THE UNIVERSITY OF NOTTINGHAM

Cust Foundation Lecture

1950

The Future Prospects for Agricultural Development in the Colonies

BY

Sir GEOFFREY EVANS, C.I.E., M.A., F.L.S.

The twenty-third Cust Foundation Lecture was delivered on Friday, 3rd February, 1950, the Chairman being Professor H. G. Robinson, M.Sc.

(ONE SHILLING AND SIXPENCE)

Henry John Cokayne Cust, born in 1861, was the elder son of Major H. F. Cokayne Cust of Cokayne Hatley, Bedfordshire, and heir-presumptive to the Barony of Brownlow. He was educated at Eton and at Trinity College, Cambridge, of which foundation he was a Major Scholar. Called to the Bar in Paris, he was also a Bar student in London. In 1890, after a period of travel which laid the foundations of his close and continuing interest in Imperial matters, he entered politics as a Conservative, representing successively the Stamford Division of Lincolnshire (1890-5) and the London Borough of Bermondsey (1901-6). In 1892 he was invited by Mr. W. Waldorf (later Viscount) Astor to edit the Pall Mall Gazette and proved a brilliant successor to Greenwood and Morley. For his arduous and unsparing work as founder and Chairman of the Central Committee for National Patriotic Organisations during the early years of the 1914-19 war he was publicly thanked by Mr. Asquith in the House of Commons. He married Emmeline, the only daughter of Sir William Welby-Gregory of Denton Manor, Grantham. He died in London in March 1917.

One of the most arresting personalities of his time and an assiduous traveller from his youth upwards, he spoke fully and authoritatively from a personal knowledge of men, books and things and with deep practical insight into national and international politics.

Cust Foundation Lectures

1921*	*Our East African Territories : Their Development and Commercial Value.*	The Rt. Hon. L. S. Amery, M.P.
1922*	*With Henry Cust and Cecil Rhodes in South Africa.*	Sir Francis Younghusband, K.C.S.I.
1923*	*The West Indies.*	The Rt. Hon. Edward Wood, M.P.
1924	*The Imperial Conferences with special reference to Commerce and Trade.*	Sir Arthur Balfour, K.B.E.
1925	*India : the Need of Faith.*	Sir Francis Younghusband, K.C.S.I.
1926†	*The Food of the Empire.*	Sir Daniel Hall, K.C.B.
1927	*The Development of our Empire in the Tropics.*	The Rt. Hon. W. G. A. Ormsby-Gore, M.P.
1928	*Empire Migration.*	H. B. Betterton, C.B.E., M.P.
1929	*England and Egypt.*	Sir Maurice S. Amos, K.B.E.
1930†	*India : The Political Problem.*	Sir William Marris, K.C.S.I., K.C.I.E.
1931	*The Problem of the Mandate in Palestine.*	The Rt. Hon. The Earl of Lytton, P.C., G.C.S.I., G.C.I.E.
1932†	*Great Britain in the Near and Middle East.*	Sir Ronald Storrs, K.C.M.G., C.B.E.
1933	*The Constitutional Problem in Kenya.*	Sir Edward Grigg, K.C.M.G., K.C.V.O., D.S.O., M.C.
1934	*Central Banking as an Imperial Factor.*	Sir Josiah Stamp, G.B.E., LL.D., D.SC., F.B.A.
1935	*India : Retrospect and Prospect.*	The Most Hon. The Marquess of Zetland, P.C., G.C.S.I., G.C.I.E.
1936	*Airways of the Empire : Their History and Development.*	The Most Hon. The Marquess of Londonderry, K.G., P.C., M.V.O.
1937	*Great Britain as a Mediterranean Power.*	Professor E. H. Carr, C.B.E., M.A.
1938	*British Interests in the Far East.*	Professor Arnold J. Toynbee, D.LITT., F.B.A.
1945†	*Democracy in International Affairs.*	Professor E. H. Carr, C.B.E., M.A.
1947	*Britain and the Commonwealth as a factor in World Economy.*	Sir George Schuster, K.C.S.I., K.C.M.G., C.B.E., M.C.
1948	*Great Britain, the United States and Canada.*	Professor H. A. Innis, M.A., PH.D., LL.D.
1949	*The Dominion of Ceylon.*	Sir Frederick Rees, M.A., LL.D.

