TROPICAL AGRICULTURE THEN AND NOW.*

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. . . our knowledge of scientific tropical agriculture is of quite recent growth. On the other hand what may conveniently be termed the art of agriculture in the tropics as practised by various native races, is based frequently on very long experience and very close observation.

Take with respect to the latter point the discoveries made by native races on the properties of plants. They are indeed remarkable. The modern world uses large quantities of three beverages, tea, coffee and cocoa, the first prepared from leaves the others from seeds, but all alike containing as their essential principle caffeine or a closely similar alkaloid. Two other plants of considerable, but not such wide use for the sake of their stimulating alkaloids are cola (caffeine) and coca (cocaine). In these cases beverages are not prepared, but the seeds or leaves respectively are chewed. The discoveries of the properties of these plants and the methods of utilization were made not only in widely separated parts of the world, tea in Indo-China, cola in tropical Africa, coffee in Arabia, cocoa in Central America and coca in the Andean region, but so long ago that they are lost in the mists of antiquity. What is still more remarkable is that primitive man seems to have conducted his researches so thoroughly that all the resources of science have not as yet discovered any other plants containing important supplies of these alkaloids. I have often wondered when strolling through a tropical forest or through a botanic garden how primitive man made his discoveries, for casually chewing a cola nut or a coca leaf produces no appreciable stimulation. Similarly it would be a piece of very long range research to prepare and test infusions of all the available seeds or leaves.

On a point of agricultural practice too, we know that some tropical crops, e.g., coffee and cacao, are commonly grown under the shade of other trees, the practice having been handed down from remote times. When, by experiment, we endeavour to ascertain whether this is a desirable practice or not, it is very difficult to arrive at a definite conclusion even when we restrict our attention to the use of one particular kind of tree. We might expect that native races in Central America who shade their coffee do so as the result of observation, and that they would use any trees which happen to be available—and they are many. As shown, however, a good many years ago by O. F. Cook this is not so. In different districts they use different trees, but with one thing in common; they practically all belong to the *Leguminosae*. In other words the practice is a form of green manuring applied to permanent crops. These folks have not an ancient literature or we might have the advantage of being able to read their views on the use of these leguminous shade trees set down as precisely as those of the Chinese, the Greeks and the Romans on the green manuring of annual crops.

This extract from p. 10 of Dr. A. J. Pieters' *Green Manuring* must suffice. "In Ts'i Min Yao Shu of Chia Szu Hsieh, who lived about the fifth century B.C., there is a passage which reads: 'For manuring the field, lu tou (*Phaseolus mungo*

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L. var. *radiatus Bak.*) is best, and siao tou (*P. mungo* L. var.) and sesame rank second. They are broadcast in the fifth or sixth month, and ploughed under in the seventh or eighth month . . . Their fertilizing value is as good as silk worm excrement and well-rotted farm manure.' "

Plant breeding, or at any rate the selection and propagation of improved types must also have been pursued from very early times. Amongst tropical examples we may cite the countless varieties of rice in the Eastern tropics, the large number of edible seedless bananas in the Indo-Malayan region all necessarily propagated vegetatively, and the races of maize in tropical America "improved" out of all resemblance to any known wild plant.

Early man often took great pains to conserve the fertility of the soil as so well described in F. H. King's *Farmers of Forty Centuries or Permanent Agriculture in China, Korea and Japan*, a book which all should read. As a more tropical example there is the case of Ceylon where for some 1,500 years the food supplies for a large population were grown in the arid northern region with the aid of an excellent system of irrigation works. The evidence of the bygone civilization of this district is indicated now by the famous Buried Cities. European man favoured the wet montane areas for his coffee, and later tea plantings, but was not so wise in his methods. As Mr. John Still says in his charming book on Ceylon entitled *The Jungle Tide*, "it is now about one century since coffee-planters attacked the forests of the hills. They have at last begun to conserve the soil, but in the early days of planting they lived on nature's capital, and the humus laid in store by the leaf fall of millions of years was flayed off by the rainfall of a few thousands of days when first the soil was denuded of its protecting forests, and carried down in spate to the sea; and now the older tea lives on fertilizers."

"In time the jungle tide will swing once more, and then those who care for other things than wealth will wander back to the wet side of the monsoon line, and while elephants browse where tea is now plucked, antiquaries will unearth the ancient bungalows of the British period, or even of the Scottish which will lie beneath it, and classify the different kinds of bottles found among the ruins, and arrange them in museums. Having both planted tea and arranged the antiquities of a museum, I venture to prophesy that this picture will be realized in very much less than fifteen centuries, perhaps in one-fifth of that, or perhaps in one-tenth."

There are many other tempting topics to touch upon, but I must not digress further. I have attempted to sketch, however cursorily, the development of our modern agricultural organisations in the tropical colonies. Our own knowledge and experience of agriculture in those countries is as yet very limited, whilst in many countries our officials come into touch with, and have to serve as advisers to, peoples whose agricultural practices are based on experience gained through many centuries. All I would urge now on the young agriculturist is to go out with an open mind prepared to admit that if a native people do not follow some recognized British practice it is not necessarily because they are foolish or obstinate. By study of their methods he may arrive at the reason for them, and then with the modern resources at his command be able to lead them on to improvements.