SECTION F - ECONOMIC SCIENCE AND STATISTICS.

PLANTATION ECONOMY.

ADDRESS BY

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1. THE NATURE OF PLANTATION AGRICULTURE.

The Royal Commission on Agriculture in India of 1928 in its brief notice of Plantations remarks on their importance to the export agriculture of India. 'The three main planters' crops are tea, coffee and rubber, but sugar-cane is important in Bihar as are spices in the South of India. The area under indigo in Bihar, where it was formerly the principal planter's crop, is now negligible. The total area under tea, coffee, rubber and indigo in 1925-26 was 1,169,000 acres, of which 982,000 acres were in British India. A little cinchona is also grown by planters. The value of their crops is out of all proportion to their acreage. In 1926-27 the value of the total exports, including spices, amounted to Rs.34.59 crores or about 18 per cent. of the value of all agricultural products exported. By far the greater part of this was accounted for by tea, the value of the exports of which amounted to Rs.29.06 crores.' (Report, P.597). A crore is 10,000,000 and a lakh is 100,000, of persons, things, or money: and the present value of the rupee is 1s.6d. The Commission appends plantations to its chapter on horticulture as a special type of intensive agriculture, and it does not even raise the question whether the staples of agriculture such as cotton and wheat in the years to come may adopt the plantation system and thus cause Indian agriculture to exhibit a structure which would resemble outwardly the collective farms of Soviet Russia.

The Royal Commission on Labour in India of 1931 has four chapters on Plantations, dealing respectively with general survey, recruitment of labour, wages, health and welfare. It studies them as a distinctive and important section of wage labour in a country

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where factory employment is relatively rare; and it defines the system succinctly thus: ' The Plantation system connotes the acquisition of a limited but fairly extensive area for the cultivation of a particular crop, the actual cultivation being done under the direct supervision of a manager, who in some cases may himself be the actual proprietor. A considerable number of persons (the number may run as high as 4,000) are employed under his control in the same way as the factory workers are under the control of the factory manager, but there is one important difference in that the work is essentially agricultural and is not concentrated in a large building'.

(Report,P.349).

The Plantation has behind it a long history. It was the creation of the English overseas, beginning with the Plantation of Ulster, extending to America and finding its modern home in the East. In old usage the word is synonymous with colony; and as cunningham well says, ' English colonisation was, in its beginning and in its growth, the expansion of the landed interest.' 1 Now in early Canada and the early relations of England with India we are confronted not with plantations but with factories and forts, factories for trade and forts for the protection of trade. The plantation flourished in the West Indies and on the American sea-board, and was the economic instrument whereby colonies were established there. The Commissioners of Trade and Plantations embraced the two sides of a imperial economy, trade and plantations embraced the two sides of by sea and plantation of the land.

On the mainland the first planted commodity was tobacco, which so monopolised the life of the southern colonies that they were called the tobacco colonies. Sugar held a similar pre-eminence in the West Indian islands. From the end of the seventeenth century the range of plantation produce of the West was widened on the mainland. In 1694 rice was introduced into

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South Carolina from Madagascar; in 1745 indigo into South Carolina from Montserrat in the French West Indies; in 1794 sugar, the main produce of the West Indies, into Louisiana; in 1797, most crucial of all, sea-island cotton into Georgia from the West Indies via the Bahamas. But already before 1800 on the mainland, in contrast with the West Indies, the plantation had ceased to be the only form of agriculture exploited by settlers. The planter employing hired labour, at first white indentured labour and before long coloured slave labour, found a rival in the white settler employing only his family and himself. The free settler won in the end, and his triumph furnished the outstanding crisis of American social history. He was essentially a pioneer, and as the interior of the continent was settled, he and his type prevailed increasingly. The plantation, it was observed in early Virginia, hugged the tide water, whilst the free settlers pushed inland; this was typical of all plantation history. Apart from the short-lived reign of the great ranches, with their cattle kings, and of the bonanza wheat farms, the unit of enterprise in American agriculture has been small; and when the North by its victory in the Civil War ended slavery, it dissolved the Plantation into similar small parts. The integrated enterprise of the slave owner gave place to a loose system under which tenants held on money or shares from indigent landlords and lived in a state of debt either to these landlords or to strong commercial middle-men. In the West Indies, as in Cuba, the sugar plantations survived, but the slaves freed in 1833 would not work properly on them, and their survival into modern times was only made possible by the introduction of coolie labour from the East. Our colonial empire is a great producer of sugar to-day, and the sugar plantation, though it exists in places, does not predominate on the whole. In all cases the organisation of production centres round the factory. But in the West Indies and Mauritius sugar factories buy both from

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1W. Cunningham, Growth of English Industry and Commerce, vol 11.PP.119.120

outside planters and peasant farmers, though sometimes they have plantations of their own; and in Fiji, where the industry is under the control of the Colonial Sugar Refining Co. of Australia, almost all the cane used is bought from peasant farmers occupying their own lands or lands leased from the company. Only in British Guiana and East Africa is there in general that complete integration, to be met with in the tea industry, in which the cane is grown on estates connected with particular factories and under the same ownership and control. Nor is peasant cultivation falling away. The tendencies in recent years have been towards (1) increased size and centralisation of factories; and (11) greater development of peasant farming as the most economical method of producing cane.2. Everywhere in North and South India one notices the small and isolated clumps of sugar-cane. Over broad, continuous sugar fields, one is told, the jackals would plunder without hindrance. There is thus a balance between large and small. Sir William Ashley taught us to recognise the complementary relation between first and final producers - the former large, the latter small, in the old-time textile and metal industries of England. In sugar we have a similar relationship, with the difference that the first producer is the small peasant and the final producer the large factory.

The course of land settlement in Australia was different from that in North America, being dominated by the large sheep run of the pastoralist, which has held its place in the Australian economy. The sheep property is, indeed, not a plantation, but structurally it is not far removed. It has a large area, it requires a manager and at certain seasons, though not throughout the year, it has an important labour force on it, the sheep-shearers. It may be owned by capitalists overseas, such as the Australian Estates and Mortgage Company, which administers sheep and cattle properties, operates stud farms and has an agency business as well. The desire for agricultural settlement makes these properties difficult to administer, especially at long range; and while the large property may be

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2.Cf.Economic Surveys of the Colonial Empire, ed.1935.P.515

a permanency in the dry interior, it is likely to disappear in time, at any rate as an investment for overseas capital, in other parts of Australia, Messrs.Drabble Brothers, the Buenos Ayres representatives of Geo.Fraser, Son and Co., of Manchester, a cotton business with which the ~~mk~~ writer's father was connected for over sixty years, formed with capital raised in Manchester the Rivers, ~~the Buenos Ayres representatives of Geo. Fraser~~, plate Estanicia Company. After yielding 40 per cent. in dividends for many years it was wound up in 1910 as the result of the area coming into demand for building and other purposes, and over a million pounds was available for distribution among the shareholders of a company with a nominal capital of £80,000 only. Fruit-growing, however, has not been developed by the company fruit ranch. Alike in California and Australia, it is the stronghold of relatively small-scale and highly intensive agriculture. Perhaps if oriental labour had not been excluded from America and Australia, horticulture would have developed on the plantation pattern.