* Not published.

† Out of print.

FUTURE PROSPECTS FOR AGRICULTURAL DEVELOPMENT IN THE COLONIES

The economic difficulties that have arisen in the United Kingdom as the result of two world wars, in which we as a nation took such a prominent part, and during the course of which we expended the greater part of the national wealth accumulated during the Victorian epoch, has caused many people to give thought to the possibilities of the further development of our Colonies as a means of ensuring the necessary supplies of food and raw materials. Formerly, we were accustomed to purchase these goods in the open market, wherever prices and other circumstances proved suitable, but in recent years currency regulations and monetary restrictions have, as you are aware, limited the countries from which we can purchase our needs, and public attention has, particularly of late, been attracted to the idea of obtaining these goods from within the Commonwealth. The big Dominions have been supplying this country with large quantities of meat, wool, dairy produce and grain for years past, and without their aid we should indeed have been in queer street. For these small islands with their dense population and large industrialised centres cannot supply nearly all our food, and we shall always have to import at least one third of our requirements and possibly more. It is not prospects in the Dominions, but in the Colonies that I wish to discuss to-night however, since these might be expected to supply much of the tropical raw material that we need. With the exception of the new Dominion of Ceylon, which is wholly within the tropics, and India which is partly so, the Dominions are situated outside the tropics, and therefore can provide us with the agricultural products that grow in the temperate zone. The Colonies on the other hand, are almost entirely tropical, and the few exceptions such as the Falkland Islands and the Mediterranean Colonies are small in area, and their possible development, though of course of great importance, is not likely to influence the main problem one way or another.

The chief products that are grown in the tropics are oilseeds, such as oil palm, cocoanut, sesame, and others, including of course, the groundnut of which we have heard so much lately. All these oilseeds are required for the production of margarine, soap, and other essential products. Then there are the fibre plants, such as cotton, sisal, jute and coir, required to keep our textile industry supplied. The possibility of increased meat supplies is being examined along with other animal products, such as dairy produce, hides, wool, and so on. Could the output of rootcrops such as cassava, arrowroot, and cereals such as maize and sorghums be expanded to provide animal feeding stuffs and starch for industrial purposes? These are only a few of the agricultural products that many believe could be supplied in increasing quantities and might eventually meet all our needs. While I believe that a great deal more can be done to develop colonial agriculture, and that eventually we shall go a long way to be self-supporting in these products, it is as well to issue a word of warning against undue optimism or immediate results. People are apt to rush to conclusions from a glance at statistics, backed up by wishful thinking. It is argued that if the United Kingdom with an area of only 89,000 square miles and a population of some fifty million is able to produce enough food for more than half its requirements, surely the 45 territories administered by the Colonial Office with a total area of over 2 million square miles and a population of only about 66 million, ought to have lots of foodstuffs and raw material to spare for export after their own needs have been met.

The answer is not nearly so easy as that, for unlike this country with its fertile soils, kindly climate and a highly scientific agricultural system which has been devised as the result of many years of tradition and experiment, most of the colonies are still largely undeveloped and still rely on the most primitive methods. Tropical soils also are not on the whole as fertile as those of the temperate zone. Large parts of Africa for example are not intrinsically of more than average fertility, and many big areas are definitely lacking in certain essential minerals, such as phosphates or lime, whilst in others the physical nature of the soil, or the undependable nature of the rainfall renders them unsuitable for intensive agricultural production.

I should like to discuss some of these difficulties in more detail and then, if time permits, mention some of the measures that are being taken to overcome them.

