

mum yield per cow has now been raised to 4 seers per day and it is hoped to raise the standard still further in the near future. At Dacca a herd of pure Sindhi cattle is being raised with the same standard as regards milk yield as at Rangpur. I also saw an Ayrshire bull at the Dacca farm, but the animal did not seem to be in a very good condition and was rigorously segregated to prevent his catching infection, a danger to which English cattle seem to be specially exposed in this country. It would appear that at Pusa the milk yield of the pure Sahiwal herd has been almost doubled in 10 years by selective breeding and better feeding, while the immediate result of cross breeding with sire of European pedigree has been to produce animals giving on an average double the milk yield of the best Sahiwals. It is proposed by the Agricultural Department to establish another cattle breeding farm near Calcutta and stock it with half-bred Ayrshire cows. Pusa has offered 16 such cows and the Ayrshire bull at Dacca will be used for crossing good cows from the Sindhi herd at Dacca and others from the Rangpur herd and the progeny will be taken to the proposed farm. It is to be sincerely hoped that the scheme will materialise soon, specially as an excellent site for such a farm has now been found in the Company Bagan property at Krishnagar. Bulls from selected cattle are available for sale at both the Government farms at Rangpur and Dacca.

It has been suggested that if the quality of the cattle is to be improved, every village must be supplied with one bull and one male buffalo. This will be too ambitious a programme at the present stage and we may make a beginning by keeping two or three stud-bulls and buffaloes in the Union Board farm to which I have just alluded, and these stud-bulls should be used for improving the breed of cattle of the neighbouring villages. The Government and District Board should jointly supply Union Boards with these stud-bulls. All Court of Wards estates and Khas Mahal cutcheries of Government should similarly be stocked with a number of stud-bulls, while the district and subdivisional veterinary hospitals should also keep such bulls. Public-spirited zamindars and talukdars should also be encouraged to keep stud-bulls in their zamindari cutcheries for the use of their raiyats. In this connection I recommend for adoption the suggestion of Mr. Kerr, Veterinary Advisor to Government, that all jails in Bengal, which

already have small herds of cows for the sick prisoners, should be utilized and stocked with a full number of selected cattle to the full accommodating capacity of the jail. Similarly, all Government agricultural farms should also be utilized for the breeding of suitable types of cattle and cow and bull calves should be available for sale at all these centres.

As regards feeding, there is little prospect in Bengal of increasing pasturage to any great extent on account of the pressure of population on land, and in any case the grass in our meadows is of such poor quality and has so little nutrition that pasture lands are more useful for affording exercise ground for the cattle than for finding food and nourishment for them. Nevertheless, it is not necessary to discourage any spontaneous effort on the part of the local bodies and private persons to acquire land for pasture. A good start has been made by the District Board of Khulna which has financed some of its Union Boards to acquire pasture lands which are being leased out to raiyats on payment of small fees. It is reported that by this means there will be a sufficient income to gradually pay for the acquisition of land. This policy might be followed by all District Boards and Union Boards and groups of Co-operative Societies should also be encouraged to club together and acquire pasture lands for their members' cattle. But it is obvious that in stall-feeding and the provision of suitable fodder for the cattle that a proper solution of the problem is to be found. It is pointed out that an acre of grazing ground is now made to support 4 animals in a constant stage of starvation, whereas the same acre if used for fodder crops will keep six animals in good condition. An acre devoted to fodder crops will produce 570 mds. of fodder sufficient to feed 6 cattle with 10 srs. of fodder a day. The fodder crops which the Agriculture Department recommend for Bengal are maize and *juar* as early *kharif* crop, cowpea to follow and peas as a *rabi* crop, while Guinea grass can be grown as a perennial requiring irrigation in the cold weather. In fact, irrigation is a very important factor in growing fodder crops and when irrigation is not practicable and fodder cannot be grown all the year round, it must be preserved in silos. The method of silage consists in chopping up maize, *juar* or peas and keeping the mixture covered with earth in a pit or container for six months. Besides fodder,

the cattle should receive other nourishing food grain and oil cakes, such as mustard cake, *chuni bhusi*, linseed meal, rice meal etc. As a rule for every 3 lbs. of milk which a cow gives she ought to receive 1 lb of concentrated food besides green fodder, in addition to the basic ration of 4 lbs. for maintenance. The care of the calf should receive special attention, if a healthy animal is to be reared. Besides food the cattle ought to be properly housed, groomed and bathed.

But in pointing to the carelessness and neglect of the Bengal peasant to feed his cattle and in dwelling upon the importance of stall-feeding if the cattle are to be kept in an efficient condition, we feel that we have not probed the trouble deep enough. It may be possible to grow sufficient fodder on an acre of land, but where is the ordinary Bengal raiyat to find this extra acre of land? Where is he to find the surplus money for bringing that land under fodder? In other words, the problem is really economic. The raiyat does not neglect his cattle from perverseness, to some extent his carelessness is due to his ignorance, but the really deciding factor is his poverty. There appears to be only two ways in which we can help the cultivator to improve his cattle by better feeding than he does now. The first is to teach him better and more intensive method of cultivation which will enable him to grow more on the same fields or get the same yield from a smaller area so that the surplus land could be used for producing fodder. Fodder could of course be also grown on his food producing field as a rotation crop in the dry season if irrigation facilities were extended. As pointed out by Howard it is only when the holdings of the cultivator will produce more than is sufficient for himself and his family that the cattle will be properly fed. The second would be to demonstrate to the farmer the money value of his cow as a milk producer and in order to do this we must create a demand for the sale of milk in rural areas. It may be true that the price of milk even in villages has gone up considerably, but unfortunately there is no steady demand for milk and milk products in villages and this can only be created by the establishment of co-operative milk societies in villages which will feed a central sale society which will supply milk to larger towns and townships. One of the most valuable lessons of the Pioneer Co-operative Milk Union of Calcutta has been the

marked improvement in the condition of the cattle of the members of the branch societies and the increase in the yield of their cattle due to better keeping, feeding and breeding. The Bengal raiyat is not impervious to new ideas and adopts new methods as soon as he finds that it pays him to do so. The formation of milk societies of the Calcutta Union type in all places where there is a demand for milk and milk products will be the most practical as well as the most efficient incentive to improved methods of husbandry.

Simultaneously, I would recommend the fostering and encouraging of the cattle-breeding industry in all suitable places. The cattle-breeding industry should be fostered and encouraged in selected districts where climatic conditions are favourable. More cattle-breeding farms should be established jointly by Government and District Boards and run on commercial lines so that private enterprise may be persuaded to take up the industry for commercial purposes. At present Bengal has to depend almost entirely on cattle imported from Bihar and the Central and Upper Provinces. I have later on also spoken of the importance of encouraging and developing live-stock and dairy produce industries as being most profitable branches of the agricultural industry. This will undoubtedly help to greatly improve the condition of both the draught and milch cattle of the Province. The Company Bagan property of Nadia comprising of over 300 acres of land, which has been made over to Government by the Municipality, ought to be an ideal location for a cattle-breeding and dairy farm for the Presidency Division. I might also mention that there is a considerable volume of public opinion in favour of stoppage by legislation of the slaughtering of prime cows and calves and it might be desirable to define the age at which dairy cows could be slaughtered.

We cannot leave this subject of the improvement of cattle without saying a word about veterinary work. At present this Department of Government works independently of the Agricultural Department, and is engaged both in purely technical and medical work as also in the broader problem of the improvement of cattle. The improvement of cattle is obviously a most important branch of agriculture and should be placed under a separate officer under the Director of Agriculture. As regards veterinary dispensaries

their multiplication and the proper support of all existing dispensaries by local bodies should go a long way in preserving the cattle of the country in a state of health and in preventing the spread of epidemic diseases. An excellent scheme of cattle dispensaries for each Union or Thana has been evolved in Faridpur and some Union Boards are, I understand, willing to put down a portion of the money necessary for the purpose. Even if we cannot get a separate cattle dispensary for each Union I would propose that the Demonstrator in charge of the Union farm should receive training in inoculating cattle and giving first aid in cases of cattle epidemics etc. Along with this, spread of information amongst the cultivators as to the methods of prevention and treatment of common diseases of cattle would seem to be urgently called for. Extensive propaganda is, therefore, necessary with a view to instilling into the minds of the cultivators the importance of preserving their cattle in a healthy and efficient condition and in creating public opinion amongst local bodies and philanthropic societies for taking steps for the preservation of cattle and the improvement of their condition.

CHAPTER VII

AGRICULTURE AND CO OPERATION.

Economic position and indebtedness of Agriculturists.

Extremely limited resources, complete dependence on favourable rainfall, and the difficulty of obtaining credit on easy terms, coupled no doubt with low-level of education and absence of any ambition to improve their condition are the chief causes of the indebtedness of the Indian agriculturists. Their chronic state of indebtedness is only another name for their poverty. Opinion is divided as to whether the Indian raiyat is becoming more resourceful and self-reliant every day or whether he is sinking deeper into debt and poverty. As for Bengal there cannot be any doubt that in the jute-growing areas of Eastern and Northern Bengal the cultivators are becoming more prosperous every day, and there is a distinct rise in the standard of their living as is evidenced by the better class of houses, household furniture, utensils etc. used by them. In Western Bengal and in the decaying districts of Central Bengal, such as Jessore, Nadia and Murshidabad, on the other hand, the raiyats are comparatively poorer and the extent of indebtedness amongst them is, therefore, comparatively much greater. Along with the decay of the agricultural industry, malaria and kala-azar have played havoc in many parts, and large areas in Jessore and Murshidabad have been deserted and are lying waste. The decay and extinction of indigenous industries have tended to throw an increasingly heavy burden on the soil. Fortunately in the jute-growing areas this tension has been relieved to a great extent by the growing demand for jute—a monopoly crop of Bengal, and in West Bengal by the demand for labour in connection with the jute-mills which have been established on both sides of the Hooghly, and the mines and other manufacturing industries in the mining areas of the Burdwan Division. But in spite of these compensating factors the material condition of the average cultivator in Western Bengal and to a great extent

in Eastern and Northern Bengal also is far from being satisfactory. There are no reliable statistics to show the exact income and expenditure, the economic position and the extent of indebtedness amongst the various classes of agriculturists, and no absolutely reliable figures are therefore available for the whole Province. Some interesting figures have, however, been collected for particular districts by Special Officers. The late Major Jack, I.C.S., collected information for Faridpur in connection with the settlement proceedings of that district. He states on the basis of the figures collected by his officers that 49½ per cent. of the agriculturists in that district live in comfort with an income per head of Rs. 60 per annum, or Rs. 5 per month; while 28½ per cent. are below comfort with an income of Rs. 43 per annum; 18 per cent. above want with an income of Rs. 34; while only 4 per cent. are in want with an income per head of Rs. 27 per annum, or Rs. 2-2 per month. It must be confessed that the picture of the agriculturists living in comfort on an income of Rs 5 per head per month may arouse a certain amount of scepticism, but what is perhaps meant to be implied is that as the wants of the agriculturists are few and they have in almost every case some subsidiary employment, even this small money income is sufficient to satisfy their wants. Major Jack also states that as the result of his enquiries he found that out of every 100 families, 35 feed themselves entirely off their own land, 25 need to work as labourers for complete support, and 40 buy grain because they either prefer to grow jute or are unable to feed themselves, but certainly far more often because they prefer to grow jute. He also found that in Faridpur 55 per cent. of the agriculturists were free from debts, and that of the 45 per cent. who were in debt more than half were in debt to a less amount than one-quarter of their annual income. Faridpur, however, is one of the prosperous districts of Bengal, and far gloomier is the picture of Jessore, one of the decaying districts, drawn by Mr. Momen in his settlement report of the district completed in 1924. According to Mr. Momen only 15 per cent. of the agriculturists in Jessore are in comfort, while 32 per cent. are below comfort, 33 per cent. above want, and as many as 20 per cent. are in actual want. "The percentage of people in prosperity cannot also be

expected to be higher than 15", he goes on to observe, "in a country in which the average income of the agriculturists, who form 77 per cent. of the population, on a most liberal calculation is only Rs. 54 per head, and the annual income of population as a whole is only Rs. 60, which is 25 per cent. less than what the Government thinks necessary to spend on an ordinary convict in jail for food, clothing and bedding only. No wonder that the condition of the Jessore peasant is so miserable and his power of recoupment so small. Having no spare capital, he finds himself stranded whenever one out of two heads of cattle dies. He has to borrow at a high rate of interest, the average rate in this district being 25 per cent. And once in debt, he can never extricate himself and finally becomes a landless labourer. The incidence of debt which is found to be Rs. 12-2-10 per head (the total indebtedness of the District being $2\frac{1}{2}$ crores) and which works out at only one-fourth of the annual income, though it may not appear so, is certainly heavy, considering that the average total value of an individual raiyat's stock (which consists of $1\frac{1}{2}$ acres of land, $\frac{2}{3}$ ths of plough cattle) is not more than Rs. 100. The raiyat's indebtedness is more than 12 per cent. of the total value of his land and stock, and as he has practically no savings from which to pay off the capital as well as interest, this cannot but be a matter of great concern. Then again it must be remembered that the average income of an agriculturist is Rs. 54 and his debt Rs. 12-2-0, but this income and debt will vary inversely accordingly as a cultivator is in comfort or in want. The income of the 15 per cent. of the population who are in comfort will probably be Rs. 80 per head and no debts. The 32 per cent. who are below comfort will have an income of Rs. 58 per head and Rs. 8 as debt, the 33 per cent. who are just above want will have an income of Rs. 50 per head and Rs. 12 as debt, and the 20 per cent. who are in want will have an income of Rs. 35 per head and a debt of Rs. 30. It is not therefore difficult to conceive that the last class will rapidly become landless and their proportion will fast increase, unless something is done to increase their income to pay off debts."

I am also inclined to think that the figures given by Major Jack are not representative of the Province and indebtedness.

amongst agriculturists is unfortunately prevalent to a much larger extent. Such a view was supported by Mr. Peddie, I.C.S., Collector of Malda, who gave his evidence before the Agricultural Commission. From my own personal experience I would be inclined to think that at least 75 per cent. of the agriculturists are in debt, and fully 50 per cent. live in a chronic state of indebtedness and are just able to carry on and provide the barest necessities of existence for their families. At the same time there is no doubt that there has been a rise in the standard of comfort and living of the agriculturists in the jute-producing areas of Eastern and Central Bengal. Unfortunately, however, even in the case of the majority of cultivators of these favoured areas, their prosperity continues to be seasonal and depends on the outturn of their fields and the price which jute commands in the market in any particular year. The condition of the majority of the agriculturists in the less favoured areas of Western and Central Bengal remains in the meanwhile extremely unsatisfactory. They have no reserve and very little credit, and one or two bad seasons followed by a failure of crops is sufficient to throw the majority of cultivators into a state of abject poverty and complete dependence.

Co-operation and the Co-operative movement.