Outrivalled and dispossessed in North America, kept out in our own time by the policy of Government from the tribal economy of West Africa, the planters found a new home in the East: in particular in the British and Dutch East Indies. And to-day plantation denotes not only a system of agriculture but a system which chiefly grows plants from wood as opposed to plants from grass: tea, coffee, rubber, cocoa, coco-nut, cinchona. No doubt the capital investment required in raising wood plants has been instrumental in bringing these products under the plantation system, though it has not made it impossible for native growers, e.g. in rubber, to produce for themselves. There are no cotton or tobacco plantations in India and only a few sugar plantations; and although indigo is a grass plant and provided the first form of plantation in India, it has all but disappeared through the supersession of indigo in commerce by aniline dyes. In method of exploitation, therefore, the plantation of today is closer to certain forms of forestry than it is to ~~grain~~ crops or roots. One may think of it with advantage as intensive forestry conducted in regions of hitherto sparse population

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2. THE HISTORY OF INDIGO.

Indigo and saltpetre are the two export specialties of Indian economic history: the former a crop yielding a textile dye, the latter a deposit, not a mineral but a human and animal deposit, used in the making of gunpowder. Neither is a foodstuff: and both have been superseded, the one by aniline dyes, the other by nitrate of soda (Chile saltpetre). Between Latin America and the Troppical East there has been a many-sided and age-long rivalry of supply. Cinchona and rubber were taken to the East from their habitat in South America, and the planted product of the East has ousted the wild product. Similarly, around 1830, in a battle of the insects, the lac of India, which yielded the scarlet red of soldiers' uniforms, displaced the cochineal of Central America. On the other hand, coffee, first supplied to the European market from Mocha in Arabia and later from South India, Ceylon and Java, to-day has its centre of production in Brazil, which provides 60 percent. of the world's coffee and could easily provide the whole. Indigo has shared the same geographic pull. As the name signifies, its origin was in India, where the English and Dutch competed as merchants for the finished native product, but towards the close of the seventeenth century the trade was lost to Latin America, to reappear at the end of the eighteenth century, when there arose a new demand for ' navy blue ' and when the West Indies were distracted by revolution, as in Haiti, or switching, as in the British West Indies, to more profitable crops such as cotton.

Thr revival of indigo production towards 1800 was the work of European planters in Bengal; and they were assisted by the East India Company, which advanced large sums of money to the industry, encouraged its servants to take up planting, and relaxed, in favour of the planters, its monopoly of trade. Hitherto the Europeans had been merchants, buying in certain markets of West, North and East India the village-made product. The planters of the seventeenth century were the peasants themselves, but they were not independent producers. For the Dutch trader,

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Pelsaert, writing in 1626, states that when supply is short it is prudent to avoid running around the villages, as the hungry Armenians do, and better to buy in the town ' from the substantial Hindu or Moslem merchants who live there and have been many years in the trade, and who have made advances against indigo some months beforehand, binding the debtors to sell to no one else' 3. The European planters took the place of the Indian merchants and something more: for they set up factories in the areas of supply and manufactured the raw produce by improved machinery, drawing on the personnel and practice of the West Indies. Like Samuel Oldknow in eighteenth-century Lancashire, they advanced from merchant capitalism to factory ownership. As the land was already in the hands of the ryot, they were not able to set up the slave plantation system, in which the planter owns and operates both factory and land; and they endeavoured to ensure supplies by intensifying the debtor relationship which existed already between native merchants and native cultivators. They made advances of money which gave them a lien on the ryots' crop at a fixed price and reinforced their position as creditor by acquiring zemindar (landlord) rights over the [illegible] cultivator. Sons succeeding to their fathers' property and debts inherited, so they believed, the compulsion to grow indigo. This was what the ryots detested and the planters desired; for as one of the latterobserved in 1860, ' to encourage any ryot to pay off his balance would be virtually to close the factory' 4. The situation became intolerable when the planters, having formed a planters' Association, divided up the territory and maintained a fixed price which was much below the cost of production at a time when other crops and the expenses of cultivation in labour and draught animals were rising rapidly. The result was a growers' strike, accompanied by dirorders, which led to the appointment of a Royal Commission, and its Report of 1860 is a document of the first importance. It shows that the planters had been guilty of illegal seizures and detentions of ryots, and that the contract to grow, though believed to

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be hereditary, was not really so. It evinced a determination to protect the peasant, but was so dominated by current doctrines of non-interference that it was opposed both to penal legislation against the cultivator and to any proteetive legislation in his favour that ' fetters the free agency of the contracting parties.'5

But throughout the nineteenth century the indigo planters owned some land and to that extent were true planters. This was called Nij-joti (' it may be likened in some respects to a home farm managed by the proprietor of an estate in Engaland') 6 and the majority of it was on land of new alluvial formation annually inundated and occurring mainly in Eastern Bengal. On this class of land indigo was the crop most suited to the soil, and there were few disorders here in 1860. But so long as the tyot was compelled to deliver indigo at much less than the cost of production, the major part of the supply was virtually subsidised, and the Lieutenant-Governor of Bengal, in commenting on the findings of the Commission, pointed out that ' the real planter who grows and manufactures his own plant is, in fact, injured by the manufacturer who undersells him, because he gets his plant at a less price than any free system cultivator in his senses would grow it for' 7 · However, both he and the Commission believed that it would be impossible for Nij cultivation to replace ryot cultivation, even if the contract system was abolished, inasmuch as the ryots were already in possession of the good lands and planters could not here obtain compact estates. It would be a slow business for the planter to move his servants and ploughs from place to place, whereas the ryot on the spot could trun out with his own plough and sow the moment the weather was favourable. Therefore, after 1860, the planters were still dependent on the ryots and now assured themselves of supplies by procuring leases or other forms of control over ryot land. A planter would make loans and receive as comepensation a sub-lease of the ryots' holding, thus becoming often a sub-tenant of his own tenant, over whom he already had general zemindar rights. It was only towards the end of the indigo period that the full plantation system was adopted, immigrant hillmen working in

the factories and their women and children in the planter's fields. In 1890 about half of the 240,000 acres under indigo in Bihar was thus cultivated.

Inasmuch as indigo was superseded by synthetic dyes, we must turn to a commodity in new demand on already occupied land, to find out how a prosperous indigo industry might have evolved under twentieth-century conditions. Tobacco furnished a good example. The British-American Tobacco Company through its associated companies, is something more than a merchant and manufacturer in India, yet it is not a planter. The centre of its operations is Gunthur in Madras Province. India is, after the United States, the greatest producer of tobacco in the world, and the great majority of it is consumed locally. Of some 900- 1,000 millionlb. of Indian tobacco, the British-American Tobacco company handles about 40 million. Its task has been to introduce tobacco of the Virginian type to Indian consumers on the lines of its earlier work in China, and them, under the stimulus of a protective tariff, to manufacture this kind of leaf in India itself. Its problem was to secure adequate supplies of the right type. Therefore, in addition to its factories, it has a Leaf Development Company, which teaches the ryot how to grow improved varieties and supervises the growing. The seed is issued by the company's staff of expert botanists, and the company contracts to purchase crops of selected ryots whose output can be expected in a normal year to reach a certain figure. It thus exerts in a paternal way the influence which Messrs. Chivers, fruit and Jam manufacturers at Histon, Cambridgeshire, exert on the surrounding fruit growers. When the indigo planters tried to improve their product by the issue of selected seed, the ryots refused to take it, lest this should count as a money advance of the old type, which would put them in permanent bondage. But the British-American Tobacco Company has no such designs on the peasant and his land. The ryots grow the new varieties eagerly and well; and I saw the rich green of the highly cultivated tobacco land around gunthur.

