

Agriculture in India.<sup>1</sup>

IN the previous article special attention was directed to agriculture, the first of the two main subjects dealt with by the Royal Commission on Agriculture in India; and it is perhaps worth while emphasising here that this term has a much wider significance in the tropics than in temperate regions. The employment of the people is much more uniform and less divided into watertight compartments, and that employment is in the vast majority of cases connected with the cultivation of the land. Modern industrial development is in its infancy, and even such as exists is largely concerned with the preparation and utilisation of plant products. Irrigation, with its engineering problems, is closely connected with agriculture, and especially so in such a dry country as India. Forestry, often only of late years separated off, has many lines of contact; either direct, as in the gathering of crops, provision for grazing, wood for implements, and leaves for manure; or indirect, in its effect on the soil, water for irrigation, and the amelioration of climate. Even fisheries overlap, whether in the supply of manure or occasionally in the 'rotation of crops.'

Co-operation is peculiarly important in the development of agriculture; communications are necessary for transport, marketing, and export, while medical work and sanitation have much to do with the ability of the labourer to perform his tasks in an exacting climate. Ultimately, the whole economics of village life and the education and general uplift of the rural population are of fundamental significance. To consider Indian agriculture only in the narrow western sense would be a colossal blunder, and, as we have indicated, there was no intention that the work of the Commission should be thus limited. To all of these subjects, largely embryonic in the tropics, the Commission has turned its attention; and zealously lays them under contribution for the betterment of the second main subject of reference, namely, rural economy.

One section included under agricultural research remains to be dealt with, and that is animal husbandry, so closely related to the raising of crops as to be inseparable from it. In the monsoon regions, cultivation of the soil and transport of its products depend on cattle, in contrast with the hand labour and head loads of large portions of Africa and the machinery of western countries. Cattle in India are not required for meat, so that their use as draught animals is peculiarly important. The subject is dealt with by the Commission in two long chapters (vii. and ix.) covering 130 pages, somewhat curiously separated by that on forestry, and it is discussed in great detail. As contrasted with the raising of crops, the study of cattle has more definite units and is thus simplified; the staff employed is, moreover, more numerous and has been longer at work.

The number of livestock in British India is given as 151 millions of cattle and buffaloes, and

62.5 million sheep and goats; while in such native States as have records the figures are 36 million and 25 million respectively. Compared with these figures, the numbers of horses, mules, donkeys, and camels are insignificant—another point of contrast with other parts of the world. The main function of cattle in India is draught, although buffaloes are also valuable draught animals: milk is chiefly obtained from the latter. The Commission records its opinion that, in comparison with other countries, the number of cattle is in excess of that needed for cultivation, and finds that this is due to series of factors working in a vicious circle. The cattle are in general small and weak for their work: the smaller they become, the greater numbers are reared to get useful bullocks: this increase in numbers causes larger areas to be cultivated at the expense of grazing grounds: the actual working cattle alone receive attention as regards their food, and the calves and mothers get what they can: the result is smaller and weaker calves. . . . The points of policy should be reduction in numbers and increase in efficiency, better cultivation of smaller areas, and more attention to cows and cows-in-calf. Feeding and breeding are, and always will be, the main lines for the improvement of Indian cattle; here and there throughout the country are found fine types carefully treated, which might serve as examples to be followed. The possibilities in these and other directions are exhaustively explored in the report.

The ravages of disease are dealt with in Chapter ix. Rinderpest, hæmorrhagic septicæmia, and foot-and-mouth disease are the most serious; and the methods adopted in checking the first of these, which takes the greatest toll of cattle annually, are described as typical of control work. For efficient cattle work the Commission considers that one inspector should be provided for every 25,000 cattle. There should be a superior officer in each district with an appropriate number of inspectors under him, which would mean 300 district officers and 6000 inspectors for British India. An all-India veterinary college on the lines of Pusa is not advocated. The existing research institute at Muktesar should not be saddled with training work, as this can be efficiently carried out in the provincial veterinary colleges; but the director at Muktesar should have the assistance of an officer experienced in administrative work.

Forestry is sometimes called 'the handmaiden of agriculture,' and is only considered in this capacity by the Commission. It is suggested that grass cutting should be developed wherever possible in place of grazing. Fuel is one product for which forests might reasonably be held responsible, but large cultivated areas have no forests to speak of, and everywhere cowdung is preferred; and, although the Commission suggests the study of possible substitutes, there seems little likelihood of any change from this continual destruction of cattle manure. A re-classification of forest areas is recommended, according to the uses for which

<sup>1</sup> Continued from p. 135.

they are designed : for timber and fuel, those desirable for physical and climatic reasons, fodder and grazing, and those more suitable for cultivation. One of the most promising lines would be the handing over of certain tracts adjoining villages for control by them under certain restrictions.