Having referred to the extremely unsatisfactory economic position of the majority of the agriculturists, their indebtedness, want of resource and forethought, we may now proceed to consider the practical measures which might be adopted to improve their position. The experience of other countries even in Europe shows that indebtedness cannot be considered to be an unusual phenomenon among the agriculturists of India alone, but that the agriculturists in most parts of the world have also been more or less in an indebted condition. But whereas in progressive countries, debts are incurred by agriculturists mainly with a desire to improve their position by the acquisition of free-holds, purchase of more land, cattle or appliances, in India, the major portion of the vast agricultural debt represents the ineffectual struggle of the producers to keep themselves from starvation and for the satis-

faction of their pressing social and other wants. But although there may be differences in the degree and causes of the poverty of the Indian agriculturists as compared to the poverty of the poorer classes of agriculturists in more progressive countries, there is no reason to believe that the methods which have proved so eminently successful in European countries, notably in Ireland, Germany, Holland and Italy, will not prove equally successful in India. It is in this belief that the co-operative movement was started in India about 40 years ago, and the success which has already attained this movement justifies the hope that in the co-operative movement we have found the means by which the agriculturists will be taught to shake off the inertia of ages and acquire the confidence that is begotten of self-exertion and self-reliance. As by their own unaided resources, the majority of the agriculturists are unable to lay out any capital for the improvement of their holdings or to free themselves from the heavy load of debts under which the majority of them are groaning, the only hope is to teach them to combine with their brother agriculturists and thus obtain a strength which individually they do not possess now. This accession of strength, moral and material, which co-operation is likely to give the agriculturists should be directed in helping them gradually to free themselves from their load of debts and simultaneously to learn to produce more from their fields than they do now and utilise the profits in paying off their debts and building up a small reserve for the rainy day. The essence of this movement is that if the agriculturists will combine and form themselves into co-operative associations they will create credit on their joint security which they do not possess individually, and they will at the same time imbibe lessons of corporate action which will raise their standard of intelligence and engender a desire to save and improve their position generally. The co-operative movement has thus both a moral and a material aim in view.

These are the ideals. It is obvious, however, that they can be realised very slowly and after great perseverance. It is not necessary here to trace the progress of the co-operative movement from the beginning. It has been, on the whole, satisfactory throughout India, and in 1924 it was found that the rate of development in the seven previous years have been four times as great as in the first 13 years of the co-operative movement. The first Co-operative

Societies Act in India was passed in 1904 and by the middle of 1925 the number of societies had risen to 71,608, their membership to over 2½ million persons and their working capital to nearly 500 millions of rupees. Bengal has kept pace with the other parts of India and provincial report of the Co-operative Department of 1924-25 shows that continuous progress in every direction has been maintained—in the number of societies, the efficiency of their working, the enlargement of the sphere of their activities and the extension of the moral and educative effect of the movement on the people. The number of societies of all classes in the province rose from 9,342 in the previous year to 11,081 and membership rose from 3,40,159 to 3,86,050 and the working capital rose from Rs. 5,07,66,290 to Rs. 6,18,38,550, showing a satisfactory increase of 21 per cent. The actual cash employed in the movement amounted to Rs. 3·98 crores against Rs. 3·2 crores in the preceding year. Out of the sum of 3·98 crores which is the working capital of primary societies the amount received from outside sources was Rs. 2·17 crores, while co-operative societies and their members provided 45·5 per cent. of the working capital. As regards agricultural credit societies alone their number rose from 8,368 to 9,835

It is satisfactory to find from the report that the co-operative credit movement is being recognised by the public as a sound system of rural finance and it has been able for some time past to attract with ease ample funds for its purpose, and several Central Banks were obliged to refuse local deposits as their cash balance was heavy. There is, however, room for improvement in several important directions. More attention on the part of central societies is needed to improve the quality of the members of village societies, coupled with exercise of proper control over the supervisors. Not till the general body of members fully realise their rights and responsibilities will it be possible entirely to check the irresponsible action of panchyats who manage the affairs of village societies. The general body leaves affairs almost wholly to the discretion of the committee, and the committee transfers its power to the Chairman, Secretary or some other member. In many a society activity is displayed only twice in the year, once during the cultivation season when loans are advanced and again after harvest time when recoveries are collected. Closer and more

intimate relationship between the central and the primary societies and a wider diffusion of the sense of responsibility amongst all the members of rural societies would thus seem to be greatly needed. There is also great inelasticity in the working of these banks. These societies are unable to act as real Banks by accepting for deposit money when presented, meeting withdrawals of such saving deposits or temporary surplus funds without delay, and granting loans on demand according to actual requirements. Very often members of village societies are unable to obtain loans at the particular moment when they badly require them, specially if at that time the societies are not in funds. A member wanting the loan urgently will have to apply to his society for it, and the managing committee of the society will take some time to deal with the loan application and by the time the Central Bank sanctions the loan and money is brought to the village for disbursement the need for borrowing on the part of the applicant may disappear. Another disadvantage of the present system is that loans are very often brought to the village from the Central Bank in a lump sum and distributed immediately to the members, although some of the members may not actually require the loan at that time. Attempts are being made to improve the present system of financial transactions by the introduction of a system of allowing well-managed village societies to draw accounts with their Central Bank against which members would operate by means of cheques. The Registrar is also very anxious to introduce the system of short-time borrowing and to differentiate between long and short term loans. Loans for normal crop requirements should be met by short term loans which should be repaid at harvest time, whereas loans for the liquidation of debts and for land improvement would naturally require a much longer period for repayment. By insisting on punctual repayment of short term loans a very healthy check would be exercised on the misuse of cheap credit. The aim of the department is that the entire requirements of members in respect of their short term loans should be met from cash credit account which should be given by the Central Bank to its societies, the Central Bank in turn receiving similar accommodation from the Bengal Provincial Co-operative Bank. By introducing the system of allowing cash credit to village societies and the privilege to members to operate by means of cheques against the cash credit

account allowed to the society by the Central Bank, it is hoped that much of the inelasticity and the piecemeal character of the present system of agricultural finance through the medium of co-operative societies will be removed.

Particular attention will, however, have to be paid to the proper use of the credit obtained by the individual members from the society, for cheap credit is not an unmixed blessing and unless continuous control is kept by the society of the use made by the members of the credit of the society in repaying their outside debts one of the main objects of the movement will be lost. No reliable figures are kept to show exactly to what extent the agriculturists of Bengal are being able to relieve themselves of their load of debts, but the Department informs me that members are paying off their debts at the rate of at least a lakh of rupees a year. The Department is also trying to encourage the use of home safe boxes where the cultivators could put by their small savings. In the Durgapur Society in Chittagong alone the deposits collected through these boxes amounted to Rs. 4,000. Progress in this direction, it must be admitted, however, has been very slow, and there are some critics who hold that at the present rate of progress it will be many years before the co-operative movement alone can make any substantial impression on the material condition of the agriculturists. Messrs Wadia and Joshi in their work "Wealth of India" have calculated that taking the total agricultural debt of India to be 500 crores of rupees it will take the Co-operative Department at its present rate of progress 300 years to wipe out the total agrarian debt of the country. The slow rate of progress of the co-operative movement under existing lines is attributed by these authors to the fact that the success of the movement presupposes economic conditions which are absent in India, for there are no savings of the agriculturists which can be mobilised and there is also a lamentable lack of education and consequently of desire to save on the part of the agriculturists. They are, therefore, of opinion that a practical solution of the difficulty can only be had by the establishment of a State Agricultural Bank with a large credit superstructure built up with Government help and on the reserves of Government, and such a Central Bank alone with its branches scattered all over the country can find credit sufficiently large to wipe off substantially the indebted-

ness of the rural areas and can thus render effective help to the agriculturists and solve the problem of agrarian indebtedness as it has done in Egypt. The Co-operative Department is also making experiment in the direction of Land Mortgage Banks and one such bank has been established in the Naogaon Gānga Mahal. The Bank will take over the entire outside debts of the members against the mortgage of all their properties. The progress of this Bank should be watched with interest, for it is undeniable that Banks of this nature will be capable of dealing with the problem of agricultural indebtedness much more effectually than ordinary credit banks. For, if the total indebtedness of the agriculturists of this province is somewhere about 75 crores of rupees, it must be admitted that it will take the co-operative credit movement many years, at the present rate of progress, before it can help the agriculturists to completely free themselves from their load of debts.

There is another important direction in which the co-operative movement can help the agriculturists. Though credit societies by affording cheap credit to the agriculturists are undoubtedly doing most useful work and it is now possible for agriculturists to borrow at 9 to 10 p. c. what they could not borrow at less than 20 to 75 p. c. formerly, and the agriculturists of the whole of India are perhaps saving themselves from an unnecessary burden of a crore of rupees annually, yet it is obvious that unless the agriculturist takes advantage of cheaper and more facile credit to raise his efficiency as a producer of wealth and unless his outlook on life changes considerably and he is able to think and act for himself and for his future more than he does now there will be no permanent improvement in his position. And unless that happens then even if every pice of his debts were to be paid off to-day he will soon find himself involved in debts again. From this point of view co-operative societies for helping cultivators to secure better classes of seeds, manures, and the use of modern appliances are more valuable than credit societies for the repayment of debts only. It is satisfactory that in this direction also there is considerable activity in the province, but not so much as in Bombay, for instance, where a number of seed societies has been organised, wheress in Madras societies for the co-operative purchase and sale of manures have been established. During the last two years

much attention has been paid in the Presidency Division to the formation of active co-operative agricultural associations, and as an example might be mentioned the Chuadanga Krishi Samabya Ltd. with 4,000 bonafide agriculturists as its members. Last year the society distributed Chinsura Green Government jute seeds of the value of Rs. 22,000/-, 24,000 mds. of Kataktara paddy and 2,000 sugar cuttings to its members, with most satisfactory results. The society has a credit balance and is contemplating with the assistance of Government to start a small demonstration and cattle farm of its own. Even if we succeeded in establishing only one such active co-operative agricultural association in each Union Board, we shall go a long way towards securing rural prosperity and solving the problem of agricultural indebtedness in Bengal.

Of the activities of the Co-operative Department in helping the distribution of agricultural produce by the establishment of sale societies we shall refer later on. In concluding this Chapter I shall like to mention that at the present stage important and most helpful as the activities of these organizations have been in helping the cause of agriculture, yet they cannot be said to have yet touched more than a fringe of the vast problem of the reconstruction of the moral and material life of the masses of the people. According to the figures for 1922-23, there were in Bengal only 6 members of primary societies for every 1,000 of the population and 16·8 societies for 100,000 inhabitants. It is also necessary to refer to the unfortunate tendency on the part of some supporters of this movement to underestimate the value of other organizations such as the Union Boards in the uplift of rural areas. Such an attitude is opposed to the true spirit of co-operation. For, the aim and object of both organizations--the rural Union Boards and the rural primary co-operative societies--are the same, viz. to stimulate a spirit of self-help amongst the people and to organize them for co-operative work for the good of the public. Besides helping the agriculturists through the co-operative movement, Government are also prepared to advance loans on proper security for land and agricultural improvements under the Land Improvement Loans Act of 1883 and the Agricultural Loans Act of 1884. Loans under the former are meant for the improvement of land, for digging wells, excavating tanks, improving drainage etc., and under the latter for the

purchase of cattle, seeds, implements etc., particularly in periods of distress and scarcity. Loans taken during famines and scarcity, from the very nature of the case, do not leave much permanent results and do not help materially to raise the condition of the raiyats. Land Improvement loans are available by the comparatively well-to-do agriculturists who can offer adequate security and therefore the range of the beneficence of these advances is also extremely limited. In any case, these loans have not been popular and the sums advanced annually under these Acts in the Province are insignificant. It is clear, therefore, that as no permanent improvement in the agricultural conditions of the country can be expected without the employment of more capital, a scheme which will provide for the advancing of loans to the agriculturists on proper security, but in sufficient amounts to enable permanent improvements to be effected, should form the bedrock on which any effective programme of agricultural progress can be based. Unless this is done, very little practical benefit, it is feared, will be derived by the majority of the cultivators from the labours of the Agricultural Department. In Bombay since 1923 Government place at the disposal of the Provincial Bank an allotment for distribution as advances to agriculturists under the Land Improvement Loans Act, such advances to be made through primary societies and Central Banks to which they are affiliated. I have already indicated how Government could co-operate with local bodies in establishing manure depots and seed farms, and arranging for the distribution of good seeds and necessary manures to the cultivators. I have also urged the necessity of taking immediate steps for the improvement of the draught and milch cattle of the country by the establishment of State-aided cattle farms and dairies at suitable centres in the mofussil areas of the districts. The programme I would suggest, therefore, would be the formation of active co-operative associations for the improvement of agriculture throughout rural areas. We should then work out a system for the granting of loans under a new or amended Agricultural Improvement Loans Act, on the joint recommendation of the Agricultural and Co-operative departments, to be approved by the Collector. Registered Agricultural Associations should receive the bulk of the available allotment for loans, but deserving individuals should also be suitably encouraged. To

enable these objects to be attained sufficiently large allotment of funds will have to be made and necessary instructions issued on the District Officers and the departmental officers of Government.

Distribution of Agricultural Wealth.

After dealing with some of the economic laws which govern the production of agricultural wealth we must refer to the existing conditions of the distribution of that wealth. There are two powerful causes which prevent the agriculturist from getting the most value from the fruits of his industry. The first is his indebtedness, and his consequent dependence on money-lenders and *saokars* to whom not unoften future crops are hypothecated, and to whom the cultivator has to make over the produce of his field at a rate previously fixed and having little regard to the prices prevailing at the time. The second is his isolated and unorganized position with regard to the world's market, with the result that middle-men have to arrange for the sale of his produce, and are able to appropriate a disproportionately high proportion of the profits. In Rangpur I found the *farias* and middle-men making as much as 4 rupees per maund of tobacco sold, and it is notorious that in the case of jute, the commodity has to pass through several classes of middle-men before it reaches the hands of the actual manufacturer. Fortunately, growing competition and the excess of demand over supply is helping to break the ring of the brokers and middle-men, and the cultivators are gradually getting a more effective voice in settling prices and in securing a fair share of profits. But even now there is great scope for improvement, and there is as much if not greater need for organization for the distribution and sale of agricultural wealth as for its production. This organization, it is needless to point out, can best be started by the co-operative method, a method which has proved so eminently successful in countries like Italy, Ireland, Switzerland and Denmark, where the small cultivator thus organized has held his own against the competition of the industrial world. A most successful example of the organization of an agricultural industry on co-operative lines is to be found in the production and sale society for *ganja* in Naogaon.

The Naogaon Ganja cultivators' Co-operative Society Limited.

It is true that here the society deals with a monopoly produce, but it is also true that before the organization of the *ganja* producers in a co-operative society their condition was not very different from agriculturists of other parts of Bengal, and it is only since the adoption of co-operative methods that the *ganja* producers have been able to reap the full advantage of their special position. Now this society has succeeded in creating so much wealth and well-being for its members as to be in a position to construct out of its savings works of public utility such as tanks, roads, mosques and charitable dispensaries, and even to finance the District Board with a loan in constructing an important bridge. During the year 1924-25 the society had 3,681 members and its share capital amounted to Rs. 41,310, deposits from non-members increased to Rs. 268,629 and those from members to Rs. 63,216, while its total working capital was Rs. 5,75,635. It maintained 3 charitable dispensaries besides opening a kala-azar centre — its total budget for medical aid amounted to Rs. 5,763. The society is keeping 5 stud-bulls for the use of the members. It spent Rs. 10,213 towards the maintenance of the various primary and secondary schools in the Ganja Mahal, including night schools and girls schools.

Paddy and Jute sale Societies.

