there are a bureau for the investigation of soils, a bureau of chemistry for the analysis of fertilizers, a bureau of plant industry to study the bacteriological problems connected with plant production and plant nutrition, a bureau of entomology to obtain information regarding injurious insects affecting field crops, fruits, etc., a bureau of biological survey which recommends measures for the preservation of beneficial and the destruction of injurious species of birds and mammals, a bureau of animal industry for the inspection of animals, meat and meat food products, and the investigation of dangerous diseases among live stock, and a weather bureau which will keep the farmer informed of the meteorological conditions. It would seem that with all these different bureaus the interests of the farmer were well taken care of. However, says the *Scientific American*, there is one important branch of farming that has been entirely ignored by the Department of Agriculture, namely, the subject of farm power. The American farmer has, it appears, outgrown the age of hand labor, and even animal labor is now on the wane. Steam power was introduced on the farm many years ago, and of late the internal combustion engine has been playing a very important part, and now electricity is beginning to be used.

The epoch of mechanical power on the farm has already begun, and it is important that farmers should be educated upon matters pertaining to labor-saving machinery. Realizing this need, Mr. H. T. Rainey of New York city recently introduced a bill in the House of Representatives to establish in the Department of Agriculture a Bureau of Farm Power. The province and duties of the bureau are "to investigate and report upon all matters pertaining to methods of furnishing power on farms and all labor-saving machinery adapted for use on farms and the use of electricity, gasoline and steam in propelling farm vehicles in operating plows, reapers, mowing machines, threshing machines and other machines and implements used in planting, cultivating, harvesting and marketing corn, wheat, oats, potatoes, hay, rice, vegetables, and all other agricultural products.

"It shall be within the province of said bureau to make diligent investigations into the matter of machines and labor-saving devices used in the dairying industry as conducted on farms and into the methods of heating and lighting all farm buildings. In general, said bureau is authorized and directed to investigate diligently all machinery, and devices which will lessen the amount of labor necessary in agricultural pursuits and lessen the expense of producing and marketing such of the necessaries of life as are produced on farms

and to report the results of said investigations to said Department of Agriculture."

A Bill on London.

In an article entitled "Why London is the Centre," in the *World's Work*, Mr. James H. Collins explains the vast financial machine which operates when anybody anywhere draws a bill of exchange on London, a bill, by the way, which is the one medium that always has a ready market in any part of the world, civilised or uncivilised. A bill of exchange drawn by a cotton-buyer in America or a Manchester merchant may go round the world to reach London. First, perhaps, it goes to Havana, may be, to pay for tobacco. Havana sends it to Paris to pay for millinery. Paris sends it to the Orient, and finally it comes home to London from South America, to pay dividends on British investments ; and is duly met with cash by the Manchester man. Half a dozen nations have saved exchange through passing it along.

London is the only banking centre in the world that can perform such a feat in finance, because, by reason of England's vast trade with every country on earth, large or small, near or remote, London alone is able to clear the whole transaction. John Bull laid the foundations of this mighty financial structure more than two hundred years ago. In the days of Charles I there were no banks, no trust companies, no safe-deposit vaults, no bonds or stocks, no Government Consols. When a king wanted to make war he had to hustle for ready money—wars were always billed strictly net cash. Londoners who had gold, silver, and family valuables took them to goldsmiths who possessed strong-rooms to keep their own valuable goods, and also deposited bullion in the Tower of London.

Charles I wanted money in a hurry. He sent down to the Tower and seized all the gold-smiths had there. He promised to pay it back—and did pay them 8 per cent. interest ; but from that day to this they have never seen the principal. When Charles II came to the throne, the sum, then about £1,800,000, was organised into what ulimately became the British National Debt—to-day more than £700,000,000.

As a result everyone hoarded, and it was most difficult to raise public money. When William III wanted cash to carry on war in the Netherlands, the Chancellor of the Exchequer had to go begging in the City with the aid of the Lord Mayor, borrowing a hundred pounds here, a thousand there from rather reluctant merchants.

Then a Scotchman came along with the idea of the Bank of England. Londoners rather resent this memory. They say the Scotchman's part in the matter has been unduly magnified, and that, anyway, he appears to have been a pirate before he turned up in London. However he got together a syndicate that lent the Government £1,200,000, and the Government gave in return the Bank of England's charter, which carried a monopoly of note-issuing and other profitable perquisites.

From that time Londoners had a safe place for their spare cash, and there was ready capital not only for public use but for private enterprise. This has been the source of John Bull's financial strength—that, though other nations might have as much money stuck away in old stockings, where nobody could find it and put it to work, his money has been available in the bank for 200 years ready to go on the job anywhere in the world.

Fibre Sandals.

A very important industry is carried on in Spain in the manufacture of a sort of a sandal or slipper known by the name of *espadrille*, which is in general use among the poorer classes, and is also exported in large quantities to other countries. According to a United States Consular Trade Report, the total number exported to Cuba, Algeria, Argentine, Italy, France, Mexico, Panama, Philippines, Porto Rico and other countries amounted to 403,439 dozens in 1909.

They are made of plaited soles of jute or hemp cord about a quarter inch thick. To this sole is sewn an "upper" piece of cotton canvas, rather lower in height than a shoe, and it is attached by tapes fixed to the upper edge and bound round the ankle. The favourite colours are white, black, red, blue, and dark grey in the above order. There is a very large home consumption in Spain which is supplied by small workshops distributed in the industrial quarters of all Spanish towns. Barcelona alone possesses 209, Madrid 94, and Valencia 78, where the work is either entirely by hand or machine-made parts are put together by hand. In addition, there are factories for the manufacture of soles by machinery, but the development of automatic machines similar to those used in the boot trade progresses very slowly. Espadrilles are nevertheless made very cheaply and are sold at from Rs. 3 to Rs. 3-7½ per dozen pairs or from 7½ to 9 annas retail per pair

The cheapest have jute soles, and a better quality have soles of hemp and sell from 10 to 15 annas per pair. Work people are paid at the rate of Re. 1-4-0 for men, 15 to 18 annas for women, and 11 to 13 annas for children per day. Workers make from two to three pairs per day, men making the large sizes, women the intermediate and children the smaller ones. In the Basque Provinces, the production is estimated at 10,000 to 12,000 pairs per day.

Here is an industry, says the *Indian Textile Journal*, that might with every prospect of success be taken up in India. All the materials are produced locally. Woven soles of cotton are a well known product of our jails, the espadrille is suitable for people who object to wear leather, and there is abundance of labour of a suitable kind, for the work is much more easy to learn than hand-loom weaving. The tools are those of the mochi, but, as leather is not used, there can be no caste prejudice against the work which might find occupation for agriculturists in the enforced intervals of field work. Raw materials could be distributed and the finished articles collected in villages by the same organisation as serves the hand-loom weaver's.

A rival material for the same footwear for indoor use is paper, which, when cut, spun and woven, makes mats and cloths of various qualities. For the manufacture of soles, it has the advantage of being a good non-conductor.

How to Sell Patent Medicines.

The composition of a proprietary medicine is of small account from the commercial standpoint, according to *The Druggists' Circular*, New York. Perfectly good formulas are lying around loose, any one can get the recipe for an effective laxative or expectorant or tonic, for the asking. The promotion of the article, after it is compounded, is the important thing. Without it, the best medicine will not "go." With it, ordinary water, with or without a flavoring and coloring, has been known to yield a fortune. The *Circular* is moved to discourse on this subject by the receipt of a letter from a subscriber, who says he knows a man with a lot of splendid formulas for medicines and asks how he shall go about to exploit them. To him says the writer :

"For a dollar, a dollar and a half, or two dollars, anybody may buy a book containing formulas for remedies for every different kind of disease that actually exists or can be imagined for advertising purposes; almost any body can manufacture the goods, or have some firm of manufacturing pharmacists do this for him; and without the expenditure of more than a week or two's salary of an ordinary working man, may find himself in possession of a stock of medicine which, at a dollar a bottle, or twenty-five cents a box, or even at 'two, four and eight,' would net him a tidy little sum. Having proceeded thus far, our supposititious man could by reinvesting the said tidy sum in more of the medicines and converting them likewise into cash, be able to buy a good farm and retire. The thing looks so easy that it seems a shame for any man to have to shovel dirt at a dollar a day or edit a paper for his board and clothes.

The only weak link in the get-rich-quick chain is where the owner of the formulas depends upon somebody else to create

a demand for the goods. It is easy to say 'just advertise,' but not everybody knows quite how or where to advertise, and not all have the money to pay the bills. "An illiterate farmer once mixt a little acid with water and fooled enough people into paying him three dollars a jug for it to enable him to buy a Fifth avenue mansion; and while the people have grown somewhat wiser in the last dozen or two years, and are not 'biting' as readily as of yore, there are still fools enough who part quickly with their money to keep numerous equally illiterate fakers rolling in wealth.

"Many of the proprietary medicines which have made fortunes for their owners have not the merit of dozens of simple preparations which may be obtained in any drug store for less than half the price of the 'patents,' the vogue of the latter being the result of a psychological impression made on the public by shrewd and often thoroughly unscrupulous promoters. In a partnership between a man who supplies the formulas and a man who creates the demand and sells the goods, the former, under an equitable distribution of the dividends, should, generally speaking, receive not exceeding one per cent ....

"If the public who have so long supported the nostrum business could be brought to a recognition of what constitutes its mainspring, it would save them from many harms to purse and body."

The Cork Industry.

The cork tree is a species of oak whose outer bark, which is the commercial cork or 'corkwood," is first stripped when the tree has a circumference of about sixteen inches, and thereafter regularly every 9 or 10 years throughout the life of the tree. The best bark, commercially speaking, is produced, according to a writer in the *Journal of the Royal Society of Arts*, when the cork tree is fifty to one hundred years old. The bark taken from the tree trunk sometimes measures more than two inches in thickness, and the total yield of the tree occasionally reaches 500 pounds, though this yield varies enormously from fifty pounds upward, in accordance with the age and size of the tree. After having been stripped, the bark is generally left for a few days to dry. It is then weighed and taken to the boiling station. The simple boiling process makes the bark soft and flexible, and, quite as important, renders easy the scraping off of the woody weather-hardened outer coating which is commercially useless. Occasionally the boiling station is located near the cork forest; in other instances at the shipping port, where the cork factories are situated. At these factories, the bark is sorted very carefully, according to quality and thickness, and is then —if for sale as raw corkwood—baled for shipment. In the manufacture of these articles there is a very great amount of unavoidable waste, which is largely exported in the form of cork shavings for use in making linoleum and other by-products of cork. Of all the uses to which corkwood is now put, the manufacture of corks themselves still remains pre-eminent. Formerly corks were made almost entirely by manual labour; the workers cut the bark into small squares, from which they whittled out each cork by hand. At the present time this method is still employed in the very small and unimportant "home" factories, where the family constitutes the working force, but the larger local establishments use very satisfactory machinery for the production of corks and discs.

The manufacture of cork is an interesting process when watched from the beginning. Before use at the factory the cork bark in loose bales is boiled for half an hour to render it pliant; upon drying it is sorted into at least ten grades of differing quality and thickness. This sorting is most important, if waste is to be reduced to a minimum, for corks are cut from the bark transversely, and are hence limited in their diameter (rather than in their length, as might at first be supposed) by the thickness of the bark. After sorting, the sheets of bark are cut into strips and squares, according to the length of the cork desired. Next the cork itself is carved out of the small square block, polished by a sand papering machine, washed, sorted, and disinfected; The corks are shipped in sacks of strong burlap containing generally from 100 to 150 lbs.

Among the articles in the manufacture of which cork is used are cork discs, life preservers, cigarette tips, instrument handles, polishing wheels, etc.

The Europe-returned Technical.

In view of the recently published report of Lieut.-Colonel Atkinson and Mr. Dawson on Technical Education in India, the article on the 'Europe-returned Technical' in a recent number of *Science and Industry* will be found interesting. The writer, Mr. Khare, states that now a days the position and prospects of the England-returned (in the sense of Europe returned) technical have become worse a good deal. After having specialised in a particular part of a technical subject in the United Kingdom, the England-returned Indian finds that the field for his employment becomes naturally limited. Indeed, cautious parents and guardians have long recognised this difficulty and we find them therefore always insisting on the young man's 'putting in terms for the Bar.' We have thus at times the good fortune of meeting a barrister, a glass blower, so that, though his attempts at glass manufacture fail, he might still hope to be a leading member of the Bar. Needless to say, such attempts at learning a technical trade mostly fail, because of their half-heartedness and, though it may be thought a very prudent policy in a young gentleman from India to combine both legal and technical knowledge, there is no doubt that he himself later on deprecates a similar intention in those who want to follow in the same path.

Besides the unavoidable difficulty of a restricted sphere of employment, the England-returned technical has to meet further difficulties. In the first place, our Indian capitalists fight shy of employing such men and, whenever they do, they start them, in comparison with their European competitors for the same post, on an abnormally small pay. For this the capitalist cannot of course be wholly blamed. Ever since India took to manufacturing on Western lines, the idea has been ingrained in the Indian capitalist that his European employe' is by nature endowed with the qualities of conscientiousness and perseverance in work. He found these essentials lacking amongst his Indian subordinates and, there being no Europe-trained Indians at the time, who could be compared in business calibre with Europeans, it became an axiom with the Indian capitalist that, man for man, the European employe was far better than the Indian. It is against this belief that the foreign-trained Indian has to fight. Secondly, it happens very often that now-a-days the wrong sort of man goes to England. Ten years ago it was only the pick of the Universities in India that had any chances of going to England. Now, thanks to the awakening interest of the capitalist-classes in industrial education, the young graduate in India has more facilities for securing the necessary wherewithal to proceed to England, when he is unable to go at his own expense. The result of these increasing facilities and decreasing opposition of parents has been that for sometime past many a young man has crossed the water, who ought not to have done so.

In the end, Mr. Khare offers the following suggestions in regard to the work done by bodies like the Industrial and Scientific Association and other societies :—One might suggest, here, that such societies might, instead of being in a hurry to send more scholars to Europe every year, limit the number of those to be sent out and reserve the sum which would thus be spent for (*a*) giving maintenance scholarships for a couple of years to their trained scholars to show them how much they have learnt and for (*b*) starting a small fund which could be utilised to finance small experimental concerns, in which their trained scholars can work. A scholar on return will then be given an allowance, let us suppose, of 75 Rs. a month and asked whether he can find capital enough to start his concern. If he can do so indepedently of the society's help, he will not have to work in any of the model

concerns which the society has started. It is assumed that the society will send out young men, only to learn those industries for which the society is ready to start model concerns.

Co-operation in Agriculture.

Of all the points of variance in regard to this subject, by far the most prominent is the relation of the State to the co-operative movement. There is on the one hand the uncompromising opponent of State assistance in any form and on the other there are the never-do-wells who always look up to Government to be handfed. However, there is no country which does not accord more than mere legislative recognition to the co-operative idea. The aid is rendered in different ways in different states, in the form of legal privileges, assistance in propaganda, financial facilities, direct subvention and otherwise. One may hold that the State aid is often unnecessarily and sometimes injudiciously given. One could prove that where the movement is strongest, dependence on the State is lightest. Yet, it is not to be denied that the help of Government has been of great service in most countries and especially to certain branches of co-operative work, and that but for that help, co-operation would not be the vigorous growth that it is to-day. State aid is not a principle to be condemned or approved in the abstract. There is a time to give and a time to withhold aid. Like every other principle it is relative, and must be applied with direct reference to the circumstances of each country and people and the requirements of each form of co-operative activity.

Whatever however be the academic view held about the question, there is no denying the fact that, *first*, the co-operative movement has taken some hold in the Indian soil, and, *secondly*, that the success that has attended the movement is in a large measure due to the interest taken in it by the Government. There has recently been published a collection of monographs by the International Institute of Agriculture at Rome, which trace the history of the co-operative movement in the various countries of the world. The writer of the monograph on India, quoted by Mr. W. H. Buchan, I.C.S., Registrar, Co-operative Credit Societies, Bengal, in the July issue of the *Quarterly Agricultural Journal of India*, confirms the statement we have made above, and in fact sums up the reprogress made as "an illustration of State aid effectively administered rather than of organised self-help."

On this Mr. Buchan comments:—We reversed the normal process by beginning at the top. Government not only introduced the idea to India but appointed official Registrars to make it known and to organise and guide a co-operative movement. It was the only possible course. The condition of agricultural India obviously called for co-operative societies, although the people had not thought the matter out and there was no conscious demand for them. The great danger of the arrangement was the possible officialisation of the movement. Every Registrar on his appointment at once becomes an enthusiast. He is convinced, and rightly, that widespread co-operative system would mean the regeneration of the rural population. But he finds that the educated classes, the natural organising agency, are apathetic, and the temptation to form societies by official means is strong. The reports show that in most provinces this temptation has been resisted. In India, as in every other country, the teaching of experience is that excessive artificial fostering produces a weakling growth. Government has shown the way. There are in every province the beginnings of a healthy movement, which grows more self-conscious every year, and which is gradually attracting the interest of the educated classes. *The future rests with the people of India.* An officially run movement on a wide scale is a thing unthinkable. A popular movement, appealing consciously to the interests of the agricultural classes, under general official guidance but supported by the energy of numbers of local organisers, is eminently practicable That is the ideal aimed at. It is certain that without that propelling popular force the movement can *never* have vitality or spontaneity. *The italics are ours.*

AGRICULTURE.

The Organism of Foot-and-Mouth Disease.

Dr. Siegel the well-known bacteriologist of Berlin has isolated a bacillus, which he regards as the specific pathogenic organism of foot-and-mouth disease. The new bacillus he has named "Cytorrhyctes ;" he has obtained it in pure culture and found it respond to all the Koch tests. He has successfully inoculated lower animals with the culture, and after much experimentation has succeeded in producing a considerable degree of immunity against infection, although much remains to be achieved in that direction. These conclusions, it is stated, are the result of many years' patient research.

The Living Soil.