Let us first take the case of those colonies which carry a dense population and are situated in forest or bush country. Here the usual agricultural method is that known as "shifting cultivation" in which an area, amounting to a few acres of bush or forest, is felled during the dry season and then burnt. The seeds or seedlings are planted in the ashes and the land is cropped for perhaps two seasons, by which time weeds have intruded. It is then abandoned and given back to bush for a period of years. If this "bush fallow" is allowed to continue for a period of seven or more years, it can again be cropped with good results, as the soil fertility has been restored. In recent years as the result of Pax Britannica and improved social services, the population has rapidly increased and the pressure on the land is now so great that the period of bush fallowing has had to be reduced in some instances to only two or three years, with the result that the land is deteriorating rapidly and the crops are becoming poorer each year. This, for instance, is what is happening in the Protectorate of Sierra Leone, where de-forestation has gone so far that the slopes of the valleys have lost practically all the soil, and measures have had to be taken to move many of the villages elsewhere. In all these areas the land is worked entirely by the hoe, since no cattle are available, usually because of the presence of tsetse fly or else because the people have never had cattle and are unaccustomed to them. This system of bush fallowing is universal all over the tropics. You find it in British Honduras under the "milpa" system of the Maya Indians; you find it wherever bush occurs in the West Indian Islands, which have largely been de-forested as a result; it is the universal method throughout Central Africa, and the same system applies in Malaya and the Pacific Islands.

It is a system wasteful of land because of the long period of bush fallow which must occur if fertility is to be maintained. It will have to be replaced by a more permanent and productive system of agriculture if the rising population is to be fed. This problem has the first priority of agricultural departments throughout our tropical colonies, and it has many ramifications.

In Kenya, for example, where pressure on the land is leading to an alarming increase in soil erosion, the Governor (Sir Phillip Mitchell) in a recent statement put the whole matter succinctly. He stated " the basic central economic problem that has to be recognised and tackled is that an ignorant man and his wife with a hoe, are a totally inadequate foundation for an enlightened state of society, a high standard of living, and elaborate social services, and that unless an alternative foundation can be devised, a great deal of the modern talking and writing about Colonial Development and Welfare is moonshine."

This statement throws a good deal of light on the immediate prospect of getting abundant surpluses from the East African Colonies at any rate for this country.

The Governor's conclusions have been widely discussed and it is recognised that the real problem in East Africa is to increase the efficiency of man's labour, and this problem applies equally to most other tropical areas.

In regions where the absence of tsetse fly allows cattle to be kept, the agricultural departments, as in Northern Nigeria, are encouraging the peasant to use plough cattle. It is a long uphill struggle as the Hausa is not a cattle man and has therefore to be trained not only in the use of the plough, but in the care and maintenance of livestock. One of the advantages of introducing cattle into the agricultural system is of course the production of farmyard manure and the consequent maintenance of soil condition.

However, in many parts of Africa the use of cattle is prohibited by the presence of tsetse fly which conveys the deadly disease trypanosomiasis and until the drug *anthrycide,* which has recently been discovered, has been thoroughly tried out and application made effective on a wide scale, the use of plough-oxen is impracticable. In any case, there is an increasing school of thought which advocates the use of the tractor for ploughing and argues that it should be possible to " leap-frog " the plough cattle stage and proceed straight from " the man with the hoe " to the modern tractor plough and mechanisation. One of the lessons learnt during the war was the perhaps unexpected aptitude shown by many African recruits in the handling of machines and lorries

under proper supervision. This aspect is now receiving the closest attention—particularly in the African colonies and Malaya.

Broadly speaking, agricultural systems in the tropics can be placed into four categories.

(1) Large scale monoculture by big companies with plenty of capital behind them such as is found in the sugar plantations of the West Indies and Mauritius, the rubber plantations of Malaya, and the sisal plantations of East Africa, to quote a few examples.

(2) Large scale farming by Europeans on intensively cultivated holdings, as for example in the Highlands of Kenya.

(3) Settlement or resettlement areas such as occur in areas freed from tsetse fly in Africa or brought in from the forest or swamp lands in Malaya, the Caribbean and elsewhere.

(4) Subsistence peasant farming which is the usual type found in most of our colonies.

Generally speaking there are considerable opportunities for mechanisation in the first three categories, but subsistence farming presents particular difficulties because one of the essentials for successful mechanisation is a sufficiently large holding to permit of the economic use of the tractor.