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A second example is supplied by sugar. For in India since the war sugar-cane production has been increased by the aid of tariffs and subsidised sugar factories. The research stations of the Government, e.g. that of Heppal outside Bangalore in Mysore State, play the part of leaf development companies to the suppliers of sugar. What role co-operation among growers may one day play in tobacco and sugar is hard to forecast. I suggest that, co-operation for credit apart, it will take the form of collective bargaining association, as among the milk producers of America, rather than of a processing organisation like that of the fruit growers of California or the dairy farmers of Denmark and New-Zealand. The capitalisation and technique are too advanced to allow of the peasant undertaking the co-operative management of sugar factories. In tobacco, as contrasted with butter or sugar, a further difficulty is present. It is exceptional for any tobacco product to be manufactured exclusively from a single grade of leaf. Nearly all are blended from a variety of leaves possessing different qualities, and the expert blender, who makes these mixtures, must be satisfied that the leaf offered to him possesses the qualities which he requires.

3. <u>TEA AS A COMMODITY</u>.

The bulk of the tea consumed by Great Britain is grown in one of three districts, Assam (with adjoining territory) South India and Ceylon. Java is a competitor in lower-priced teas, and China grows its special China tea. The production is highly localised, and tea tends to drive out any rival. Climate and altitude are important, and Ceylon is favoured in both respects. First of all it has two monsoons: the south west, June, July, August, September; and the north-east, November, December, with the tail end in January; and the rainfall is sufficient to promote growth virtually the whole year round. In Assam, which is outside the Tropics, there is only the one monsoon, the south-west and for a part of the year there is no growth owing to the winter cold, and theplantations are closed down. South India has a shorter off-seans, though in parts there may be a five-month drought, when growth is slow. Of Ceylon, though not of India, it may be said that the higher the land the

better is the quality of the tea. S Just as in Canada the best apples are grown near the frost line, so in Ceylon the best tea comes from the high land. Ceylon distingnishes between three classes of plantation land, the low coastal land which is devoted to coco-nut plantations, the middle land which has rubber, cocoa and tea, and the high land which has been all but monopolised by tea since tea, fifty years ago, took the place of coffee. But even in Ceylon the range of tea is wide; and the Colombo market reports distinguish between high, medium and low elevation teas. The handicap of Ceylon is its relatively samall area and the consequent high price of land. In South India along the Western Ghats plantations are of more recent growth and there is more room for expansion. On the middle land in Ceylon tea and rubber are seen side by side, but the interplanting of tea with rubber is rare. After the rubber slump of a few years ago a certain amount of interplanted rubber was removed and the whole left to tea. Strong regionalisation, conforming to natural requirements, has been reached as the outcome of experience.

The Royal Commission on labour in India continues: 'Factories are to be found on certain plantations. Most tea gardens have their own factories for dealing with the harvested crop. A number of the coffee plantations in South India also have their own factories, but in them the process of manufacture is only a preliminary stage, the coffee being cured and finally prepared for export in factories outside the plantations' (P.349)9. This quotation calls attention to an important feature in tea. Every tea estate has on it, or adjoining it, a tea factory; and in this factory tea leaf is carried to its final processed form. When it arrives overseas, it only has to be blended to be ready for consumption. Moreover, when blended it is ready for final consumption. It is not, like cocoa, the raw material of a further industry such as chocolate. Coffee again is different; for on the coffee estate processing is confined to the removal of the two coffee berries from the

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containing skin or cherry. When the cherry has been removed, the berry is sent in parchment form to curers on the coast, and finally is roasted and ground overseas. The coffee estate is very far from turning out the finished article. Similarly with rubber the latex comes in liquid form from the trees and, after the impurities have been strained off, it is coagulated into sheet or crepe rubber, baled and exported. These processes require a very elementary factory in comparison with the sequence in a tea factory or rubber and tyre factory.

As a plant, tea is distinguished by a further feature. It is a leaf and not a fruit, and its yield is both continuous and reliable. It is like having one's hair cut every week or fortnight. But a fruit such as the organge or the coffee berry has a flowering season, and damage to flowering may hurt the crop beyond remedy, whereas in a foliage crop, although certain conditions may arrest growth and hurt the quality, yet these adverse conditions may be followed by good conditions favourable to further growth and a restoration of quality. Finally, because it is a leaf no spraying is possible. To spray a whole tree would be too large a task and might leave deleterious matter on the leaf. Of course, when the tree is being pruned and out of use, this objection does not hold.

4. <u>THE TEA FACTORY</u>.

Let us enter a South Indian or Ceylon tea factory and watch the sequence of operations.

1. <u>Withering</u>:- The leaf on entering the factory is taken to lofts where it is spread on tats, strips of hessian cloth on which the leaf is thinly spread. It remains here for a minimum period of eighteen hours, after which it is in a withered state. The required degree of wither is checked by one of the factory

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9. Tea 'gardens' I take to be the language of China and Assam. Does it derive from the time when tea was grown by the villagers of China in little gardens?

staff, and should be taken to a stage of approximately 58 per cent., 42 per cent. of moisture being removed. In certain conditions of weather it is necessary to wither the leaf artificially by hot air. Modern atmospheric contitioning plant woking automatically opens up great possibilities for the future. One thinks of the perfect control given by the Humidifier' in the modern cotton mill.

2. Rolling and Breaking:- The leaf is collected and fed to a roller consisting of a large box-like arrangement with a brass table. About 350 lb. are taken on to a roller and rolled for three to five periods of about half an hour each. The object is to put a twist on the withered leaf and to break it up gently. The small leaf passing through the mesh is collected and taken away to a cool room to ferment. This is called 'fine bulk'. The bigger bulk, which is carried off the end of the roll breaker, returns to the roller, where the process is repeated. This is called 'coarse bulk' and goes also to the fermenting room. Overrolling would reduce the leaf to a mush and break the fine tips.

3. Fermenting:- In the fermenting room the leaf is evenly spread on a tray and exposed to air. The object is to improve the liquor and flavour of the tea under chemical action. It takes about three hours, and at a certain stage the leaf gives out a smell which informs the teamaker that it is ready to be fired. If it were left for twenty-four hours, it would be ruined and the smell would be offensive.

4. Firing:- The tea is now passed over revolving trays, dropping from one to the other. As it goes over the trays, hot air is passed continually through it. The object of firing is to make the tea black and crisp, and the process corresponds to the roasting of coffee. It is now quite black. Green tea comes from the same plant; but if green tea is required, the leaf is heated by steam to a degree at which fermentation cannot occur and stays green in colour.

5. Sifting and packing:- On the next day the teas thus made are taken to another room on the ground floor, where they are

sifted and cut and sorted into a series of evenly graded clean teas, the final products being classified thus: broken orgnge pekoe (B.O.P.), broken pekoe, pecke, peoke su, B.O.P fannings, B.P. fannings, dust, fluff (this comes from the hairs on the tip of the leaf and, though formerly used as a dye, is now used only as manure). 'Orgnge' pekoe is so named because of the bright golden pieces of tea, which are the buds of the bush. The Oxford English Dictionary says, under 'Pekoe' 'Chinese, from pek white + ho down. A superior kind of black tea, so called from the leaves being picked young with the down still on them'.