Societies among producers of other agricultural produce may not be able immediately to obtain the same prosperity, but there cannot be any question that there is vast scope of useful work in organizing paddy and jute sale societies in Bengal. The organization of paddy sale societies does not present as much difficulty as jute which is a highly speculative commodity and the price of which is constantly fluctuating and susceptible to a variety of different causes. After some preliminary failures the paddy sale societies at Khapupara, Pangsha, Khelar and Gossaba in the Sunderban area are doing well. It is proposed to extend the sphere of activity of the Gossaba Paddy Sale Societies by starting rice manufacturing mills in connection with these societies, so that

the cultivators themselves will be able to place the finished article in the market and appropriate the bulk of the profits of the industry. The organization of jute sale societies presents more serious difficulties, both on account of the difficulties of storage and the constant fluctuations in price. The Dewanganj and the Kamarpara Jute Sale Societies failed, because they held up stock too long. A jute sale society at Kazipur, however, is reported to be doing good business. Quite recently a sale society on a fairly extensive scale has been organized at Almdanga in the Chuadanga subdivision of the Nadia Districts, the Alamdanga Central Co-operative Sale Society Limited. There are already a number of co-operative societies near Alamdanga, the members of which are growers of jute, and there is also an important jute market at Alamdanga with easy transport facilities to Calcutta. This society is at present dealing chiefly in jute, and in spite of the adverse circumstances which the jute industry had to face last year the society transacted business to the extent of Rs. 60,000, whilst 4,175 shares of the value of Rs. 51, 750 have already been sold, and the society made a profit of Rs. 7,500 in round figures. The society has made such a hopeful start chiefly on account of the keen personal interest taken by the Sub-Divisional Officer, Babu Srimanta Kumar Das Gupta and the support he received from his Collector and the Co-operative Department. If the society succeeds in maintaining its position and other similar societies are started in the numerous jute centres of Bengal, there is no doubt that they will open the door to a momentous development of the most important agricultural industry in Bengal. I have not got all the latest information before me of the progress of the jute sale societies which have quite recently been organized in Chandpur and other centres in East Bengal, but I understood from the Registrar that a most hopeful start had been made. The most encouraging feature of the movement is the sympathy and support which it is getting from the jute-mill owners of Calcutta, and the reputation which the co-operative society's jute has already established in the Calcutta market. About 60 crores of rupees worth of raw jute is annually sold in Bengal, and if the co-operative societies are able to capture and handle even half of this quantity, and even if 5 per cent., represents establishment charges of these societies, a crore-and-half will be

available every year for the remuneration of such middle-class educated young men who may be employed by these societies. And the producers themselves will certainly increase their profits by at least 5 crores of rupees annually, if their transactions are conducted through these sale societies. There is no doubt considerable risk in the storage and sale of jute, but if individuals can take that risk and make money on it, there is no reason why societies could not do the same. In fact, they should be in a more secure position than individuals, specially if their activities are guided by sound business men and expert advisers of Government. The establishment of co-operative jute sale societies will not only help the producers but also the manufacturers of jute, as they will be able to rely far more on the quality of the jute they buy through these societies than they are able to now under present conditions. As was to be expected the organization of paddy and jute sale societies is receiving special encouragement from Government. To help paddy sale societies a central godown will be established at Calcutta by the Bengal Co-operative Organization Ltd. which will receive from Government an amount equivalent to the cost of the godown for the first 3 years. A scheme has also been sanctioned which will provide adequate supervision of these societies and the grant of financial assistance in the shape of loans for the provision of storage accommodation. Another useful and less risky direction in which co-operative societies are being encouraged to tackle this problem is to open supply annexes to the existing agricultural credit societies by a special provision in the bye-laws of the Society. Up to now a few societies have collected orders from their members for jute seeds and other needs and obtained supply from the Agricultural Department by submitting a consolidated indent through their Central Bank. The idea of utilizing existing credit societies for organizing the supply of the agricultural needs of their members is obviously sound, but the most fruitful development of the principle would seem to lie in the direction of those societies taking up both sale and supply through the medium of either the existing central Banks or special Central Societies to be organized for the purpose.

Having regard however to the vast potential field of useful work in the organization of the sale of jute and paddy on

co-operative lines that there is a strong case for the appointment of a specially selected officer of the Co-operative Department to take charge of this work.

Food crops v. Commercial crops.

The question of the desirability of growing commercial crops like jute in preference to food crops like paddy may appropriately be mentioned here in connection with the distribution of agricultural wealth. In all such matters, however, I think the producer understands his own interest well enough to make outside interference undesirable and unnecessary. If he can sell jute dearer than paddy which he may have to buy, he will not be easily persuaded to give up the actual profit which he will thus make for any distant national interests, and it is doubtful whether any national interests are served by producing a less valuable crop in preference to another which will fetch a larger money value. Similar considerations apply to the question of the export of food crops to foreign countries. It will certainly be undesirable if the unrestricted exportation of food crops, such as rice and wheat, should result in the producing country being left with a deficiency of food for the maintenance of its own population. This, however, raises large issues and we shall hardly be in place to discuss the relative merits of *laissez faire* and protection in helping the development of the agricultural resources of the country at the stage which we have at present reached.

Communications.

Improvement of communications is an important factor in helping to facilitate the distribution of agricultural produce. We need hardly refer here to railway and steamer communications. As regards road communications I have always held that the opening out of every portion of a district by the construction of suitable roads, *kacha*, if necessary, is one of the most important duties of the District Board. Each Board should, therefore, have a carefully prepared scheme of road construction which will

provide equal facilities to all parts, as it is not unoften the case that influential members of the Board are able to get metal roads in areas where they are interested, whereas large tracts in the meanwhile have to get on without any roads at all.

Development of rural industries.

It is obvious, however, that whatever improvements may be effected in the production and the distribution of agricultural wealth, the steadily expanding population of the rural areas will find increasing difficulty in maintaining itself on the produce of the soil alone. About 20 years ago it was calculated that "India feeds and to some extent clothes its population from what two-thirds of an acre per head can produce". The productive resources of the land must be still more heavily taxed at the present moment. A most urgent problem, therefore, is to relieve the ever increasing pressure on land and multiply occupations for the people, so that there will be a more natural adjustment between the agricultural population and those following other avocations. Not to speak of the elements of uncertainty of the agricultural industry due to the failure of the monsoon and other causes, we have also to reckon on the difficulty that, while the pressure of population on the land is daily increasing the major portion of the land is losing its fertility by long cultivation and more money has to be spent to get the same return. If no other avenues can be found for the growing population of the country, we will have to fall back on the less fertile lands which have hitherto remained uncultivated and which will require comparatively larger capital to enable them to be brought under the plough. We have already seen that, even if the population of the rural areas were to remain stationary, it would be a great relief to those who at present depend on agriculture for their maintenance, if a certain number could be diverted to other avocations leaving to the rest a little more land and other resources than they have at present. But the agricultural population is not stationary. There is a slow but steady increase, and the more prosperous the agriculturists the more rapid the increase amongst them. The Muhammadan cultivators who are generally better off than the Hindus are increasing faster than their Hindu

brethren. The prospect of the agriculturists rising sufficiently in the moral and social scale to exercise a moral restraint on the increase of population is remote, and might, for the present, be left out of account altogether. As regards migration also, it appears that the Bengal peasant will not leave his village except under stress of the direst circumstances. In the jute mill and the mining areas of Bengal, there has been a great deal of shrinkage within recent years of the purely Bengali population as labourers. Our efforts will, therefore, have to be chiefly devoted to developing suitable industries near the homes of the agriculturists. As noted before, such industries will help in two ways. It will provide in the first place some occupation to those who depend mainly on agriculture to have something to do during their leisure hours, and thus to substantially supplement their income ; and, secondly, it will draw away a portion of the population which has now to depend on agriculture and thus relieve the pressure on that industry. In order to revive indigenous and suitable home industries a movement was set on foot by Lord Carmichael some years ago and a Home Industries Association was started. Such industries were selected for encouragement as did not come into direct competition with machine-made goods and at the same time had a fairly large local demand. The Co-operative Department of Government has also taken up the important work of reviving village industries and a number of industrial co-operative societies has been organized in the different districts. The members of these societies are able to obtain raw materials at cheaper rates than they would be able to get individually, and the Union also arranges to find sale for the output of their branch societies. The most successful Union in this line, to my knowledge, is the Bankura Industrial Weaving Union Ltd, which has materially raised the prospects of the weavers of that district, and succeeded in finding remunerative occupation for a large number of people who would otherwise have been inevitably thrown on land to eke out a miserable pittance from the soil. It is most important, therefore, that the attention of the Industrial and the Co-operative Departments of Government should be directed towards re-organizing the village industries of Bengal on business lines, so that profitable avenues could be opened up for the poorer and the middle-classes of the people. This is a subject, however,

which will be more suitably discussed in the chapter on "Industries".

But I would like to refer to a branch of the Agricultural industry itself to which very little attention is paid in India. In the European countries a most important, probably the most important, department of agriculture is the rearing of live-stock, of pigs, cows, sheep etc. for the market and the production of dairy produces, milk, cheese, butter and eggs etc. Taking the example of Denmark, for instance, one of the most agriculturally advanced and prosperous countries in the world, one finds that the agricultural wealth of that country is built up almost entirely on the stock of cattle, poultry and milk products. As long ago as 1908, it was found that Denmark was exporting to England £18,500,000 worth of butter, bacon and eggs, while feeding a comparatively dense population of her own. Even as compared with England, Danish land carries a much heavier head of cattle. In 1909 it was found that although the acreage of Denmark was 9,375,403 or roughly $\frac{1}{10}$ th of Great Britain, there were 1,840,000 horned cattle and 1,457,000 pigs in Denmark, whereas in England there were 6,912,000 horned cattle and 2,637,000 pigs. As a result the Danes are probably the most prosperous and enlightened agriculturists in the world. State aid, education and co-operation have helped the Danes to rise to their present position. In Denmark the State helped a large number of agriculturists of approved character and experience to acquire a certain area of land in free-hold by aid of money advanced by the State, which money is to be repaid in a total period of ninety-eight years. A large number of schools and colleges teach agricultural science and every branch of knowledge connected with dairy work, special attention being paid to practical training at farms attached to these institutions. But as stated by H. Rider Haggard in his interesting book on 'Rural Denmark and its lessons' agriculture has been raised to its present flourishing position in that country 'by the aid of the mighty engine of co-operation.' In the field of dairy produce alone there were in 1909 no less than 1157 co-operative dairies in Denmark with 157,000 members. Besides these, there were bacon-curing societies, societies for export of cattle and eggs, and horse-breeding, cattle-breeding pig-breeding and sheep-breeding societies. There are also numerous 'control societies', which keep an accurate account of the milking capacity of every cow

belonging to their members. In 1909, 276,000 cows, or over 17 p.c. of the total number in Denmark, were supervised by the control societies, and it was found that the controlled cow produced $\frac{1}{3}$ th more milk than the uncontrolled one. To these control societies and to the societies for the improvement of live-stock the State granted a subsidy of over £55,416. Apart from the numerous substantial advantages which these co-operative societies bring to their members, it has been found that as a result of these societies there has been a large increase in the number of cows in Denmark and also in the average annual milk yield from each cow.

Mr. Haggard gives interesting accounts of several of these co-operative dairies: The Brorup Co-operative Dairy, for instance, collects 27,000 lbs. of Danish milk from 264 co-operating members. The factory owns 18 carts in which the milk is brought to the factory every morning. About this dairy Mr. Haggard remarks.

"I was informed that a factory of this sort and size, including machinery, costs from £3500 to £4000. When it is thought advisable to establish such a factory in any district, the necessary capital is borrowed and guaranteed by the local farmers in proportion to the amount of milk to be supplied by each of them. Should the venture fail, these farmers must pay up in proportion to their respective guarantees. This however is not a liability that need disturb their sleep at night, as if any co-operative factory in Denmark has failed of late years. I have not heard of that event. Thus this place at Brorup, which may be taken as a fair sample is, as the Manager informed, in a prosperous condition and able to pay a good price to the co-operators for their milk."

Similarly in Germany also we find that agriculture and the rural industries—live-stock breeding and dairy farming—had made enormous strides in the decade before the war, thanks chiefly to the encouragement and financial assistance given by the State and the stimulating influence of the co-operative movement. We find the following account in Barker's "Germany":—

"Aided by the State and by the communities co-operation among the German agriculturists has developed with ever-increasing rapidity. In 1890 there were in Germany 3000 co-operative agricultural societies. In 1908 there were no less than 22,000 societies of this kind in existence. Of these, 16083 are credit societies, 1448 were societies for co-operative buying and selling,

2980 were co-operative dairy societies and societies which deal with milk, and more than 1,000 associations were devoted to various purposes." How vast the number of these societies is in Germany may be seen from the fact that there is now on an average one co-operative society for every 300 individual holdings.

"There are numerous associations for building dykes against floods, for developing irrigation, for draining fields, drying swamps, acquiring bulls and stallions for breeding purposes, for milling and storing grain, for effecting insurance, etc. and in consequence small and poor farmers may have the use of steam ploughs, threshing machines etc. at most moderate rates. Thus a comparative small quantity of expensive agricultural machinery is made to do service to large number of peasants, much capital is saved and small cultivators receive all the advantages which otherwise are only within the reach of wealthy landowners.

"Apart from the co-operative associations, the rural industries of Germany possess numerous huge and powerful societies for improving the breed of horses and cattle, promoting the keeping of fowls, for growing hops and fruit, for keeping bus etc.; and many of these societies receive considerable subvention from the State."

Accordingly we find that not only has the agricultural area of Germany been considerably extended and the produce per acre also enormously increased, but at the same time the live-stock of Germany has astonishingly multiplied notwithstanding the shrinkage of grass lands. From 1873 to 1907 cattle increased from 18,776,702 to 20,889,856 and pigs from 7,124,088, to 22,080,008, or in other words, the increase in pigs was not less than 215 per cent. The value of live-stock during the 17 years from 1883 to 1900 rose from £278,845,000 to £284,920,000.

How and to what extent can the lessons of Denmark and Germany be utilized for developing live-stock and dairy produce industry in Bengal? That question must necessarily be left to the expert departments of Government to answer. But one may be permitted to observe that this is the direction in which the agricultural industry of the country seems to be most in need of development. We must, of course, work with the materials we have. First of all, the importance of the live-stock and dairy produce industry from a purely business point of view must be

brought home to the agriculturists. It may be argued how can the poorer cultivator who is not able to keep his plough cattle in good condition be expected to feed and keep his milch cows? Where is he to get the money to buy the cows? If, however, co-operative dairies and live-stock breeding societies are started in the mofussil areas, it will pay these societies to make an advance of cows to such cultivators as will like to join the society as members. The State, which is not required here as in Denmark to help the agriculturists to acquire free-hold lands, could grant reasonable subsidies to these societies. If only the more well-to-do agriculturists at first joined these societies and succeeded in making an income out of their live-stock and dairy produce, their example was sure to be followed gradually by the comparatively poorer amongst them. They will soon find out that it will pay them much more to keep goats, sheep, fowls and cows, and pigs than to depend solely on the produce of their small holdings, when under present conditions an average crop is only a ten-anna yield, and when the vicissitudes of the seasons make the future so uncertain. The Hindu cultivator perhaps will not take to rearing poultry and the Mussalman cultivator will feel defiled if he keeps pigs. But the Mussalman cultivator ought to make a very fair income if he is taught and encouraged to keep fowls, ducks, cows and goats and sheep; and the Hindu cultivator ducks, cows and goats and sheep. Perhaps the keeping of pigs will be considered a degrading profession by both communities for sometime to come. The price of fowls and eggs has gone up about three times during the last 20 years and the demand for them also has greatly increased. The price of milk similarly has gone up three or four times within the same period, and even in the mofussil, now-a-days, it is difficult to get more than 3 seers of milk for the rupee and in the rains it very often sells for 8 annas per seer. There is also an ever-increasing demand for pure *ghee*. Goats multiply fast and are easy to keep and the demand for goats is daily increasing. There is also a steady demand both for the wool and flesh of sheep. There is thus evidently great scope for the live-stock and dairy produce industry. But it is clear that the success of our enterprise in this field will depend a great deal on the establishment of co-operative dairy and live-stock societies which will arrange to take poultry and animals and dairy produce from the individual farmers. And

for the establishment of such societies State aid will be indispensable, specially in the initial stage.

