

unto itself ; it exists for others. It bears fruits not in its stem but in its branches ; and the branches cannot bear fruit except when they abide in the stem. Such an interdependence is indispensable for fruit bearing. Again the peculiarity of the Vine is that it is relentlessly cut down almost to its roots every single season. It has to give up its glory and its possessions year after year. And because of that treatment it comes out in greater glory and in more abundant possession of branches every spring. And in all its limbs its life-blood courses bodying itself in luscious grapes which is most wonderful to see and most delicious to eat. But all that beauty and sustenance are forthwith given away. They are not for the Vine or its branches ; they are meant to be consumed, to be enjoyed and assimilated by others. And so in many another imagery the Master reiterated this Law of Life ever bringing out a fresh aspect of its application.

Reproduced from "Young Men of India" August, 28 Vol. 40 No. 8

(To be continued)

<https://doi.org/10.29321/MAJ.10.A01393>

Chinese Agriculture and its Lessons for India.

BY DR. K. KUNHI KANNAN, M. A., PH. D.

The achievements of Scientific Agriculture in the West are of such magnitude that we in India are apt to look to the West almost exclusively for inspiration and guidance in the matter of improvement of our Agriculture. While this attitude is for the most part justified there are other directions also to which we may turn with advantage. Agriculture in the Far East has important analogies with that of India not only because in the Far East as well as in India Agriculture dates back forty centuries but also because the pressure on land in India, if it has not already reached, is likely to reach before long the same degree it has in China and Japan. It is true that even these countries look to the West for development of their agriculture on scientific lines, but investigations have shown that the essential principles of many a discovery of agricultural science have been grouped very early in China and an unflinching practice built upon them. Indeed in certain departments it is the West that has to learn from China and Japan more than these centuries have to learn from them.

For all the scientific agriculture in the West, the people there have not been subject to the necessity of practising the same severe economies which overgrown populations have to practise in tilling their land. European countries have had vast areas and the pressure on land has not reached anything like the level it has reached in the Far East. Human labour in European colonies being far short of the requirements of boundless tracts of virgin land the settlers have had to make good the deficiency by the invention of agricultural machinery which has made for extensive rather than intensive farming. Industrial opportunities being no less there has been a development as great in that field and the action and re-action between the two has resulted in a marked increase in the standard of equipment, in facilities of transport and organisation and in the application of scientific processes to agriculture which are adopted with difficulty in countries whose populations are rural and where small holdings predominate. The application of machinery and science to agriculture is more a result than a cause of extensive farming and large scale production. For farming on a small scale the methods and equipment of scientific agriculture have to be modified and investigations have shown that farm equipment and machinery tend to exceed the requirements of holdings progressively with decrease in their size.

Without in any way disparaging the value of science in Agriculture, the fact has therefore to be admitted that the application of one to the other in over-populated countries has to proceed on lines which have regard to the $\frac{v}{w}$ supplies of human labour, to the absence of adequate capital for investment among small farmers who usually form the bulk of the agricultural population in these countries. Viewed from this standpoint, Far Eastern Agriculture has lessons not only to India, which presents much the same conditions as China and Japan as regards the main features of agriculture, but also to the West, where a century or two hence the same conditions may be reproduced.

The most striking feature of Far Eastern Agriculture is the utilisation of waste of every description to maintain soil fertility. The use of human excreta as a soil fertiliser is a special feature of the agriculture of Mongolian Races. An analysis of night soil has shown that for every 2000 pounds of it there are 127 pounds of nitrogen, 4 lb. of potassium and 1.7 pounds of phosphorus. On the basis of an average of 40 oz. of excreta for the adult, the average annual production per million of adult population is

57,94,300 lb. of nitrogen, 18,25,000 pounds of potassium and 7,75,000 pounds of phosphorous carried in 4,56,250 tons of excreta. In Japan the annual output was estimated some years ago at 24 million tons.

Fully to realise the importance of this practice one has to consider the gradual depletion of soil fertility in America in lands which have been barely 100 years under the plough in spite of the use of costly mineral fertiliser while by elaborate and expensive methods as hydraulic sewage the human excreta is swept into rivers and the sea. The double wastage involved in the western method stands further condemned by the recent advances made in Bacteriology which indicate that foecal matter and human refuse are best destroyed by returning them to a clean soil.