5. THE TEA PLANTATION.

We step now outside the factory to inspect the factory from without and the estate itself.

The factory, with its roof and walls of corrugated iron, painted brickred or left plain, has a basement of brick and mud cement floors, and it is built on steel framework panelled with wood. It is not so gaunt as a grain elevator in Canada, and its background is always pleasing. It will be a little way inside the limits of the estate, and usually near the bottom of it, and it is reached by a winding road. Near-by are the superintendent's bungalow, the coolie lines and a store. The chug of the engine is audible some distance away.

Where, as in tea-or butter-making, the raw material is processed close to its place of growth, the conveyance of the raw material to the factory is economically important. There are five different ways in which the tea leaf may come to the factory: (1) the whole way in baskets on the heads of the girls, to be weighed at the factory door; (2) on the bullock with side bags, which is now out of date; (3) in the bullock cart; (4) on the wire shoot, using gravity, with overhead carriages, resembling the aparatus on which cheese is slung in the Alps; (5) in the motor truck. The truck is now ousting the bullock cart and represents the best modern practice. The tea is weighed

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from the basket into the truck at the roadside, and the babies are fed at the same time. Lorry leaf, because it comes so expeditiously, arrives in better condition. Similarly, the source of power for the operation of the factory is closely bound up with its neighbourhood. The usual fuel is wood taken from the jungle, or stump wood from the estate itself, when it is being cleared. Wood fuel favours the desperion of factories in such a way that each will have around it an adequate fuel supply. The wood is used in two forms: (1) as heated charcoal, made by estate labour, which gives off gas for the generation of power in an internal combustion engine; (2) as logs for firing the furnaces which heat the pipes through which air is taken into the drying machines. But in the Anamalais (South India) group of the English and Scottish Joint Co-operative Wholesale Society Ltd., three factories have been recently electrified to take power from the Pykara Dam, and in its Manantoddy group the possibilities of Cauvery water have been considered. Ceylon is rich in hydro-electric power, but very little has been developed. Any general adoption of hydro-electric power would be a force favouring the concentration of production at one or more central points in a group of estates.

The work on the estate embraces three distinct tasks: (1) clearnce and planting; (2) cultivation and soil conservation; (3) the plucking of the leaf.

(1) A planter must be an engineer, road-builder, technical agriculturist and labour manager all in one; and at the outset a labour force must be assembled which is ready to turn its hand to every task that is required. The area to be cleared is first of all surveyed for roads and levelled. The jungle wood is felled, dried and burnt; unburnt residue being cut up and reburnt. Large roots are taken out. Lines are then laid, normally north-south, and pitted for tea bushes. The estate is roaded, drained and

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planted. All this requires a period of about six months, from felling in October to planting in May, in readiness for the south-west monsoon. In the same interval protective trees are planted.

The tea seed either is raised in a nursery and the plant lifted after eighteen months or more, or else after germination it is put in a basket in which it is shortly taken to its position in the field. It is then left to grow for a period (during which the planted area is weeded, dug and cleaned), and after a light pruning yields tea. Whether it is nursery or basket plant, the interval between planting in the field and coming into bearing may be reckoned at 2½ to 4½ years, according to climate and elevation. Thenceforward the trees are pruned on a two -to three-year cycle: the object of pruning being to control the tree and get an even spread of leaves. It is a serious operation, to which only healthy trees respond properly. Bushes in use are 3 to 4 ft. high, but left wild they would grow to a height of 20 to 30 ft. or more, and would have small white flowers all over them at blossom time. It is interesting to remember that in NewZeland in spring the white flower of the manuka shows up prominently. It is called the tea tree because the earlier settlers made a drink resembling tea from it, and it is sometimes spelt incorrectly 'ti' tree, as though it were a Maori word.

(2) An estate in bearing is cultivated each year as well as pruned periodically. Growth is permitted during the wet season to resist erosion, but after the rains must be cleared. The digging is done with a fourpronged fork, and its purpose is to turn and aerate the soil, bury weeds and absorb water. (In parts of South India the division of labour is carried to the point at which two men work one spade, one man inserting and raising the spade, and another jerking the contents to one side by means of a small cord attached to the neck of the spade.) In pruning the branches are cut away and stacked

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in rows, and, when the foliage had dropped, they are removed for firewood or manure. The leaves themselves are scraped into heaps and forked in with the help of the worker's feet above the bushes. Compost manure is humus made from the waste products of agriculture such as leaves, sweepings and cattle dung. Heaped rubbish engenders great heat, takes up nitrogen and kills lice. It is finally dug into the soil between the bushes, say five tons to the acre. The value of this organic manure is now generally recognised, and it is customary to apply it with a chemical concentrate such as bone meal and potash.

Though tea is the only plant on the estate grown to yield a cash return, yet there are other trees planted on it to help the tea tree by way of protection and nourishment. The most common shade tree is the tall grey Grevillea robusta, commonly caled the silver oak. The stouter Albizzia yields good wood as well as shade. The Dadap is a quick-growing nitrogenous shrub, which is lopped for its leafage. In Ceylon a common catch crop is the yellow-flowered Crotolaria which is cut down and forked in. The deciduous leaves of the Grevilleas, when they lie on theground, protect the soil from the baking effects of the sun and act as a mulch, preventing soil washing.

There is thus on the estate, even when cleared, a continuous programme of cultivation, which is done by male labour. Any slackening of cultivation is punished by attacks from couch grass, allock, lantana and other noxious weeds. These have to be eradicated by continuous forking and burning, after which it is possible to re-establish high-shade, medium-shade and green nitrogenous plants.

(3) Tea-plucking falls into two parts. The first plucking is on the young trees to bring them to a level, and it is done three times over. Then comes the regular plucking once every week or ten days or more until the

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tree is rested for pruning - provided of course that as in Ceylon, all-year picking is possible. Only the tips of the bush ('two leaves and the bud') are picked. The small tap leaf (which is a out the size of one's little finger), together with one leaf above that, is left on the bush, and only the tender leaves at the top are taken for manufacture. Inside these leaves rests the orange-coloured bud. The lower leaves would be too coarse and bitter; they are not left because of any scheme of restriction.

Plucking is done by women under the supervision of a maistry or foreman, and is the crucial operation on which the wage economy of the plantation rests. It corresponds to the shearing of sheep, the harvesting of wheat, and the stripping of cotton. Shearing is done once a year by itinerant shearers using machine clippers, harvesting by the aid of the harvester which both strips (or cuts) and thrashes, cotton-picking either byhand or by the mechanical stripper. But there is no machine for tea-picking, and for technical reasons there is never likely to be one. If there were, it would upset the balance of the labour force. For the men workers and women workers with their families live and work on the estate.