The chapter on irrigation enumerates the projects at present being developed in the different provinces. For the rest, the Irrigation Committee of 1903 is stated to have treated all aspects in such a comprehensive manner that no further inquiry was considered necessary.

Communications and marketing are appropriately considered together in Chapter xi. The opening up of the country has had the effect of introducing money crops, that is, those for sale in place of direct consumption. Evidence shows, however, that there has been a deterioration in the character of the roads during recent years ; and on this account the Government of India has instituted a Road Development Committee. But this appears to deal primarily with the arterial roads, and the Commission again urges the importance of those leading to the villages, seeing in them a ready means of stimulating village thought by bringing them into closer connexion with the towns.

Although the Agricultural Department has done much to improve the quality and increase the quantity of the cultivator's products, comparatively little seems to have been done to enable the producer to get the full advantage of this. Markets are numerous in India ; for example, in Bihar and Orissa there are 432 principal and 2624 minor ones, and much information has been brought together and collated by the Commission. It suggests, however, that a regular survey of markets should be taken in hand, and that an expert marketing officer should be attached to each provincial agricultural department. A further attempt should also be made to standardise the weights and measures throughout India.

Under finance, land mortgages are somewhat fully considered, and the importance of facilitating redemption within a reasonable period, say twenty years, is insisted on. The Commission resolves that "the greatest hope for the salvation of the rural masses from their crushing burden of debt lies in the growth and spread of a healthy and well-organised co-operative movement, and local governments should, therefore, give that movement all the encouragement possible."

Co-operation is very fully discussed in Chapter xiii., and the remarkable advance made in recent times is indicated by a table showing a quadrupling of credit societies during the past eleven years—from 16,690 to 65,101, with a like rise in the number of members and a somewhat greater increase in capital. "Where the co-operative movement is strongly established, there has been a general lowering of the rate of interest charged by money-lenders ; the hold of the moneylender has been loosened, with the result that a marked change has been brought about in the outlook of the people."

The formation of non-credit societies (such as for

seed, implements, manures, cattle insurance) is naturally a later growth ; they are a much more difficult proposition, because of the need of business capacity and expert advice. The figures given in the same table for the past eleven years show an increase from 96 to 2133, with a much greater rise in the number of members and a still greater rate of increase in the amount of capital involved. The Commission records its opinion that single purpose societies are to be preferred to multiple purpose societies.

In Chapter xiv. the Commission returns to "The Village," and deals comprehensively with sanitary and medical matters, and especially with the various agencies, official and non-official, for the improvement of the amenities of village life. This is an exceedingly interesting and inspiring chapter, and the members of the Commission evidently have the matter very much at heart. They take the long view and enumerate, at length, the various possible directions in which they consider that a betterment can be brought about : they recognise that progress must be slow, and can only be effected through the will of the people themselves, and that a public opinion must be created among them.

Those who know their India may perhaps feel that the view is so long that it sometimes tends to become visionary. We read that in the latter days "the old men shall dream dreams and the young men shall see visions" ; and it is therefore appropriate that the Commission should turn for help to the universities, who "have at once an obligation and a great opportunity to assist in the work of rural development on both its economic and educative sides." Leadership is in fact required, and must come from outside. An interesting local solution is described from one of the districts in the Punjab, where young men are carefully trained as 'guides,' and each is posted to a number of villages to act as propagandist for improvements of all sorts and as counsellor in all welfare matters. These young men are not experts, but know where to look for them, and can thus act as connecting links between the villages and the various departments—agricultural, medical, co-operative, and so forth.

The Indian Research Fund Association is quoted as an admirable example of combination of private and official effort. The line of research under this foundation which comes to one's mind is that on human and animal nutrition, already referred to in these columns. A great extension of this class of work is hoped for by the Commission—a concerted effort to improve the nutrition contained in the diet of the cultivator is a pressing need.

Education, perhaps fittingly, occupies the next chapter, for "few problems have been more anxiously debated as to the type of education best adapted to an agricultural population. . . ." "The idea that education in rural areas should bear a close relationship to the daily lives of the people is but a recognition of the truth that the environment in which rural workers live is different from that in towns." There is not space to analyse the mass

of facts and ideas which are contained in this chapter, and we shall content ourselves with selecting two of the Commission's conclusions.