The Milk Supply Union of Calcutta.

Fortunately for Bengal a lead has now been given in this field of work by the successful establishment of the Milk Supply Union of Calcutta registered in May 1919. The Union supervises, controls and finances 63 milk societies with a membership of 2,909 persons and arranges for the distribution and sale of their milk in Calcutta. Only milk producers can be enlisted as members of the primary milk societies and only milk societies can be members of the Calcutta Milk Union. The societies are arranged in groups for the purpose of collection of milk by paid milkers and carriers. Each group consists of six or more societies. The milk obtained from the societies in a group is collected at a depot which is under the charge of a depot manager whose duty it is to receive the milk in properly sterilized cans, measure it, note the general condition and the lactometer point and give a receipt to the carrier. The working of the depot is looked after by the depot supervisor. Above the supervisors there are the depot managers and the society managers. There is also the veterinary inspector, who examines and treats the cattle belonging to the societies, and looks after the milking arrangements and the sanitary condition of the cowsheds. Above them all is a sub-deputy collector placed on special duty in the Co-operative Department. He is in charge of these milk societies and is the deputy chairman of the Milk Union.

The Union has got a pasteurizing plant and a boiler. All distributing cans are properly sterilized. Milk is generally distributed raw to individual customers, but the supply to hospitals is pasteurized. The Union has got a motor lorry and has also introduced the cycle lorry system of delivery. The milk is also carried by hand carts and coolies for delivery to customers. The Union at present supplies milk to 5 hospitals, 4 hostels and a large number of individual customers through a number of depots. The Union has distributing centres at convenient places all over the city. At present milk is distributed in special cans, but the Union proposes to adopt as soon as possible the system of supplying milk in sealed bottles.

The Corporation of Calcutta has this year given a non-recurring subsidy of Rs. 5,000 and a loan of Rs. 50,000 free of interest and repayable in 6 years on condition that the Union will increase its yield to 500 maunds a day in course of 5 years and would sell milk at 3 srs. for a rupee. A loan of Rs. 14,000 from the Government which has been paid off was obtained for the purchase of lorries. The Union has been striving to achieve financial independence, and out of a total working capital of Rs. 75,638 only Rs. 15,834, i.e. about 20 per cent. has been obtained from outside sources. The Union has also current deposits amounting to Rs. 34,678 in the Bengal Provincial Co-operative Bank. There has also been a steady rise in its profits which in 1924-25 amounted to Rs. 20,146

In the quinquennium from 1921-1926 the average outturn of milk of each member rose from 56 srs. to 1 maund 15 seers. The Union also distributes stud-bulls to the societies and provision is made for replacing these when necessary. A shed is provided for each stud-bull along with a grazing ground of one bigha. The bull is allowed to cover cows of members of societies free of charge. Fifteen stud-bulls have been distributed. The members obtain veterinary assistance free of charge. Provision has been made for free distribution of fodder seeds to encourage members to grow fodder crops. The Union maintains a dispensary to provide medical aid to its members. Two schools have recently been started for the benefit of girls of members and are receiving grants-in-aid regularly from the Union. The Union spends Rs. 1,000 a year at present towards the education of members of societies. Out of this fund assistance is given to 5 primary schools and one secondary school in the area of operation of the Union. The Union arranges for the delivery of lantern lectures on sanitation, anti-malarial and anti-kala-azar work. It has made provision at group depots for treatment by injection of members suffering from kala-azar and malaria. It also organizes cattle shows and has contributed towards the sinking of 6 tube-wells in its area.

The example of the Calcutta Milk Supply Union might with very great profit be followed in all such large towns and townships where there is a demand for milk and milk products. It is not to be expected that the mofussil

Unions will carry on business on the same scale as the metropolitan Union, but there can be little doubt that there is scope for a very profitable line of business by the establishment of such Unions in the more populous districts of Bengal. Nothing is more likely to help the cattle industry and improve the material condition of the agriculturists. We should also have schools and colleges where this branch of agriculture—dairy and live-stock rearing—would be exclusively taught. Model farms will have to be attached to these institutions where practical training will be given. There should be at least one such institution at the headquarters of each district maintained jointly by the District Board and the Government. I am confident there will be no lack of students. For such institutions are sure to attract a large number of educated young men. After giving them a thorough practical training, the State would advance the necessary capital to them on easy terms to enable them to start co-operative dairy and live-stock farms. I would also suggest that there should be a special sub-department of Government for developing this branch of the agricultural industry.

Other suitable village industries—weaving.

I will mention here two other forms of cottage and village industries which I think will greatly relieve the pressure on agriculture. The first is cloth-weaving. This industry should be eminently suitable both as a subsidiary and as an independent industry for our villages. It may be true that as a rule it is only men of the weaver caste who will take to weaving as an independent industry, but at Serampore and other weaving schools and colleges, *bhadrolok* students of all castes are taking lessons and I have come across a fair number of educated young men who have tried to earn a livelihood by flyshuttle-weaving. For the ordinary cultivator the growing of cotton in a corner of his *bari* or homestead, the plying of the *charka* for spinning the yarn, and the weaving of a *sari* or *dhoti* on a fly-shuttle handloom suited to his knowledge and requirements, ought to bring considerable relief. If the ordinary cultivator could be spared the expense of clothing the members of his family in addition to feeding them, that would

certainly mean a most substantial relief. But if weaving is to bring a decent income as a subsidiary industry, it must be run on co-operative lines, and it will be a great help if the ordinary cultivator or weaver got the assistance of weavers' unions to help him to get the materials and to sell the output of his loom. We have now got a few peripatetic teachers going round into villages to teach fly-shuttle weaving. There is room for many more, and the District Boards and the Industries Department should join hands to provide a suitable staff for each district. I need not, however, go into any further details on this topic here. I will return to it when dealing with Industrial development.

Pisciculture.

The other industry which might be most suitable for rural areas is pisciculture to be taken up along with extension of facilities for irrigation. The different ways in which pisciculture can be developed in Bengal have been dealt with in the reports of the late Sir K. G. Gupta and Mr. K. C. De, C.I.E., I.C.S. But the most practical way in which the rearing of fish can be introduced as a most profitable occupation for the cultivator would be by encouraging a co-operative irrigation society which excavates a tank or constructs a *bundh* or some other form of water reservoir to rear fish in it. This is already being done to some extent in Bankura, but the movement needs the backing of both the Agricultural and Co-operative departments. In this connection the following quotation from a paper read at the Paris International Congress of 1189 by the Chinese Statesman, General Schangte-tong, showing the extent to which this industry is carried on in China and the material help it gives to the people will be of interest. "I may add that without these gigantic irrigation works, the Chinese could never have carried to such a pitch perfection one of their most important industries. I speak of pisciculture. Thanks to the abundance of water, the whole of my countrymen, instead of contenting themselves with covering with their fishing boats the seas, rivers, and lakes of our country, have devoted themselves to the breeding of fish. The spawn is every where carefully collected; far from leaving it to take its chance, the peasants give this source

of wealth a safe shelter in some spot where a perennial supply of water can be assured. The irrigation reservoirs teem with fish. During winter, the rice fields are fallow ; the water is led into them, and they are instantly full of carp. The industry allows us to make fish a considerable factor in the food of our people. The fish are either eaten fresh, or salted, and dried ; they are despatched to all parts of the Empire and sold at a price which is remunerative, though it is exceedingly cheap."

Agencies for agricultural work in rural areas.

Having attempted to indicate the lines on which the agricultural resources of the country could be developed, it remains to discuss the agencies through which progress in those directions can be achieved. It is obvious that the increase of knowledge and the application of money are the two requisites which, above all others, would be necessary to inaugurate a new era in the agricultural development of India ; and for both, the people will look upon Government for a lead. It is not necessary to cite the examples of European countries like Holland or Germany, or of Japan or even of Egypt to show how the efforts of an enlightened and far-sighted Government can succeed in developing the agricultural resources of a country. It may be taken for granted that the Indian Government is fully alive to its all-important responsibilities in this direction. But the problem is vast and the resources of the Government limited ; while the calls on it are manifold and those regarding the safety of the country so exacting that not enough is left for dealing adequately with the paramount needs regarding the moral and material prosperity of the people. Fortunately, at the present moment both the Government and the people realise that in dealing with agriculture we are face to face with the one stable foundation of the prosperity of the vast masses of the people and of the revenue resources of the country. What is needed, therefore, is not so much to expatiate on the paramount duty of the State to develop the agricultural resources of the country as to indicate how best in practice the available resources of the Government can be directed towards that object. I may, however, be permitted to make a few general observations on this point. It is worthwhile

remembering that any forward movement for a radical improvement of the material condition of the people must be organic and all-sided, and if agriculture is to be developed, we must simultaneously provide for the improvement of health and education of the people. Having regard again to the vastness of the problem any scheme of financial assistance to the people for agricultural purposes is bound to prove wholly inadequate, unless it succeeds in evoking a spirit of responsive self-help amongst the people themselves. Lastly, though the application of science to agriculture is essential and the energies of the Agricultural Department must be constantly devoted to keeping Indian agriculture abreast of the theory and practice of other progressive countries, yet it is obvious that mere knowledge without application will be barren of any fruitful results, and the most important task before the Agricultural Department of Government is to ensure that the agriculturists utilize and make practical use of the knowledge which it has already made available.

As far as this Province is concerned, I think it has to be admitted that the general feeling is that this department is not in as close touch with the people as might be desired. There is also a consensus of opinion that the funds placed at the disposal of this department are wholly insufficient to achieve any substantial results. It may be that want of sufficient funds is the principal cause of the want of close touch between the department and the people. What is needed more than anything else is that the department should be guided by a policy which will have for its main object close co-operation with people for whose benefit the department exists, and a sufficient staff to enable the department to get in close touch with the people. Under a strange delusion of short-sighted economy the Retrenchment Committee recommended the curtailment of the staff of this department, and as a result some districts have actually been deprived of their district agricultural officer, and some reductions were also made in the cadre of demonstrators and other subordinate officers. That the department is fully alive to the primary need of close co-operation with the people will be seen from the recent circular of the Director, Nos. 10493-95 of June 1895, laying down the duties of District Agricultural Officers. The two main ideas underlying this circular are :

- (1) That the agricultural officers must study the feelings, outlook and need of the people, and try to bring them into direct touch with the activities of the department.
- (2) That the agricultural officers must act in close co-operation with the District Officer and his subordinates and with the officers of other special departments, specially the Co-operative Department.

I may be permitted in this connection to point out that the instructions now issued by the department have been repeatedly recommended by me as District Officer for many years past, and as long ago as 1917 at a conference held at Rangpur in August of that year at which both Mr. Milligan, the Director of Agriculture, and Mr. Mackenna, the then Agricultural Advisor to the Government of India, were present, the following resolution was passed :—

“The progress of agricultural work in Rangpur as outlined in the scheme for Village Improvement in the Rangpur District drawn up by the Collector was discussed. The plan of work as laid down in the scheme was generally approved. The Conference are strongly of opinion that in order to ensure the systematic extension of the work of the Agricultural Department amongst the rural population of a district it is essential to secure the active co-operation of local bodies like Agricultural Associations, District Boards and recognized village organizations like Union Committees and their Panchayets, as has been recommended in the scheme. It will also be most desirable to provide for the co-operation of the officers of the General Administrative Department like Sub-divisional Officers and Circle Officers for agricultural work as outlined in the scheme.”

It will thus be seen that besides Government the agencies primarily concerned are the people themselves, acting collectively by preference, through the agricultural and other co-operative

associations, and the people's representatives on the District Board and the self-governing village institutions, the Union Boards. How it is possible for all these agencies to act in close co-operation for the improvement of agriculture will best be illustrated if I recapitulate the efforts made in this direction in some of the districts where I have served. At Rangpur we were fortunate in having a very keen and active agricultural Association. The Association accumulated a fund of Rs. 4,000 derived from subscriptions and donations supplemented by occasional grants from the District Board and interests from deposits in Banks and Co-operative Societies. The income was spent mainly in purchasing seeds, manures and implements etc. which were supplied at cost price to the cultivators and also in giving rewards to cultivators for successful demonstration and publishing leaflets etc. The agricultural staff proper of the district which consisted of one Superintendent, one District Agricultural Officer and three Demonstrators could not possibly come into close touch with the people or to undertake demonstration work on a large scale. Our first object was to bring about a closer co-operation and co-ordination between these officers of the Agricultural Department and those of the General Administrative Department in improving the condition of the rural population of the district. During the four years four important agricultural conferences were held, at three of which the Director of Agriculture was present and at the last Mr. Mackenna, the Agricultural Advisor to the Government of India, was also present. The agricultural programme for the district and subdivisions were drawn up and discussed at these conferences. The next step was directed towards creating a sufficiently large and cheap local staff to help the few officers of the Agricultural Department to carry on agricultural work amongst the masses of the people. Advantage was taken of the circle system to push on agricultural reforms amongst the rural people through the agency of village organizations and the special supervising officers created by the circle system. A few thanas were selected where the work of seed distribution was carried out almost entirely through President-Panchayets and Union Munshis. The Munshis received a short course of practical training in one of the Agricultural Farms. The District Board also helped forward the agricultural progress of the district in various ways. It appointed one Agricultural

Overseer and three Demonstrators and made substantial grants for the construction of seed stores and for imparting agricultural education. The landed aristocracy of the district, viz., the Maharaja of Cossimbazar, Raja of Tajhat, Rai Annada Mohan Roy Chowdhury each appointed a Demonstrator for propaganda work in his zamindari.

The same policy of intimate co-operation between the departments and the people and their representatives on District Boards and Union Boards was advocated and followed in the districts of the Burdwan Division during 1919-22. In Bankura small agricultural associations were organized under the guidance of its capable and devoted District Officer, Mr. G. S. Dutt, and such associations multiplied all over the district.

In the Presidency Division too considerable activities in matters agricultural are in evidence since 1925. As has been already stated the District Board of Alipore sanctioned a handsome grant for the establishment of seed stores and manure depots. The example of Alipore was followed by other District Boards according to their means.

Each district has a District Agricultural Association at its headquarters which is doing useful work. And perhaps the most extensive rural agricultural association has just been started at Chuadanga in the Nadia district with 4,000 bonafide agriculturists as members. In the same sub-division efforts are being made to establish Jute Sale Societies at Alamdanga.

The influence of Farms.

Before I close this section on the agencies necessary for agricultural progress, mention must be made of the powerful influence of well-managed and well-equipped farms. Hitherto the way has been shown chiefly by Government farms. Farms help to stimulate agricultural activity in many ways. Firstly, we can demonstrate the value of new methods in increasing the outturn of crops and also how new crops can be grown in the same field after the usual crops have been grown. The second great use of farms is the production and distribution of better varieties of seeds. Lastly, the educative influence of a commercially successful farm

in shewing the way to new fields of enterprise for our young men must be considerable. From the last point of view the recent decision of Government to run a portion of Government farms on commercial lines has no doubt been wise, for to the cultivator as also to the educated young man on the look out for a profitable opening, it is a demonstration of the profit-yielding character of the farm which is likely to make the strongest appeal. It is also very satisfactory to find that enlightened zamindars and educated young men have taken up mixed farming as a vocation. The Maharaja of Cossimbazar with his characteristic enthusiasm for all pioneer work has set apart his Banjatia garden for a farm and during the last year a Demonstrator of the Agricultural Department managed this farm quite successfully. In the same district the Kumar of Nashipur runs a farm on business lines, and the Chaudhury zamindars of Nimtita also own a very successful farm. Steps are being taken to start a farm at Chuadanga by the central co-operative and agricultural associations, and the result of this enterprise should be watched with great interest, for should existing co-operative associations actively take up agriculture as a part of their business a most powerful ally for the development of the agricultural resources of the district will be secured. The District Agricultural Association of Khulna has recently started a farm, and a scheme for the establishment of a mixed dairy farm in Ranaghat is well advanced.