Subsistence Farming.

In areas of subsistence farming a great deal of negotiation and organisation will be needed before mechanisation can be applied, because problems of land tenure and the fragmentation of holdings will first need to be solved, and the necessary capital provided. The peasant farmers in the tropics hold their land under various forms of tenure, their holdings are small, rarely more than four or five acres in extent, and often consist of fragments some distance from each other—and they are almost invariably in debt. It will therefore be necessary to organise the village area by mutual agreement, or by co-operative methods before it becomes possible to introduce the tractor. This will be a long and difficult process.

With regard to the first two categories I have mentioned, considerable progress has been made during recent years, and much has been learnt about the best way to handle the land, to prevent soil erosion, and the use of fertilisers. Many tropical soils are deficient in phosphates, for example, and recent research on the application of mineral fertilisers by the "placement" method opens a new line of investigation. In the past, although it was known that certain soils were deficient in phosphates, for example, no significant results were obtained by applying the fertiliser by the methods employed in temporate regions. Possibly this was due to the rapid fixing of the phosphate under tropical conditions, and so the "placement" method whereby small pellets are placed alongside the seed or plant, is being tried out with promising results. The actual technique of the method will doubtless be improved and be made adaptable to a wide range of conditions.

The problem of keeping up the humic content of the soil is also under close study. In this country an outgoing farmer is awarded certain allowances for the residual effect of farmyard manure he has applied in previous years. In the tropics, however, chemical and biological action is so rapid under tropical conditions of intense light, heat and moisture, that no residual effect is apparent after the first few months. The maintenance of soil texture is of vital importance, for soils that have lost their crumb structure are less fertile and more subject to erosion.

Whilst on the subject of erosion, let me say that there is a far better chance of preventing erosion on large units than in subsistence farming, because the problem can be tackled in an intelligent way, treating the whole area as one, whereas in the case of small holdings, each individual tends to regard only his own particular little problem and the maintenance of the whole area cannot be safeguarded under such conditions.

Returning to the possibilities of mechanisation, let me say that there is a great deal to be learnt and many new problems will arise.

These things can only be learnt by trial and error, and the embarkation on huge schemes without preliminary investigation, and the establishments of pilot areas is unwise. Since

much of the best land is already occupied, trial plots for mechanised cultivation will have to be carried out on areas that are unoccupied, or are not at present closely settled. Areas of this sort do occur, and the reasons why they have not already been settled are various. Sometimes, as in the West Indies, large estates have been taken over by the Government and resettled with peasant farmers. Opportunity can then be taken to plan out the area into compact holdings of reasonable size—fragmentation is avoided and some opportunity for mechanised cultivation on a co-operative basis becomes possible.

Lack of surface water may be another reason for empty lands. This difficulty may be overcome in future by the sinking of wells or the building of dams. Remoteness from markets and lack of communications may be another reason, or the presence of tsetse fly or malaria. Again the reason may be historical, such as the proximity to powerful slave raiding neighbours which caused the area to be evacuated years ago. Finally, there is the question of the quality of the land. The native farmer usually knows good land when he sees it, and if large areas of sparsely occupied country occur, to which none of the above reasons apply, one begins to suspect that the soils may be of indifferent fertility or suffer from deficiencies. This is an additional reason why pilot plots are advisable to precede any large scale scheme, and should be accompanied by soil surveys.

New Projects.

It is satisfactory to know that various projects on these lines are now being initiated.