It has been shown, says a scientific contemporary, that soils which have been treated with certain volatile antiseptics and afterwards prepared again for plant growth show a great increase in fertility. The soil bacteria are reduced in numbers by the first process, but afterwards they increase greatly. Why should this decrease in the bacteria be followed by such an increase? It has been suggested in explanation that the antiseptics kill off "the protozoa of the soil," some of which feed on the bacteria, and that thus the bacteria are permitted to multiply. A recent investigator into the protozoa of the soil names about thirty kinds, of which eighteen exist in an encysted state, not in an active one, and so as he says, cannot act as the limiters of bacterial activity. As to the other twelve we find nothing said. But however the case may be, we come to this: that the soil is no longer regarded as so much dirt but as teeming with life.

Indian Agricultural Improvements.

Mr. M. E. Couchman, I. C. S. late Director of Agriculture, Madras, in an article in the *Agricultural Journal of India* thus sums up the difficulties in the way of improving our agriculture:—"I may then sum up the chief difficulties which hamper the progress of agricultural improvement, as, first, the want of knowledge regarding Indian agriculture. Second, the fact that in India so much practical knowledge has already been discovered by the experience of generations that there is less scope for a rapid advance than in new countries ; and thirdly, that the Indian cultivator possesses in an intensified form the conservatism of the farmer common to all countries, and that, owing to the separation of classes here, the difficulty of breaking down that conservatism is greater here than elsewhere. The last difficulty, however, is the least of the three. Our experience is that the Madras cultivator is by no means unwilling to take up a new thing if it is really an improvement. The rapid spread of Cambodia or American Cotton in Tinnevelly, Ramnad, and Madura Districts in the last few years is a most encouraging sign that a really good new crop can be introduced very rapidly".

Cotton Growing in India.

The following is extracted from the report of Mr. Arno Schmidt, the Secretary of the International Federation of Master Cotton Spinners and Manufacturers' Associations on the subject of cotton-growing in India :—

It is now recognised by the Government experts and others that the cultivation in India of exotic types of long staple cotton must be confined almost entirely to the irrigated districts. Whilst long staple cottons can also be produced in a few non-irrigated tracts, it has been clearly demonstrated that, with the exception of the Tinnevelly cotton in Madras and Broach cotton in Gujarat, the cultivation of long staple cotton in unirrigated parts is not economically sound ; the cultivation of indigenous cottons proves more remunerative to the farmer in non-irrigated tracts, owing to the higher ginning outturn (percentage of fibre), to the higher yield per acre, and to the less attention required. Nevertheless, the prospects of the production of long staple cottons in India are decidedly favourable in the following Provinces : Sind, Punjab, Gujarat, Southern Madras, and the Central Provinces. Spinners and all interested in the cultivation of long staple cottons in India should look upon this as a definitely settled opinion, arrived at after many years of careful investigation. The prospects of an extension of the area for these cottons lies mainly in the irrigation of hitherto dry tracts.

COMMERCE.

Profits and Risks.

The *Pioneers'* Calcutta correspondent writes in a recent issue of that paper.. In business, as in every other condition of social or domestic life, it is seldom that everything goes absolutely perfectly right. Just when indications are most favourable and things all appear to be running smoothly, some little difficulty brings itself into prominence and strikes a jarring note which may end in a debacle of discord. It is possibly this familiarity with the rough side of life that makes the average business man a pessimist. It is not merely avarice which prompts the business man always to complain that "business is bad" or "might be better ;" it is more, because the man of commerce has probably several times in his career had a "severe knock" just at the time when everything seemed to be doing well. Take any ordinary business transaction. A salesman sells, suppose, "gunny bags" to the value of one lakh of rupees to a good buyer in America—the difference between the price sold at and the cost of purchase from the mill works out to about 1 to 1½ per cent. which on Rs. 1,00,000 would mean a profit of Rs 1,000 to Rs 1,500. But this had to be earned, every bit of it—leaving out any question of speculation—the order has to be placed with a suitable mill—the mill who is likely to give the best make—and who is likely to give no trouble about delivery. The delivery may be spread over 3 or 4 months. The mill has to receive packing and marking and shipping instructions—finance has to be arranged, freights have to be engaged, and a dozen and one other details of routine fixed up, not to mention all the intricate code messages which have passed with the buyer. So it is usually some months before the seller of the Rs. 1,00,000 of gunnies in Calcutta sees his Rs. 1,500 profit, and then it only comes in instalments, so much per shipment. A strike or breakdown at the mill means more wiring and anxiety and tact and negotiation—perhaps the goods are partially cancelled—and away goes so much of the profit. Finally let us suppose the goods have been shipped and the Mate's receipts and other shipping documents all got together. Now comes the time to negotiate the bills.

Fixing the Exchange.

As a matter of fact the wise salesman usually fixes his exchange at the time the order has been booked. By fixing exchange is meant that the shipper through that useful "appendage" of Calcutta commercial life, the exchange broker, has made a contract—call it a compact—with a bank that the bank will buy the shippers' draft on the American buyers, London bankers on New York bankers at a certain rate of exchange, which means that the shipper hands over to the bank all the shipping documents—with a bill of the actual amount that the man in America has to pay for the goods he has bought. The bank here pays the Calcutta shipper, sends the document home to its London or New York Agents who presents the bill to the American buyer for his "acceptance;" in other words, the buyer signs the bill and by doing so binds himself to pay the New York banker the value of the bill "four months after sight." If the buyer is a good man the documents are handed over to him on trust, enabling him to get possession of the goods before payment—"on tick" in fact; meantime the shipper in Calcutta has realised his money and paid the mill for the goods bought. But it will be seen his interests in the transaction are not yet nearly at an end. The American buyer, now the drawee, may go insolvent and then the bank comes down on the shipper—now the drawer of the bill—and he has to pay up and perhaps lose not only his profits but the goods as well to the value of ten or 100 times the amount of the profit he anticipated making. But it will be obvious to my up-country non-box-wallah readers (for whose delectation principally I am writing this)—it will be obvious that there are a dozen and one other complications and embroglios which may still easily arise. Supposing the American man thinks that the goods supplied are not up to standard and it is remarkable how an adverse market can bias opinions, or supposing the mill has actually been a little careless in the make, or has made a genuine mistake and so on and so forth. And so it is, when a zealous young salesman makes his report to his Burra Sahib that he has booked so many lakhs of corn sacks or wool packs or ore packets on which a profit of "Rs. 1,000 at least" has been made, the Burra Sahib is the lesser optimist of the two. He knows that the transaction has only just begun.

INDUSTRY.

The Sugar Industry.

In February last, the Government of India placed at the disposal of the Government of the United Provinces the services of a Sugar Engineer with a view to enable those engaged in the industry to obtain expert advice as to the types of machinery and equipment most suitable to the varying needs of the different sugar tracts. Mr. A. Hulme, the Engineer selected for the appointment, may be consulted on application made to him through the Office of the Director of Land Records and Agriculture, Lucknow.

The Mysore Silk Industry.

There is evidently a bright future for the Mysore silk industry, judging from a letter received by the Superintendent, Tata Silk Farm, Bangalore, upon the success of the samples of Mysore silk at the recent Exhibition held in London. The President of the Royal Silk Association, Mr. F. Warner, writes :—"A bale of your silk was shown by Messrs. Durant & Co., in their case at the above-mentioned Silk Exhibition *and it attracted the attention of many of the visitors to the Exhibition including the King and Queen and others of the Royal Family.*

"From enquiries I have made respecting your silk, I am inclined to think that there should be a possibility of an increasing demand for it in European markets. Personally I am more struck with its appearance in the Raw than in the thrown, and am therefore inclined to think that if it were sent to Italy or France in the Raw state and thrown by one of the best French or Italian throwsters it would prove to be quite a good class and serviceable silk."

Large Chemical Works in Bombay.

A scheme is being pushed forward for the establishment of a large Chemical works in Bombay for the manufacture from sulphuric acid of a large number of products dependent on this acid. The intention is to take the raw materials of the country which are now being exported or not used at all and convert them into fertilisers or chemical products used by the textile trades of Bombay. H. E. Sir George Clarke, who recently referred in a speech to the advantages of chemical fertilisers, is taking great interest in the scheme. It is altogether a new development for Bombay as it will be the first large heavy chemical industry on that side, which in Southern India is being done on a large scale by Messrs. Parry & Co. in their manure works at Ranipet. The advantages to Bombay will be the production of cheaper chemicals for the textile trade and manufacture of fertilisers. There is enormous field for the chemical fertilisers in India as farmers will realise when they are educated on these points. Ceylon, Java, Japan and China are already large consumers of chemical fertilisers and appreciate their value. Mr. H. N. Morris, Chairman, Chemical Factories at Manchester and Cheshire, who has been in Bombay for several months making arrangements for the erection of a chemical fertiliser factory is returing to England and will come back in February or March when the new works are expected to be ready to start.

The Mysore Chemical and Pharmaceutical Works.

The Mysore Chemical and Pharmaceutical Works, Limited, has been registered under Mysore Regulation 3 of 1895. The objects of the Company include the business of manufacturing chemists, druggists and analytical chemists, drysalters, wood distillers, distillers of essential oils, manufacturers of soaps, artificial manures, fertilisers, disinfectants, perfumery, etc. It is now intended to confine operations to the Mysore State. As a matter of fact it is at present in negotiation for contracts in other parts of Southern India. It is pointed that there are now works actually carrying on this industry south of Bombay and that the value of imported drugs and chemicals during 1908-1909 at the Port of Madras reached Rs. 1,238,548 and the consumption is inereasing. The Mysore budget for drugs and medicines for 1912-13 is Rs. 1,10,000 of which Rs. 65,000 is for such chemicals, etc. which the Company could produce within six months of starting. Valuable concessions are expected from the Mysore Government including fuel free of royalty, preference in Government purchases, land on advantageous terms, good roads from factories to railway, alcohol duty free for industrial purposes and contribution of a moiety of salary of a special whole-time chemist. The share capital is Rs 500,000 in shares of Rs. 100 and the provisional directors include Messrs. Hajjee Ismail Sait, H. Luebeck, O. Bird Irwin Monro and Masilamony Chetty with Mr. J. Ingle as Secretary.

ECONOMICS.

Some Census Figures

In India, as a whole, ninety-five males and ten females per ten thousand are literate in English. Amongst the main British Provinces Bombay leads, and the United Provinces come last. A colloquial knowledge of English is probably most widespread in Madras.

Of every 100,000 persons, 26 are insane, 64 deaf-mute, 142 blind, and 35 lepers. Blindness affects the two sexes almost equally; but the number of females returned as insane or deaf-mute is only about two-thirds that of the males while in the case of lepers it is barely one-third.

High prices and Cold Storage

Cold storage has been accounted as one of the causes contributing to the rise in prices experienced in modern days. We read, however, in *Ice and Cold Storage*, that a committee of the Chicago Association of Commerce appointed to investigate cold storage and cold storage products have reported otherwise. To the charge that cold storage tends to increase the price of food products, the committee reply that its investigations, on the contrary, have conclusively proved that cold storage is the great equaliser of prices, and that prices throughout the year have been maintained nearer a level since cold storage has become a factor compared with the days of artificial preservation of foods by cold storage.

The Rupee in India.

In the House of Commons on October 9th Sir John Rolleston asked the Under Seeretary of State for India : If he will state the actual cost to the Government of India in terms of gold of the silver contained in the rupee, which has the legal value conferred upon it in India of 1*s.* 4*d.* ; and whether rupees are being coined in India not alone for local purposes, but also for exportation to and use in other parts of the British Empire. Mr. Montagu replied: The actual cost of the rupee in terms of gold necessarily varies with the price of silver. The rupee contains three-eighths of an ounce of silver of eleventwelfths fineness, and the cost of coining a rupee, after including all charges, is slightly more than three-eighths of the price per ounce paid for the silver used in its coinage. Thus when standard silver is bought at 24*d.* per ounce the cost of a rupee, after minting, is approximately 9·181*d.*; with silver at 32*d.* it is approximately 12·24133*d.*; and so on. Rupees are coined in India to meet the requirements of that country and not directly for exportation. The Indian rupee, however, circulates in Ceylon and in parts of East Africa, and passes, in the course of trade from India to those countries and from them to India ; and in so far as such movements affect the stock of rupees in India they influence the amount of coinage of rupees in that country.

The Protection of Gullible Investors.

The *Bankers' Magazine* of New York conainst a useful article urging the need for the spread of financial education. The *Magazine* adverts to a recent estimate that seventy-seven million dollars have been lost in the past year through investments in schemes that had no possibility of paying legitimate dividends. "These figures may be too high, but the frequency with which promoters are arrested and the increasing number of firms to which the Government denies the use of the mails mean that their is a constantly flowing stream of money from the hands of hard-working people to those of rascals. The gullibility of the investors is past understanding. A magazine a few months ago published a burlesque story of a goose farm and demonstrated by the usual fake promoter's method that by the sale of goose oil, feathers, etc., the profits on $1,000 invested in the project would return $301,000 in three years. It received scores of letters inquiring about the plan and asking where stock in the farm could be obtained. Its readers had actually believed the thing possible." The only adequate protection from "share-pushing" frauds and all the other evils to which incautious investors are exposed, lies in their acquainting themselves thoroughly with sound investment principles.

CO-OPERATION.

The Mysore Co-operative Conference.

At the Second Conference of the Mysore Co-operative Societies held in Mysore recently, there were nearly four-hundred delegates present. Mr. H. V. Nanjundayya, the first Councillor and officiating Chief Judge of the Chief Court presided. His Highness the Yuvaraja in declaring the conference open, gave a short resume of the progress of co-operation in the State. Since the last conference, the number of Societies had risen from 111 to 217 ; the number of members had increased from about 10,000 to 14,000 ; the working capital from about 4 to 8 lakhs of Rupees ; and the volume of business from 21 to 36 lakhs of Rupees. "I am glad to note," said His Highness, "what is of even greater importance than these figures, that the true spirit of co-operation is more and more realised and practised in the working of our Societies." In rural areas, we are told that the operations of societies extend only to 1500 villages out of a possible 16,000. The fact that interest to the extent of Rs. 50,000 on debts aggregating 6½ lakhs was saved in the course of last year must make the people more active in the direction of extending the movement. According to His Highness, only one-tenth of the work has been done and there is yet nine-tenth to be done.

The Bombay Co-operative Conference.

The Fourth Provincial Co-operative Conference was held recently in the Council Hall, Poona, about a hundred members from the districts being present. H. E. the Governor delivered the opening speech. H. E. noted with satisfaction the progress in co-operation made during the last four years. In 1908 the total number of societies was 145 with a membership of 8,477, and a working capital of Rs. 869,680 ; the eighth annual report now showed that societies of all kinds numbered 888, with a membership of 29,419, and a working capital of Rs. 32,08,911 at the end of 1910-11. H. E. noted with special interest the progress in rural societies from 99 in 1908 to 284 with a membership of 19,247 and capital of Rs. 14,47,118 ; 14 per cent. of this capital was lent by Government, 43 p. c. by financing institutions, 43 p. c. being raised "partly by non-members but chiefly as deposits from the members themselves." Referring to the Bombay Central Co-operative Credit Bank, H. E. said that it was registered on 11th October 1911, and had a good start. There were 913 share-holders, and up to the end of July last, the Bank had lent 10½ lakhs of rupees, of which 3 lakhs were repaid to 88 rural societies at interest from 7—8 per cent. H. E. said that, at the outset, Government aid was necessary, but now Co-operative Societies should strive to be self-contained and independant. There were 18 weavers' societies with a capital of Rs. 18,000. H. E. said that in tanning and chemical manure, co-operative action had large scope, as also in the case of seed-supply, as very few of the existing 49 seed-supplying societies worked on co-operative principles. Towards the close of his speech H. E. dwelt on the political and economic importance of the co-operative movement, with its valuable lessons of thrift, honesty, business capacity, mutual confidence, dignity and self-respect.

Some Dangers of the Co-operative Movement.

The Hon'ble Sir Robert Carlyle, in an address to the Conference of Registrar of Co-operative Societies, held in Simla on the 28th October, said that the very success of the Co-operative Movement brought its own dangers, and that the chief of those dangers was that we may be tempted to go too fast and outgrow our strength. We should, he observed, be very careful in organising societies. One good society does more good for the Co-operative cause than twelve indifferent ones. One society well run on sound Co-operative lines does good not only to its own members, but also outside throughout the neighbourhood in which it is working. It forms a centre from which the understanding of Co-operation is radiated, and one such centre is worth many

societies in the working of which the benefit of Co-operation is indifferently illustrated. There is a distinct danger now that the great benefits of Co-operation are so conspicuous, that we will be pressed to move too fast.

If we get a sufficient number of non-official gentlemen interested in the Movement and understanding the principles of Co-operation, we can ensure that societies shall be started in large numbers and yet be run on sound lines. He said "what I am afraid of is not rapid progress, but unsound progress beyond our strength to supervise. What a safe rate of progress may be, depends very largely on the rate on which our supervising agency can be developed, and this again depends on how rapidly we can attract to our assistance non-officials full of zeal and understanding; and the understanding is as necessary as the zeal."

Speaking of Government Supervision, Sir Carlyle observed that detailed inspection and supervision should be as far as possible non-official. He did not wish to see the Government lose touch of the Movement. On the contrary, it is essential that the Government should guide and assist Co-operation, but "we have to guard against departmentalism, and routine, and it is very difficult to avoid these evils if the number of Government officers connected chiefly with the Movement is not kept low in proportion to the work to be done."

The Hon'ble member next touched on the question of government pecuniary aid and expressed the opinion that it is desirable to limit Government grants to the narrowest possible limits, because it is impossible for Co-operation to develop on a large scale in a healthy manner if it is not run on strictly business lines. He equally objected to charitable relief from private individuals.

Help may be given from charitable motives, but it should be given on business lines. Special cases may arise and have arisen, and must be dealt with on their merits. It may prove possible to do a great deal in times of famine through Co-operative Societies, and it is certainly not in times of famine that the Government would allow Co-operative Societies to struggle unaided.