6. OPTIMUM SIZE AND THE AGENCY SYSTEM.

What is the optimum size of the tea plantation? The figure generally given for a mature estate is 500 acres. In east Africa, where tea-planting is new, there is no restriction of export as such, but a recent arrangement 10 provides that planters with 100 acres and upwards shall be allowed to expand to 500 acres, which is conceived of as the working optimum. In India and Ceylon it was determined historically by the capacity of the individual planter in pre-motor days to finance and supervise the development of the

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10 Report of the International Tea Committee, 1934-35,P.7

estate, its cultivation and woking and the treatment of its product in the factory on the estate. With primitive roads and bullock carts the daily delivery of the leaf made an estate of much over 500 acres impracticable; and many private estates lacking finance would remain smaller than this. But the days of the proprietary planter are over [illegible] and now one meets not with planter owners but salaried superintendents - one superintendent to each estate. Moreover, several estates, say two, three or four, are grouped together to form a 'group' with a group manager. The latter superintends the other estates on his group and in addition manages one estate directely. A large company will have a number of groups in different districts.

Normally the position still is one estate, one tea factory, but not always. There is a growing tendency for the factory to be enlarged, so that it can take the produce of several estates. For example, recently in the Sheikalmudi (Anamalais) group of the English and Scottish Joint Co-operative wholesale Society in South India, four estates have been feeding one factory, and the two factories thereby put out of action are kept as stand-bys for use in the x rush season. From the estate superintendent's point of view this development may be unwelcome. As one of them (not in t is group) said to me, ' You will have no end of complaints about the quality of your tea if you do not make your own leaf.' Mechanical transport and electrical operation indicate a figure closer to 800 than to 500 acres as the optimum size of a single estate in the future.

As the result of evolution there are four different types of plantation to-day.

1. The Proprietary Planter:- He is almost extinct. The man who is called a planter is in fact a salaried superintendent. In 1909 -10 perhaps 30 percent. of the planters were proprietary planters (except in the coco-nut plantations, which have always been either a village or a company enterprise). But to-day it is rare to meet one.

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2. The Small Companies:- These, with their agents at the coast, are the most representative type of plantation in Ceylon to-day. They have their London shareholders and directors and their agents in Ceylon, and they may employ the services of visiting agents to report on the condition of the estate from time to time. I visited the estates of two such companies: the Nayabedde Estate Company Ltd., at Passara, Ceylon, and the Dimbula Valley Tea Company Ltd., at Bearwell, Ceylon.

3. The Large Companies:- Examples are the Ceylon Tea plantations Ltd., which acts as its own agent, and the Anglo-Ceylon and General Estates Ltd. These large companies produce rubber and coco-nut as well as tea, thus diversifying their interests. The Ceylon Tea Plantations Company has the following acreage in bearing: tea, 9,456; rubber, 5,193; coco-nut, 2,414 acres. Its profits for 1935 were £ 54,000, dividend 10 percent, by comparison with the prosperous days of the 1920's, when -e.g. 1925 - profits were £ 332,000 and dividend 60 percent.

4. The Consumer Companies:- These companies have in Great Britain their own wholesale and retail organisation for the disposal of tea, and they operate estates from which they derive a portion of their supplies. Such are Lipton, Brooke Bond, and the English and Scottish Joint Co-operative Wholesale Society.

The small companies above mentioned could hardly exist in their present small form if they were not commercially integrated by the great coastal agencies. These agents play a dominant part in the commercial and industrial life of the East. The evolution of their contact with plantation agriculture may be studied in the indigo industry. ' They (the Calcutta agency houses of the 1830's) also became Calcutta agents for the plantations and received commissions on purchases and various other transactions, including 2 percent, on all sales. Mortgages were taken

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on the property, but the risks were great. The investments in buildings and land were not nearly so substanital as the outlays for advances to cultivators'. 11 And there is a strong analogy in the stock and station agents of Australia and NewZealand, like Dalgety, Goldsbrough Mort and the New Zealand Loan and Mercantile Agency, which have served as the financial spine of the pastoral industry in those parts. The agents' functions are very miscellaneous. They act as shipping agents, as import agents and as export agents. Some of them are almost exclusively connected with plantation produce, and in particular with tea. A large agency firm will be agent for perhaps forty or fift y plantations, they may have a financial interest in them, and though not technically the managers of the estate they may be virtually so. They supply their estates with planters' requirements and they handle the produce of the estates, selling it at the auctions in Colombo or sending it to London for auction there. At the auction they are present both as buyers and sellers, and if the lot of tea on offer comes from one of their own estates and they want it for a customer, other buyers (I was told) do not bid against them. Leading agencies are: Harrison and Crossfield, James Finsly & Co. of Calcutta, Carson's of Colombo, George Steuart & Co. of Colombo. The managing agency is applied in India to factory industry also. But whereas in factory industry the commission is usually paid on a profits basis, in plantation industry it is paid on a quantity basis, calculated on purchases, shipments or sales. Its penetration is, therefore, [illegible], less complete here: the agents manage the plantation in an indirect fashion only.

The English and Scottish Co-operative does not employ agents. It started on the coast as a merchant and then pushed inland to own and manage tea estates, the produce of which it despatches to the English and Scottish Wholesale Societies, who jointly own it, in Great Britain. It procured its estates by the purchase both of planted and unplanted land. The

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nucleus of its South Indian properties was bought by Sir Fairless Barber, who later became the general manager. In Ceylon it sent its commercial manager from the Colombo depot to take charge of its estates when it acquired them there. Being structurally a buying agency which has pushed inland, the English and Scottish Co-operative has naturally followed other agents in developing an inward as well as an outward business. Not only does it supply its estates with requirements but it also in Calicut does a general business of import, selling to wholesalers in the district. It sells where it can the products of the factories of the Co-operative wholesale Society itself, but except in proprietary lines this has not been easy to develop owing to Japanese competition. A similar attempt with somewhat similar results has attended the efforts of the Co-operative Wholesale Society to develop a reciprocal trade between itself and the dairy farmers of New Zealand.

7. LABOUR CONDITIONS.

Where tea is grown in hilly regions or in an area that has hitherto been jungle, the problem of labour is in the first instance one of recruitment from a distance. It is a special case of that larger problem which we call migration. Migration is of two kinds: from village life in one country to village life in another, and from village life to town life inside the same country. Estate labour migration comes midway between the two. It is migration from one rural existence to another, but the discipline of the estate is not far removed from that of the urban factory. However, unlike many factories, the plantation requires the whole labour force of the family, the terrain is rural and the environment is pleasant. There is thus in plantation labour no marked hostility to the employment as such. The workers are not thinking the whole time of the village at home to which they will return when they have made enough money. In time t e plantation becomes their home, and the return to their own country is a holiday away from home rather than an escape to it.