Amongst private farms one of the most successful farms in the Province from a commercial point of view is the Nadiha farm in the Burdwan district belonging to Babu Aghore Nath Mukherji and his brothers. The Mukherji brothers work the farm themselves and no expert managers are employed, although they get advice and other assistance from the Agricultural department. There are about 800 bighas of land in 3 villages, but the main farm consists of about 500 bighas only. In the year 1920 when I visited the farm with the then Member-in-charge, Hon. Mr. J. G. Cumming, we were told that the average annual income of the farm was Rs. 50,000. Even according to the note of the Deputy Director which I have before me, the average annual income of this farm is Rs. 30,000. Plenty of manures, chiefly cow-dung and oil-cakes, are used. Well-irrigation and tank-irrigation are resorted to. The outturn of paddy per bigha is reported to be 12 mds.

yielding a profit of Rs. 20 per bigha. For sugarcane a bigha yields 24 mds. of *gur* and leaves a profit of Rs. 125, while potato yields 60 mds. per bigha with a profit of Rs. 90 per bigha. Departmental sugarcane, paddy and wheat seeds are used, and rotation of crops is also observed. There are no motor tractors, and ploughing is done with ordinary ploughs. There are 47 pairs of bullocks and a number of milch cows are kept. The cattle looked healthy and well looked after. The crops which were on the ground, particularly the sugar-cane and wheat, were the best specimens I had seen anywhere, and altogether the farm presented a look of general prosperity and efficient supervision. Even accepting the figures of the Agricultural Department if a farm of 600 to 700 bighas yields an income of Rs. 30,000 a year, this ought to set a powerful example for others to take to agriculture as a suitable and profitable vocation in life. But the most up-to-date private farm in the Province is undoubtedly the one at Ranaghat belonging to Rai Bahadur K. B. Mullick and his brothers. The Rai Bahadur owns two separate farms close to each other and the smaller farm which is now taken up with sugar cane cultivation is the one which I visited. The Rai Bahadur is ahead of the Government farms in his methods of cultivation and the manufacture of country sugar or *gur*. A motor tractor is used for ploughing. Irrigation is done by tube-wells. The Rai Bahadur's son and nephew both are practical engineers and are in charge of the machinery and appliances. Coimbatore canes are being grown and the method of extraction is by machinery and the manufacture of *gur* is by Hadi method. An assistant who has been trained by Hadi himself is in charge. The Rai Bahadur informed me that he gets about 25 p.c. more *gur* by Hadi method than what he used to do by the use of country ovens and pans, and the *gur* also is much clearer and of better quality with the result that he gets 2 rupees per maund extra for his *gur* than the ordinary producer. From only 200 bighas of land the Rai Bahadur expects an annual income of Rs. 500. That he is in earnest and intends to do his best to make his farm a success is clear from the fact that he has got both his son and nephew both well-educated young men to work with him. He most thoroughly deserves success and every encouragement and assistance from Government.

Conclusion.

On the eve of the recommendations of the important Royal Commission which is now engaged in examining the possibilities of agricultural development in India, it might seem an act of temerity to offer any suggestions with regard to the agricultural improvement of Bengal. There are, however, some considerations in connection with the agricultural industry of the province so axiomatic, and the paths of possible progress so obvious, though so sadly neglected, that there seem to be ample justification for even non-expert speculation.

Agricultural progress like advance in other directions in India is very much a question of finance. It will be readily conceded that given more money even with the knowledge of agricultural methods which have been already made available it would be possible to greatly increase the produce of the agricultural industry. The most important service which the Royal Commission can render to the cause of agriculture in India would be to emphasize the total inadequacy of the funds which are now allotted by Government for this all-important work and the urgent need for an immediate change of policy in this direction—so that far larger allotments are made in future for agricultural work in the different provinces.

A survey of the agricultural needs of the country which we have just completed leads us to the conclusion that the extension of irrigation facilities is what is most urgently needed and likely to have the most immediate effect in increasing the agricultural wealth of the country. With the knowledge of agricultural methods and tillage, which our agriculturists already possess, and the soil and the seed which are available, the cultivator can count upon a fair harvest sufficient to meet his present requirements. But unfortunately on account of the complete dependence of agriculture on rainfall and the frequent insufficiency or unseasonableness of the rainfall a normal harvest is gathered only in two out of three successive years, and the average yield of the fields is only about 10 annas. If by the extension of irrigation facilities and drainage works suitable moisture could be assured we could count upon at least 25 per cent. increase in the agricultural wealth of the country. Besides, extension of irrigation facilities is almost

the only practical means by which the area under cultivation can be appreciably increased. The extension of the irrigation facilities of the country should, therefore, have the first call on the available resources of the Government and the people. The splitting up of the present department of irrigation and the establishment of a department of irrigation proper separate from the department of water communication is strongly recommended.

The Agricultural Department have now succeeded in demonstrating the value of certain class of seeds of our principal crops. The value of different kinds of manures and fertilizers are also known. What is necessary now is to make the use of better seeds and sufficient manure universal amongst our agriculturists. We must strain all our available resources towards this object. I have referred to the schemes for advancing manure and seeds to the agriculturists through co-operative societies and the Agricultural Department. I have also recommended the establishment of Union Board farms and Union depots for seeds, manure and implements. I have also suggested the utilization of village and Union farms for imparting practical agricultural instruction to agriculturists and their children. Much useful work in this direction can be done in my opinion if the newly established self-governing village institutions known as Union Boards are utilized for agricultural work in the villages comprised in the Union, and a liberal policy of decentralization is adopted by the Agricultural Department, so that instead of concentrating attention on central farms and laboratories more attention is paid to village work, and much larger number of village demonstrators and outdoor agricultural officers are appointed. A definite policy will, however, have to be laid down by Government for the guidance alike of District Officers and the officers of the Agricultural Department for the utilization of village organizations under the combined supervision of the officers of the general and such special departments of Government as Agriculture and Co-operation.

Thirdly, special attention should be paid to the improvement both of the quality and the number of the cattle employed in the agricultural industry. The breeding and rearing of cattle and poultry and dairy farming should be taken up as a part of the agricultural industry as is done in all the progressive agricultural countries of the world, and there should be a special branch of the

Agricultural Department for developing this side of the agricultural industry. The State should set the example to zamindars and well-to-do agriculturists by establishing on commercial lines mixed farms for live-stock breeding and dairy produce. Special efforts should be directed to establishing State-aided co-operative dairies and cattle-breeding farms on the model of the Danish Co-operative farms.

May I be permitted to indulge in a parting speculation as to the minimum amount of State aid which the above recommendations would require and justify. As has been stated before, the total number of people supported by agriculture in Bengal was found at the last census of 1921 to be 40,543,580. It is at least 5 per cent. more at the present date. For all that is necessary to be done to improve agriculture could we possibly do with less than just 3 annas of State aid per head of the agricultural population, or a total annual expenditure of a crore of rupees? Looking at the problem from another point of view we find there are 85 subdivisions of the districts in this province roughly with an average area of 900 square miles each and a population of $5\frac{1}{2}$ lakhs. Are we likely to create any substantial impression in the improvement of agriculture of this vast area and this teeming population if we provide less than just over one lakh a year for each subdivision? And will it be too much for Bengal to expect the expenditure of 1 30th of her normal revenue of 30 crores, at least for 10 or 15 years, for the initiation of measures which, as far as the lessons of science and the experience of other countries can help us to make a prediction, will make the province travel in one generation as far forward in the path of true progress as she has hitherto done since the beginning of the British rule in India? If, however, the exigencies of the public administration, Imperial and Provincial, will not permit of expenditure on such a scale for agricultural improvement from the ordinary income of the province, I think one can boldly say here at least is as strong a case as can be imagined for the scheme to be financed by a loan to be raised on the credit of the resources of the province.

CHAPTER VIII.

INDUSTRIAL DEVELOPMENT.

I.

The need for Industrial advancement.

We will now pass to the consideration of what is unquestionably one of the most important problems with regard to the welfare and happiness of the people, the question of the economic and industrial development of the country. Modern civilization is based on modern industry, and the poverty of India is admittedly the greatest drawback in the path of her progress. A more advanced and progressive system of administration, the spread of education and civilizing influence amongst the people, the successful campaign against disease and insanitation, all depend upon the industrial development of the country and the increase of her financial resources. Fortunately, the attention of all classes, and above all others of Government, has been forcibly drawn within recent years to this important subject and the moment would also seem to be opportune for the advance of industrial enterprise in India.

In the previous chapter we have dwelt upon the importance of the agricultural industry in the economic scheme of India as it is today. The importance of the manufacturing industries will be apparent if we try to visualize the economic scheme of India as it should be. For, undoubtedly the root cause of the poverty of India is the want of a natural adjustment between the agricultural and industrial occupations, and the almost entire dependence of the vast majority of the people on a comparatively inefficient and primitive form of agriculture. At the last census it was found that fully 73 per cent. of the people were dependent on agriculture, whereas only 10 per cent. of the people pursued industrial avocations and 5 per cent. were engaged in trade. This unfortunate position appears to be gaining ground every day and we find that the proportion to the total population depending on agriculture rose from 61 per cent. in 1891 to 66 per

cent. in 1901, to 71 per cent. in 1911 to 73 per cent. in 1921. The cultivated area, however, has not been able to keep pace with the growth of the population depending on agriculture for their subsistence. From available statistics it would appear that during the year 1901-02 there were 1.78 acres under cultivation per unit of population supported, while in 1911-12 the average per unit was reduced to 1.24. About 20 years ago Sir Thomas Holderness calculated that subtracting the land utilized for supplying foreign markets from the total area under cultivation, India feeds and to some extent clothes its population from what $\frac{2}{3}$ rds. of an acre per head can produce. There is evidence to show that the pressure on land has still further increased since 1911. There is no country in the world where the demand on land is so exacting. In Europe a population with an average density of 250 to the square mile is supported chiefly by industries and manufactures, and to a small extent by agriculture. Agricultural Bengal supports on an average 578 to every square mile of the total area, which is greater than the population supported in countries where both agriculture and industries are well developed, *e.g.* Great Britain with an average of 450 to the square mile, Germany which has an average of 311, and France where the average is 189 only. The result is that taking the population of the country as a whole, India is one of the poorest countries in the world, and the average income per head of population is extremely low compared with the standard of modern western countries and even of such advanced Asiatic nations as Japan. Various estimates have from time to time been made of the average income of the Indian people per head of the population ranging from Rs. 30. to Rs. 100 per month, which is less than one-twentieth of the corresponding average for the United Kingdom and one-thirtieth for that of the United States. Sufficiently reliable figures are however not available for making a correct estimate for the different parts of India. But whatever the exact figures of income and expenditure may be, it is certain that for the majority of the people the satisfaction of the most elementary physical wants exhausts the bulk of the income, leaving hardly any margin for saving, for health, education and recreation, while in the case of the poorer classes there are many who have to be satisfied with only one meal in the day. This low level of

income is due chiefly to the low productive capacity of the people in the country. Sir Visvesvaraya has calculated that the production per head for India is only about Rs. 40, whereas the per capita production in the United States and Canada is £29 under agriculture and £46 and £72 under Industries, respectively. The extremely low wealth producing capacity of the Indian people is undoubtedly due, as we have just said, to the dependence of the people mainly on practically one somewhat archaic and under the present conditions extremely precarious industry. The problem of problems in modern India is, therefore, how to multiply occupations and provide suitable employment to the mass of the people and thus increase their earning capacity and the wealth of the country.

In the previous chapter we have said that perhaps the speediest way of increasing the wealth of the country would be to increase the efficiency of the agricultural industry both in intensive and extensive directions. But we have also seen that the development of the village industries has become a pressing need to provide occupation for those who have no employment at present, and also for a subsidiary occupation for those engaged in the agricultural industry to be taken up during their leisure hours and in seasons when they have no work in their fields. In most areas also land has reached the margin of productivity, and comparatively more capital will be required if existing waste lands have to be brought under cultivation. Even as early as 1880 the Famine Commission of that year found that the numbers depending on agriculture were far in excess of that needed for its thorough cultivation. The great desideratum for rural welfare would, therefore, be to relieve the ever increasing burden on agriculture by providing industrial avocations to the people either in their own cottages or in factories and mills. From a broader economic and national point of view also the exploitation of the vast mineral and agricultural resources of the country by the children of the soil for the manufacture of finished commodities would seem to be an urgent necessity. Not only are the profits of the manufacturing industries comparatively higher than that of the agricultural industry, but India is a double loser under existing conditions. She has to export raw materials which are manufactured abroad and then sent back to India for consumption in the country.

If these goods could be manufactured in India, she would retain all the profits to be derived from the manufacturing of the articles and would also give employment to those who are employed both in the manufacturing of the articles and its transport backwards and forwards to India. It is not likely, therefore, that the school of economists who hold that India should confine her attention solely to agriculture and not enter into competition with the manufacturing countries which are already in the possession of the markets of the world will have many followers in India. No true lover of India would like to see her agricultural industry neglected, but it would be purely arcadian sentiment to preach that India should not pass beyond the agricultural stage.

Unanimity of opinion regarding Industrial progress.

It is not necessary in this brochure to recount the history of the Indian agitation for the industrial emancipation of India or to show how Indian economists of the last half century like Ranade, Naroji and Dutt dwelt "upon the formidable though unfelt domination which the capital, skill and enterprise of one country exercise upon the trade and manufacture of another, and how such a domination has an insidious influence which paralyses the springs of all the various activities which together make up the life of a nation" (Ranade's *Essays on Indian Economics*). The example of Japan which in one generation transformed herself from an agricultural country into one of the foremost manufacturing countries of the world also exercised a powerful influence in whetting Indian national and patriotic sentiments to place Indian Industrial emancipation in the forefront of its political propaganda. But the economic and even the political need of multiplying occupations for the people and making India as far as possible an industrially self-contained entity, has been amply borne out by all Government Commissions and enquiries from the time of the Famine Commission of 1880 which so strongly recommended "the development of industries other than agriculture and independent of the fluctuations of the seasons and as a complete remedy for the insecure and precarious economic condition of the country". A forward policy of industrial advance for India could

not be more ably urged than in the words of the Montagu-Chelmsford report: "On all grounds a forward policy in industrial development is urgently called for ; not merely to give India economic stability but in order to satisfy the aspirations of her people who desire to see her stand before the world as a well-poised up-to-date country ; in order to provide an outlet for the energies of her young men who are otherwise drawn exclusively to Government service or to a few overstocked professions ; in order that money now lying unproductive may be applied to the benefit of the whole community ; and in order that the too speculative and literary tendencies of Indian thought may be bent to more practical ends, and the people may be better qualified to shoulder the new responsibilities which the new constitution will lay upon them."

Conditions for Industrial Progress.

The success of a forward policy of industrial development in India will obviously depend on various conditions. The principal of these would perhaps be :

- (1) A liberal policy of State assistance for indigenous industrial enterprise and for providing facilities for technical and commercial education.
- (2) World conditions permitting of a quick development of indigenous industrial enterprise in India.
- (3) The existence of sufficient capital, raw materials, and suitable machinery and appliances.
- (4) Capacity of the Indians for industrial enterprise.