The first is in connexion with the influence of female education on rural development. Very few boys attending the primary schools in British India stay long enough to attain permanent literacy. In 1921-22 the proportion of boys attending primary schools was 32.2 per cent of the population, and that of girls 7.6 per cent. On the other hand, the percentages of literacy at 20 years and above were 18.13 and 1.9 respectively: it is evident that girls especially do not stay long at school. It is argued that if a mother is literate, a very strong influence will be brought to bear on keeping her children at school until literacy is assured. The Commission, for the purpose of testing this idea, suggest that "a definite effort should be made to impart literacy to a certain number of young mothers" and the results be carefully recorded.

The second is concerned with the kind of education to be given to older boys in rural India. Two existing types of such education, for boys from fourteen to seventeen years of age, are described and contrasted. In the first the school is voca-

tional, being in fact an agricultural college and farm in miniature, with the important proviso that if the whole four-year course is gone through, all charges will be met by the school; in the second, agriculture is a voluntary subject in a vernacular middle school. The first type, started in 1910 in Bombay, has slowly extended, but it has not been taken up to any extent elsewhere: there are six schools of this type at present. The second type was started in the Punjab in 1923: there were 66 in 1926-27, and it was hoped that there would be 121 in 1927-28. In the United Provinces 20 such schools exist, where, however, agriculture is compulsory. Farms of three acres are intended, but all are not as yet provided with these. The Commission is strongly in favour of this latter class, financially and otherwise. It does not consider that the heavy cost of free vocational schools is justifiable, and there appears to be no general call from the people for them.

The remaining chapters deal with rural industries and labour, horticulture and plantations, and agricultural statistics. There are a number of graphs interspersed and a short series of appendices.

### News and Views.

ETHYL petrol—the only motor spirit on the market which contains any lead compound—is, after all, adjudged to be not so deleterious when used under proper safeguards as has been feared in some well-informed quarters. The Departmental Committee which was charged with the examination of the question has issued a unanimous interim report in which it states that, having considered the experimental work which has been done in America, and the evidence which it has itself taken, and having discussed the matter with high officials of the United States Public Health Service, it has reached the conclusion that the findings of the United States Government Committee were justified, and that further experience has supported its conclusion that there are no reasons for prohibiting the use of ethyl petrol. The British Committee does not minimise the risks of using either ethyl or ordinary petrol when ordinary safeguards, such as proper ventilation in garages, are lacking, but it believes that provided ethyl petrol is used solely as a motor fuel, and not for such purposes as cooking or cleaning, its use does not involve a special risk. The dangers attending the manufacture of lead tetraethyl for incorporation into the 'ethyl fluid,' and even the operation of mixing the fluid with petrol, are, of course, in another category. The former operation is not carried out in Great Britain, but in the United States of America it proceeds under proper regulations; the latter stage in the preparation is carried out in Great Britain at nine stations, where the precautions suggested by the United States Committee are observed in all respects, and the arrangements are such that the health of the workers is fully safeguarded.

SCIENTIFIC men who were aware of the peculiarly toxic nature of the material to be employed in the manufacture of ethyl fluid, and of the cumulative effect of the poisonous action of lead compounds in general, and who therefore entertained anxiety concerning the ultimate effect not only on users of the spirit but also on any who might be compelled to breathe an atmosphere polluted with exhaust gases, would have been lacking in an adequate sense of public duty if they had not given expression to their doubts. So far as the evidence is available at present, these fears are not necessarily without foundation, but at least they appear to be concerned with a risk sufficiently circumscribed to fall within that margin of common hazard which modern man has to accept with the other blessings of his civilisation. It remains to be seen whether with the passage of time no such evidence will present itself; in the United States, however, ethyl petrol was in use for some three years before it was introduced commercially into Great Britain, so that the lack of evidence from America in that respect is to be regarded as indicating the improbability of any serious deferred injury. The Committee considers that it would be impossible, and in fact superfluous, to embark on an extensive examination of human subjects in Great Britain, although it proposes to undertake certain confirmatory investigations, and possibly to elucidate some points which have not yet been examined.

EXCEPTION has been taken to the suggestion made at the close of our leading article on "The Museums of the British Isles" (July 14), that the first step in the improvement of the provincial museums should be made by funds independent of the public and the