Thus surveys of shifting cultivation and of the effect of mechanisation on African agriculture took place in 1948-49 with the aim of "studying the impact of modern methods on traditional forms of agriculture." In this connection settlement schemes in Kenya have been designed to test ways of raising the level of production without unduly disturbing the social structure of the people. The Nigerian Government and the Colonial Development Corporation conjointly are establishing a semi-mechanised pilot scheme for the production of cereals, groundnuts and other crops at

Kintogoro in Nigeria. There is also a project for growing sorghum and other millets and of using the grain to raise poultry for export—which has been started in the Gambia. Experiments in group farming are being undertaken in Nyasaland and elsewhere, and are examples of community planning based on division of labour, a rationalised system of cultivation and co-operative marketing. I have mentioned these examples to give some indication of the way matters are developing. In all cases the maintenance of soil fertility is a first priority, and these pilot schemes are therefore based on a system of crop rotation and fallow. The length of the fallow can only be determined by experience and it is hoped that grass fallowing will be possible, using either elephant grass or other types of grass suited to the tropics. The introduction of these grass "leys" will do much to maintain the fertility and the crumb structure of the soil, and will help to check soil erosion. It also means the introduction of mixed farming, since cattle must be kept to deal with the grass "leys." These cattle will not be plough oxen, for it is intended that cultivation shall be by tractor, but dairy cows or young stores brought from the cattle ranching areas.

Plantations v. Small Holding.

For political and social reasons, which this is not the place to discuss, the Colonial Office has always set its face against the plantation system in the African colonies, and because of this the introduction of mechanised farming will prove more difficult than in other areas where plantations are the usual practice. The pilot areas for oil seeds, and cotton, that it is proposed to start in the Gold Coast and Nigeria on existing unoccupied areas, will, it is hoped, serve as a demonstration and encourage native authorities to group their people into compact holdings which will make mechanisation a feasible proposition in the future.

The advantages of agricultural production by big units, whether an orthodox plantation or a co-operative or collective grouping, are obvious from the economic point of view. Yields are usually much higher, the cost of implements lower, fertilisers and stores, being bought in bulk, are cheaper, and the end product—whether it is cocoa beans or palm

kernels—is of better quality, better graded and better packed, and therefore commands a higher price, than the small parcels from thousands of individual small holders. The marketing also is easier and less expensive. The big unit can also command the services of trained men and obtain the best scientific advice on the control of diseases and pests. When in Jamaica fairly recently I watched the loading of a fruit ship with bananas. I remarked to the Captain, who was an old friend of mine, that a large proportion of the bunches were very small and would never have been passed for export before the war. His reply was to show me the various consignments. The best fruits all came from plantations where the trees had been regularly sprayed against the leaf spot disease. The peasant had not sprayed and consequently his fruit was of very poor quality. Again, in the Gold Coast the cocoa crop is produced by thousands of individual farmers on small holdings, and has in recent years been decimated by a virus disease known as "swollen shoot." It is proving very difficult to deal with this disease and apply control measures because the thousands of small cocoa plots scattered through the forest are difficult to locate. The use of insecticides or sprays is impracticable because the trees are planted haphazard and not in orderly rows. It is difficult to believe that if the cocoa crop had been established on an orderly basis in big, properly planted units, the threat from diseases and pests would have been allowed to get out of control, as it has under existing circumstances. All tropical crops are liable to serious damage from diseases and pests, and their control is one of the main problems the producer has to face, and the best brains science can provide will be needed.

Utilisation of Swamps.

There is another kind of development that is now proceeding apace, and I refer to the utilisation of swamp land. There are large areas of swamps in our tropical colonies of great potential value, because of the high humus content, but they are useless unless drained. I have already mentioned the problem of getting the people off the hill slopes in Sierra Leone in order to prevent further soil erosion. The only place where the surplus population can settle is in the swamp lands on the estuaries of the Scarcies