It would be obviously beyond the scope of this brochure to attempt at anything like a comprehensive and adequate treatment of the above considerations, but it may be stated generally that conditions seem to be specially favourable at the present moment for a rapid industrial advance in India. There cannot be any doubt regarding the intention of Government in this matter. Since the appointment of the Royal Commission of Industries in 1916 a progressive policy both for helping individual industrial enterprise and providing technical and industrial education of the Indians has been more and more in evidence. Perhaps the exigencies of public finance and the demands made on the exche-

quer by the inauguration of the expensive scheme of administration required for the Reforms has not left sufficient revenue to be employed in the cause of industrial development, and as a result few noteworthy achievements either educative or pioneering have yet been made. The repeal of the cotton excise duties, the grant of State subsidy to the Tata Iron and Steel Works, the stricter enforcement of the orders regarding preference for indigenous products for the supply of Indian stores and such other measures have, however, given ample proof of the earnestness of Government in this direction. The many technological institutions which have been planned for different parts of India and some of which are already functioning, including the Dhanbad Mining School and the Calcutta Technical Institute which were opened last year, bear testimony to the desire of Government to provide for Indians facilities for every form of engineering and technical instruction in their own country. The present Viceroy while so forcibly insisting on the importance of the agricultural industry in any scheme of the economic regeneration of India has also given public expression to his desire "to further all practical schemes for the development of the industrial resources of the country for completing the whole chain of manufacture from the sowing of the seed to the last touch of the finishing machine and thus secure for Indian hands the full reward of productive enterprise." The world conditions are also favourable for India. The Great War has greatly crippled the resources of the Central European powers and Germany is no longer the same overshadowing menace to the industrial progress of Asia. Even Japan has gone through national calamities of unprecedented magnitude which have temporarily crippled her. France is in the throes of acute financial depression. The present, therefore, seems to be a psychological moment for rapid industrial progress and the establishment of important industries in India. Fortunately, the political outlook of India has also greatly improved, and thanks to the succession of favourable monsoons, the revenues of India are now on the ascending curve and there have been two successive surplus budgets during the last two years.

As regards the agricultural and mineral resources of India it is hardly necessary to point out that there is perhaps no other country in the world so richly favoured by nature. Her agricul-

tural resources are almost limitless and her mineral resources are no less rich and varied. Coal, rich deposits of iron ore, manganese, lead, zinc, tin, copper, mica, and other minerals and oils are to be found in large quantities in different parts of India and Burma.

Lastly, only a word about the capacity of Indians for the modern forms of industrial enterprise. Pandit Madan Mohan Malavya in his able note of dissent published in the report of the Industries Commission has been at great pains to show the world-wide reputation which the Indian handicrafts and art products enjoyed in the ancient and medieval world, and how Indian merchandise had penetrated into Egypt, Rome, Greece, Babylon and Persia and into Venice and other Italian markets later on, and how even at the time of the East India Company there was a brisk trade with all the flourishing markets of Western Europe. A point of special interest for Bengal is that although in the race of industrial regeneration the Bengalee is lagging far behind his compatriots in Bombay and other parts of India, yet the fame of the workers of deltaic Bengal, specially of the famous muslin producers of Dacca, was an outstanding feature of the commercial ascendancy of ancient India. As to the capacity of the Indians to adapt themselves to the methods and technique of modern industry, I do not think that there is any reason for any excessive pessimism. It cannot of course be denied that Indians are woefully deficient in technical training in all branches of industrial enterprise and even Indian concerns have at present to be managed by foreign engineers, entrepreneurs and managers - English, Scotch and American. But it is equally true that this is not due so much to any lack of capacity as to the lamentable lack of opportunity. Given favourable opportunity the Indian, I think, will do justice to any position of responsibility to which he may be called. I do not think, for instance, that in the highest spheres of business management Sir R. N. Mookerji has any reason to shrink from a comparison with the head of any other large industrial firm in India. Not to speak of the success of Parsi and Hindu enterprise in Bombay, even in Bengal there is ample evidence of the capacity of Indians in every field of industrial enterprise. Lately I visited the Hukumchand Jute Mills in Haliashahar and was greatly impressed with the business capacity of its Managing Director, the late Rai Bahadur Bhattar. When I visited the Tata Works at Jamsedpur,

the largest industrial enterprise in India and one of the largest in the world, I was agreeably surprised and not a bit elated to find that at least three of the most important departments, the electrical, the sheet metal and the coke ovens, were in charge of Bengalee Engineers. Since my visit, my friend Mr. D. N. Gupta of the Tata Coke Ovens, has been appointed by the Behar Government to be the Director of Industries of the Province. Descending to the actual workshop I was struck to find that in one of the most advanced workshops in Bengal, the Angus Engineering Works, Bengalee *mistries* were practically doing all the difficult work under the almost nominal supervision of Europeans. Mr. Stewart, the Engineer-in-charge of the Works, remarked to me that there were only two classes of people, who really excel in moulding, the most difficult job in the workshop, and they were Scotchmen and Bengalees. It is of course true that most of the hands working in the workshop have been trained there, but that only proves that given the opportunity they are as quick and capable and possess the same finesse of touch and workmanship as the best workmen in the world. The same fact was demonstrated to me when I visited the Government Factory at Ichapur, where I found the most difficult processes connected with the manufacture of rifles, inclusive of gauging and testing placed in the hands of Bengalee workers, and Major Len Festie, the Officer-in-charge, was loud in the praise of the Bengalee artisans' intelligence and capacity. The above observations do not imply that there is no need for any further education of the Indian entrepreneurs and workmen. On the contrary, my point is that there is suitable material available and it is the duty of the State to provide facilities for training and instruction not only in educational and technical institutions, but in workshops both of the State and of all private firms who are in any way directly or indirectly beholden to the State for patronage and assistance.

Special need for Industrial awakening in Bengal.

Before leaving this portion of the subject I propose to quote from my address to the students of the Hooghly College delivered in 1920 on the urgent need for the diversion of Bengali

brains to the exploiting of the industrial resources of the country having regard particularly to the disappointing backwardness of Bengal in this respect :

"During the war the vast potentialities of the industrial resources of the country have only just come into view. In the meanwhile the dislocation of the industrial organization of the Central European powers has created an opening of which full advantage has been taken by Japanese and American enterprise. But it is difficult to believe that these countries will be able to maintain indefinitely the initial advantage they have gained. There is no reason why industrially awakened India under State direction and with State support should not only supply her own markets but win for herself an important place in the markets of the world. She is ideally situated for being the emporium for the supply of the requirements of the whole of the South-Eastern British Empire. In fact, if you study the figures of the industrial advance of India during the war, the rapid growth of her imports and exports, not only of raw materials but of manufactured articles, and take into consideration the new manufacturing industries which have been recently started in the country, there should be just grounds for optimism. But unfortunately from the point of view of ourselves the situation is not one which can be contemplated with equanimity. For, it cannot be denied that the bulk of the industrial advance which has recently been made in Bengal is due to European enterprise, and it is the English, American, Japanese and other firms which have been the first to seize the great opportunities for industrial openings created by the war. Of course, this was only to be expected. Modern Indian industry has been built up, at least in Bengal, mainly by English and foreign enterprise. They have the immense advantage not only of being first in the field, but have already got established connections with the great business houses in England and other commercial countries. They have experience and knowledge, they have the credit of Banks and joint-stock capital at their command. But there is no reason for any poignant disappointment for this. The new industries, however, started, cannot fail to afford so many models at our doors for our education and emulation. The resources of the country too are so vast that there is no ground for any apprehension that the spoliation of her resources by European enterprise will not leave enough

for the children of the soil. For the raw materials of industry, such as jute, cotton etc. are chiefly agricultural and they can be reproduced as quickly as they are consumed. It is true, however, that as regards mineral industries the case is somewhat different, because mineral wealth once exploited can never be replaced, and it must be a matter of serious concern to Government to hold the scale even between the claims of European and foreign enterprise and the future needs of the people of whose interests they are the trustees. But there is no reason to anticipate that the difficulty will not be satisfactorily solved, specially as the new Department of Industry will be directly under popular control. A more depressing feature of the situation, however, is that while in spite of many difficulties indigenous enterprise is showing marked activity in other parts of India, the achievements of Bengal in this sphere of national regeneration have up to now been insignificant and somewhat disappointing. It may of course be pointed out that for over a century our training has been more or less literary and our habits sedentary, and the adoption of the Permanent Settlement of the land offered an opening for the safe investment of capital which has served to destroy all ambition for industrial enterprise. The result has been that in Bengal at the present moment such sections of the community who do not produce any wealth are financially the best off, namely the money-lenders and the lawyers. Fortunately, however, even in Bengal, there is a wave of industrial enthusiasm passing over the country and highly successful pioneers of Industry are not altogether absent. The examples of the careers of such men as Sir R. N. Mookerjee and others cannot fail to stimulate your imagination and influence your decision in selecting your future careers in life.

I cannot more fittingly close this section of my address than by referring to the noble efforts of our patriotic and eminent scientist, Sir P. C. Roy, to awaken in the minds of young men a true sense of our present day national requirements and to show them the way by which they can secure both an honourable career and serve the best interests of the country. I have myself listened to a lecture of my revered friend in which he ruthlessly exposed the fatuity of guardians in driving their children to the beaten folds of University careers, which ends so often in loss of health

and energy and failure in actual life. The present blind rush of the entire youth of the country for university degrees and for the learned professions, Sir Profulla Chandra pointed out, if pursued much longer, will leave the European, the Parsi and the Marwari masters of all the industrial and commercial openings, whereas the Bengalee in his own home will have to be satisfied with a mere pittance as a clerk or book-keeper in the counting house of a successful merchant who may perhaps be ignorant of all book learning. He also exposed the fallacy of imagining that for industrial careers large capitals are indispensable. You must know some of our most successful business men like Sir R. N. Mookerjee began life with practically no capital, and certainly with no passports granted by the University. I came across a Gujrati gentleman at Cairo who had left home with Rs. 50/- in his pocket and in less than 5 years he had shops of his own at Cairo, Alexandria and Port Said and was paying over £700/- a month to his shop assistants alone. I was also told that several Bengali young men who started shops in Mesopotamia during the war are doing quite well. It is the spirit of adventure and self-reliance and a firm determination to carve out a career for oneself which you want. Nor did the Professor discourage learning and the acquisition of true knowledge, but he was pitiless in his exposure of the methods of the present system of University education which according to him crushes out all manliness and independence of thought and action. The views of the Professor are supported by the weighty and considered findings of the University Commission and I would exhort you to pay serious heed to the advice of one of the greatest and most devoted educationists that India has produced."

Fortunately since I spoke, owing to a variety of causes amongst which the educative influence of foreign industrial enterprise in this country and the gradual contraction of the openings in the professions have been the most prominent, have within recent years greatly intensified the growing desire of the Bengalee youths for industrial avocations. This is evidenced by the fact that whereas 15 years ago the majority of young men who went to England had learned professions as their goal—the majority now go to qualify for industry and commerce either as engineers, chartered accountants or for commercial training. It is to be devoutly hoped that there will be some opening for these enterprising young men or

rather they will be able to carve out suitable openings for themselves.

II

Sub-division of Industries.

For the purposes of dealing with the question of the possibility of revival and establishment of industries I think we may for convenience of treatment divide them into the following groups:—

- (1) Hand industries—in which mechanical power is not used and pursued generally by artisans and their families in their own home and in a few instances by groups of artisans organized in small factories, also known as cottage industries. These are mostly old Indian industries.
- (2) Small power-industries requiring moderate capital, *e.g.* small mills for crushing oil, cleaning rice, aluminium ware, and for the manufacture of sugar, spinning and weaving cotton etc., which are being gradually introduced into the country.
- (3) Large power-industries requiring large capital financed generally by joint stock enterprise.

LARGE INDUSTRIES.

Recommendations of Industries Commission.

As regards the larger industries they only indirectly affect the scope of our investigations. In any case, I think I am hardly qualified to make any useful suggestions about them. Neither am I quite sure that there is as much scope for outside influences in these enterprises as in the case of the smaller and cottage industries.

Regarding the whole industrial position of India the Industries Commission of 1916 found "India is a country rich in raw materials and in industrial possibilities but poor in manufacturing accomplishment. The deficiencies in her industrial system are such as to render her liable to foreign penetration in time of peace and to serious dangers in time of war. Her labour is inefficient, but for this reason capable of vast improvement. She relies almost entirely on foreign sources for foremen and supervisors and her intelligentsia have yet to develop a right tradition of industrialism. Her stores of money lie inert and idle. The necessity for securing the economic safety of the country and the inability of the people to secure it without co-operation and stimulation of Government impose, therefore, on Government a policy of energetic intervention in industrial affairs ; and to discharge the multifarious activities which this policy demands Government must be provided with a suitable industrial equipment in the form of imperial and provincial departments of industries." The Commission assigned three causes for the inefficiency of Indian labour, viz., the absence of education, the prevailing low standard of comfort, and the effects of preventable disease. Besides advocating universal primary education in the case of organized industries, mechanical engineering being taken as typical instance, they advocated a system of organized apprenticeship for a period of 4 or 5 years with a practical training in the workshops and theoretical instruction in attached teaching institutions. Special proposals are made for commercial and mining education ; and the future establishment of two imperial colleges is adumbrated—one for the highest grade of engineering and the other for metallurgy. To ensure the maintenance of close relations between the training institutions and the world of industry, the general control of technical education is recommended to be transferred to the department of Industries. The Commission also considered various methods by which Government might render technical aid to industries, but expressed the opinion that ordinarily Government should itself undertake manufacturing operations only for the production of lethal munitions. The Commission also favoured the establishment of an industrial Bank or Banks. As an interim measure, they recommended financial assistance to middle-class industrialists by Banks opening cash credits in favour of

applicants to be approved by the Department of Industries on the guarantee of Government.

It is noteworthy that the recommendations of the Industries Commission did not quite meet with the approval of advanced Indian public opinion. Pandit Madan Mohan Malavya recorded a note of dissent. Sir M. Visvesvaraya thinks that "the recommendations were conceived on wrong lines and that the people require help and backing and not control and direction." In his well-known work "Reconstructing India" the same author points to the following ways in which the Government of India can render direct help :

- (1) Protection of any newly started industry for a term of six years, or till the industry is firmly established by imposing tariffs on imported goods.
- (2) Inducing Indian, British and foreign firms to start industries, particularly machinery and chemical industries, by levying tariffs on imports as was done in Japan.
- (3) Pioneering large and difficult industries, including the manufacture of railway materials and ship-building, and also pioneering key industries.
- (4) Granting premiums, subsidies and subventions and guaranteeing dividends to individuals or indigenous companies who show enterprise in starting a new industry.
- (5) Providing the services of experts free, or at special low rates, or granting subsidies for the purpose.
- (6) Affording special railway facilities.
- (7) Taking an industrial census periodically as required and publishing statistics.

In most successful countries the scientific use of tariffs has been a most powerful factor in building up modern industries.

The Provincial Governments may make a start by pioneering some of the larger industries like ship-building, machinery, engines, motor transport, chemicals, paper etc. and also some of the many key industries needed with the object of making them a success

and subsequently transferring them to the people. There are few technical secrets that are not readily available or that cannot be secured by the expenditure of money.

For the rapid growth of industries it is first necessary to create an atmosphere of business confidence and a continuity of policy and operations. The development work should be under the advice and control of the leaders of the people closely interested in the work, and represented by an Advisory Council and Board. Government should definitely announce the policy of support and encouragement of industries which should be ensured by law as in Japan."

Results of the Commission's Work.