BANKING.

The Bombay Provincial Bank.

This company has been formed with a capital of a hundred thousand shares of rupees twenty-five each. The life and soul of the concern is Mr. Balubhai Kahandas, the Bombay agent to the Nawab Sahib of Palanpur. He is the head of the firm carrying on business under his name and *ipso facto* Messrs. Balubhai Kahandas and Co. are the Agents of the Bank. Sir Bhalchandra Krishna, *Kt.* L.M.,J.P., is the Chairman of the Board of Directors amongst whom appear the names of H. H. Maharajah Saheb Dolabsinhji Bahadur, Ruler of Limbdi, the Hon'ble Sirdar Mudaliar of Poona, Mr. R. V. Patvari, Chief Dewan of Gondal, Mr. A. P. Patni, State Controller, Bhavanagar, and Mr. Devadas Desai, the Solicitor. The personnel of the directorate is very influential. It is the opinion of the Chairman of the Native Merchants' Chamber that Bombay has not had enough banks and if his estimation be correct the new bank may do well.

What is a Bank?

A decision of the German Imperial Court on the abuse of the title "bank" is of interest. The judgment runs as follows:—"The conception of a bank is determined by the general opinion of business men. According to this, a small tradesman cannot be considered a banker, and no more can an ordinary money-lender. Anyone who, in conscious contradiction to this usual business definition, poses as a banker, either in public or in communications addressed to a considerable number of people, lays himself open to punishment for unfair competition without question as to whether he can find any justification for his use of the term in the works of authorities on commercial law."

INSURANCE.

The Long Lives of Women.

The statistics of French Insurance Companies prove beyond question that women live longer than men. Nor is the feminine advantage in longevity a matter of a few months, or even years. The difference is one of almost a third. Thus, the average age of death for women annuitants on the books of one company is 70, and for men a bare 50. Another company has several centenarians, all women, on its books. These fortunate persons have already received their capital back five or six times over. This Company is now thinking of revising its tariffs and making "one law for the man and another for the women." Asked to assign reasons for the greater longevity of women, a distinguished doctor attributed the fact to difference in the lives led by the two sexes. "Men live much harder," he said; "they smoke too much; they drink too much; they even, though rarely, work too much." Women are much wiser. At 40 a women is in the plenitude of her physical powers, while a man at the same age has probably contracted organic weaknesses which menace his life.

Insurance Agents and Lapses.

If there is one subject which should claim the attention of agents it is the lapse question. On yearly contracts there is an annual temptation to a lapse – carelessness, shortness of funds, the blandishments of competing agents and so forth. All these factors make for a possible lapse, and they should all call forth the resisting powers of the agent. John Wesley preached the value of personal contract, and it is in personal contract with his clients that an agent has his best line of defence. Letter-writing, while sometimes a necessity of the case, is a poor substitute for the personal visit of the agent. The assured should have timely notice of the approach of the renewal date, and should be promptly visited and the premium collected when the date arrives. To let the days of grace run on or run out is to risk the loss of the business, and that is a risk the wise agent will not take. And important as it is to the agent to hold his renewals, it is even more important to the company. A renewal to the company means a risk that they have had for a year, or a number of years; it is a risk they know and approve, and are satisfied to continue. The moral hazard counts for much in insurance work, and the moral hazard is of course a more ascertained factor in the case of a renewal than in the case of a new proposal. – *Liverpool Victoria Record, London.*

Interest in Life Assurance.

According to *Business*, the average man is interested in nothing beyond his *own* daily needs. An interest in life assurance has to be *created* in most cases either by a printed or a personal explanation of its advantages to him.

Men differ so much in character that different methods have to be used in educating them. The rich do not need education; *they* appreciate life assurance, and take out policies for large amounts. The trouble is to create an interest in life assurance among the middle classes.

They take an *extremely light view of insurance*; To most of them it appears to be the merest side issue, instead of being regarded as one of the first duties of the head of a family—one of the corner stones of the home – so to speak.

Who is responsible for this extremely light view of insurance? Insurance Companies. The managers are satisfied in most cases, if they can secure enough new business to replace the old, and much of the new business is secured by bribery and corruption, not by straightforward methods of conducting business. Educational work is scorned by the vast majority of general and branch managers, who cut each other's throat to secure a "case" by the trick of commission One will offer a rebate of £1 and 2½ per cent. whilst the other fellow will offer 30/- and 5. They are like dogs fighting over a bone, but the man who bribes the most usually secures the bone, which is often picked dry when the other leeches have had a go at it.

But who pays the piper? The other policy holders in a decreased bonus, and in some cases none at all.

EDUCATION.

Instruction in Primary Schools.

Commenting on the report of the technical education presented by Lieut.-Col. Atkinson and Mr. Dawson, the *Indian Textile Journal* considers that "a further, and equally thorough enquiry, is now needed to ascertain how far the instruction given in primary village schools is of use to the children of the labourer and village craftsman in after life. To this should be added well-considered suggestions as to the changes that should be introduced. These changes will probably demand a new class of schoolmaster."

Research Work on Indiarubber.

Machinery is to be installed at the Manchester School of Technology for the purpose of practical instruction and research work on Indiarubber, and the Manchester Corporation have accepted the tender of Messrs. F. Shaw and Co., Limited, for the supply of experimental plant for equipment of a laboratory, where research upon broad lines will be carried out During the last two years, courses of lectures have been given in the school upon the chemistry of rubber, and these are now to be supplemented by practical work.

Agricultural Education in the Punjab.

The Punjab Government have inaugurated a class from the 1st October for a vernacular course at the Punjab Agricultural College, Lyallpur. The present scientific courses at the College do not provide for simple demonstrative teaching such as would benefit practical farmers, and the addition of the new vernacular course to the curriculum will therefore provide comprehensive instruction for all those desirous of improving their knowledge of agriculture. The instruction will be simple and the bulk of the teaching demonstrative. The class will be placed under the superintendence of a college diplomate.

This course is intended for—

(1) Large landowners who desire to improve their farms.

(2) Persons who wish to adopt the profession of land agents or managers of estates under the Court of Wards.

(3) Selected revenue officials deputed by Deputy Commissioners.

(4) Normal School Masters.

(5) Small zemindars who have passed the Primary School examination.

The Prepared Mind.

Dr. Pearce of the University of Pennsylvania in an address which he delivered at the Syracuse University recently took as his text the words of Pasteur "In the fields of observation, chance favours only the mind which is prepared" and went on to preach on the value of research work. The mind which is trained to observe the details of natural phenomena, and to reason concerning the bearing of known laws on such phenomena, is the "prepared mind," that is to say, it is a class of mind which, because it is endowed with a peculiar faculty, best described as a scientific imagination, grasps the significance of a new observation, or, of a variance of a known sequence of events, and thus establishes a new law or invents a new practical procedure.

The preliminary education of the individual is the first and in many ways the most important consideration, and a knowledge of the scientific principles of chemistry, physics and biology is invaluable to our youth. The value of biological training was emphasized by Huxley many years ago, and that of physics and chemistry has recently been emphasized by Frederich Muller in his memorandum to the Royal Commission on University education in London.

Dr. Pearce dealt with his subject in relation to medical education, but the need for a scientific grounding and the "prepared mind" is as urgent in this as in other lines of study (whether Medicine, Agriculture, or Botany) if education is to aid the human mind in the direction of originality, investigation, invention and discovery.

ECONOMIC PRODUCTS.

Uses of Sugar.

Improvements in the processes of refining sugar have led to an extension of the use of this material in many directions. A number of these were indicated by Dr. Viven at a meeting of the French Association of Sugar and Distillery Chemists.

1. As a preservative, in the preservation of fruits and vegetables, of condensed milk; it is mixed with flour to preserve it, as well as with tea and with coffee. It is used in preserving flowers, and even of wood. It is sometimes used for diluting aniline colors. Its most familiar use is of course as a condiment in many food prepartions, such as cakes, confectionery and carbonated beverages. It must be remembered, however, that sugar is of value apart from its agreeable taste; it is a 100 per cent. fuel food.

2. As a matrix or medium for extractive processes, as in the case of phosphate of lime from dolomite and calamine, as well as in the liming of hides.

3. As a factor in various compounds, sugar enters into the manufacture of Chinese cement and of various explosives.

4. As a reducing agent, it is used in the manufacture of carbon monoxide and sulphurous acid, and in the manufacture of mirrors.

5. As a raw material, sugar is used in many industries, such as the manufacture of alcohol, artificial ciders, vinegar, whey, a number of organic acids, such as acetic, lactic, metacetonic, formic, butyric, levulic, tartaric and saccharic. In the synthetic production of a number of compounds, sugar serves as the starting point; some of these are acetone, acetic saccharose, arsenic saccharose and hexabenzoic saccharose.

6. In the preparation of various kinds of sealing waxes, copying inks, hektograph inks, liquid glue, transparent soap, cloth finishes, leather dressings and other materials in common use, sugar plays an important part.

In forty years, from 1870 to 1910, the world's consumption of sugar has increased from less than two and a half million tons to over seventeen million tons.

The Cocoanut Boom

In order to gauge the potentiality and lasting powers of the cocoanut boom it is desirable, says *Commerce*, in the first place, to realise when, how, and wherefore the boom commenced. In England the cocoanut has been regarded for many years, as merely an object for "pot shots." In the East, on the other hand, the palm, the fruit and the leaves have been put to many valuable uses. To the people who live in many tropical lands it provides the greater part of their food supply; the kernel contains more than 70 per cent. of a fixed oil called cocoanut oil, or cocoanut butter; this liquid has been used from time immemorial as a lamp oil and as an unguent; the root of the tree possesses narcotic properties; the terminal bud is esteemed as a delicacy; the central part of the young stem is succulent and eatable: the saccharine sap, or "toddy," is esteemed as a beverage; the juice when boiled produces sugar, or "jaggery"; a variety of arrack is distilled from the fermented milk; the dried leaves of the palm are used as thatch, or are converted into mats, sunblinds and baskets; the midribs of the leaves are fashioned into oars by the natives on some tropical coasts; as "porcupine wood" the stem of the tree is used for ornamental joinery; the fibrous tissue of the less mature stem is converted into cordage; a kind of gum is frequently obtained from the bark; the fibre of the imperfectly ripened nut is the well-known "coir" of commerce; the shell of the nut is made into cups, goblets and ladles Every part of the palm possesses, in short. some special of virtue of its own. But, it was not until candles and marine soaps were manufactured from the oil, that the cocoanut became an important factor in the markets of the West. It was only quite recently, however, when manufacturers began to realise the exceedingly great value of copra as a butter substitute, that the demand for cocoanuts exceeded the supply, a circumstance which led eventually to the inevitable boom.

BUSINESS METHODS.

The Crime of Losing Money.

"No man has a right to go into business and not make money. He has also no right to transact business unless the man he deals with has an opportunity also to make some thing."—Elliott Fisher in *Book-keeping To-day*

Indian Industrial Developement.

The *Indian Textile journal* gives a piece of sound advice which those who intend starting industries in India might well treasure in their hearts. It is that "a large amount of the raw material exported from India might be manufactured in the country, if the people would only qualify for the work. They do not lack intelligence of mind, but new habits and ways of thinking must be adopted, if they hope ever to benefit fully by their country's wealth. There is no use in trying to follow Indian ways in the administration of any manufactory that must work in direct or even indirect competition with those of Europe. Already the most successful Indian manufactories are those whose management approaches most closely to the best European methods."

How Doctors Advertise.

Medical etiquette forbids doctors to advertise. But they do it all the same. Even a brass plate on the front door is a method of advertising. Sir James Barr shows that there is another method. It is reading papers on special diseases. This is quite a common trick, to read a paper full of text book facts, secure publicity for it in medical organs, reprint it, and send it "discreetly broadcast" to tempt the unwary. Another medical advertising dodge is to write a book on some medical subject and advertise it. The public do not read the book ; but they see that Dr. A has written on "Osteoporosis" or some other uncommon complaint from which they have been told they are suffering. They infer, therefore, that A is an authority on the subject. They consult him, and in roll the fees. That is medical advertising.

Business Manners.

It will not be strange reading to many of our readers to be told that large and small merchants in this country, more especially among the Indians lose a good deal of custom by the indifferent and at times positively rude treatment which they mete out to intending purchasers. Tact, patience and politeness are not less needed in the successful conduct of a concern than good sense, business acumen and honesty. To such men who want these essential qualities we commend the following advice tendered by *Dixon's Monthly.*

Diplomacy is at the root of it all. Diplomacy, with reasoning faculties and training to make use of them. The salesman must learn how to handle the stranger, how to discern what his tastes are, and what his requirements may be. He must be able to lead his customer on and on until the *desire* is created. Then, although the customer does not know it, it is the salesman who has created this desire, and not himself. It is the salesman who has worked into his inner self, so to speak. Although the customer imagines he has been obliged by one who was civil and pleasant and brought out just what he wanted, yet although he will not confess it and cannot admit it because he doesn't know it, it is the salesman who has done it all. ..When the salesman finds his customer agrees with him, he has made the first step. Antagonism between the salesman and the customer should never by any mode of rhyme or reason be permitted. The solid, steady obliging salesman who knows his business is the one who scores. One will buy only where sympathetic attention is the most prominent, and where one can be made to feel most at ones ease. People who can be made to appreciate the care and trouble taken will return. The steady patronage of customers is the point all businessmen look to. Either on the part of the salesman or the customer, indifference will kill more business than many other causes.

FRAUDS AND FAKES.

Pure Food Bill.

Science Siftings states that the President of the Local Government Board in England will soon introduce a pure food bill. It will establish a legal standard for foods, notably bread. Poisoning flour by chemical and electrical bleaching should become a thing of the past when the Statute book is thus reinforced. But Mr. Burns will have to fight the millers, chemists, and other huge vested interests.

A Pure-Clothes Law.

In America they go even further. Not only have they had a pure food law for years, but they are now introducing a "Pure-Clothes" law. Under its provisions manufacturers of wearing apparel will be required to designate the precise quantity and grade of the material used, and a standing temptation to misrepresentation will be removed. Trade custom has sanctioned a use of terms, particularly as respects woollen goods, which are necessarily more or less misleading To have shoddy so labelled and the amount of cotton in merino garments as well as in those often sold as "pure wool" exactly specified may cause some disillusion, but it will establish a juster basis of trade relations the effect of which no reputable dealer will have occasion to fear. Such a law would effect a standardisation of fabrics and substitute uniformity of quality for the differences which now vary according to the character of the maker. Customers who want shoddy goods could then at least have the satisfaction of obtaining them at shoddy prices.

Adulterating Milk.

For many weeks complaints had been received that the milk sold by a Paris dairyman was too thin ; samples were taken by the police, and on each occasion the milk was found to contain a large proportion of water. Despite this, the man vehemently protested his innocence and invited the police to visit his dairy at any time to see the cows milked. Two inspectors did so, and after witnessing the milking carried away the milk, which on examination was found to contain a large proportion of water. The visits were repeated, but each time the milk which came straight from the cow was found to be too thin. The police were much puzzled, until one day Inspector Debout noticed that the milkman, who was very fat, milked with only one hand. Another curious point was that he also seemed to grow thinner as the milk pail grew fuller. Insp. Debout at once ordered the milkman to undo his waistcoat, when two Indiarubber bladders and a system of piping were revealed. One bladder contained air and the other water. By pressing the air bladder, the milkman caused the water to trickle out of the water bladder through a pipe into the milk pail, the operation being concealed by his artificial obesity. This story has been vouched for before; its repetition is, to say the least, suspicious.—*Dairy and cowkeepers Journal.*

Frauds in Jam Making.

The making of jam and marmalade in the hands of the pseudo-scientific manufacturer is a very different thing from the old-fashioned methods of making strawberry jam from strawberries and sugar, or marmalade by boiling oranges with sugar.

The food-faker buys tons of turnips and beetroot and the residue of cider-making, and mixes them with fruit pulp imported from abroad. If he is in a big way he may have his pip-making machine ; if not, he orders the pips from the United States, and adulterates them, in turn, with sawdust. He sweetens with glucose, molasses, saccharine, or sugar-sweepings, suspends decomposition with salicylic acid or other preservatives, and colours the whole with aniline dye, red and yellow ochre and other dye stuffs, according to the kind of jam or marmalade ordered. Some of the jellies on the market are made from agar-agar - the material used by bacteriologists in the making of pure cultures of certain bacteria—and from interior gelatine. As jelly of this kind is sold by those who pay but little regard to such matters as scrupulous cleanliness and effective sterilisation, it provides happy hunting-grounds for bacteria of many kinds, including those of cholera and tetanus.

MACHINERY AND INVENTION.

Sinhalese Type writer.

Mr. J. S. de Silva, Chief Clerk of the Agricultural Society's Office, has invented a Sinhalese type-writer. He will shortly place the machine on the market. A London firm of typewriter makers will turn out the machines. Mr. de Silva has very ingeniously brought in the large number of Sinhalese characters within the compass of a standard English type-writer. He was awarded a special prize for the machine at the All-Ceylon Exhibition.

Ink in the Fountain Pen.

A New York fountain-pen manufacturer has hit upon a very ingenious method whereby he provides his fountain-pens with little windows, two in the smaller size and three in the larger. These indicate exactly the quantity of ink in the pen. The windows are as thick as the wall of the ink cylinder, and cannot possibly break. They are invariably clear and white whenever the ink is below their level. Even when the pen is nearly full the amount of ink contained in it can be ascertained by tilting the pen from side to side and watching the ink seek its level through the windows.

Synthetic Rubber.

The present position of the synthetic rubber question, says the *India Rubber World*, is that: (1) The production of synthetic rubber has been successful in the scientific laboratory, and on a small scale in the factory. (2) The rubber obtained has partially the same properties as inferior natural rubbers. (3) The technical problem of the production of synthetic rubber has not begun to be solved, and will still have to face interminable difficulties. (4) Above all, no reliable proof has been adduced, which renders certain the competition of synthethic with plantation rubber. (5) An equality of price between the synthetic and the natural product is to be expected in years, but as to a parity of quality nothing can at present be said. Meanwhile, from a technical standpoint, the synthetic products are wholly of low value.