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The problem of recruitment differs according to the area. First, North India. In the Darjeeling area much of the land is too high for the plains people, and the labour is derived from the voluntary migration of near-by hill peoples from Nepal and Sikkim. Manyof these workers have lived on the estate since birth. 12 Assam was the difficult district to settle. Seventy years ago it was uncultivated, and nearly uninhabited, jungle. It was a rude and insecure region close to the frontier of India. In the nineteenth century planters had to obtainand hold their labour by a system which had many harsh features in it. It was virtually a system of indentured labour with severe penal contracts attached. Recruitment was prohibited in certain districts outside Assam - for example, in parts of the United Provinces - and the planters obtained their main labour from primitive x tribes peope of the Santal Parganas and Chota Nagpur by methods which degenerated at times into a system approaching to slavery. Even before the war this was greatly changed. The penal contract had been modified, and propaganda and advertisement by recruiting agencies forbidden. There has, however, to be some method of recruitment, and, in the absence of organised agents on the one hand or a Government system of labour exchanges on the other, there grew up a highly expensive system of informal recruiting by the foremen of the estate, themselves ex-workers. Under this system it cost before the war Rs.200 to Rs.500 to recruit one labourer, and in1930 Rs.150. The fore-men (sardar) abused his position. Aboutone-half of them did not recruit a soul, and about one-third did not even return themselves, according to the Royal Commission in 1931 . Moreover, it became customary to make everyone who was returning home a sardar, because that was the simplest means of assistang his return. ' It is only in the case of Assam that neither the employer nor anyone else can assist the labourer who is willing to migrate except by the expensive and cumbersome expedient of sending down a garden sardar to sponsor the recruit' 13 The Commission therefore recommended

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that a recruiting body representing Indian as well as European planters should be allowed to open recruiting depots, and that assisted recruits should not be forwarded except through these depots; while, to protect the workers on arrival, a protector of Immigrants with powers to work inside Assam should be appointed. The problem is likely to diminish; for it is computed that over 600,000 ex-garden labourers were settled on Government land in Assam in 1921, the total number of foreigners in the province attributable to the tea industry being one and one-third million, i.e. one sixth of all Assam. With tea restriction and the acclimatisation of foreign-born workers to Assam they will to an increasing degree find a place of retirement within Assam itself.

The Position in South India is rather different. The country is newer, and the problem of recruitment is easier because in Madras Province, and especially in Malabar, there is a great mass of labour seeking work. The existence of 'distressed' areas, where poverty was extreme and perennial, facilitated recruitment at the outset. The labour comes to the estates and returns to a near-by home once a year, for the tea year is a ten-month year, and in the two idle months the workers go home. This is the inland side of that great overseas movement which until recently took place year by year from the west coast of Madras to the rice fields of the Irrawaddy Delta in Burma.

In Ceylon there are, from an agricultural standpoint, four distinct divisions of population: (1) the European commercial and planting community; (2) the native Sinhalese, who are the officials, the x lawyers, and the ordinary agriculturists of the island, but though some Sinhalese are employed incidentally on the estates, they are rarely part of its labourforce; (3) the old immigrants from South India, the Jaffina Tamils, who are also agriculturists - Jaffina being a rich agricultural district which, inter alia, grows tobacco

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for the South Indian market; (4) the estate labourers, also Tamils from India, who supply the labour force of the estates. It is estimated that in 1935 the estate population of men, women and children numbered 688,000, or one-ninth of the island population. The movement of labour is strictly controlled, and there are no abuses. They have paid in the past periodic visits to their old homes, but more and more the younger workers are coming to regard the estate where they work and perhaps were born as their home.

I did not visit Assam, therefore I will draw my example of wages and living conditions from South India and Ceylon. In South India the methods of wage payment (16 annas -R.1, 1 anna = a penny) are as follows.

A male worker earns 6 to 7 annas a day and is given a difinite task of digging, etc; to perform in the working day. The women work by piecerate, so much per pound of green leaf plucked. In the hot weather, when the crop is short, they may earn only 2 to 3 annas a day, but in the flush season perhaps a rupee. Under restriction h the working week is a five-day one, with no plucking on Saturday or Sunday. The earnings of the workers are not, however paid out each day or week, or even each month. They are credited to him or her on the worker's check roll account and paid out as follows: each week to each man and woman 4 annas for the whole week (also 2 to each working child), this payment being called selvade, together with a ration of rice, say 11 annas' worth per adult worker. During the season one or more advances will be made to enable the worker to pay off village debts or to incur some outlay, such as purchasing a marriage Sari(dress). Finally, at the end of the season, the worker draws a lump sum in cash, being the balance of what is due to him after all deductions. This sum the workers take home with them, but it is said that many are already so greatly in debt to a near-by moneylender or trader that the lump sum earned is in their possession only for a moment.

In Ceylon (100 cents= R.1, 6 cents = a penny) the system is different. First of all there is a legal basic rate, which is fully enforced. Secondaly, payment of the whole wage due is

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made once a month, the standard rates being as follows:

	Cents a day.	Rs.a month.
Man	50	11
Wife	40	9
Two children	30	14
		34

Careful estimates of budgets have been compiled, to ensure that the wage rate is sufficient for reasonable subsistence. The monthly expenditure is calculated as follows:

	Rs.	Cents.
Rice 1 bushel at current rates for the man	4	40
" ¾ " " " " " " Wife	3	30
" 1 " " " " " " 1 Working Children.	4	40
	12	10

A further Rs.7 and 50 cents is allowed for other grains, such as gram, dhal (a pea), and soya beans. Thus the family bill for the main foodstuffs is about Rs.20 a month against a family income of Rs.34. To this must be added expenditure on oddments such as chillies, spices, sugar. I inspected the edibles in several of the co-operative stores run by the planters on their estates, and they represented over half the total trade of the store.

The remaining trade was in mxk cooking vessels made of clay, and clothing, of which the chief items were saris (women's dresses), vertis (men's skirts), shirts, loin cloths, head cloths, and rain shawls with hood attached. The vertis and head clothing were the only products coming from Lancashire. The shirt is frequently native-or Indian-made, from homespun Khaddar. But the bulk of the clothing is Japanese. When, in pursuance of theOttawa agreement, textile quotas were imposed by proclamation on Japanese textile imports, as from July 31, 1934, the Japanese mxdx-up in part got round the quotas by sending in the finished article, which was not quota'ed, instead of piece goods. ' The imports of Japanese made-up apparel have intensified during the past three years.

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This development not only represents an increase of possibly 50 per cent. of the Japanese quota, but has also caused considerable hardship to the local tailoring community.' 14 I found a widespread condemnation of the textile quota. It came at a time when the earning power of the population had been heavily reduced by distress and disease, and it was forced by London on Colombo. Butfor the reduced cost of clothing due to the Japanese imports the real earnings of the working population of Ceylon, and in particular those of the general agricultural population, whose returns vary with the price of their produce, would have fallen below subsistence level after 1929.

It is noteworthy how frequently the Royal Commission on Labour in India quotes with admiration the methods of Ceylon. The tea company itself, the Ceylon Government and the Government of India's agent from Madras (who resides in Kandy and is entitled to visit the estate and inspect pay-sheets) all look after the coolies' welfare. And when Indian planters objected to this or that proposal, the Royal Commission was able to argue with effect that this very proposal had been introduced in Ceylon at the demand of India's representative in Ceylon, so that India was only being asked to follow the practice which she had helped to impose on Ceylon.