The above observations and recommendations appear to be comprehensive enough and no doubt the new Industries Department of the Government of India which has now been in charge of an Indian Member for some years past is giving careful attention to the present day needs of industrial enterprise of the country. The vigilance and attention of the foremost leaders of Indian opinion in the Imperial Council are also being steadfastly directed to all industrial, commercial, tariff and currency questions and the suspension and repeal of the cotton excise duties, the creation of the Tariff Board and the protection afforded to deserving Indian industries demonstrate the increasing weight of Indian public opinion in shaping the industrial policy of the country. As far as this province is concerned, we have to gratefully acknowledge that the Provincial Department of Industry is the outcome of the recommendations of the Industries Commission. Being a part of the Transferred Department of Government it is under the charge of an Indian Minister. The very interesting report of the work of the Department which is now under the Directorship of one of the most capable members of the Indian Civil Service is before me and gives an account of the activities of the Department during last year in developing the various nascent Industries of the province. It is frankly admitted, however, that the officers of the Department have neither the time nor the resources to investigate different problems of the larger industries

of the province which according to the Director are more or less well-organised and well-established. There is, therefore, not much to record about the activities of the department with regard to the larger industries of the province. But the education and training of industrialists of all classes is undoubtedly one of the most effectual ways in which the State can help the people, and we may here refer briefly to the facilities that exist in this province for Technical and Industrial training. It is hardly necessary to point out that the industrial and technical institutions of the province are meant to meet the requirements of all classes of industries, the higher grade institutions naturally being occupied with higher instruction.

Industrial and Technical Institutions.

The Bengal Engineering College at Shibpur gives the highest training in Mechanical and Electrical Engineering available in this country. As feeders to this there are at present the following senior Technical Schools.

- (1) Kanchrapara Technical School in connection with the E. B. Railway.
- (2) The Kharagpur Technical school in connection with the B. N. Railway, and
- (3) The Calcutta Technical School in connection with the Calcutta firms.

In 1926 the Kanchrapara Technical School had 59 students and the subjects taught included machine construction and driving heat engine, magnetism and electricity and strength of materials. Two students of the school passed the final examination in Boiler-makers work held by the London City and Guilds examination in Mechanical Engineering. There is not sufficient accommodation in the present building and a new school building is nearing completion, The cost to the Bengal Government for the school in 1926 was Rs. 68, 765. The Calcutta Technical School was opened in February 1926 and absorbed with it the late Calcutta Technical Evening School. The number of students was 241 per month on the average. Provision has been made for each student to attend 10 hours per week.

Some firms allow their apprentices to attend the normal scheme of the school, but for those who do not a special scheme has been provided. It is now possible for a lad to receive a good theoretical training at this school whilst he received practical training under commercial conditions. Thus his education may be continued whilst at the same time he is able to earn money to pay for his education. This system, the Director points out, has provided the back-bone of British Industrial life—a system followed in America, France and other established industrial countries. The organization of the school, it is observed, is sufficiently elastic to enable its methods to expand or change to meet the needs of the future industrial life of the district in which it is placed. The school is maintained almost by Government, some donations are received from firms and a grant-in-aid from the Port Commissioners. It is unfortunate that the Corporation did not see its way to making any contribution to the school.

Besides the above three schools there is the Bengal Technical Institute at Jadabpur, the Technical School at Bolpur and the E. I. Railway School at Lillooah. There is also facility for a limited number of students for instruction and training of the most advanced character in the school attached to the Tata Iron Works at Jamshedpur. For junior technical instruction for giving preliminary training to artisans and technical students who intend to work as *mistries*, contractors or manufacturers or go on as recruits to the senior Technical Schools there are a number of such schools in the different districts and four of these have now been selected and organized as model schools for the rest of Bengal. These are the Barisal, Rangpur, Bogra and Pabna schools. Besides these there are aided schools at Mymensingh, Rajshahi, Comilla, Vishnupur and Burdwan and two new schools are about to be established at Krishnagar and Berhampore.

For instruction in special subjects we have the Calcutta Research Tannery recently converted into the Bengal Tanning Institute and placed on a permanent footing. Schemes of a two years diploma course in tanning and of a boot and shoe making department for the training of the students are now under the consideration of Government. The production of leather goods can be easily taught the demand is very steady and a training

centre in Calcutta is considered to be one of the most important requirements of the Department. As regards weaving we have the Serampore Weaving Institute which gives training to young men in all the branches of weaving and dyeing and aims at making them fit for starting weaving factories of their own or to work as artisans in hand-loom or power-loom factories. There were 81 students in 1926 and the institute continues to do excellent work in familiarizing hand-loom weaving by its net-work of affiliated schools. A most interesting development of the school was the introduction of facilities for the training of women in weaving. An important advance has also been made by the establishment of silk-weaving and dyeing institute at Berhampore for teaching improved processes of silk reeling and dyeing and weaving including power-weaving. The school has been housed in the female ward of the now vacant Mental Hospital building at Berhampore. A staff has been sanctioned and the school will open shortly.

As for mining there are the mining classes in the mining areas controlled by the Mining Advisory Board. There are also mining classes in the Bengal Engineering College, Shibpur, while the new Indian School of Mining at Dhanbad was formally opened by the Viceroy in December last year. The Government of Bengal have decided to make no further admission to the mining classes of the Bengal Engineering College and to close these classes finally. It has also been decided to grant four scholarships for Bengalee students at the new school. For instruction in survey we have the Mainamati Survey School.

Special needs of Bengal

In the opinion of the Director, there are two crying needs of the province with regard to technical and industrial education. The first is the want of a high-grade school for the arts and crafts which will turn out artisans fully trained in wood work, brass work, iron work and leather work in all their branches, commercial and artistic. The present technical schools with carpentry and blacksmithy are mainly engaged in local jobs and repair work and the instruction given at these schools do not go

far enough. On this point I shall have to speak again in dealing with cottage industries. The second want is that of a technological institute in Calcutta, for there is no institution where apprentices or young men desirous of entering technical trades can obtain theoretical instruction in connection therewith. Clearly one of the most obvious and practical methods for promoting industry is to place at the disposal of industrialists young men who have a thorough practical technical knowledge of the industry concerned. For example, there are in Calcutta flour mills, rice mills, oil mills drug manufactories, electro-plating factory etc., all these industries are based on scientific processes of which the theoretical knowledge could be imparted in some central institute. Accordingly the Director has made arrangements to have lectures delivered at the Calcutta Technical school on specialised subjects. It is in this connection, however, that I have a suggestion to make for the consideration of the Director.

Suggestion for a Technological Institute at Asansol.

The provision of a first-grade technological institute which could give instruction in such industries as glass-making, paper-making, soap-making, pottery, fire bricks etc. is so essential for the industrial development of the province that there should obviously be a separate institution for this purpose. I am also of opinion that instead of locating such an institute at Calcutta it might be located in a healthy and purely industrial centre such as Asansol in the Burdwan district. In fact, while I was Commissioner of Burdwan Division a scheme of this nature was investigated by me and some advance was actually made when I had to leave the Division on transfer. Asansol, as is well-known, is the centre of perhaps the largest number of industrial and manufacturing concerns of any part of Bengal, if not in all India. There are as many as 26 industrial and engineering workshops of various kinds and over 200 coal mines within the sub-division. It is also well-known that an industrial school to be really successful must be placed within an industrial area, where there will not only be facilities for practical training of the students, but where there will be reasonable chances of their future employ-

ment if they make good use of their opportunities. The objects of the proposed school were to be two-fold. First of all it was to meet the increased demand of the educated Indian community to find facilities for industrial and practical training for their boys in order to enable Indians to take a larger part in the industrial development of the country, and secondly to supply the increased demand of the industrialists themselves for technically trained Indian youths, whom on general as well as on economic grounds, they would like to employ in larger numbers than at present. As was so forcibly and ably explained by Mr. Nichols, the then Manager of the Bengal Iron Company, at a conference held on the 24th September, 1923, the whole future industrial development of India depended on the training up of Indians to fill up the great gap which now exists between the European employers and leaders of industry, the highly paid European Managers and the Heads of the different Departments whom they have to employ, and the common Indian mechanic. The product of firms in India cannot compete on equal terms with the product of European countries, because of the difficulty of producing articles in India of the same fine quality and the same standard of finish as is attained in foreign firms; and this is mainly due to the fact that the main body of workers in the Indian firms are not skilled to the same extent and have not the same training as the workers in the European firms. From an economic point of view also it will be a great advantage if firms in India could employ a fairly large number of well-trained Indians to discharge the duties for which highly paid Englishmen have now to be employed, for it will then enable these firms to offer Indian goods at a cheaper rate than is possible at present. There is no need to refer at length to the rapidly growing demand on the part of the Indians themselves for securing industrial training and openings in industrial occupations. At Asansol another very important asset, which enquiries demonstrated beyond doubt, is that all the European heads of the different firms would cordially support the proposed institution and will give every facility for instruction of the students in their workshops and will do all they can to provide for their future employment. The school would have been unique of its kind, for although there are several other Government institutions, the proposed Asansol School would have been a local

institution relying chiefly on the support of the people of the Burdwan Division, with such aid from Government and the University as might have been forthcoming. It was proposed that the school should provide instruction in

- (1) Mechanical engineering,
- (2) Electrical engineering,
- (3) Industrial chemistry, with special reference to clay brick making, pottery, paper making and metallurgy.

The course of training was to be for 5 years in which practical training and apprenticeship at the workshop was to alternate with the theoretical training at the school.

I would commend the above scheme to the favourable consideration of the present Director of Industries. Much of the spade work was done by me and at the time there was a good deal of local enthusiasm for the school. Business is dull now. The coal industry is passing through a crisis and the Bengal Iron Co. has also gone through bad times. But business is sure to improve and if a lead is given by Government, I venture to think that a most useful institution for practical and mechanical training could be established at Asansol.

III.

Middle Industries.

As regards the smaller power-industries and other organised industries apart from cottage industries, Government assistance is perhaps needed in the following directions :—

- (1) In giving technical advice and assistance as regards the feasibility and the commercial possibility of the industry.
- (2) In giving technical and expert assistance in procuring suitable machinery and setting up the machinery when received.
- (3) In procuring raw materials on favourable terms necessary for the industry.
- (4) In research work and demonstration to prove the

suitability of better methods and suitability of possible materials.

- (5) In establishing business connection either with Stores Department of Government or overseas firms and outside public.
- (6) And in giving the financial assistance by suitable loans for the purchase of machinery etc.

The recent report of the Industries Department shows that these industries received substantial assistance from the department in all the above directions. For instance, last year technical advice was given to the Ichapore Rifle Factory Co-operative Society Limited for starting an oil mill for extracting oil from mustard seeds. Advice was given to the Techno-chemical Laboratory and Works Limited, Konnagar on the materials with which moulds for casting silver nitrate are made. Similarly, a complete scheme for the starting of a pioneer Button Factory was prepared and supplied to Mr. Mustafi. At the request of the Manager of the Pioneer Factory, Dum Dum a demonstration extending over several days was carried out at the factory on the bleaching of Gangua wood. The firm was satisfied with the result achieved. The bleaching of Gangua wood was worked out in the Tannery Laboratory and was published in 1923 in a departmental bulletin. In June 1926 at the instance of the Collector, Malda demonstration was carried out of an improved process for the manufacture of shellac. This was worked out by an industrial chemist and is described in a bulletin. The Department also helped match factories to secure wood from the Forest Department on favourable terms. Various enquiries regarding commercial possibility of different industries were answered, and although it is not certain that any practical use was made in every case of the information received from the department, yet the information given may have deterred the enquirer from undertaking any rash experiment with its inevitable losses, and 'that is,' very rightly remarks the Director, 'just as useful as supplying information on which sound business may be built up.' The Industrial Engineer helped the Co-operative Industrial Union, Raipore. in the lay out of their tannery, and the tannery has been constructed according to his plans and directions. The Registrar, Co-operative Societies was provided with full information regard-

ing machinery for the manufacture of metal savings boxes. It is reported that few entrepreneurs and pioneers of industry approach the department for help in the erection of power plant and factory machinery, but it is hoped that with greater publicity and propaganda there will be more practical opportunities for the Engineer to help private enterprise in these directions. The Engineer, however, rendered valuable assistance to several firms by bringing them to the notice of the Chief Controller of Stores and the Store purchasing officers of other provinces with a view to having them registered as approved contractors of Government. Lastly, as regards financial help, the draft of the proposed State aid to Industries Bill is still before Government. As all the major provinces of India have already placed legislation of this kind on the statute book and considerable activity has already been shown in making use of the provisions of the Bill, it is eminently desirable that there should be no further delay in placing the Bengal Bill on the statute book also. But it would appear that the main object of the proposed Bill is to assist new and nascent industry or to aid the purchase of machinery on the hire system and not to provide easy banking facility to industrialists. Such assistance was strongly recommended by the Industrial Commission. It is, therefore, to be hoped that before the Bill is passed into law it should be carefully examined with a view to enlarging the scope of its utility, if possible.

IV.

SMALL INDUSTRIES.

Importance and present position of cottage industries.

Turning to present position of hand industries, it is no exaggeration to say that for thousands of years past, India has been the home of such industries and crafts and they enjoyed world-wide reputation both in the ancient and medieval world. In the days of Akbar, Indian silk and cotton goods were exported in large quantities to Persia, Turkey, Syria and Arabia. Even after the advent of the East India Company in the 18th century the

Company carried on a most lucrative business in the famous linens and jewels and embroideries of India. Dyeing, rugmaking, fine embroidery, metal work, damasking of arms, carving, paper making, all flourished on a large scale and maintained a considerable proportion of the population. Through the agency of the Dutch and the English East India Companies, Indian goods became familiar in Amsterdam, London, Paris and other markets. What is perhaps more remarkable than the past excellence of the workmanship of Indian artisans and craftsmen is the wonderful vitality of these industries and the survival of most of these old industries inspite of the unequal struggle they had to face with the manufacturing industries of foreign countries and also of the nascent manufactures of India. The Industries Commission of 1916 came to the conclusion "that cottage industries are a very important feature in the industrial life of India; that they are by no means so primitive as they are usually depicted; that there is no real ground for belief that they are generally in a decadent condition; and that their numbers are still vastly larger than those of the operatives employed in organized industries." They found that between two and three million handlooms are at work in India and their annual gross earnings must amount to something like fifty crores of rupees. It was calculated in 1921 that the average estimated production from handlooms for the 5 years ending in 1920 was 978·7 million yards, the total annual cloth consumption of India being 3,803·7 million yards. Recent figures quoted by the Director of Industries show that out of a total Indian consumption of 4,700 million yards the handlooms supply 1,200 million yards. It would thus appear that over 25 per cent. of the demand is met from handlooms. According to Mr. Ewbank, who made a special enquiry into this subject, out of 17 millions actually employed in industries in India, only 8,23,000 were employed in power mills, leaving over 16 millions occupied in small industries and workshops. In Bengal, according to the census of 1921, there are 210,000 actual workers engaged in the home weaving industry and there are at least 50,00,000 persons dependent on the handloom for a living. It is estimated that Bengal has about 153,000 handlooms of which only 52,000 or roughly 34 per cent. are fitted with fly-shuttles. The total output of cloth is calculated to be at least 173,400,000 yards worth something in the neighbourhood of $6\frac{1}{2}$ crores of rupees.

Reasons for their survival.