A Pocket Type-writer.

One of the most pontable roductions in this line is the pocket type-writer invented by Mr. Albert Fink. This has the form and dimensions of a big watch comprising on its dial the letters of the alphabet, the numerals and the signs. Its manipulation is extremely easy, the whole machine being slightly pressed against the paper after the proper letter has been adjusted or. After printing a letter it advances one space along the rack traversing the watch-like attachment, which also carries at its back edge the paper to be typed on. With some practice one gets up a certain, though of course modest, speed.

The whole arrangement is extremely simple and the price of course only a small fraction of the cost of even the cheapest regular typewriter. The principle used in connection with this machine is the same as that on which the very first type-writers were based.

Steam Ploughing Plant

The following Press note has been issued by the Bombay Government: "For some time past the Agricultural Department has been investigating into the question of introducing mechanical traction for ploughing and other operations of cultivation. The question is becoming more and more important owing to the growing scarcity of fodder, cattle, and labour, besides hand-digging being an inefficient means of clearing the soil of weeds. The Bajac windlass plough, drawn by bullocks, has now been introduced, and there is a rapidly growing demand for its use, but progress is slow as it works at a rate of one-fourth acre per day, and in view of the enormous areas of weed infested lands that require deep ploughing steam traction was absolutely necessary. A scheme was accordingly prepared and submitted to the committee of the Sir Sassoon David Trust Fund, who provided funds for obtaining a double engine steam ploughing plant. It is expected that this plant will plough 8 acres per day, at a cost of rupees seventeen per acre, about half the cost of the Bajac plough. In sugarcane tracts the introduction of the steam ploughs promises excellent results as the soil requires deep cultivation during the dry season, an operation which under existing conditions puts the cultivator to great expense."

HINTS AND RECIPES.

Symptoms of Malaria.

The earliest symptom and one of the most characteristic is an ague or shivering fit. It invariably occurs in the morning or early afternoon, and though, in rare cases, it may attack the patient in the evening, it seldom occurs in the night or early morning. In this way, malaria may generally be distinguished from kala-azar, in whlch the shivering fit occurs in the early morning hours.

Precautions in Storing Potatoes.

Select a cool, clean, water-tight godown with its walls and roof water-tight, clean, and free from potatomoth. (2) See that the floor is raised above the ground and is dry and likely to remain so in the monsoon; it is advisable to spread *chatais* over the floor. (3) Pick over the potatoes before storage and make certain that no tubers are already rotten or contain insects. (4) Cover each heap of potatoes with clean, *dry* river sand and make certain that no tubers are exposed above the sand at any time during the storing period. The sand should be thoroughly dried before use and a heap of potatoes should never exceed one cubit in height. (5) Pick over the heaps of potatoes at regular intervals and remove all those tubers that are rotten or contain insects. The rejected tubers should be buried deep in the ground. During the rains the heaps must be picked over very frequently and the sand dried when necessary.

For the Laundry.

Shave a pound bar of good soap into one gallon and a half of water as hot as the hand can bear, and stir until the soap is dissolved; add to it one tablespoonful of turpentine and three tablespoonfuls of household ammonia. Stir the compound well, and see that the soap is all dissolved. If necessary, the soap may be set on the back of the stove until dissolved, in which case the turpentine and ammonia are not to be added until it is ready to use. Put the clothes to be washed into a tub, add to the dissolved soap enough water to cover the clothes, having the added water hot as the soap liquid, and pour over the clothes, cover closely and let soak for two or three hours, after which wash in the usual manner. After the suds have been used for one tubful, it can be used again by re-heating, and adding to it a second proportion of the soap, turpentine and ammonia. There will be little rubbing needed, and the clothes will be beautifully white and clean. Neither turpentine nor ammonia will in any way harm the clothes.

Fire-proof Paints.

On this subject the *Farbenzeitung* has some important information. To render readily combustible material (wood, cardboard, paper, etc.) difficult of ignition we have recourse either to impregnation or to a protective coating. Before wood can be impregnated it must be exhausted of air; the fluid is then forced into it under a pressure of eight atmospheres. For this purpose, water glass, salts of ammonium and tungsten, find extensive, alum, boracic acid, chloride of zinc and sodium phosphate a more limited use. Girard recommends, as the best impregnating fluid, a solution of 100 parts phosphate of ammonium and 10 parts boracic acid in 1,000 parts of water. Coating can also furnish fair protection. As coatings the following mixtures are used. Dissolve in 60 parts of water, 15 parts of borax, and 15 parts of Epsom salts and add color as desired; or use a solution of 14 parts sulphate of ammonium, 10 parts borax, and 25 parts glue in 80 parts of water. Very suitable is likewise a mixture of 100 parts of gypsum with 50 parts sulphate of ammonium and 150 parts of water. By the addition of dissolved walnut stain, colored coatings may be obtained. If the coatings are to have covering properties, a mixture of 15 parts of asbestos, 10 parts of clay, 5 parts of borax, 5 parts of water glass, and 15 parts of water is recommended. The asbestos and the clay, which must both be ground very fine, are first mixed and then thoroughly stirred with the solution of borax and water glass, the whole being applied warm. Other fire-proof coatings are obtained by mixing 100 parts heavy spar, 5 parts zinc white, 100 parts water-glass solution (30 deg. Be) and 80 parts water in the hopper mill, or by mixing 70 parts of zinc white, 80 parts of hydrate of lime, 10 parts water glass, 50 parts white lead, 10 parts zinc vitriol, and as much water as desired, also in the hopper mill

ECONOMIC LITERATURE.

Making the Foreigner Pay.

We take the following from the *Liberal Monthly* :—Taxes are very necessary things, but nobody likes paying them. What are taxes? Taxes are the price of Government. When we think of it, which we do not do often enough, it becomes quite clear that if the Government suddenly ceased to do for us the things that it does every day, we should very soon be reduced to savagery. If a man has purchased a hat he does not think it a hardship to have to pay for it, but it is a curious fact that most people, when they pay rates or taxes, are inclined to think that they do not get anything for their money. What they do get is the comfort and order and decency of life in a well-governed country like England, and if they were removed to some barbarous country, where taxes did not exist, they would realize very clearly what it was they got for their money when they were living in dear old England

Still, the fact remains that taxes are almost universally voted a nuisance, and the Tariff Reformer takes advantage of this when he promises us that if we will let him have his way he will "tax the foreigner." He says that if we set up taxes on goods brought into this country from abroad, the foreigner will pay the taxes in order to keep our custom.

We can easily find a simple but searching test of the truth of this statement. If by means of a Protectionist tariff we could tax the foreigner, it is perfectly clear that the Protective tariffs of foreign countries would do the same thing. We are the greatest exporting nation in the world; every year we sell to foreigners something like £400,000,000 worth of British goods Nearly all these goods go to countries which have tariffs exactly like those which the Tariff Reformer wants to set up in this country. If it is true that our tariff would tax the foreigner, it must be true that the existing tariffs of foreign nations tax us.

Where are the Englishmen who are paying these taxes to foreign countries? Is it not very strange that we never hear of them? If it is not very nice to have to pay taxes to your own Government it surely must be extremely unpleasant to have to pay taxes to foreign governments. Yet, according to the Tariff Reformers, we are constantly doing this, and, strange to say, we never hear a single murmur of discontent from the people who are doing it.

Obviously it is all nonsense to suppose that they are doing it. When an English exporter sends his goods to foreign countries he never pays a single farthing of the tariff taxes existing in those countries. The almost universal rule of selling abroad is that the English merchant puts the goods on board ship at a British port, and then has nothing more to do with them. All further charges, including cost of carriage and all import duties on landing, are paid by the foreigner who has purchased the goods.

Here is a case in point, taken from the report for 1909 of the British Consul-General at Leipzig, in Germany. He tells us that in the German Town of Chemnitz there was a certain manuiacturer of stockings who exported his goods to England, Canada and America. He charged the same wholesale price, 7s. 6d. a dozen pairs, to all three countries. When the stockings came to be sold in the shops of the countries the following were the prices:—12s. a dozen in England; 17s. 6d. a dozen in Canada; and 24s. a dozen in America.

What we want to know is why a pair of stockings which costs 1s. in England costs 1s. 5½d. in Canada, and 2s. in America, all the stockings coming from the same mill and costing the same price at the mill. The answer is that in England there is no duty to be paid whereas in Canada there is a duty of 2½d. a pair, and in the United States a duty of 5d. a pair. Not only did the Canadian and American purchasers pay for the stockings and the duty, but they had to pay something additional as well. This is what "Tariff Reform" means in America.

If we were so unwise as to adopt Tariff Reform or Protection, we should find ourselves suffering exactly the same penalties as protected countries suffer. We should pay the taxes. Indians who want protection will kindly note this.

OPENINGS FOR BUSINESS.

[For particulars, address the Director-General of Commercial Intelligence, new Imperial Secretariat, 1, Council House Street, Calcutta, mentioning the *Wealth of India*. Firms that may like to follow up any enquiry should give proper references and restrict themselves to those enquiries only which they are fully and seriously qualfied to handle.]

Ivory.

A Calcutta correspondent desires to be placed in communication with purchasers of ivory. (B156).

India-rubber (Caoutchouc).

A Virginian correspondent desires to be placed in communication with exporters of India-rubber. (B159).

Lace and Lace Manufactures.

An English firm of lace manufacturers desires to appoint agents in India for the sale of the articles dealt with by the firm, which include laces, plain and fancy, crochet trimmings, etc. (B160).

Grain Bags.

A firm in Vancouver (British Columbia) desires to be placed in communication with Calcutta manufacturers of grain bags who are in a position to supply the Canadian market. (B162)

Tallow.

A Liverpool firm exporting tallow desires to be placed in communication with buyers in Calcutta. (B163).

Carbonate of Ammonia.

A firm in Amsterdam desires to be placed in communication with Calcutta importers o carbonate of ammonia. (B164).

Goat Hair.

A firm in Dehli desires to be placed in communication with dealers in goat hair in the principal towns in the Punjab and the United Provinces. (B165)

Red Ochre.

A correspondent in Bombay wishes to get into touch with wholesale purchasers of Red Ochre. (B166).

Sundry Japanese Goods.

A firm in Osaka is desirous of getting into communication with Calcutta importers of sundry Japanese goods. (B167).

Wood Splitting and Billeting Machines.

A correspondent desires to be placed in communication with makers of wood splitting and billetting machines. (B168).

Oriental Curios.

A London firm dealing in oriental curios desires to be placed in communication with makers of articles in wood inlaid with ivory or bone. (B169).

Rice Starch.

An Austria firm desires to be placed in communication with importers of rice starch. (B170).

Peas.

A firm in Toronto (Canada) desires to be placed in communication with shippers of peas. (B171).

Mother-of-Pearl.

A firm in Italy desires to be placed in communication with sellers of mother-of pearl in Calcutta. (B172)

Cloth Cuttings.

An Italan firm wishes to get into touch with exporters of waste cuttings of cotton and woollen cloths. (B173).

Irish Linens.

A correspondent in Belfast desires to get into touch with agents for the import of Irish linen fabrics into India. (B174).

Hosiery, Piece-goods and Glassware.

A firm in Osaka (Japan) asks for names of importers of Japanese hosiery, piece-goods and glassware in Calcutta. (B175).

Tramway Manufactures.

An English firm of tramway contractors, manufacturing engineers and exporters desire to get into touch with firms of electrical engineers with a view to appoint sole agents for the sale of their manufactures. (B176).

Corundum.

A firm in London desires to be placed in communication with shippers of corundum, (B177).

MISCELLANEOUS.

Cocoanut oil in Marseilles.

Marseilles has long held the position of the chief oil city of the world, says the Philippine *Agricultural Review*, but it is only recently that the cocoanut oil business has taken a jump. From 1905 to 1910, the vegetable oil business of the city doubled in value, so that by 1915 it is probable that the oil and oil-cake industry there will amount to over P. 200,000,000 per annum (£20,000,000). The local purchases of coprah during the past five years in Marseilles have increased by 70 per cent. due very largely to the remarkable development of the cocoanut oil industry of which Marseilles is the most important centre, as it is of oils generally, although several cities in England and Germany are following suit.

A New Beverage.

There is a peculiar beverage which Mr. J. N. Wood, Director of the Natal Botanic Gardens, is trying to popularise. This may be called coffe-tea, for in its manufacture the young leaves of the coffee plant are dried and rolled in the same way as ordinary tea is manufactured. In fact, to look at, the coffee-tea closely resembles the every day tea leaf, but when brewed, it produces a beverage somewhat bitter, yet containing as much theine as ordinary tea and much less tannin. It is said to be "admirably refreshing and restorative in its effect," but as the new beverage is not nearly as palatable as either tea or coffee, it is not very likely to displace either of them as a popular favourite, though there may be some demand for it by those who cannot tolerate an afternoon cup of tea or an after dinner cup of coffee.

Cigar Tasters.

There exists in the Ministry of Finance of France officials whose duties are but little known to the public. They are the tobacco tasters. Their duties are, we are told, to smoke from morning till night cigars, cigarettes, and even the pipe, and to render account of the qualities of the various samples submitted to them. The tasters receive the tobacco in leaf, and it is then made up either as cigars, cigarettes, or cut for smoking. There are about twenty factories in France, and their products are sent regularly to the tasters to appraise the value. The Frenchman's notion of an ideal cigar, we are told, is that it should be blonde, dry, veined, spotted, brittle, and homogeneous.

Men Who have Risen.

The following is a list of a few of the many hundreds of Englishmen and Americans who started their careers practically without money or influence, and are now occupying eminent positions in their respective spheres :—Lord Strathcona, High Commissioner for Canada (junior clerk), Lord Mount Stephen (herd-boy), Lord Pirrie, the great ship-builder (office boy), Sir W. H. Lover (grocers assistant), Mr. Frank Potter, General manager, Mr. Sam Fay, general manager, Sir James Duckworth (cotton weaver), Mr. A. W. Gamage (draper's assistant), Sir Thomas Lipton (errand boy at 2*s*. 2*d*. a week), Mr. Andrew Carnegie (bobbin-boy) Mr. T. A. Edison (news boy), Mr. John D. Rockefeller (book-keeper), Mr. H. Gordon Selfridge (clerk), Lord Furness, the great shipowner (grocer's traveller), Mr. Charles M, Schwab, the American capitalist (stage coach driver), Mr. John Pearce, the caterer (coffee-stall keeper), Sir. Hiram Maxim (coach builder's apprentice) Sir W. Van Horne (telegraphist).

The Minerva Diaries.

Messrs. Thompson & Co., the well known firm of printers in Broadway, Madras, have sent us their Gem Diary, No 5 Diary and a Blotting Pad. The Gem Diary as its name indicates is really a Gem of a diary, light, handsome and well bound and will quite conveniently go into the pocket. The No. 5 diary, on the other hand, is bigger and contains a lot of useful information besides the Calendar. which is in English, Tamil, Telugu, Canarese and Malayalam—the Panchangam being in Tamil and Telugu. It is really cheap at its published price of As 6. The Novelty Blotting Pad is bound in book form in morocco leather with gilt letters in the front page, blotter in the centre and 8 pockets in the right hand side. It will be very useful for travelling officers, Price Re. 1-4-0.

THE

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SPECIAL ARTICLES.

ABUNDANCE—SCARCITY.

BY

T. M. SATCHIT.

Abundance or Scarcity? Which is the greater good to man and to society? The reader might exclaim, "How can this be made a question?" Has any one ever advanced, and is it possible to maintain, that scarcity is the foundation of the well-being of men? Yes, this has been advanced and maintained; it is maintained every day that the *theory of scarcity* is much the more popular of the two. This theory when presented in a naked form appears so irrational. It is seen that a man becomes rich, in proportion as he draws a greater profit from his work, that is to say, according as he sells at a higher price. He sells at a higher price, in proportion to the rarity, the scarcity of the kind of product which is the object of his industry. Hence, we may conclude that, with regard to him at least, scarcity enriches him. Applying this reasoning successively to all manufacturers and producers, the *theory of scarcity* is deduced. Thus, in order to favour all classes of producers, dearness is artificially excited, the scarcity of everything is brought about by prohibition, restriction, abolition of machines, and other analogous means. The same reasoning may be pursued in the case of abundance. When any particular produce abounds, it is sold at a low price, and the pro-

ducer gains less. If all producers are in the same situation, they are all miserable; it is then abundance which ruins society. And as all conviction seeks to be embodied in fact, it is seen that in most countries the laws of men are opposed to the abundance of things.

This is an economic sophism that would perhaps, if clothed in a general form, make little impression; but applied to a particular order of facts, it is extremely specious. It is a syllogism, not *false*, but *incomplete*. But whatever there may be which is *true* in a syllogism, is always and necessarily present to the mind. On the other hand, *incompleteness* is a negative quality, an absent-*datum* which we cannot hold of any account.

Man produces in order to consume. He is, at the same time, a producer and a consumer. The consumer is inasmuch more rich, as he *buys* all things cheaper; he buys things cheaper in proportion to their abundance; then abundance enriches him; and this reasoning extended to all consumers would lead to the *theory of abundance*!

It is the imperfectly comprehended notion of *exchange* which produces these illusions. If we consult our personal interest, we distinctly recognise that it is two-fold. As sellers, we are interested in the dearness of the article, and by consequence in its rarity; as buyers, in a cheap market, that is, in the abundance of things. We cannot then base our reasoning upon one or the other of these interests, until we shall have recognised which of the two coincides, and is identified with the general and permanent interests of the human species.