and other big rivers. This has meant hydraulic surveys, considerable capital expenditure and the bringing of large swamps under irrigation and drainage. It has also meant instructing the African farmer in growing wet paddy, a type of cultivation which he does not understand and does not particularly like. The same problems of over population and soil erosion also exist in the Eastern Provinces of Nigeria, and now surveys are being carried out in the delta of the Niger river, with the object of developing it for paddy cultivation and so relieving the pressure on the land. In Malaya also surveys of the swamps are being made. There the object is not so much the relief of over populated areas as the urgent need for more rice, which is the main food of the country and the normal sources of supply of which have disappeared as one of the aftermaths of World War II. The same reason has led to a great increase in rice production in British Guiana which aims to supply the whole needs of the British West Indian Colonies, which formerly brought their rice right across the world by ship from Burma. The local population of this colony is small (300,000), and the traditional methods of cultivation employed by the farmers could not possibly produce the rice needed to meet their export target of 80,000 or 90,000 tons. It was therefore decided to try and step up production by mechanisation. Government erected a large central rice mill and undertook the cultivation of some 8,000 acres by mechanised means. Different types of tractor and ploughs are tried, and the reaping was also carried out by combine machines. There were difficulties to start with, as was naturally to be expected, but the demonstration is having an effect on production. A pool of tractors and ploughs for hire has been started, and whereas a farmer using bullocks can only cultivate four or five acres, he is now able to plant four times as much. There are very large areas of potential rice land in this Colony, and very considerable grants from the C.D. & W. have been spent or reserved for drainage and irrigation works. This will render thousands of additional acres available in the near future.

Cattle and Meat Supplies.

I should like now to discuss briefly the cattle position in our Colonies, more especially since meat is one of the commodities that is in short supply, not only in this country,

but also in many other parts of the world. It is estimated that there are about thirty million cattle in our East and West African Colonies. Of these perhaps six million are in Nigeria and 600,000 of them ought to be available for slaughter each year. There are various reasons why this is not the case, but if they were available, they would just about satisfy the needs of the Nigerian population of 25 millions, the majority of whom get little or no meat at present. I mention this point because there is a tendency to believe that these huge areas in Africa ought to be able to supply large quantities of beef to meet the existing shortage in this country.

But there is a large unsatisfied demand for meat in each colony which must be met before any exportable surplus can become available.

The cattle raising industry in the tropics faces many difficulties. The coastal belt of Africa, where the population is densest, is forest country, and is not suitable for cattle because of the presence of the tsetse fly. So cattle raising is carried out in the dryer regions several hundred miles from the coast, where disease is less prevalent. This of course means transport problems which often present great difficulties. The interior regions of low rainfall where the cattle are raised are subject to prolonged dry periods during which water and grazing are both hard to come by. During the monsoon or rainy season there may be an abundance of grass, but towards the end of the dry season, which may last for anything up to seven months, there is little for the cattle to eat.

For these reasons, extensive methods only are possible at present. The stock travel over wide ranges, their owners being generally nomads. In West Africa the Fulani are the cattle men, and they understand their stock and take pride in their breeding. They have raised types of cattle that are able to stand the hard conditions under which they must exist under present conditions, where European cattle would starve. In East Africa the chief cattle raising tribe is the Masai, people who treasure their stock as a form of currency and can with difficulty be pursuaded to part with any. This is the case with many tribes. A chief's importance is reckoned by

the number of cattle he owns, and not by their quality. Until these prejudices can be broken down, serious overstocking, resulting in land erosion, will continue, and there will be little improvement in the breed. Much is being done by the all too few veterinarians and livestock officers to effect improvements, and in some areas the scourge of rinderpest is now kept under control, and other diseases dealt with as outbreaks occur. Meanwhile much spade work has been done and much knowledge acquired. Stock farms for raising improved stud animals have been opened and a greatly enlarged programme has been laid down, but it is evident that a great deal more research into the pathological and breeding problems will be necessary, and a greatly increased staff of livestock officers must be recruited to see that the results of experiments and research are applied on a large scale.

Feeding More Important than Breeding.

It is not only a matter of breeding improved stock, it is even more important to improve the feeding. As I have explained, the only land available for cattle raising is at the best, marginal land, situated in a region of uncertain rainfall. Problems of reliable water supply, fodder reserves for the dry season and improvement in the pastures by introducing better grasses and rotational grazing all have to be solved if real progress is to be made, and improved types of cattle introduced.

Lack of Trained Men.