Besides the human excreta, both the Chinese and the Japanese use composts on an extensive scale into the composition of which enter every form of suitable silt from canal beds, green manure collected from forests and green manure specially grown for the purpose. The dressing of canal mud applied to the fields which may be as much as 2 to 70 tons per acre helps to prevent the growth of weeds and the silting up of beds in the canals. In the neighbourhood of villages the reverse process may take place of soil from the fields being thrown into the canals, of course to be taken back as soon as it has absorbed in sufficient quantity the minerals dissolved in the water. The silt is not the only earth that goes back to the soil in the fields. Even the earth from the floor of houses is removed from time to time as soon as a sufficient amount to nitrification has taken place in it. For an equally good reason the bricks used for chimneys are replaced and the old ones broken up and thrown into compost pits. An exchange of soil between mulberry and rice fields is considered to be of mutual advantage to the crops and is effected in most parts of China.

Apart from these economies, the Chinese and Japanese have so well adapted their methods to the climate and soil that they are able to take no less than four crops during the year and as many as three of them may be found at the same time in the same field, one near maturity, another in the seedling stage and the third in the stage when its demands on the soil are at their maximum. Almost invariably two crops are taken from the rice fields, the system of transplanting universally adopted giving more time for the maturing of winter crops. The use of green manure grown

as a crop in the field or brought from mountain slopes is a very old practice in the Far East as it is in India, and it helps to restore to the soil the nitrogen removed by the crops. These are among the more important features of Agriculture in the Far East. It will have been observed that a number of these are shared in common by Indian Agriculture. The use of human excreta as a fertiliser is not unknown in India, the silt from tank beds is taken to enrich the soil in the fields. So is green manure grown. But these features are confined to certain tracts and have not extended to others where conditions are by no means against the employment of these methods. While this is in part to be explained by caste or social prejudices and conservatism, there is reason to believe that the fondness to imitate practices adopted in Western countries has arrested the spread of useful practical methods better adapted to Indian conditions. At any rate the costly method of sewage disposal adopted in large towns in India and the preferential use of commercial fertilisers in imitation of the West have not had a little to do with the increasing aversion to the employment of foecal matter for the purpose of restoring soil fertility.

Full allowance being made for features which are common to India and the Far East however, the Mongolian races are still ahead of Indians in regard to the attention and care they bestow on the crops, in the yields they secure per acre and in the yields they secure per acre and in the correct adjustment of crops to soil and soil to crops. In these as in many others India would do well to imitate Far Eastern rather than Western methods.

It may seem a strange advice to give. We are so impressed by the work on a large farm of several hundred acres in the West by the machinery employed for various operations by its electric lights, sewage disposal, by the large ploughs and tractors and sowing and harvesting machines. But cut up that farm into holdings of a few acres, imagine each has to support a large family and the ploughs and tractors and the sowing and threshing and harvesting machines look impossible and we turn more kindly to the simpler devices of the Chinese farmer perhaps slower in work and cruder to the eye but capable of utilising the human labour of which there is always a surplus. Then, too, we appreciate better the severe economy he practises, his careful almost religious utilisation of all waste and his patient and painstaking methods of tending his crop.

It is by no means suggested that Science has no place in *petite culture*. In the control of pests and diseases and in the creation of new varieties of crops, Science has for the first time laid down lines of advance which the East as well as the West may follow. But in Agriculture proper, the methods and practices of the Far East embody the experience of 40 centuries and may not without causing serious dislocation be replaced by those of the West with its vast resources of capital and virgin land and limited population. To India at any rate, which is fast reproducing the very conditions of overgrown populations and limited land which China and Japan have had to face, their methods and practices have lessons which it would be foolish to neglect or to ignore.

(*The Madras Mail*—September 15). G. N. R.

How to check decimation of the Countryside by Malaria. An example from Egypt.

In December last, the great Irrigation Engineer, Sir William Willcocks, delivered at Cairo a lecture entitled, "Why is cultivated Egypt Immune from Malaria?", and any new information on such subject must obviously be of interest to Malaria-stricken India. If there is a country which by reason of its climatic and other conditions should be eaten up by malaria, it might well be thought that it would be Egypt. Yet the cultivated Nile valley from Aswan to the Mediterranean is immune. There are places on the edge of the cultivation like Ismailia and the Khanka desert farm where malaria occurs but they are not cultivated. Egypt. It was shortly after the construction of the sweet water canal to Ismailia that marshes formed in the depressions northeast of the town, and Ismailia was decimated by malaria. It was after some years of irrigation at the Khanka farm that clear seepage water showed itself in the low-lying land, and there was a severe outbreak of malaria. There is nothing in the climate or physical conditions of Egypt to keep the scourge in check, it can be as bad in Egypt as anywhere else where the conditions are favourable to mosquito life, but there is no malaria in cultivated Egypt. Sir William Willcocks says that during all the long years he slept in a tent or in the open between rice fields, surrounded by marshes, and travelled about the delta on foot or in a boat, he never had a touch of fever. It was not that he was himself immune, he went to Grèce to report on the reclamations of Lake Copais and in spite of every form of screened protection he suffered badly, he suffered