If man were a solitary animal, if he worked exclusively for himself, if he consumed directly the fruit of his own labour—in a word, if he did not *exchange*, then the theory of scarcity would never have been introduced into the world. It would be too evident that abundance would be advantageous to him, in whatever way it might come to him; whether it were the result of his industry, of ingenious tools, of powerful machinery which he might have invented, or whether he owed it to the fertility of the soil, to the liberality of nature, or even to a mysterious *invasion* of productions which the waves might have brought from other parts, and abandoned to his use on the shore. The solitary man, in order to give encouragement, in order to insure sufficient demand for his own labour, would never dream of breaking the instruments which spared it, of neutralising the fertility of the soil, of restoring to the sea the goods which it had borne to him. He would easily comprehend that labour is not an end, but a means; that it would be absurd to reject the end for fear of injuring the means. He would comprehend that if he devoted two hours in the day to furnish himself with articles of necessity, any circumstance which spared him an hour of this labour, the result remaining the same, would put this hour at his own disposal, and that he could consecrate it to augment his well-being; he would comprehend, in a word, that *the economy of labour* is another name for *progress*.

But *exchange* confuses our view of this simple truth. In the social state, and with the separation of occupations which it brings about, the production and consumption of an article are not combined in the same individual. Each is therefore induced to see in his own labour no longer a means, but an end. Exchange creates relatively to each article two interests, that of the producer and that of the consumer, and these two interests are always directly opposed to each other.

Let us take a producer of any description; what is his immediate interest? It consists in these two things; first, that the smallest number possible of persons should occupy themselves in the same business as his; secondly, that the greatest number possible of persons should seek for the produce of this kind of labour; which political economy expresses more succinctly in these terms; that the supply may be very restricted and the demand very extended; and again, in other terms, competition limited and sale unlimited. On the other hand, the immediate interest of the consumer is that the supply of the productions which he requires may be extended and the demand restricted.

Since these two interests are at variance with each other, one of them ought necessarily to coincide with the social or general interest, and the other to be contrary to it. In the character of producers, it must be allowed each of us has anti-social wishes; and inasmuch as we exercise a profession, deriving from that profession our support, our position in the world and the means of existence for our family, it cannot but be that man's desires and interests must be anti-social. The shop-keeper prospers by the excesses of youth, the farmer by the dearness of corn, the architect by the ruin of houses, the officers of justice by law suits, and the quarrels of men. No physician can take pleasure in the health of the people, nor any soldier in the peace of the city. It follows thence, that if the secret wishes of each producer were realised, the world would rapidly retrograde towards barbarism. The sail would proscribe the steam; the oar would proscribe the sail, and in its turn would soon have to cede the right of transit to the cart, this again to the mule, and the mule to the pedlar. Wool would exclude cotton, cotton would exclude wool, and thus it would go on till the dearth of everything would cause man himself even to disappear from the surface of the globe.

If we now proceed to consider the immediate interest of the consumer, we shall find that it is in perfect harmony with the general interest, with what the well-being of the human race demands. When the buyer presents himself in the market, he desires that it may be abundantly provided; that the seasons may be propitious to the gathering in of the various produce: that inventions more and more admirable may place within his reach a greater number of articles of necessity and of comfort; that time and labour may be saved; that distances may vanish: that the spirit of peace and of justice may allow a diminution in the weight of taxes; that barriers of every kind may fall; in all this, the interest of the consumer runs parallel with the public interest. He can push his secret wishes to a chimera, to absurdity, without his wishes ceasing to be philanthropic. He may desire that provisions and furniture, the house and the hearth, instruction and morality, security and peace, strength and health, may be obtained without effort, without labour, and without limit, as the dust of the roads, the water of the torrent, the air which surrounds us, the light which enwraps us, without the realisation of such desire being in opposition to the good of society.

THE POSSIBILITIES OF HANDLOOM WEAVING.

BY

B. VENKOBA RAO.

In the course of an article contributed to the *Empire Review*, Mr. S. M. Johnson strikes a note which is most likely to jar on the ears of handloom weavers in India. He seems to think that handlooms will be unable to hold their own against power-looms, that history has pointed to the inevitable fact that manual labour should yield to mechanical power and that sooner or later the handlooms are bound to languish and die. Mr. J. A. Wadia, one of the Mill-owners of Bombay, has written in the same strain in the English papers and there are a few more, mostly interested in the development of Cotton Mills, who share the opinion with Messrs. Johnson and Wadia. In view however of the huge efforts now put forward to rehabilitate the handloom industry, it may be desirable to examine its possibilities in all its aspects. The Government of Madras took the initiative in the matter by establishing a weaving factory, in which the latest appliances and methods were demonstrated, and many private gentlemen are sinking money in establishing small weaving factories and in adopting improvements which seem to promise a larger outturn and considerable saving of time and labour in the processes of manufacture.

The introduction of fly-shuttle in handloom weaving is the eye-opener to its potentialities, and weaver after weaver who has attended a demonstration or seen the loom where it is

used, has no hesitation in deciding that its adoption will greatly increase the outturn of cloth and also his earning capacity. In the ordinary country loom in which the shuttle used is made of ordinary bamboo and has to be thrown at one end and drawn by hands at the other, the highest speed that has been attained even by a weaver of considerable experience and great dexterity in the use of hands and feet, is about 30 picks per minute. To the same man, the use of fly-wheel shuttle means that he can put in from 80 to 100 picks per minute. The work of three minutes is reduced to a minute. Another advantage in the use of fly-shuttle is that the workman has not to wobble from side to side in the act of throwing the shuttle at one end and drawing it at the other, a process which soon exhausts the weaver. In the fly-shuttle loom, he sits at ease and simply jerks the shuttle from side to side by merely pulling strings attached to pickers which serve as propellers. I have seen that in the country process, the weavers are unable to sit steadily at their looms and work continuously for two hours without feeling a desire to desist from work for at least half an hour. This interval of half an hour in the course of the day is increased according to the temperament of the worker. A busy man does not take rest more than is absolutely necessary while those indolently disposed are misusing the opportunities to their disadvantage and to the disadvantage of their employer. On the other hand, the fly-shuttle loom weaver is able to sit and work at a stretch for 4 or 5 hours without feeling tired; with the fly-shuttle it is easy to work and the outturn is at least 2½ times what it is in country looms. The bulk of the cloths manufactured in the country is made of yarn of 60s counts. A nicely woven cloth of this count and of close texture, would require that there should beat least 70 picks or weft threads per inch, and the country loom weaver cannot put this number of picks in the cloth without unduly straining himself, and this is how we find that the fly-shuttle loom cloths are better woven than the country loom cloths which are loose in texture. Allowing some margin of time for piecing the broken threads, there is no doubt the fly-shuttle weaver can put in at least 60 picks per inch in ¾ of a minute. His outturn per hour will then be 45 inches of cloth per hour, and supposing that he works steadily and regularly for 6 hours, he is in a position to turn out 7½ yards of cloth per day. He can thus earn from 10 to 14 annas in a day—a wage which, as compared with the rates now current, may be termed sufficiently remunerative.

According to the census of 1911, there are in our Presidency about 12,93,401 persons supported by cotton and silk-weaving. Of these, 5,75,594 are mere dependents. The actual workers number about 6,17,807, but Mr. A. Chatterton has calculated that there are about 3,68,509 hand weavers working their looms. It may be taken that one fourth of this number are engaged in weaving course cloths of counts 30 and below, and another one-fourth in superior cloths of 80s counts and above. The cloths for ordinary requirements are made of 40s and 60s, and if we assume, as we may fairly do, that there are 1,50,000 hand workers weaving 40s and 60s and that every one of them can produce 7 yards of cloth in a day or 2,160 yards in a year, the total out-put per annum in handloom weaving will be 1,50,000 × 2,160 or 324 millions of yards of cloth.

The population of the Presidency is 41 millions, of which 21 millions are women who use coloured cloths and 5 million children under 10 years of age who require scanty clothing and whose requirements are met by the production of coarse cloth weavers. Taking the population that require cloths of 40s and 60s at 15 millions, and assuming without fear of contradiction, that each man will require about 20 yards of cloth in a year, the requirements of the Presidency will be easily met from home-made goods alone, for we have calculated the handloom production at the lowest reckoning of324 millions of yards and the demand for it at the highest reckoning of 320 millions. It is notorious that most of our

people in villages are ill-clad and the climate of the country is so favourable for the use of only a small quantity of cloth It is unlikely therefore that the demand for cloth will ever exceed 300 million yards in a year. The inference deducible from the above figures is that we have a large body of professional weavers who can weave or can be trained to weave not less than 7 yards of cloth a day, and that the total production in handloom weaving will ordinarily be sufficient to meet the existing demand, without having to go in for importation of foreign cloths from Manchester or elsewhere.

The next point for consideration is of course the cost. I have been the manager of a handloom weaving factory for over five years and have personal experience of the working. I do not think that the cost of the country-made cloths of the size and description of imported foreign stuff is relatively more than the latter. Thirty yards of cloth of 60s counts can be made at a cost of Rs 11 as shown below :—

	Rs.	A.	P.
Cost of yarn for warp for cloth of 54" width allowing 70 threads per inch	2	10	0
Charges for warping and sizing	1	1	0
Yarn for weft at 70 picks per inch ..	2	8	0
Weaver's wages at 2 as per yard...	3	12	0
	9	15	0
Margin of profits on the capital invested and loss by depreciation of tools and plants	1	1	0
Total...	11	0	0

The average cost will be about Re. 0-5-10½ per yard. The Manchester mulls of the same count and texture, "Jaconets and 1703s" are sold in the bazaars from Re. 0-6-3 to Re. 0-7-0 per yard and on the last Depavali day, it was sold for Re. 0-7-6 per yard in Madura. It will thus be seen that the increased cost to the consumer which is made much of by advocates of powerlooms rests on slender grounds, and I have no doubt that with a little more organization and co-operation, the cost of production of handmade cloths can be reduced below the cost at which the mill-made foreign goods are sold in the Indian markets.

In the calculations set forth above, I have assumed that a hank of yarn can only give 26 threads of 30 yards length for warp and 530 threads of 54" weft, although the reputed length of mill-made hanks is 840 yards. I have made a very liberal allowance for wastage in reeling and of shortage in hanks, and I am not without hope that with a little more sense of honesty in the labourers and with the use of good machines for reeling, warping and sizing (and I may add that efforts are being made in these directions also for improvement), a full 840 yards can be availed of and the cost of labour cheapened in proportion to the facilities of work. The saving in the total cost can then be expected at one rupee on this account.

One more apparatus that has come in use in the labour saving-process is the automatic take-up motion which enables the weavers to work on without having to stop every 15 minutes or so to wind up the woven cloth, and with the use of English healds which do not require the pressure of hand for moving them as it is in the country healds, the weaver's work is further facilitated, and one hour of his time is saved which he can utilise in weaving. He is in a position to weave 10 yards in place of the estimated 7 yards, and under the circumstances, one can fairly expect that the wages of a weaver can bear a proportionate reduction. Given the facilities and other concessions, he ought reasonably to be content with Re. 0-1-6 a yard, and when the men are sufficiently trained, they would look to the increase in outturn rather than for the rate as under the existing conditions. Another rupee is thus saved in the cost of production. It is the unnecessary straining that has influenced the distaste for work in the weaver, as the present type of men are notorious for their indolence and have been induced to be dishonest in order to supplement the starvation wages by dishonest practices. Under the

new conditions, this is bound to disappear and we may fairly look to regularity, punctuality and honesty of work in the future. There are other minor details in which the weavers' attention can usefully be employed in increasing the output and decreasing the cost of manufacture, but these are matters too technical to be discussed here. If then the total cost can be reduced to Rs. 9, the country-made cloth can be offered for sale at Re. 0-5-0 per yard.

These then are the possibilities that lie before the handloom industry. It will rest entirely with the general public, and with the Government, what measure of support can be accorded towards the realisation of the hope raised in the above thoughts.

SELECTIONS.

MAGIC OF THE MAGNET.

Those who have watched a toy magnet lift up pins and needles, and marvelled not a little at the unseen power that causes the bits of metal to jump, might well be excused for standing aghast at the sight of a modern giant magnet picking up several tons of iron and steel from the scrapheap and conveying it with ease and rapidity to the melting furnace beyond. So great has been the commercial development of the magnet that it can lift five and a half tons. These giant magnets used in iron and steel mills can (says Mr. George E. Walsh, writing in the New York *Tribune*) pick up hot as well as cold billets, and a single one of this character will displace half a hundred workmen.

A further improvement may be noted in the combination of "skull cracker" and magnet. The "skull cracker" is a huge pear-shaped ball of iron suspended by a chain to a hook and steel ropes. This "skull cracker" is dropped with great force on scrap metal to be broken up for remelting. It breaks the metal into convenient small pieces, and is lifted up and down by the magnet until the scrap is reduced to proper size. Then the invisible fingers of the magnet gather up the small pieces and carry them to the melting furnance. The entire operation is accomplished in one hundredth of the time formerly required by manual labour.

More recently magnets have been employed in the milling industry to pick out small particles of metal that frequently get into flour and cause explosions through friction when they come in contact with the big rollers. Not a particle of metal can escape the powerful magnets suspended over the chute through which the grain passes. In mining and metallurgical work the magnet has become an indispensable labour saving agent The magnetic separation of ores has saved thousands of dollars to mining companies.

When the rocks are crushed and pulverised powerful magnets gather up the infinitesimal parts of metal released from their beds and convey them to the smelting furnace. Quantities of ore can thus be saved from old tailings that were formerly considered pure waste. Recently commercial magnets were employed for the novel purpose of raising sunken treasures.

A big cargo of nails was lost in twenty fathoms of water and the loss seemed irreparable until some enterprising genius raised them easily and cheaply by means of a magnet suspended from a derrick by steel cables. In the most improved commercial magnet shallow steel castings are used in which magnetised coils are placed. The latter are built up of alternate layers of copper and asbestos, and insulated from the cast steel frames by thick sheets of mica. A magnet of this construction is proof against heat and cold, and free from the danger of short circuiting. There is nothing combustible used in its manufacture, and it can gather up a ton of hot scraps of steel with comparative ease.

But the invisible fingers of the magnet can pick up the most delicate splinter of steel no larger than a sewing needle as easily as it lifts a huge iron or steel beam weighing a ton or two. The small magnets have therefore found as great a field of usefulness as the big ones. In all trades they are employed for handling pieces of metal too small for fingers to pick up easily.

In a medical way they are used successfully for extracting iron or steel cinders from the eye, and also for drawing out of the body needles and pieces of metal that have found lodgment there. A dressmaker who had inadvertently swallowed a dozen needles was operated upon in this way with entire success. For several days she was placed under a powerful magnet until every needle had been drawn from the body.

In a therapeutic way magnets have proved of value in destroying ulcerous and cancerous growths, and even blood diseases of some kinds have yielded to their curative effects. A man with the point of a dagger broken off in his body had it removed by a magnet. Another patient had been suffering from a painful ulcer on the chin for many years without finding relief. He was finally cured by treatment with a magnet, which drew from his chin a lot of steel filings that had caused all the trouble. The filings had found lodgment in his face one day when working before a turning lathe. No immediate trouble had followed and the man had forgotten the incident until the magnet drew them out and gave the ulcer a chance to heal.

SERICULTURE IN THE PUNJAB.

The Punjab Government have issued the following Press *communique* :—

In view of an article which appeared in an issue of the *Tribune* in July last, on the silk industry in the Punjab, and which was evidently written in ignorance of the later developments in the industry, it may be of interest to state the causes which led to the failure of the early attempts at sericulture in the Punjab and Kashmir, and to define the measures which are now being taken to revive it.

In the Punjab as in Kashmir sericulture flourished as a cottage industry in the sub-montane districts of Gurdaspur, Sialkot and Kangra where the mulberry grows freely. The industry began to decline in about 1885, and though Messrs. Lister and Co. took it up on a large scale in Dehra Dun and also in Gurdaspur the industry collapsed in about 1889 almost entirely.

CAUSES OF FAILURE.

The outbreak of certain epidemic diseases among silk worms was the principal cause of the collapse of this industry in the Punjab as well as in Kashmir. Mulberry feeding silk worms on account of their complete domestication have become extremely susceptible to certain diseases. Of these "Pebrine" is the worst, being virulently contagious and infectious. This disease at one time menaced the existence of the silk industry in Europe, and it was not until 1866 that the great French savant, M. Pasteur, discovered a means of combating its ravages. He demonstrated that the disease is caused by the development of certain germs which are visible under the microscope, and that it is hereditary. Thus the eggs which are laid by a pebrinised moth are also tainted. To secure an immunity from the disease rearings should be done only with microscopically selected disease-free eggs. It is since this discovery that sericulture has become a scientific industry and cocoon rearing has become a certainty.

Sir Thomas Wardle, who assisted largely in placing the present very flourishing industry in Kashmir on a sound basis, describes the history of the decay of sericulture in Kashmir prior to 1897 as follows :—

"The industry lingered on till 1882, and from that time to 1890 the State had left it to the silk rearers, the quantity of seed rapidly diminished and sericulture was virtually at an end. Why did these efforts not succeed? That is easy to tell. Ignorant procedure. Letting silkworm diseases have their own way, because they were not understood. Ignorance of the scientific work of Pasteur and of the present methods of prevention of disease which he alone first formulated."