I was in Ceylon at the tail end of the great malaria epidemic, which, in conjunction with famine, in the space of a year and a quarter destroyed around 100,000 lives. A full account of its cause, course and consequences is given in the Reports of Colonel Gill of the Indian Medical Service (September 1935), of Dr. Briercliffe, head of the Medical Department of Ceylon (September 1935), and of the special relief commissioner, Mr. H.E. Newnham, Ceylon Civil Service (March 1936). Dr. Gill emphasises the cumulative damage wrought by the epidemic. First, the actual sickness and mortality which attended it. Secondly, the accompanying privation and starvation. Thirdly, the paralysis of village life. Fourthly, the debility and sickness

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consequent upon it. The cause of the malaria epidemic, as well as of the famine, was the abnormal drought of 1934 and 1935, so that rivers which normally flowed strongly were reduced to stagnant pools in the sand and rock of the river-bed. In these the mosquito (Anopheles culifacies) found an ideal breeding ground. Malaria is endemic in parts of Ceylon and in the East generally, but there was no epidemic in those parts of the country which normally suffer the most. The epidemic was confined to certain river systems, flowing inthe main to the west coast. The area included all but the higher situatedtea plantations. At the height of the epidemic in certain regions every other person was stricken. It was the duty of Mr. Newnham to organise the programme of relief. He testifies in his Report to the excellent response of the native self-governing legislature in the crisis and to the honourable conduct of the large majority of those who were relieved. He quotescases of abuse, but they were in the minority, and he is able also to quotecases of villagers refusing supplies, on the ground that the needs of their neighbours were greater than their own. The blow to the economic life of the country was so complete that it was necessary to organise relief works. The lack of technical experts in sufficient numbers was found a major obstacle in instituting suddenly a largely increased programme of road building. Moreover, the workers were themselves in poor condition. Therefore at first anti-mosquito measures, such as clearing stagnant water and spraying river streams, proved the most suitable light work to those recoveering from malaria. In addition to clearing streams they removed undergrowth, filled hollows and burnt rubbish. Thereafter they were employed on road-making and irrigation works. But the financial drain on the State was heavy and, though aid was given freely while the crisis lasted, the State Council felt compelled to curtail its works programme as soon as these were unnecessary for relief; and Mr. Newnham laments the resulting loss, for ' meanwhile the rain descended and the floods came and beat upon the earthwork, and for want of culverts, etc., some hundreds

of miles of roads were becoming derelict.15

Colonel Gill's Report emphasises the fine work done by the planters. Both in South India and Ceylon the hospital facilities on the estates are of a high order; for the planters have to maintain a continual fight not only against malaria but also against the hook-worm, which enters through the bare feet of the workers when they tread on infected matter. During the epidemic the planters took charge of their own people and also of adjacent villages. Dr. Gill concludes that in certain rural areas, and more especially on estates, the prevention of malaria epidemics is a practicable proposition. He ventures the opinion that another major epidemic is unlikely within the next five years, and meanwhile he submits a programme of preparation and co-ordination of effort. It is useless, for example, for the planters to clear their estates if the neighbouring village land continues to breed the mosquito.

A final thought emerging from this crisis concerns the relation between plantation agriculture and village agriculture. Too often the hope of village agriculture is thought to lie in the export market when there is a better one at home. The plantations by their great demand for supplies ~~of~~ offer a considerable local market. Secondly, though the workers on them have hitherto been immigrants, it is by no means certain that they will always be, especially as the standard of living on the estates rises. It may be expected, therefore, that there will not be the disinclination which there has been in the past on the part of the native Sinhalese to work as daily paid 'coolies' under a regimen which to him was servitude. In the old days the housing on the estates was not what it is to-day. Now in addition to excellent medical facilities and (in a few cases) to excellent co-operative stores, the housing itself of the labourers has been greatly improved. This the new lines which I saw on the estate of the English and Scottish Co-operative at Westhall, Kotmale district, Ceylon, are Government- Standard

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huts made of cement, with concrete walls, iron frames, and verandas 6 ft. wide with a low wall in front, inside which the family can rest and play when it is too hot or too wet to be outside, while some yards away in the rear, and apart, are tidy latrines, also made of cement. Each room has its own chimney and fireplace, three or four inhabitants to the room. It must be remembered that the climate is such that much of the day throughout the year can be spent out of doors, while the nights are often so hot that many prefer to sleep in the veranda.

8. TEA CONTROL.

It is customary to use the leading cash crop of a country as the source from which funds are derived for purposes common to the growers concerned; and in addition the Government may add in this way to general revenue. In the Canadian wheat pools expenses were met by deductions from growers' receipts, and at any pool meeting or general agricultural conference it was frequent to hear suggestions that this or that desirable purpose could be thus financed. The planters of Ceylon have their planters' Association, to which the members subscribe on an acreage basis. But the tea planters in addition pay a number of export taxes or 'cesses.' They amounted in April 1936, per 100 lb. of tea exported to the following:

	Rs.	Cents.
a. Customs duty (taken to general revenues)	2.	00
b. Medical wants on estates.	0	15
c. Tea research.	0	14
d. Tea propaganda	0	75
e. Tea control.	0	11
	3	15.

The restriction scheme is more properly called a regulation scheme; and it is concerned with the regulation of exports. In Ceylon it takes no account of domestic consumption, but in India it is accompanied at present by a gentleman's agreement under which producers agree not to manufacture for sale in the domestic

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market more than a certain percentage (in 1936, 12 percent) of the estate's basic crop. It does, however, in both countries, provide for a prohibition of new planting, save in special cases, and then, only up to ½ of 1 per cent. of the total area under tea. Replanting is limited to replanting on the same area which has been uprooted, and the nursery acreage may not be increased permanently. The scheme came into force on April 1, 1933. There was a precedent for it in the post-war scheme of rubber restriction known as the Stevenson Scheme. The latter eventually failed, because in addition to being rather greedy and very inelastic it did not include the Dutch East Indies, where an enormous impetus was given to new production, especially by native producers. But this time Holland herself took the lead; and the tea scheme of April 1, 1933, was followed by the new rubber scheme of June1, 1934, Holland again being a member in respect of the Netherlands Indies. Inasmuch as the schemes in each country have the force of law, all producers must conform. Tea restriction has borne with exceptional severity on the activities of the English and Scottish Joint Co-operative Wholesale Society in South India. Since 1914 the English and Scottish Co-operative has added largely to its acreage, its policy being to produce as much as possible of its own consumption. What it already produces is a fraction only of this consumption. But now it cannot add to this except to a slight degree by the purchase of other producers' export rights.

Regulation was the final item in a long chapter of voluntary co-operation for other ends. The planters of Ceylon first came to co-operate closely with one another for the recruitment and regulation of labour and the organisation of medical services. Their next step was to co-operate for research. Before the war research was done in the Royal Botanical Gardens at Peradeniya, which in 1914 were transferred to the Department of Agriculture to serve as its technical nucleus. After the war the tea-planters began to feel that there was need of tea research by the planters themselves;

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for the Agricultural Department now desired to pay more attention than before to the ordinary village agriculture of the island. A tea research scheme accordingly was drawn up, supported and financed by the tea industry and established by colonial ordinance. The Institute was opened in 1926 and acquired its present habitation in 1929. This is the St. Coombs Estate.

Research hitherto called upon to assist expansion is now helping the difficult task of restriction. The supply of tea is not a tap that can be truned off and on at will. The produce cannot be left like tin or copper to lie in the ground until the market is better. Butrestriction being a fact, it must be carried through with the least financial and technical damage. A large company with numerous estates, some on high and some on low land, is in the better postion. It will consider whether it is not better to close up one estate and put it down to ' care and maintenance,' allowing the other estates to work to capacity. A small company has less scope for this kind of rationalisation. It must decide whether it will (a) buy export coupons from others, so as to produce as much as before; (b) export only the higher grades of tea, putting the lower grades on the home market; (c) restrict production to its quota by discarding the poorer fields. But the home market is a small one and crowded with native small-holders, who are in the same case; while cutting out particular fields may bring a small company down to a production level which is well below the technical optimum. Therefore the Institute is engaged in working out the kind of reduction which is least harmful technically for estates in different situations.