You will have gathered from my remarks that the further development of agriculture in our colonies is not all plain sailing. Quite apart from the importance of a guaranteed market for a period of years, which applies particularly to sugar and to tree crops which do not come into bearing for some years, it is obvious that much research work and organisation is needed. The difficulty since the war has been to recruit trained men for these tasks. The lacuna in training at our Universities during the war is now shrinking and the prospect of filling the large number of vacancies in the Colonial Agricultural and Animal Health services is now much brighter. With the cadres full, it should be

possible to make much more rapid progress with the various schemes that have been planned. As I have already stressed, research and experiment must precede any large-scale development, but there is also a great dearth of officers to see that the results of research are applied on a wide scale.

COLONIAL AGRICULTURAL EXPORTS.

The peoples of our Colonies must naturally look first to their own requirements before the export of their products and particularly of foodstuffs can be expected.

Nevertheless, the Colonies are now making substantial contributions to present world shortages, and it may not be out of place to mention some of them.

Sugar. Last year, exports from the Colonies amounted to about 1,200,000 tons, the main contributions being from Mauritius, Fiji and the Caribbean Colonies. If arrangements can be concluded with the United Kingdom for a guaranteed market over a series of years, and at a fair price, there is little doubt that these colonies could go a great way towards rendering the country independent of purchases from hard currency areas. Sugar cane is particularly suited to the Caribbean area and there is scope for greatly increased production. The industry is well organised and equipped as a result of research and experiments extending over many years, both on the technological as well as on the field side. Much success has in recent years attended the work of the plant breeders and high yielding disease resisting varieties are now universally available to growers.

Oilseeds. You are all aware of the schemes of the Overseas Food Corporation with regard to groundnuts. I have never been to these areas in Tanganyika, and so do not propose to discuss them, but we must all hope that those responsible will be able to benefit from the present troubles and make the scheme a success.

The trouble is that so many people think that the groundnut is a fool-proof crop. When you get on to the right soil and in the right climate it is not difficult to grow, but the conditions have to be closely gone into and it is always wise to plant a pilot area before launching out into schemes involving millions of expenditure. The main groundnut

producing areas at present are the Gambia and Northern Nigeria, and there this crop is proved and proposals for extending the cultivation in Nigeria and the northern territories of the Gold Coast are now being examined.

Oil Palms. In 1948 Palm kernels for export were 350,000 tons from Nigeria and 70,000 tons from Sierra Leone, whilst 151,000 tons of palm oil were also exported from Nigeria. These figures are above the acreage of the five years just before the war. The Malayan plantations have also made a rapid recovery and exported 49,000 tons of palm oil in 1948. This is largely because improved strains planted before the war are now coming into bearing. This aspect is being studied also in West Africa at the Oil Palm Research Station at Berin.

Coconut Products. The main areas growing coconuts are Malaya and the Pacific Colonies. In both areas coconut plantations were badly damaged during the war and recovery to pre-war levels has not been reached. There is also an increased local demand and less is exported from East Africa and Zanzibar, whilst none is now forthcoming from the West Indies. The coconut palm takes eight or nine years to come into bearing and it is therefore hoped that the long term contracts concluded by the Ministry of Food will encourage more planting.

Cocoa. A very large proportion of the world's output of cocoa comes from West Africa, and about two thirds of the total world production of over 600,000 tons is produced in the two colonies of Gold Coast and Nigeria. The trees have in recent years suffered from a virus disease known as " swollen shoot." The Cocoa Research Station in the Gold Coast has demonstrated that the disease can be checked by a system of cutting out diseased trees. But those recommendations have proved difficult to implement and the disease is still spreading rapidly and it is thought that the Gold Coast is unlikely to approach during the next ten years the pre-war level of 300,000 tons exported annually. For this reason alternative sites for cocoa growing have been sought, and Malaya and North Borneo in the East and British Honduras in Central America have been examined and are thought to be suitable.

Coffee. The chief source of European Coffee is East Africa which annually exports about 40-50 thousand tons, which only meets a fraction of our requirements.

Rice. The need for more rice is paramount as it is the main food crop of the tropics. The world relied before the war on the great rice growing areas of Burma, Siam and Indo China. Owing to the war, supplies from these sources dried up and as I have already said a great deal is now being done to expand rice production in our colonies, particularly Malaya, Sierra Leone and British Guiana.