What really rendered it possible to revive the industry in Kashmir was the annual importation of disease-free eggs from Europe, and

owing to the brilliant results so obtained in Kashmir it was decided to give another trial to sericulture in the Punjab by importing similar eggs. The first lot of these was imported from France for use in the spring of 1908. Experiments on a small scale were tried at Lyallpur and Chhanga Manga, and small quantities of seed were distributed free of charge to a limited number of selected rearers in the Gurdaspur District. Outturns were very poor that year as the rearers clung to their dirty and unscientific methods of rearing, but, in spite of this our seed made a very favourable impression as it gave a much better yield than locally purchased country-bred eggs. The most encouraging feature of the work of that year was that a private individual, K.B.Sh. Ghulam Sadik, of Amritsar, came forward to take up silk growing on purely commercial lines in the Gurdaspur District. He has organised his operations on the Kashmir system as far as possible, and has set up a filature of his own at Amritsar. Since then carefully-conducted experiments have been carried on in the Districts of Lyallpur, Jhelum, Amritsar, Ferozepore, Ludhiana, Bhatinda and Gurdaspur. Seed is supplied to private gentlemen who show their willingness to try rearings. New plantations of suitable varieties of mulberry have been started and they are thrown open to the rearers. The experimental stage of the work is over, and efforts are being made to extend the work in new districts. The irrigated forests at Chhanga Manga is full of mulberry, and the Salvation Army are making an interesting experiment there of employing members of the criminal tribes on rearing and reeling silk as well as on purely forest work. Large plantations of mulberry are being put in along the upper courses of the main canals, and there can be no doubt that throughout the whole of the Northern Punjab plenty of food will be available, and the mitigation of the hot winds in April, which formerly did much damage, should be secured by the fact that the worms would be reared in or near these plantations. The Kashmir industry gives a net return of 7 lakhs a year to the Durbar besides giving well paid employment to over one lakh rearers and to some 9,000 spinners. The demand for silk in India itself is good, and elsewhere and especially in America, it is very great and steadily increases so there is no danger of glutting the market.

What is required to make the industry a success is not only the knowledge of how to grapple with the silk worm disease, but knowledge of the proper care and attention which the worms require at each stage of their growth. This knowledge must be imparted to the rearer before he can reap the full profits of his labours. Under continuous expert supervision educational efforts to improve the native methods of rearing are being made. Leaflets containing brief instructions about the management of the worms are distributed, and our trained staff is sent round on tour to hold practical demonstrations and to advise the rearers at frequent intervals during the rearing season. Sericulture being essentially a "cottage industry" a skilled organisation is essential for its full development. It is hoped that influential and go-ahead capitalists will come forward and attempt with Government assistance and advise the extension of this industry on commercial lines.

IMPORTANT NOTICE TO SUBSCRIBERS.

Beginning with the January issue, the *Wealth of India* will be enlarged from 32 to 72 pages and the subscription raised from Rs. 3 to 5 per annum. Existing subscribers will receive the January issue. In the absence of advice to the contrary, it will be presumed that they elect to continue as subscribers at the enhanced rate and V. P.s will be made out accordingly to recover the subscription in due course.

The object of this Journal is to publish the views of experts on the various problems bearing on material progress, specially agriculture, commerce, industry, economics, co-operation, banking, insurance, popular, scientific and technical education, to digest the notable articles appearing in the leading magazines and periodicals and generally to serve as a record of practical information, and useful discussions. It is believed such a publication is indispensable to statesmen, publicists, businessmen, students of economics and all others interested in the material and moral advancement of the country.

VIEWS AND REVIEWS.

The White Ant

The ubiquity of the white ant and its persistency are things we all know to our grief, but it needs a *little knowledge* of the natural history of the germs to understand how difficult a customer it is to deal with. There is an interesting monograph on the subject in a recent issue of the *Agricultural Journal of India*. It appears that as soon as the young female white ant pairs, she settles down to the business of laying eggs, to which her whole existence is henceforth to be devoted. "Her body rapidly swells and ultimately she develops into a monstrous unwieldy grublike animal, incapable of walking, a mere pulsating mass of eggs. How long it takes for the female to assume this monstrous shape we cannot say, but it is probably not less than two years." The perpetual process of egg laying begins when the ant is three months old. "The total length of life of a female is quite unknown, but (barring accidents, of course) it is probably not less than five years and may perhaps extend to ten or more years. A female taken from a mound at Hoshangabad and placed under as natural conditions as possible, was found to have laid 359 eggs in fifteen minutes, a rate of oviposition which works out roughly at 34,000 in one day. When the female has attained these enlarged dimensions, she is indeed nothing but a vast reservoir of eggs, and their extrusion appears to be purely an involuntary action." Is it any wonder that when white ants once establish themselves in a place it is almost impossible to get them out?

Concrete Brick-Making.

To prevent destruction by fire of lives and properties, they have invented in America what is known as concrete bricks. It is said buildings built with cement bricks last much longer than if built with stones and besides they are claimed to be fire-proof.

A writer in the August *Industry* gives details as to how to make concrete bricks.

To make bricks, only two things are necessary, sand and cement. We can command sand from river-beds of unlimited quantities, which may last for many centuries. As regards cements, an enterprising man can convert stones into cement. To manufacture concrete bricks, only one set of machinery is needed. It can be worked by hand as well as by power. The output of an ordinary machine is to make 1,200 blocks, 10,000 bricks or 5,000 paving blocks *in ten hours* only, if worked by hand. And only three men are needed to work it. If it is driven by power, it will turn out nearly double the quantity. The mixture must be made ready before-hand to get the above output. The operation of mixing sand with cement is done by the aid of machinery, by which all troubles and loss of time are wholly eliminated. They call it Concrete-Mixer. You throw sand and proportionate quantity of cement into the Mixer and water, work the machine for a few hours, and the thing is done. Then the mixture is put into the machine, when a large quantity of beautiful, perfectly finished concrete bricks are ready.

The Century Cement Machine Co., 210-211, Paul street, Rochester, New York, U. S. A., can be written to for further particulars and the necessary machinery.

The Chemist as an Aid to Efficiency.

THE industrial chemist points the way to great increases in efficiency, particularly in the item of buying supplies, according to Arthur D. Little, President of the American Chemical Society. In a paper on "The Chemist in Manufacturing," he says :—

Chemistry points out the only proper way to buy supplies, which is on the basis of their industrial efficiency by means of specifications defining the quality desired and rigid tests to make sure that the quality is secured. In dependent estimates by those in exceptional positions to know, place the efficiency value of supplies as purchased and used by American manufacturers at 60 per cent. of what it should be.

Similarly the industrial chemist has a large control over the efficiency of labour. He may increase this efficiency, that is, the output of

the individual labourer, by supplying more efficient processes, as Bessemer did in case of steel, Tennant in case of bleaching, or Le Blanc and Solvay in the manufacturing of alkali. He may raise the efficiency of the labourer through education as when firemen are instructed in proper firing methods or when cooks in the sulphite pulp mill are given boiling schedules; in one instance, such schedules raised the efficiency, not of the cooks alone but of the entire plant as well, over 50 per cent.

Nowhere has the industrial chemist greater scope for the effective exercise of his trained and organized common sense than in the control of processes and the elimination of wastes, and nowhere are the results he has already obtained more valuable. His influence upon productive industry has been dramatic and profound. One need only point out that the whole art of modern steel making is under the strictest chemical control, and we have the opinion of Carnegie to the effect that it has been revolutionized thereby. No industry affords a better example of the value of such control or furnishes more striking instances of the profitable utilization of wastes. The conversion of slag into cement and fertilizer, the development of 10,000 horse power from the waste gases of a single furnace, are but steps in the development which will soon make pig iron the by-product of the furnace which derives its chief revenue from the waste of yesterday. With the open hearth furnace still utilizing less than 10 per cent. of the energy of its fuel, let no chemist think the door of opportunity has closed.

Large Crop Production.

Mr. S. Sinha writing in a recent issue of the *Indian Review* mentions the following as some of the more important factors in large crop production:—Tillage ; (2) Rotation of crops; (3) Selection of varieties ; (4) Selection of seed ; and (5) Breeding.

As regards tillage, good ploughing is profitable; if a fair crop can be obtained with poor ploughing, a better crop can be obtained with good ploughing. Thorough tillage with improved field machinery is one of the most essential factors in successful agriculture.

A good rotation of crops will include : 1. Legume, meadow or pasture ; 2. Root or corn ; 3. Some cereal crop.

The selection of proper varieties is a question of great importance in improving farm crops. In the first place, the variety should be adapted to the length of the season. Any variety can be adapted to the locality by selection through a number of years, but it is a safer practice to plant that variety best suited to the farm and climate. If satisfactory native varieties are not obtainable, approved new varieties may then be tested in a small way and gradually adapted to local needs.

One Englishman writes that, " the weakest point in the practice of the Indian ryot is the neglect of seed selection." It is advisable to get the habit of running our seed grain through an ordinary fanning-mill which is of use in blowing out the lighter seeds, in screening out the smaller and in removing weed seeds. Then, only well-cleaned, large plump seeds will be left. We would seriously urge each ryot to use such large seed, well-matured, and of strong vitality. If he has not got any good seed, let him purchase the best seed ; if it is impossible to purchase, let him select from the best that he has.

When a variety has been selected and grown, we want to make it better ; it then becomes a question of breeding and improving the varieties we now have. This can be done by continuous selection. The improvement of races by selection is slight in one generation ; if this be continued year after year, very marked results may come out in course of time. The progress of plant breeding in America is the greatest and most important undertaking of the American people. When shall we awaken to the fact that progress in Indian agriculture depends chiefly upon the breeding of plants for each agricultural district? The sooner this is done, the better for India.

Agricultural Co-operation.

Mr. N. Setharamier, Secretary, Nidamangalam Agricultural Bank, Tanjore District, in the course of a speeeh delivered before a recent assembly of the Chingleput Co-operators' Conference said :—

The system of co-operation may, with advantage, be employed in improving the agriculture of the country. I shall cite a few instances of what could easily be done in this direction. Ryots may join together to purchase improved agricultural implements. Ten persons may join together and pay Re. 1 each to purchase the *gorru* drill which costs only Rs. 10. The instrument helps in effecting a saving of seed and enables the ryot to sow a field when the process has to be completed in a hurry. There are a number of other implements which can be similarly purchased and tried.

All the agriculturists of a village can purchase all the manure required for the place, in common, thereby economising labour and trouble. The Agricultural Department now and then opens seed depots in rural areas, but it hesitates to do this on a large scale, as these depots are often exposed to risk from dishonest dealing. If a co-operative society which *prima facie* stands for uprightness should apply for a seed depot, the Department is likely to view the application with favour.

Ryots can combine together for selling their produce. At present the ryot finds himself an unequal combatant in the struggle with the *sowcar* and he has to sell his produce for any price. The moneylender advances money on the security of the growing crop. Hardly is the harvest over when he steps in to carry away the produce in satisfaction of loans advanced by him ; from the position of vantage that he holds he is able to have any price for the grain. If the ryot borrows from a co-operative society he can easily tide over the dull season in the market, stock his crop and sell it in the dearest market. He would even do better by combining with others in effecting this sale.

Co-operative principles may usefully be adopted in other ways also in stocking sheep, in lifting water for irrigation, etc.

Wood from Saw-dust.

This is how *artificial* wood is prepared from saw-dust : The binding medium used for the saw-dust was glue solution and water glass (sodium silicate) ; also, colophony (rosin), blood, glue with potasium bichromate have been found to answer the purpose. The best medium, however, is glue to which bichromate of potash is added in order to make the compound waterproof. On exposure to light, chrome glue, insoluble in water is formed. The glue solution is prepared from five parts of good pale glue and one part of isinglass (fish glue) by softening, slow heating over water, and careful filtering. The quantity of water to be added to the glue is determined by experiment, it ought not to be too small, such that the liquid forms a jelly on cooling but such that the liquid just begins to set. With it is mixed the saw-dust in such proportions that on kneading the whole mass under powerful machinery it acquires a consistency most desirable for pressing into moulds. Moulds of metal, gypsum (plaster of Paris) or even of wood, the first well oiled and the latter too well varnished with spirit shellac varnish may be used for shaping the wood mass mixed with the glue and kneaded well enough. First, a layer of thin saw-dust well prepared should be applied with the hand and then the remaining space filled up with the mass prepared from coarse saw-dust, again the upper layer should be of the thin saw dust, the whole should then pressed as hard as possible with special machinery or at least well weighed with heavy weights put on a plank above the mould. The articles may be varnished after taking them out of the mould. The artificial wood thus made is sometimes called Kylolith.

A New Industrial Science.

Under this title a writer in the September *Chambers's Journal* describes what is called 'motion study'. The man who proposed to grow strawberries upon raised beds, so that he could pick them without stooping, was apparently before his time, as this course will certainly be advocated when the latest indus-

trial science known as 'motion study' is applied to fruit-growing. One might well suppose that the art of bricklaying, having been practised for thousands of years, would now have become so perfect that it would be impossible to teach the modern bricklayer how to do his work more quickly; yet the originator of 'motion study,' Mr. Frank B. Gilbreth, has been able to do this, and with such effect as to treble the number of bricks laid by the most skilful workman, without increasing his bodily efforts.

"Motion study can be applied to all kinds of repetition work and was originated in the United States, where labour is more costly than in this country; but the results have proved that even with the comparatively low wages paid over here, an enormous saving could be effected by the application of these principles to British industries. There is not the silghtest doubt that the Americans mean to take every advantage of the new science, and if our position in the world's markets is to be retained we shall have to do likewise."

Perhaps the best example of economy in motions, says the writer, occurs when a fire-brigade is turned out. Every part of the equipment is designed to enable a rapid preparation of the fire-engine by ensuring the simplest and quickest motions on the part of the men, and the new science of 'motion study' consists in the application of similar principles to all kinds of industrial operations. It is not intended to make men work harder, as the maximum of effort has already been obtained by increasing the pay according to the work done. The idea is to simplify the motions and improve the tools so that more work can be done with the same amount of effort.

Banana Flour.

Banana flour is made from the unripe banana, that is, before the starch is changed into sugar in the ripening. It is difficult to peel green bananas, but if they are first put into scalding water (176° F.) for four or five minutes, the peel is easily removed. The peeled fruit is dried in the sun or put into a dryer of some kind to reduce the percentage of the water which they contain from 70 to 15. The drying is more readily effected if the fruit is cut up small. Steel knives should not be used as they turn the banana black; nickel blades are better. In the factory at one time in operation at Montpelier, Jamaica, belonging to the Hon. Evelyn Ellis, the bananas were dried in a vacuum, the interior of the vacuum apparatus being heated. The bananas enclosed in this dryer were stirred continuously by means of paddles which alternate and move between fixed knives. The paddles were moved by a system of belts and pulleys. The vacuum was only a slight reduction of the atmospheric pressure. The drying was complete in two hours; by this time the bananas had been reduced to the appearance of somewhat coarse flour with only 15 per cent. of water. The mass was removed from the dryer, and passed through sieves containing 120 meshes to the square inch. Whatever remained on the sieve was passed through a simple mill and sifted afresh. The flour was packed in boxes or barrels lined with paper. The odour was that characteristic of the fresh banana, the flavour agreeable and the taste somewhat sweet.

The chemical composition of the flour manufactured at Montpelier was given as: Water, 15 per cent.; starch and dextrine, 73·92 per cent.; fatty matter, 1·14 per cent.; albumen, 3·27 per cent.; fibre, colouring matter, tannin, 4·70 per cent.; ash (containing 25 per cent. of phosphoric acid),—·196 per cent.

With liquids such as water, milk, broth, a mixture is obtained without dregs. It is an excellent material for making biscuits, but can only be made into bread by mixing with wheat flour.

According to *the Lancet*, of February, 1900, "For some reason not yet explained, the starch of the banana is much more digestible than are the cereal starches, besides which the fruit contains a notable proportion of nitrogenous material."

Cottonseed Oil as a Food.

We take the following particulars from the *Cottonseed Oil Magazine*:—In one of the leading colleges of the United States considerable discussion has been precipitated between the agricultural and domestic science departments and the professor of the agricultural department has evolved the following in his defence of cottonseed oil as a wholesome food and they are given to the public for the first time as such:

"1. As to whether or not cottonseed oil is a whole some food is a chemical question, and one which chemists only can decide. I have written to more than a dozen food chemists, all of whom agree that cottonseed oil is digestible, wholesome, and nutritive, and so far as chemical literature shows contains no poison. The proof that it is injurious rests with those who say it is unwholesome, for it is eaten every day.

2. The oil mill hands use raw cottonseed oil extensively with no ill-effects recorded.

3. Probably fifty or seventy-five million people are now using the refined cottonseed oil as lard substitute, and as oil in salads, with no apparent ill-effect. The demand for cottonseed oil is even increasing, and 90 per cent. of it is used as human food.

4. Physicians are using it more and more as a valuable tissue-builder in cases of sick and thin persons.

5. All the physiological chemists agree that a liquid fat is more digestible than a fat like tallow.

6. It is cheaper than lard and can be afforded by the poor. For salads, it is equal in digestibility to olive oil and it is in reach of common people, whereas olive oil is expensive.

7. In conclusion: In all of my readings, both newspapers and scientific journals, I have not seen an account of a sickness thought to be due to cottonseed oil; nor have I found in the chemical literature any work done in this refined oil which tended to show that it was injurious, or contains an injurious impurity. I have asked twelve prominent food chemists to refer me to publications in chemical literature adverse to its use, and no one has done so, nor has any one of the chemists expressed an opinion unfavourable to its wholesomeness as a food, so, according to all rules of scientific reasoning, the conclusion is that cottonseed oil properly refined is a wholesome article of human food." Here then is a splendid testimonial about cottonseed oil. It remains for us to make 'capital' out of it.

Perfumes, Essence and Extracts..

We are indebted for the following information to a writer in the pages of the *Industry* (Calcutta):—

Perfumes.—The term perfume is mostly applied to the alcoholic solution of sweet scented essential oils. In its preparation, the alcohol or spirit used is odorless rectfied spirit of 60° o.p which is otherwise called perfumers' alcohol. It is important to note that it is not what is known as methylated spirit which can never be used for the manufacture of perfumes.

Essences.—The term essence is applied to a preparation containing essentially active portion of a substance. In its preparation, solid substances must be bruised, powdered or sliced as the case may be, so that it may be completely exposed to the action of alcohol. When the active principle to be obtained is partly fixed and partly volatile, the most suitable process is simple digestion in alcohol, either weak or absolute, according to the solubility of the substance. The digestion or maceration should be continued for at least 10—12 days and the materials should be repeatedly agitated so as to ensure contrast between all fragments. A more concentrated solution may be obtained by the process of displacement or percolation. For this an apparatus called percolator is most suitable. This process is simple and economic and yields a product of uniform strength, but experience is needed to conduct the operation in all substances. In the case of glutinous substances, it is necessary to mix with it an equal bulk of very clean well-washed sand so as to allow perfect and uniform penetration of the menstrum as these substances readily become soft and pappy, and retard percolation.