The Export Control regulations are as follows:-

The International Tea Agreement fixes for each country a standard output. 'The standard upon which regulation is based shall be fixed on the maximum exports of tea from each producing country reached in any of the three years 1929, 1930 and 1931.' For each crop year the international committee sets a regulation figure, which so far has been at the following rates: 1933-34,

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85 percent. of standard exports; 1934-35, 87½ percent. of standard experts; 1935-36, 82½ percent. of standard experts. The reduction in 1934-35 was at the request of the tea trade, but it proved excessive and threfore the rate was raised by 5 points for the ensuing year.

It is the task of each country to assign to its own producers their individual share in the country's quota. Thus in Ceylon each estate is given expert coupons for a certain quantity of tea based on past production as shown by the estate books. Native small-holders are allowed so many coupons per acre, inasmuch as they had no books showing their poundage. As the industry consisted in the main of companies possessing statistical records, the control scheme escaped the inaccuracies and ' overstatements ' (for which it may or may not be possible to work out a ' coefficient of mendacity'), which obstructed the initial operations of production control in the tobacco industry of the United States. 16 The coupon is a quantity and not a quality coupon. The owner may export so many pounds weight of tea, not so much rupees' worth of value; and pro tanto the scheme favours quality production. But this has been neutralised by the recent increase of 2d. per lb. in the British import duty, which is expected to prejudice quality production by diverting British consumers to cheaper teas. In point of fact it is very customary for the small-holders to sell all their export rights, leaving their holding idle. There is a regular market for expert coupons, as in the parallel rubber scheme.

On Monday, March 16, 1936, I attended the tea auction at Colombo. The great majority of the tea is sold with expert rights attached; and prices ranged, according to quality, from about 60 cents per lb. upwards, but at the end of the auction some parcels of native tea were sold without expert rights, and the prices were in the neighbourhood of 20 to 30 cents. This would be for tea of a lower quality than that which is exported. To give elasticity to the scheme it is allowable for a country or a company to carry over its quota from one crop year to the next.

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The international authority is the International Tea Committee. From its two Reports, 1933 -34 and 1934-35, it appears that the scheme has worked well and with but few changes. When nations mean a thing to work, there is no insuperable difficulty to international agreement. Loopholes have been stopped up. The Report of 1934-35 (PP.16,17) draws attention to the steps which have had to be taken to prevent tea smuggling across the overland frontier of India. Ceylon administers both the tea and rubber schemes in a single office, is not a part of the Government secretariate, and is close to the harbour for the convenience of merchants. There has recently been introduced in Ceylon a coco-nut board, but this is not part of an export control scheme and there is no question of coupons. It is regulated by ordinance and has a central sales room for the display of coco-nut products; and its work is confined to the stimulation of the sale of these products at home and abroad and to the general encouragement of the coco-nut industry. The tea and rubber schemes, being international agreements, have a definite duration - tea to March 1938 and rubber to December 1938.

The reports of the International Tea Committee indicate satisfaction with results achieved to date. But the Committee is concerned with the danger of a decrease in consumption and has therefore instituted propaganda designed to expand the market. One small evidence of this is the shop on Colombo ~~harbour.~~ ~~More serious is the campaign which has been launched in the United States to increase consumption there.~~ pier, where couponed tea can be purchased by passengers. Another is seen in the advertisement lighting along and around Colombo harbour. More serious is the campaign which has been launched in the United States to increase consumption there.

The British Empire is easily the largest producer of tea. Taking the figures for 1933-34, gross world exports amounted to 800 million lb. from regulated countries 650 millions, from other countries (mainly China and Japan) 150 millions. Of the 650 millions, from other countries

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million lb. 520 came from India and Ceylon, the proportionate export of the regulated countries being roughly India 3, Ceylon 2, the Netherlands East Indies 1½. In rubber the British Empire is again the leading producer, though the contribution of India and Ceylon is trifling. The basic export quota of 1935 was for the whole world 1.1 million tons, of which Malaya was given 538,000, Netherlands Indies 400,000, Ceylon 79,000 tons. The Dutch have managed the control of native production by a heavy export duty on such produce, which is now being replaced by export licences such as are required from the European planters. It must be remembered that in Sumatra, the leading producer of Netherlands Indies, much British and American capital is engaged.

In consumption of tea the British Empire again leads, for the United Kingdom and the Dominions consume respectively 430 + 110 = 540, out of 860 million lb. consumed in 1933-34. But in consumption of rubber the position is different. A foreign non-producing country, the United States, consumes far more than the United Kingdom.

9. PLANTATION PRODUCE AND FORESTRY.

Plantation economy throws light on forest economy and vice versa. In the United States crop restriction, which in its first form was pronounced unconstitutional, is now being sought in indirect fashion by measures for soil conservation; and this involves afforestation, i.e. more forest produce. But the time when the produce will mature is so far ahead that no attention is being paid to the increase of timber which the policy will cause. In any case there is a fear of scarcity rather than of abundance; and forests are desired not only for their yield, but for the help which they give to the conservation of moisture and the like. ' And thus do we by indirections find directions out'.

In New Zealand there is conflict between two points of view. The public authorities (the Central Government and the municipalities are concerned to conserve forests, protect water catchment areas and encourage native species where these will grow to advantage. The Other point of view is represented by a commercial, and rather speculative, venture, which under the title of 'Perpetual Forests, Ltd.,' has planted large areas to a soft wood, pinus insignis. It has financed itself by selling bonds not only in

in Australia and New Zealand but in many countries of the East; such bonds entitle the buyer to a share in a unit of the forest. Some of these plantations are now reaching maturity, and the problem has to be faced of how their physical increase is to be turned into cash by ex-ploitation of the maturing timber. Asiatic holders, no doubt, would be glad to take the plot itself and build a bungalow on it, but the law against immigration forbids them to put their bodies inside.

Precious woods are at the other end of the scale. In Mysore State sandalwood is a government monopoly, and here there is a kind of restriction scheme which in priciple resembles those for tea and rubber. The recent industrial depression spoilt the European market for sandalwood oil. The Government, which owns the wood and converts it into oil in its own factories, Summoned the buyers and asked them how much they would take at or near the old price; and it has endeavoured to restrict sales to this amount. The difficulty is the competition of Australia, which produces more than twice the amount of Mysore and (in Mysore's opinion) has a much inferior product, improperly admitted recently to the British pharmacopoeia. The technical problem invoved in sandalwood restriction is this, that only dead wood is cut for treatment. The present restricted cutting leaves much dead wood in the forest, where it is liable to theft or damage. If cut and stored in the depot, there would be heavy charges for storage and insurance. Madras has a little sandal-wood, which is marketed by Mysore; and Madras, apprehensive of the difficulties of restriction as at present operating, would prefer that sandalwood was sold up to the dead wood limit. It points out with reason that India is in fact making the market for Australia. There has therefore been recently an effort to associate Australia with the scheme for the lesson of rubber is that a scheme is likely to break down if it has outside it a formidable competitor.

In view of the high record of plantation economy in the nineteenth and twentieth centuries it is almost comical to remember that ' to send to the Plantations' signified in earlier days a sentence to penal servitude.