Mr. Pillai in his scholarly work on the 'Economic condition in India' and Rai Bahadur Bijoy Bihari Mukherji of the Bengal Civil Service in his recent pamphlet on 'The Cottage Industry in Bengal' have marshalled the many obvious but cogent arguments for a strenuous policy of encouragement of these industries. The reasons for the extraordinary vitality of the village industries are not far to seek. These industries are a part of the organic life of the people which they will not forsake except under the stress of the direst misfortunes. There are also economic grounds for their survival. The artisans produce goods for which there is a local demand and which so far have not been displaced by factory made goods, and they work under conditions which they prefer to factory life. Besides, taking the example of hand-loom weaving, for instance, we find that the hand-loom is specially adapted for the finer and coarser counts, so that whereas it has to compete on unequal terms with machinery in the ordinary middling qualities, at both ends of the scale it can to some extent hold its own. In Bengal as pointed out by Rai Bahadur Bijoy Bihari Mukharji, there are special grounds which help to preserve the handloom industry—the finer classes of hand spun cloth being specially favoured by the richer classes and the produce of the handloom cloths has also to be used in all ceremonial and religious functions. Besides, there are many fabrics manufactured in India which cannot be made with commercial success by the power-loom, and unless custom and tastes change, the handloom should continue to have monopoly in these branches of weaving. As pointed out by Mr. Pillai the beautiful solid bordered cloths of Salem and Madura, the fine woven Nariels of Malabar and the magnificent Kincobs and brocades of Benares and Surat are as yet unaffected by the direct competition of powerlooms. Likewise in the manufactures of very coarse cloths the handloom does not compete directly with the machine production, in as much as they are made out of inferior cotton not possessing the requisite strength for being used on powerlooms.

Mr. Pillai also points out that the difference in the cost of production by handlooms and powerlooms is also gradually getting less marked. From figures quoted by Mr. Mukherji which were collected in 1916 it would appear that the single shuttle and double

shuttle handlooms of Mysore were able to produce cloth almost as cheaply as the powerlooms of Bombay. This is explained by the fact that much smaller wages have to be paid to the weavers in the case of handlooms. In fact, as pointed out by Mr. Mukherji, the conditions regulating wages in the case of cottage industries are quite different and their wages need not rise in the same proportion as in the case of factory workers, as the producer is the consumer and production means employment of unemployed hours. In any case even if the cost of production of handlooms is somewhat higher, we must take account of the fact that the initial outlay in this case is far less and the females of the household are also able to render substantial assistance.

Progressive Elements.

Nor can it be said that the cottage industries have remained in a stationary condition and been altogether impervious to modern appliances and methods. The Industries Commission reported: "It must not be imagined, however, that the artisan of today is wholly uninfluenced by the industrial changes of the past century. His methods remain the same, but in some instances he works with superior raw materials and in others with better tools. The weaver has taken to mill yarn, the dyer to synthetic dyes, the brass and copper smiths to sheet metal, the blacksmith to iron roll, rolled in convenient sections, in each case with advantage to himself from the lessened cost of production which has greatly extended his market. In some districts in lower Bengal, the weavers use the fly shuttle sley extensively, and they have recently adopted it in large numbers in the coast districts of the Madras Presidency, while it is also gradually coming into use elsewhere. The tailors invariably employ sewing machines, and town artisans readily take to improved tools of European or American manufacture."

Need for Caution.

The above observations, however, should not be taken to imply that we agree in the view that the *Charka* and the handloom

alone will solve the problem of Indian poverty and unrest and that large scale production, manufactures and factories are to be shunned and the path of western industrialism is to be tabooed. A moment's reflection will be sufficient to convince us that it would be a fatal mistake for India to abandon the struggle in which she has already so manfully entered for capturing the larger fields of industrial enterprise and concentrate all our attention on the humbler and the least remunerative spheres of industry. But there may not be scope for the highly capitalized industries of Europe in some cases; and in any case, fresh employment must be found for those artisans who are being displaced by the increasing use of machinery. In 1921 the larger industries gave occupation only to 12,63,658 men, and if in 5 years, even if the large industries could be doubled they will only absorb about a quarter million of the population, whereas the rate of annual increase of the population in India is about 6 millions. So large scale industries alone cannot solve the problem of the economic salvation of India, and the development of small scale industries and the duplication of employment and the opening up of all possible avenues of profitable occupation must continue to form a most important plank of our programme.

Nor must we imagine that the economic condition of those engaged in home industries is satisfactory. This is far from being the case. In fact, they are not very far removed from the agriculturists in the precariousness of their existence, and in a way they are also very powerfully affected by the vicissitudes of the season and the condition of the harvests in a particular year. As their clientele are mostly agriculturists and the demand for their goods is mostly amongst the agricultural population, any wide-spread failure of crops and a depression amongst the rural population is reflected at once in the condition of these village artisans, and all acute famines have invariably hit the weavers and other village artisans the hardest. They are also as ruthlessly in the hands of the money-lenders and *mahajans* as their agricultural brethren. It is the middlemen, the Marwari or Bengali merchant, who lends money to the weavers and metal workers who engross the major portion of the profits and in the majority of cases the artisans are sweated on a bare subsistence allowance for the benefit of their *mahajans*.

Ways of Assistance.

We shall now proceed to analyse the different directions in which the condition of the hand industries can be improved. These are:—

- (1) By increasing the efficiency of the workers—by technical training by introducing improved methods of production etc.
- (2) By rendering financial assistance—
 - (a) By freeing them from the hold of the *mahajan*.
 - (b) By advancing capital for starting suitable industries.
- (3) By organizing these industries with a view to improving facilities—
 - (a) for the cheaper purchase of materials, appliances etc.
 - (b) for suitable and profitable markets for the sale of the finished products.

Before we proceed to say a few words on the above points, I might mention that a most useful handbook on the cottage industries of Bengal has been published by the Department of Industries which gives useful information on the existing industries with practical hints about possible improvements. A survey of the industries of Western and Eastern Bengal was also made in 1913, and the monograph of Sir J. G. Cumming on Western Bengal and my own report on Eastern Bengal might be of interest.

Increasing efficiency of Artisans.

As regards increasing the efficiency of the workmen the Industries Commission naturally lay great stress on the provision of much greater facilities for the industrial education of the artisan population. It is hardly necessary to point out that by enhanced skill and the knowledge of better methods and more up-to-date appliances the output of the industries should be greatly increased. Taking the example of weaving Mr. Pillai points out that the looms now work at an average effective speed of 20 picks

per minute, and if these can be increased to 50 picks, the increased production with the same number of looms will be 2,475 million yards. This increase more than equals the total cloth imported into the country. As this increase can be produced by the same number of men as are now engaged on the looms the price per yard will be cheaper than at present, and their ability to withstand foreign competition will so far be increased. A good deal of work in this direction has already been done during the last 20 years, and the technique and methods of weavers of the better classes of goods have been materially improved, notably in Madras and Bengal. It is now established beyond any doubt that the fly-shuttle sley is cheaper than the ordinary sley, and that the fly-shuttle gives a greater outturn, the increase varying not only with the skill of the weaver but also with the different counts of yarn used. It has been calculated that the outturn of the fly-shuttle relative to that of the country loom is nearly double in the case of coarse counts. Sir Alfred Chatterton estimates that the adoption of the fly-shuttle increases the wages of a weaver by Rs. 2-8-0 per mensem. Nevertheless, progress in the adoption of the fly-shuttle has been slow and in Bengal it is found that out of a total of 213,886 hand looms only 53,118 are with fly-shuttle, while 160,718 are with throw-shuttle looms.

The Serampur Government Weaving Institute and its branch institutions have done a great deal to vitalise the handloom weaving industry in Bengal. The students from Serampur have started profitable factories of their own and found employment not only in handloom concerns but in the powerloom factories of Bombay and other places. Most useful work is also being done by the peripatetic teachers who were sent out from Serampore and who set up temporary schools at suitable centres. There were 8 such schools at the beginning of the year 1926 and 13 more have been sanctioned. Besides these, demonstration parties were sent out during the year to selected areas to teach improved methods. The work of these institutions may be divided broadly under two heads :—

- (a) The training of young men belonging to the middle-classes to make them fit for working small weaving factories and also of the actual artisans in the latest methods of weaving and dyeing.

- (b) The promotion of the handloom weaving industry by demonstration of the modern methods of weaving by distribution of up-to-date information regarding the weaving industry, by the introduction of labour-saving appliances among the handloom weavers and by rendering help by way of expert advice to persons desirous of setting up weaving factories.

As regards demonstration, the students and teachers of this institution took part in almost all the important exhibitions which have been held during recent years and demonstrated improved methods of spinning and weaving of fabrics, as examples of which may be mentioned :

- (i) Checked lungi with vibrating box sley.
- (ii) Coating (cotton).
- (iii) Jute spinning and weaving and manufacture of gunny cloth and hessian by fly-shuttle loom.
- (iv) Waste tussar spinning.
- (v) Tussar weaving with Jacquard and with vibrating box sley.
- (vi) Fancy sarees and fancy bed sheets.
- (vii) Dyeing and printing of textile fabrics and piece goods.

It has now been arranged to send out the demonstrators with a stock of appliances and looms so that they might sell for cash immediately the weaver is sufficiently convinced to make a purchase, otherwise it was found that temporary enthusiasm created in the mind of the weavers did not always materialise in the purchase of a new loom.

It is satisfactory to find that the Industries Department is anxious to extend the scope of the fly-shuttle to the manufacture of other fabrics besides cotton, and improved spinning wheels to spin jute, hemp, wool and silk were supplied to the district and peripatetic weaving schools. The machines supplied were fairly cheap being only Rs. 25 each. The cost has now been still further reduced and good jute spinning machines can be had for Rs. 10 only.

The revival of silk as a cottage industry has a great future, and thanks to the efforts of the Sericultural Department, the rearing of silk cocoons is making satisfactory progress in many

districts. The reeling and spinning of silk yarn in home filatures is also growing, but the industry will not be self-contained and able to ensure satisfactory remuneration to the producers, unless silk fabrics can be manufactured in Bengal on hand looms and power looms. From this point of view the opening of the Silk Weaving School at Berhampore—where the weaving of silk on hand looms and power looms and the dyeing of silk fabrics will be taught—ought to be a most useful institution.

Besides weaving, the leather industry received the special attention of the Department. Investigations were conducted both into the methods of producing the more important varieties of commercial leather from the available raw materials under the local climatic conditions and also into some of the chemical problems in connection with the tanning process. The former were done at the demonstration tannery and the latter at the chemical laboratory of the Calcutta Research Tannery.

Besides the above important industries, the improvement of industries like small bamboo and cane basket making, also received attention. In this connection the suggestion of Rai Bahadur Bijoy Behary Mukherji to get experts from Japan to teach better class of cane and bamboo work deserves attention.

Introduction of Labour-saving Appliances.

As regards labour-saving appliances the present Industrial Engineer has devised two important labour-saving appliances for hand industries—one for cutting conch shells and the other for polishing brass and bell metal articles.

“The cutting of conch shells by the indigenous saw is a very laborious process which is said to tell heavily on the health of the workers. The difficulty of cutting conch shells is a serious obstacle in the development of this industry and so a labour-saving device for this purpose was a long-felt want. The machine devised by the Industrial Engineer is a simple power driven circular saw with proper milling attachments, requiring only 3 B. H. P. to work it. The machine that has now been constructed by the Industrial Engineer has so far proved a great success. It was demonstrated at the last exhibition held in March 1926 at Dacca, which is the principal centre of the conch shell industry, and it received a first-

class certificate from the exhibition authorities. Its further use in Dacca is now being arranged.

The machine designed and constructed by the Industrial Engineer for polishing brass and bell-metal articles proved to be equally successful. The demonstration of this machine at Bishnupur, which is one of the most important centres of this industry, was reported to be satisfactory and the local workers evinced keen interest and seemed to be convinced of the utility of such labour-saving devices. It is a power driven machine, simple in construction, requiring only 3 B. H. P. to run it and its further introduction is engaging attention.

The machine for hacking jute and sun hemp designed and constructed by the Industrial Engineer received further attention last year and some improvements were effected. It is now possible to hackle more material at one time. Experiments were also undertaken whether aloe fibre could be hacked by this machine. These proved to be successful, and the machine was demonstrated in all the exhibitions in which the Department participated. Some people from other provinces are anxious to learn the use of this hackling machine.

The cottage jute spinning machine originally designed by the Principal Government Weaving Institute and modified and cheapened by the Industrial Engineer so as to bring it within easy reach of the people for whom it is intended, was very successfully demonstrated in several jute producing districts of the province. A number of orders for the supply of these machines came in from the different places where the demonstrations were held.

The machine for bending and marking ornamental signs on umbrella handles designed by the Industrial Engineer was successfully demonstrated in Calcutta and Chittagong. Local workers were invited and they seemed to appreciate the utility of the machine, but it would require more intensive propaganda to overcome the innate conservatism of the workmen."

Education of Artisans.

Turning to the general question of education for training artisans for industrial occupations, technical training in Bengal

has hitherto been mainly occupied in turning out Amins and Overseers for the Public Works Department and District Boards, but not only is the scope of employment of men with such training extremely limited but these men can be of very little assistance in opening out industrial avocations for the people. It is only quite recently that any attempt at real industrial education is being attempted. I have already referred to the facilities for technical education in the province and mentioned the real need in Bengal for teaching high class arts and crafts to the artisans on the lines of such schools in the Punjab and other provinces. The general scheme of technical education followed by the department provides for education to commence from any stage in the cultural stage *pari passu* with a progressive course from the lowest and leading up to the highest possible stages. An important point is that it will be possible for students to enter some sphere of employment at intermediate stages, if circumstances do not allow them to continue training to the highest stage.

Besides the type of schools contemplated by the department, I am very strongly in favour of a simpler type being evolved which will train lads in useful and profitable cottage industries, on the example of the training being given, for instance, in missionary schools in the Nadia and Murshidabad districts. These industrial classes should be tentatively introduced into some selected middle schools and finally made compulsory in all middle schools and and Middle classes of high schools.

Education of the artisan to be a commercial employer.

But it is not only in the advance of his skill as an individual worker that there is scope for improvement but in his knowledge as a commercial employer of capital—as a master workman and entrepreneur. On this point, Industries Commission observes as follows :

“Numerous attempts have been made to start small factories into which it was intended that the artisans should be drawn. In only a few cases has success been achieved, and then, as a rule, by men who had acquired a practical working knowledge of the trade in question ; but this fact is sufficient to warrant further

efforts in this direction. In each industrial school provision should, therefore, be made for the instruction of a small number of pupils of a higher class with better educational attainments and with prospects of being able to command sufficient capital to start eventually in the trade themselves. In the case of weaving something in this direction is being done at the Government Weaving Institution of Serampore, where a considerable number of fairly well-educated young men are undergoing a course of instruction, which is intended to fit them ultimately to become master weavers. The scheme, however, fails to produce satisfactory results owing to the absence of opportunities to acquire practical experience in the control of workmen and in the management of a commercial business. There are no handloom factories or village associations, in which such training might be obtained, and it is necessary to arrange for a few small undertakings on these lines, if possible, under private control with assistance from Government in whatever form proves most suitable to serve as demonstrations of work under commercial methods. Failing private enterprise a purely commercial section should be attached to the larger weaving schools with the avowed object of supplying the training other than purely technical which a master weaver must possess before he can hope to start in business for himself."

Organization of Hand Industries.

We must refer lastly to the most important question of the proper organization of these industries. For there can be very little doubt that if the products of these industries could be properly advertised and suitable arrangements made for their sale locally and by export to foreign countries much of our difficulties will disappear. The following observations of the Industries Commission deserve careful consideration :

"An essential feature of any attempt to develop cottage industries in India must be the opening up of new markets for the goods produced. Many of these industries have survived because of their ability to satisfy the strongly marked local demands for special designs. But where productions go far afield it is through the agency of middle-men and merchants, who how-