Extracts.—The term extract is applied to a substance prepared from vegetable juice obtained by expression, decoction or infusion and evaporated down to a solid or semisolid consistence and fluid extracts are those evaporated only to a syrupy consistence and mixed with about $\frac{1}{8}$ volume of alcohol. The terms simple and compound distinguish whether one or more substance has been extracted. In pharmaceutical preparations, the principle solution is first obtained either by the process of maceration and percolation with any suitable menstrm, *i. e.*, solvent (such as water, alcohol, acid or ether) or by simple expression, &c., and evaporated to the desired consistence in open shallow pans in a water or vapor bath or in a vacuum pan. The simple and effective process is as follows:—that the sap or juice is subjected to congealation and subsequent expression which is repeated twice or thrice for obtaining concentrated solutions which is then exposed to the action of the heat of the sun or in a drying apparatus heating to about 86° F. to finish the operation. The congealing apparatus is chiefly a modification of ice cream freezer. As the congealation progresses the cake is removed, taken up and the mother liquor is pressed out which is finished by similar process of evaporation as stated above. It should be carefully preserved out of contact with air as soon as prepared.

Imperfect Preservation of Hides.

One of the most striking but unfortunate features of the leather trade is the indifferent supply of that most important raw material—hides and skins. Probably in no other trade of any importance could one find a greater economic loss than is to be found in the poor state of preservation of a large proportion of the necessary raw material. There is probably no other trade in which the raw material is prepared in such a crude and antiquated form.

A good deal of the existing unsatisfactory state of affairs in relation to the bad preservation of hides, skins, and furs is difficult to remedy, since the drying, coupled in some instances, with cooking in the sun, is carried out in remote places beyond the boundaries of civilisation; but according to a writer in the *Leather Trades Review*, there is not the least possible doubt that there would be very little difficulty in bringing about an improvement in many cases. It is plainly more than desirable that some crucial measures with this object should be taken, for it is not a question of the waste of a few thousand pounds only; the annual loss of valuable hide substance, 90 per cent. of which would go to the formation of leather, can only be reckoned in millions of pounds.

The main difficulty appears to arise from the poor supply, or total absence of salt in various tropical countries. It is unfortunate for some countries, however, that industries are considerably hampered by an ill-considered tax on salt, so that for industrial purposes it has to be denaturalised; the result being the frequent addition of certain chemicals, which are not only of no assistance but usually distinctly injurious to the preservation of hides.

But the most desirable reform that is called for is stated to be to get the natives of tropical countries in particular, to properly cure the hides and skins, and, wherever possible, to desinfect them. Even when hides are dried in the best condition, the original seller has to bear a heavy loss; while, if the drying is carried out in the full glare of the sun, as is not infrequently the case, he would be very fortunate if he obtained one-third of the value of the same hide when disinfected and salted in the proper way for leather manufacturing purposes. There should, therefore, not be any insuperable difficulty in teaching the native seller of hides how to treat them so as to increase substantially his own profit.

Another serious factor affecting the value of dried hides is that they are subject to a process of continual deterioration until such time as the tanner puts them into work. To all outward appearance they may not seem to have changed even after being in stock a year, but the shrinkage is slowly but surely going on, while, under certain conditions, putrefaction is often making rapid progress in the interior of the hide.

It should also be the duty of the exporting firm (in addition to its being greatly to its interest from a business point of view), to immediately arrest putrefaction by thoroughly disinfecting and salting the hides and skins so that they are prepared in the best manner for tanning purposes.

Alligator Farming.

If you are looking for a business in which you may engage without fear of competition, the *Scientific American* recommends alligator farming. An odd industry it is; but one, nevertheless, that offers enticing and interesting possibilities. In the Southern States of America, there are already several alligator farms, but all dealers in the saurians and saurian products unhesitatingly admit that the field is far from being crowded. The demand for alligators is rapidly increasing; and at the same time the supply of wild ones, once so plentiful along the Gulf of Mexico, is even more rapidly disappearing. And it may be remarked, parenthetically, that it is an undertaking open to women as well as to men, for, contrary to popular belief, there is very little danger involved in handing the reptiles.

A most useful animal is the alligator. He is made into suit cases, purses, belts, watch fobs, gem boxes, chair cushions, table covers, cuff links, hat-pin settings, paper knives, and whistles! For not only is his hide used, but his teeth and bones as well.

Until about nineteen or twenty years ago, no alligator skins were used for any purpose whatsoever, and for several years thereafter only the smooth portion, which is found on the stomach, was made use of. The back, or horny portion, which is now regarded as the most valuable, if the reptile be not too large, was thrown away, it being considered too difficult to remove from the body and too stiff and hard to use satisfactorily. To-day the entire skin is used, and often a whole one is manufactured into a single hand bag. Skin, of all sizes are in demand, although those from four to eight feet long are usable for a larger variety of purposes. For skins of these lengths just as they come from the body, the tanneries pay, according to quality and length, from fifty cents to three dollars each. Only about ten per cent. of the supply of raw skins are manufactured into finished articles in the United States, the remaining ninety per cent. going to manufacturers in Europe. From the European manufactories, the finished articles are shipped to nearly all parts of the world, but by far the bulk of their product is reshipped to America.

Apart from the demand for skins for manufacturing purposes, there is always a market for live alligators, as well as for dead ones for taxidermists. Aquariums, museums, circuses, and dealers require them alive, and are willing to pay liberal prices for them in all sizes. Baby alligators, up to three years of age, at which time they will not exceed eighteen inches in length, find the most ready market, and are sold at from one to four dollars each. Larger ones are usually sold at practically so much per foot, a six-foot alligator bringing as much as twenty dollars, and the very big ones, from fifteen to eighteen feet long, which are desired mainly by aquariums, from seventy five to one hundred dollars.

The Economic Position of Wage Earners.

Professor Henderson of the University of Chicago delivered a series of lectures in Madras recently, one of which was on the economic and cultural situation of the wage earners in the West. The learned lecturer said that in the western countries it had beeen found desirable to regulate the power of organisation for wage earners. The modern wage earner had gained legal and political liberty but not economic independance. The expansion of industry had revolutionised social relations. The wage earner did not own the tools with which he worked as the peasant did. He could not control the conditions or the hours of labour. If he did not accept those conditions, then he had to go without employment, starving. Modern spirit said that the man on the cross must be able to help himself, and if he was so weak by himself, he ought to form his guilds, gather force together and stand

against the organised force of capitalist management and lay his claims in the form of a collective bargaining. The co-operative system of Germany came to the rescue of people who had to pay usurious rates of interest, and that system was copied in India and extended by authority. The co-operative movement was helping one-sixth of the population in Europe. The industrial conditions were so important and so serious and so far beyond the power of organised workers that the great nations in the West said that it was not a matter of private concern but of public interest. In the West the great majority of capitalist managers were far from being cruel or selfish. Under the principle of competition the meanest man in the town would undersell his competitors but the State was bigger than the meanest man. The State was therefore acting for every one and the power of the law, the power of government, was the largest kind of co-operation that had yet been organised. The law provided for the safety, and the comfort and the help of working men and there was provision against accidents and other causes of disease. The central principle was that a nation through its law stood for the physical, moral and intellectual welfare of every one of its citizens. The Famine Code of India had some remarkable features about it in connection with carrying out the same principle. There was the beginning of a movement in the West to establish by law a minimum wage. It was already law in some of the States of the Colonies performing experiments for all the world and it had been already enacted into legislation in England. The United States were going to adopt it. Massachusetts, where the pilgrim fathers landed would have the same law. It was not competition but the value of human personality which determined the starting point. In fixing the minimum wage, they asked how much it cost to keep life in a human being. There were great many people who could not earn minimum wage, and if they were not in competitive ranks, they were helped by charity in poor houses. But the aim was to reduce the number of people seeking charity. Attempts were also made to teach people to earn more than they were now earning, and further attempts were also made to make children learn how to earn their own living. The system of education had been changed and the changed system took the men who were good for nothing and made them good for something. Their boys, so far as the educational system was concerned, never could learn a trade unless they were sent to a reformatory for committing some offence. Now they had manual training, and trade schools, continuation schools, were now established. The capitalist Manager in the West had now come to see that he was interested in the rising generation and that it was just as important to have capable, trained, earnest, honest, industrious workmen as it was to have good machinery, and that he could not have either of them without a great deal of capital and care. Education included all preparation for efficient living. Mere literary instruction left men helpless. Another organisation doing useful and necessary work was the employment bureau and that was a gigantic scheme organised in the world.

In conclusion, the lecturer said that taking into consideration economic facts, the western world had created a gigantic and colossal system of industries. It was thoroughly organised but it could never do its work without philanthropy and religion. It was in that spirit that the movement was tried to be taken onward. Without that spirit modern social industry—the organisation of the great capitalised industry would be a man-eater and man-destroyer. That was the opinion of Professor Taussig. Economics was valuable but religion was supreme. Religion was the power, guide, light of the world's life.

AGRICULTURE.

Paddy Yield.

We gather from an agricultural exchange that the crop from an acre of paddy can be increased 100 per cent. by transplanting alone as compared with the method of broadcasting. The further improvement which can be obtained *in a single generation* by rigorous seed selection may it is said be safely put down at least at 50 per cent.

Ploughing by Dynamite.

In the United States they are ploughing with dynamite now to such an extent that one manufacturer of explosives sold to farmers 500,000 pounds in 1908, 750,000 pounds in 1909, 1,500,000 pounds in 1910, 3,000,000 pounds in 1911, and the indications are that this one concern will ship 5,000,000 pounds to farmers this year. This method of ploughing was the idea of a Southern farmer who found it loosened up the subsoil as no ordinary method of cultivation could do. The results were astonishing in the increased size of his crops, and so out of proportion to the cost of the dynamite was that it rapidly became popular. There are to-day, says the *Weekly Scotsman*, fully half a dozen powder manufacturers who are devoting themselves specially to the sale of high explosives for cultivating the ground.

Sorghum-fed Cattle.

A great deal of trouble has been caused at various times by cattle, which have been fed on sorghum, dying suddenly. The cause was obscure, but the trouble has subsequently been found to be due to the presence of hydrocyanic —prussic—acid. Unlike the bitter cassava, which develops prussic acid as a *post mortem* change, the prussic acid in the sorghum is present during life. When very young, and up to the age of three to seven weeks, sorghum contains distinctly dangerous amounts of prussic acid. After that age, the poison disappears rapidly by decomposition. When the flowering stage is reached, not more than a trace of the poison is found.

Manure and Milk.

It is important to know how far manuring affects the milk yield. We learn from the *Dairyman* that the authorities at the Harper Adams Agricultural College are endeavouring to ascertain this, and experiments for the purpose, which were commenced last year, are being continued. Milking cows are grazed on manured and unmanured plots. So far the results show that on the manured land the cows gained an average of 29 lbs. of milk per week, while those on the unmanured plots lost at the rate of 17 lbs. of milk per week. These figures are not only interesting but extremely useful, and a full report later on of the experiment ought to be beneficial to farmers to whom the milk yield means so much.

Mango Cultivation.

Mr. D. L. Narayana Row, Proprietor, Nursery Gardens, Hyderabad writes:—The idea that mangoes grow equally well in shallow and in deep fertile soils is not based on a careful observation of facts. All successful mango gardens are situated in soils which have at least a depth of five feet with good drainage and moisture under ground. Hence the fact remains that the best yielders and longest lived and healthiest trees are found in deep fertile retentive soils. In places like the districts of North Arcot, Salem, Bangalore, Bunganpally and the vicinity of Waltair, etc., where the successful cultivation of mangoes has become traditional, the garden owners possess much practical knowledge on the subject. In these districts, varieties eminently fitted for commercial purposes were selected long ago and grown extensively with the result that these districts have been able to supply mangoes every year to distant markets up to the end of August or even later. (1) Dilpasand, (2) Thoothapari, (3) Neelam, (4) Kalapahad, (5) Nawab Pasand (Roomani) at Arcot, (6) Benishan, and (7) Shakerpara at Bunganpally in the Kurnool District are the chief commercial varieties. These varieties have spread to almost all places in Southern India and Deccan, and are easily recognized by gardeners.

COMMERCE.

Investing, Speculating, Gambling.

In his text-book on the Work of Wall Street, Scrano S. Pratt, Secretary of the New York Chamber of Commerce, differentiates between investment, speculation and gambling as follows :—"An investment is an operation based on sight or knowledge. A speculation is an operation based on faith. A gamble is an operation based on chance." In these simple definitions, Mr. Pratt outlines the great difference between investment, speculating and gambling.

The Position of a Debenture Holder.

What is the position of a Debenture holder in the event of liquidation of a company when the assets on which the Debentures are secured do not realise sufficient to pay off the Debentures? After realisation of the mortgaged property, the Debenture holders rank with the other creditors of the company for the balance still due to them, and have a claim in common with the other creditors upon all the other assets. The nominal or face value of a bond or debenture is the sum actually due for its repayment from the concern creating it, and not the price at which it was originally issued.

Investment of Reserve Funds.

Is it always advisable for a company's reserve fund to be separately invested? Experts say that no hard and fast rule can be laid down. Each particular case must be decided on its merits. For example, it would not be advisable for a company to hold large investment producing 3%, and at the same time be paying 5% interest on its Debentures. Again, a manufacturing company would probably find that instead of holding low-yielding investments, it would be much more profitable to employ its surplus funds in paying prompt cash for its raw materials and thus obtain large discounts. If this practice be rigidly followed, the amount owing to outside creditors would never in such cases be excessive. The ready-money buyer enjoys many advantages, for the seller knows that giving credit is the first step towards making bad debts. Where a reserve fund is separately invested, the selected investments should, of course, be carefully watched, as the possible depreciation in their value is of importance.

Business Enterprise in India.

The following is an abstract of the joint stock companies registered in India in the months of August and September 1912

In August.

		Rs.
4	Banking and Loan Companies ...	5,25,000
6	Insurance Companies	1,10,000
1	Railways and Tramways Company.	1,00,000
8	Trading Companies (other than those specified above)	
1	Mills and Presses Company ...	58,40,000
5	Tea and other Planting Companies.	5,00,000
1	Coal mining Company	8,70,000
1	Company (other than specified above)	1,75,000
27	GRAND TOTAL	2,25,000
		83,45,000

In September.

		Rs.
7	Banking and Loan Companies...	2,36,20,000
7	Insurance Companies	2,80,000
1	Navigation	10,00,000
5	Trading Companies (other than those specified above)	11,90,000
1	Cotton Mills Company	5,50,000
1	Cotton and Jute Screw and Press.	1,00,000
1	Flour Mills Company	5,00,000
2	Saw and Timber Mills Companies.	7,00,000
2	Tea and Other Planting Companies	2,50,000
1	Coal Mining Company	50,000
1	Mining and Quarrying Company (other than those specified above)	50,000
1	Company (other than those specified above)	2,00,000
30	GRAND TOTAL	2,84,90,000

INDUSTRY.

The Manufacture of Violin Strings.

The intestines of small sheep are used for the manufacture of violin strings. They are simply spun like ordinary cords to different thicknesses according to the pitch required. Residual intestines, which cannot be used for the finer violin strings, are generally spun into larger cords and used for the making of belts for transmitting the power in sewing machines or even larger machines.

Industries in India.

From a Blue Book just issued by the Government of India it appears that there were 2,834 factories worked by mechanical power in British India in 1910, against 2,623 in 1909. In the list the following are included :—

Cotton Gins and Presses	...	1,390
Cotton Mills	...	236
Rice Mills	...	215
Jute Presses	...	138
Saw Mills	...	101
Iron and Brass Works and Foundries	...	90
Jute Mills	...	59
Flour Mills	...	37

The daily average number of persons employed in all the above factories was 10,14,241 against 9,51,100 in 1908 and 9,84,132 in 1909. Of this total 3,06,883 were employed in Bengal and 2,30,957 in Bombay and the figures may be further classified thus :—Male adults 6,24,945, female adults 1,15,540, male children 43,273, female children 8,753. 2,16,390 persons are employed in jute mills, 2,30,876 in cotton mills and 1,16,081 in coal mines. There were 56 jute mills in Bengal in 1910-11 containing 32,935 looms and 6,77,495 spindles and employing 1,40,314 men, 33,762 women, 19,648 young persons and 20,788 children, a total of 2,14,507 operatives. The paid up capital was Rs. 7,09,77,035 and the debentures Rs. 3,74,09,870, or a total of Rs. 10,83,86,905, say £72,25,000. This is nearly all British capital and the mills are under British management.

The Mysore Silk Industry.

There is evidently a bright future for the Mysore silk industry, judging from a letter received by the Superintendent, Tata silk Farm, Bangalore, upon the success of the samples of Mysore silk at the recent Exhibition held in London. The President of the Royal Silk Association, Mr. F. Warner, writes :—"A bale of your silk was shown by Messrs. Durant & Co., in their case at the above-Mentioned Silk Exhibition *and it attracted the attention of many of the visitors to the Exhibition including the King and Queen and others of the Royal Family.*"

"From enquiries I have made respecting your silk, I am inclined to think that there should be a possibility of an increasing demand for it in European markets. Personally I am more struck with its appearance in the Raw than in the thrown, and am therefore inclined to think that if it were sent to Italy or France in the Raw state and thrown by one of the best French or Italian throwsters it would prove to be quite a good class and serviceable silk."

Tanning Extracts.

We read in the *Indian Trade Journal* :—Our occasional comments on this subject elicited a suggestion that since tanners frequently use myrabolan extract in combination with bark extracts it would be well to export a product in which such combination was affected. There appeared to be certain strong objections to such a course, and we consulted a leading authority at home who is a member of the staff of the Leather Industries Department of the University of Leeds. We quote below the opinion expressed by him in a letter just received.