Cotton. The need for increased supplies from non-dollar sources has drawn attention to the possibility of increased production in the colonies. Uganda is the main producer and exported 350,000 bales last year, which was nearly double that of the previous year.

Other considerable producers are Nigeria, Tanganyika and Nyassaland. The crop is grown by numbers of small peasant farmers, and the chief difficulty is to get them to adopt simple improvements in cultivation which, if introduced, would easily double the crop.

The Empire Cotton Growing Corporation is opening its new Research Station in Uganda this summer, and this should do much to stimulate better methods.

Rubber is of course the highest single dollar earning commodity in the Colonies, and production is now greater than ever before, reaching in 1948 the record figure of 768,000 tons. Yields per acre are expected to go up, as the high yielding clones which are now being planted come into production.

There are other crops I could mention, such as *sisal,* where the East African plantations supply not only our own needs, but those of half the world ; tobacco in the Rhodesias and Nyassaland, but I shall have to pass them by as time does not permit further discussion.

Conclusion.

I have attempted to cover the field of Colonial agriculture, but have naturally, in the time at my disposal, been able to touch only the fringe of this immense subject. You will

have noted, however, that in spite of the large number of different territories and their widely differing social and economic circumstances, there are certain main problems that are common to all the tropical regions. There is firstly the primitive method of shifting cultivation, carried on by the man with an axe, the firestick, and a hoe.

In the not-so-far-distant days, when populations in Central Africa and elsewhere were kept down to limited proportions by inter-tribal warfare, slave raiding, famine and epidemics, this primitive system of agriculture served quite well, for there was plenty of land and few people.

Nowadays the position is reversed and the pressure on the land is resulting in rapid soil deterioration. The Agricultural Departments are faced therefore with the problem of better land utilisation and of increasing the output of food or other products from each agricultural worker. The next step would normally be to introduce bullock or horse drawn ploughs, but the keeping of cattle or horses is impossible over large areas either because of tsetse fly or because the farmer knows nothing about livestock. So it is now being considered whether it will prove possible to leapfrog this stage and go straight over to mechanised agriculture, using tractors for ploughing.

To reach this stage, in Europe and the United Kingdom, has taken several hundred years, during which period much fundamental knowledge about the best way to plough and cultivate the land has been acquired by painful experience.

This knowledge is not yet available in the Tropics, although a good deal has been found out as the result of experiments during the last twenty or thirty years. We *do* know that soils behave quite differently under cultivation in the tropics and the old established methods that have proved their worth in the temporate region will not necessarily work in the tropics.

It is very wisely considered, therefore, that mechanisation must be proceeded with cautiously and pilot areas will first need to be established so that if temporary setbacks occur, the cost will not be ruinous or the effect disastrous. I have mentioned some of the difficulties of applying mechanisation

to closely settled areas. The lack of capital, the small size and fragmentation of holdings, the system of tenure, and various political and social reasons, will all make it difficult, and it will probably only come into being by degrees.

Any mechanisation that can be attempted at present, will probably be on areas at present unoccupied, or only lightly held, and the opportunity of settling such areas on a community basis with a view to mechanisation of the whole should where practicable be taken. If settlements based on this new system prove a success and result in a greatly increased output from each individual farmer, then it is hoped that the older established areas may be persuaded to follow suit, but it will take time.

In many of our Colonies and particularly in some of the West Indies and parts of Africa, the situation is rapidly becoming desperate, with populations increasing fast, and the old method of agriculture proving quite inadequate to produce enough food from the land available. The results of these large scale experiments and pilot settlement schemes will therefore be awaited with great interest and anxiety, because on the successful application of improved methods will depend to a very great extent whether it will be possible to produce surpluses for export. Naturally the African farmer's first care is to ensure his own food supply, and until this has been secured, there is not much chance of any considerable increase in exports, unless areas which at present lie unoccupied can be developed profitably by plantation methods. It still remains to be seen how such areas, which are usually "marginal" in character, can best be economically developed.

JNO. SANDS & SON, LTD.,
PALM STREET, NEW BASFORD,
NOTTINGHAM.