"In my opinion it would be a promising undertaking, when after a thorough studying of the different tanning materials at your disposal and of their special properties, the production of vegetable tanning extracts should be carried out in India. But I would not recommend you to manufacture mixed extracts, as such mixed extracts are met with considerable suspicion in Europe. Different kinds of extracts may be produced, but each of them separately, and sold as pure extract."

ECONOMICS.

India's Cash in England.

Referring to the Secretary of State's cash balance in England, the Karachi correspondent of the *British Trade Review* wrote sometime ago, "India has to pay about £ 15,000,000 per annum in London for "Home Charges"—interest on debt (mostly on capital invested in revenue-earning concerns in India, such as railways and canals), establishment, pensions, and so forth. Instead of adjusting these home charges through the agency of the leading banks, as is done in the case of Canada, Australia and South Africa, the Secretary of State for India receives tenders of money at the Bank of England every Wednesday, and to the highest bidders he sells his drafts on the Indian Treasuries at Calcutta, Bombay and Madras. This suits the Secretary of State very well, because he is able out of the taxation collected in India to receive in London the money that he requires for the home charges. And it suits the banks and others very well, because, instead of having to go to the trouble of shipping gold to India (as banks have to do in the case of all other countries whose sales of produce are greater than their purchases of manufactured goods), the Secretary of State very kindly gives them the money in Calcutta, Bombay, or Madras, where they want it, in exchange for the money which they hand to him in London. Moreover, as the Secretary of State is so good as to make the money available in India *at less cost to the banks and others than they would have to incur by shipping gold to India themselves*, the Secretary of State's action is always loudly applauded by the banking and financial community. Naturally !"

Indian Finance.

Criticising the remarks of Sir Edward Holden in his address to the Manchester Statistical Society, Professor J. Neville Keynes, of Cambridge University, expresses the view that Sir Edward does not do full justice to the policy of the India Council in the matter of the reserves they hold : "The stability of the Indian system," he writes, "depends upon the India Council's keeping sufficient reserves of coined rupees to enable them at all times to exchange international currency for local currency, and sufficient liquid reserves in sterling to enable them to change back the local currency into international currency when they are required to do so. The actual arrangement they make to this end are somewhat complicated, but the principle underlying them is simple. They must have a certain amount of coined rupees, a certain amount of coined gold, a certain amount of very liquid resources in the form of investments. These various forms of resources they keep distributed according to rules, the origin of which is largely historical, between the currency reserve, the gold standard reserve, and the cash balances. It happens that all the coined gold held in reserve is credited to the currency reserve, where it is just as available for meeting an adverse balance of trade as if it were in the gold standard reserve. Some part of this gold could be immediately transferred to the gold standard reserve, were this desired, by a mere book-keeping transaction."

Professor Keynes states that the most probable danger against which the India Council have to provide is that a large sum due to a sudden failure of "the exports should be due for immediate payment from India to this country. This contingency is quite as adequately guarded against by holding large sums at call in this country as by holding gold, and there is no reason why the use of these sums in such an emergency should lead to exports of gold from this country, or should inconvenience the London money market.

In the last part of his address Sir Edward Holden complained of the possible inconvenience to London of the heavy drain of gold now habitually required by India, and seemed to suggest that the establishment of a gold currency in India would be some remedy for this. The establishment of an effective gold currency in India would plainly increase, rather than diminish, the drain of gold thither. The present day policy of the India Council economises the use of gold in India more than would any of the alternative policies now in the field.

CO-OPERATION.

Agricultural Co-operation.

The lesson of universal agrarian history, says Mr. S. Satyamurthy in a recent issue of the *Hindustan Review*, is, that an essential of agriculture is credit. Neither the condition of the country nor the nature of the land tenures, nor the position of agriculture, affects the one great fact that agriculturists must borrow. "It is assumed then as axiomatic that the establishment of an organised system of banking, especially co-operative, is desirable and even necessary, to promote the useful accumulation of capital, to develop the qualities of thrift and prudence, to assist industries and especially agriculture, by long term loans, to turn credit into productive channels, and to stimulate into activity the great virtues of self and mutual help." And he concludes: The object of village banks should be the supply of capital to agriculture and rural industries by the promotion of general thrift, to which end it shall furnish credit—(1) for the redemption of prior debts, (2) for the current needs of the rural classes, (3) for the purchase and improvement of land, and (4) for direct agricultural and industrial developments. What will be chiefly required for the credit work of the Madras districts, are small, local, locally worked institutions on the lines of the European village institutions ; it is village banks, not district, nor even Taluk banks, that are required. The decisive advantages of village banks have been set forth as (i) their absolute proximity to the borrower, (ii) their ability to draw in local capital, (iii) their power of making the smallest loans, (iv) their ability to work cheaply, (v) their retention of all profits within the village, and if co-operative, for the members and borrowers, (vi) their ability to act as intermediaries between the State and the individual, (vii) their power of influencing borrowers towards the true use of credit, (viii) their steady, educative influence in matters of thrift, association, and self-help and (ix) their tendency to develop high forms of individual capacity, of public life, and, of national character.

Co-operation as a Business.

Speaking of co-operation recently, Mr. Swamikannu Pillai, the Registrar of Co-operative Societies, Madras, said :—Co-operation, howsoever you may define it, and however it may differ in methods and aims from other kinds of business, is business as much as the most businesslike of them. Co-operation is not charity, co-operation is not philanthropy, co-operation is not popular science, but *it is a method of doing business so as to earn profit.* Co-operation consists, as we understand it, in the division of profits on a uniform principle among all who have contributed to the profit whether by money or by labour. It does not limit the dividend to the moneyed contributor but must needs extend it also to the labourer who is a member. In unlimited liability societies, no doubt, there is such a thing as putting every pie of profit away as reserve fund, but in that case little or no capital has been contributed by members and they have their dividend in the lower rate of interest charged to them. But where some have contributed labour and others capital in order to make profit, the co-operative principle is to throw the labour and the capital into hotch pot and divide the profits among all the contributors. But there should be no relaxation of the ordinary meaning of business. Because you are doing a thing in a co-operative society, it does not follow that you should excuse slackness or slipshod ways or specula tive tendencies. If you go to a business man and ask him to pay you £500 because you have conceived a brilliant idea and there is money in it, he will probably send you about your business, because he is, as you say, a hard-headed man of business, not blessed with a soul or an imagination. No more, in such a case, should a co-operative society, engaged in work, have a soul or an imagination. For this reason, experimental work does not fall within the purview of a co-operative society, but where there is a thing bought or sold, and money is to be made by buying it or selling it

or producing it in common, by all means bring co-operation on the scene. If there are several village societies in an area doing agricultural business of this description, some buying manure in common, others investing joint funds in stocking good seed, whether of grain or of green manure, others perchance making co-operative ghee, etc., let all these societies send representatives to sit and deliberate at a Taluk or District Agricultural Association which can then compare methods and prospects and, if they like, record their joint experiences in speech or writing. If such an Agricultural Association has spare money, there is no reason why it should not carry on experiments but then it would not be carrying them on as *co-operative* work but as *agricultural* work pure and simple. I confess it is a very narrow view to take of what are ordinarily called co-operative *ideals*, but nothing seems to tend to soften the head and its contents so much as a prolonged course of co-operative dreaming and scheming, and therefore I wish to impress upon all who would do co-operative work in Agriculture that the beginning and end of it is, as in all other business, to try and make money and make a little more of it.

BANKING.

Banking Legislation.

An informal discussion took place recently between the Hon'ble Mr. R. E. Enthoven, C. I. E., I. C. S., Secretary to the Government of India, Department of Commerce and Industry, and the members of the Upper India Chamber of Commerce. Among the subjects discussed was the possibility of regulating the opening and working of banks. Mr. Enthoven was anxious to know whether it was thought that legislation on the subject was called for, whether it should be included in the Companies Bill or whether it should take the form of a separate Banking Act. Those present were unanimously of opinion, first, that legislation is a matter of imperative necessity, and secondly, that it was of such urgency that advantage should be taken of the impending amendment of the Companies Act to includ- suitable provisions for the control of banking.

Mr. Enthoven read out the definition of a bank as given in the Canadian Act and was of opinion that under a definition of that nature Courts should have no difficulty in deciding what were and what were not banks. He then desired an expression of opinion as to:—

(1) Whether banking operations should be allowed to be combined with other businesses;

(2) Whether the registration of banks should be made subject to a certain portion of the nominal capital being subscribed within a given time;

(3) Whether the use of the name "Bank" should be limited by law;

(4) Whether the suggestion made in Calcutta that capital and reserves combined should bear a definite percentage in proportion to liabilities commended itself to the meeting.

After some discusssion it was agreed

(1) That banks should not be combined or included in other businesses ;

(2) That a definite percentage of the authoris. ed capital should be subscribed within a given period;

(3) That the use of the name "Bank" should be strictly limited and

(4) That the payment of dividends should be prevented until the capital and reserves bore a certain ratio to liabilities.

INSURANCE.

Medical Expenses Insurance.

We gather from *Business* that an Insurance Company has recently formulated a scheme under which provision may be made for the payment of medical and other expenses incidental to sickness or accident which may incapacitate a policy holder from following his usual occupation. Policies are *not* issued to *females* or to persons over 50 years of age, and all policies are terminated when the insured attains 60 years of age There are no restrictions imposed as to foreign travel, but benefits are not payable in respect of ailments contracted outside Europe. A discount of 10 per cent is allowed to total abstainers, and a further allowance is made to holders of life assurance policies in the company in question.

District Agents and Sub-Agents.

District leadership counts for everything in the Life assurance business, according to the *Assurance Review*. The district manager who succeeds is not the man who depends upon a few brilliant agents. These few "star" men will become his masters as they will not be long in finding out how dependent the super is on them. The successful superintendent therefore is the man who gets together a staff of " middlings," and makes up for the shortage of brilliancy by infusing into each of the middlings some of his own personality, some of his own energy, some of his own enthusiasm.

A Novelty in Accident Insurance.

The Railway Passengers Assurance Company —with whom originated the issue of railway insurance tickets—is now issuing an accident policy in the form of a postcard, which, after being signed by the insured, can be at once posted to his friends, who are thus made aware of its existence, while the risk of the destruction of the document either in a train or boat accident is lessened.

In this connection it is worthwhile considering where policies should be kept for safe custody.

Apart from the bank or the solicitor's safe, it is a good plan to keep the fire policy on one's residence at the office, and, conversely, if one has a place of business which is covered by fire insurance, to keep this latter policy at home ; should either of the places be destroyed by fire, the document is then easily accessible and proof of claim can be furnished. Where other polices are concerned, it is best to deposit them in a place where the risk of destruction by fire is remote, and it is to be presumed that this is usually done.

Fooling the Actuary.

The actuarial knowledge of the Life Insurance companies is quite wonderful. Given a certain number of men of a certain age, they can tell, practically to a dot, how many will die this year, how many next year, and how many the next year. More than that, by comparing the records of millions of insured persons, they have reached mathematical conclusions as to how certain occupations and physical conditions affect longevity. This wonderful acturial knowledge steadily progresses as more and more records are compared ; and it is a rather uncanny thought that the Life Insurance companies can look us over, ask us a few questions, and hand us an accurately dated ticket to the undertaker.

But they can do this with us only in the mass—by taking ten or twenty thousand of us at a time. Individually we can still fool the actuary a good deal. He isn't looking when we eat things that we know do not agree with us ; or when we overeat. He doesn't see the little bracers we furtively toss under our belts, or count the cigars we smoke after we have smoked enough. On the morning after a social session no actuary is present to note that we are singularly void of appetite and our spoon rattles in a palsied manner against the coffee-cup. We are still privileged to whittle these little chips out of our lives in secret ; but very likely, for the individual, they make more difference in longevity and efficiency than all the things the actuary does know.—*Saturday Evening Post.*

The process of distillation is one that is common to a number of industries and distilling is largely employed in perfume manufacture. The substances containing the essences are steeped in water for a certain time, the temperature being raised to a certain figure, and the steam which comes away brings with it some of the essence or odour, which, on being condensed in the usual manner, is employed in the further process of working up.

The process of maceration consists in soaking the flowers, portions of the plants, etc., in heated fats. The fats are melted over water baths ; the flowers, etc., are immersed in the melted fats and allowed to remain there for a certain time till it is supposed they have delivered up all the odours they carry. They are then withdrawn from the fat, being carefully drained in the process, so that all the fat adhering to them, which will be the most valuable part for the next process, remains in the vessel in which the maceration is being carried on. After one batch of flowers, etc., have had all their odours abstracted from them, and have been withdrawn from the fat, a fresh lot are immersed, the same process being gone through, until the fat itself has taken up as much of the odours as it can carry. The fat is subjected to another process later on, by which it is made to give up the odours it has taken from the flowers, etc., to alcohol.

The process of *enfleurage* is the most delicate, and the one requiring the greatest skill of any part in connection with the perfumery industry. In this process, vessels are employed, in which are placed sheets of glass, lightly covered with films of grease or fat. The flowers from which the odours are to be taken are laid upon the films of grease, and allowed to remain there for a certain time until it is supposed the odour has all passed from the flower to the grease. The flowers are then removed, and are replaced by another lot, the process being continued, until the grease has taken up all the odour it can carry.

In this connection we would invite the attention of our readers to the leading article in the March number of *Ice and Cold Storage* dealing with the uses of refrigeration in the perfume industry. In the production of very good, very high-class perfumes, the advantages of using refrigerating appliances are various. Refrigeration gives us the command of low temperatures leading to results that are sometimes undreamt of in the realms of commerce. Low temperature enables impurities to be eliminated and the class of perfumes manufactured to be varied. Another advantage is that refrigeration renders the perfumer independant of climate. There is nothing to prevent a perfumer in London using flowers grown in the Himalayas, in Japan or elsewhere. Refrigeration is employed in the best factories though the matter is kept as secret as possible, to obtain the purest essences by separating them out at low temperatures, the temperatures varying with the different substances. The command of temperatures over a wide range must be of immense value to the perfumer, and we are convinced, says our contemporary, that it will be of greater and greater value as he appreciates and understands the usefulness of refrigerating plant more and more.

Industrial Specialisation for India.

In the March number of the *Modern World*, Profes or Ferozod Din Murad, M. Sc., B.A., puts in a plea for Industrial Specialisation in this country. Specialisation, he says, is simply the intellectual analogue of that highly eulogised economic principle, division of labour. It is rather the extreme application of that principle, assuming as it does, the existence of a vital and healthy interest in the subjects of investigation. It is an index of the intellectual and industrial life of a nation, and looked upon from a metric standpoint, affords an eminently accurate standard for gauging the intellectuality of nations as such.

The professor concludes thus :—It is an age of scientific specialization. Specialists are everywhere "in requisition." The progress of civilization centres around specialization. The salvation of India lies in industrial specialization. We, Indians, lag behind in the race of nations simply because the little stock of energy we possess, is allowed to run to waste in diffused and pointless application —is practically frittered away into nothing before we are seriously determined to realise a certain definite object in life.

AGRICULTURE.

Exotic Cotton Growing.

It is common knowledge that the cotton crops in India or any cotton-growing country are only pure in exceptional cases. They are practically all more or less mixed. Mr. Leake, Economic Botanist in the United Provinces, has just issued a most interesting monograph describing certain special enquiries he has made, with Mr. Ram Prasad, his assistant, regarding the natural difficulties of preserving purity. The inquirers addressed themselves particularly to the question how far apart crops of different forms of cotton must be to prevent cross fertilization. An American expert has stated, that, for practical isolation, different crops should be separated by at least a mile, a conclusion that suggests great difficulties in the multiplication of any pure race in India. Experiments in the United Provinces point to a far more favourable result. Mr. Leake and his colleague hold "there is no objection to cultivating different races in adjoining plots, provided the two lines bordering the second race are discarded for the purpose of seed supply." They suggest that an improvement upon this method of separation might be obtained by growing one or two lines of a different crop between two kinds. Another point brought out is that the deterioration which almost invariably occurs in exotic cotton crops is really due to the fact that, as such crops are never pure, a new climate has the effect of unduly favouring one character of the forms of which they are composed.

Sprouting of Onions.

There is no trouble in growing good onions, but there is considerable difficulty in keeping them from spoiling by sprouting. A tip as to how to overcome this difficulty may therefore be welcome. It was discovered by accident. In France, they were trying the effects of ten different manures on ten different plots to ascertain which would produce the best onions for seed purposes. The produce of the ten plots was carefully bagged and stored under identical conditions; but, when sowing time came round again, it was found, much to the disgust of the experimenters, that several of the lots had sprouted and were consequently useless, while others were in perfect condition. As each lot had been carefully labelled and stored under identical conditions, it was not difficult to ascertain that the onions which had been manured with sulphate of potash were the ones that kept well. A hundred weight of that manure per acre is ample to bring about the desired result. This discovery should be of interest to onion growers in India.

Papaya Culture.

The importance and uses of the papaya were referred to in the February number of the *Wealth of India*. Below we give cultural directions for growing the papaya :—The seed bed should be prepared by thoroughly pulverising the soil by spading or hoeing the ground well, and the clearing away of all weeds and trash. Sow the seed thinly, about 1 to 2 centimeters apart, and cover the seed not more than 1 centimeter with soil, then water the bed thoroughly. When the plants have attained a height of about 7 to 10 centimeters, they are ready to be transplanted to the place where they are intended to grow.

In transplanting, take up the plants with so large a ball of earth that as few roots are cut or disturbed as possible. Do not set out the young plant deeper in the new place than it grew in the nursery ; firm the soil well around the roots, making a slight depression around the plant, and water it thoroughly. Seed should be saved from the best fruits only. All male plants should be destroyed wherever they appear, as not only are they unproductive but their pollen being carried to the fruiting plants they tend to produce degenerate plants when these are grown from the seed produced on plants growing in the vicinity of the male plants. The papaya is very impatient of water standing around the roots, and should be planted only on well-drained land ; being easily injured by strong winds, it should be planted in sheltered situations. Keep the land clean of weeds and the plants well mulched.