

THESIS SUBMITTED FOR THE M.A. EXAMINATION

(April, 1929)

INTRODUCTION

Chapter I. General Geography of Ceylon. Its position, relief, water, climate, agriculture and other industries, population in 1926 census; administrative divisions.

Chapter II. Distribution of population in Ceylon before British occupation. Division of history of island into 5 periods. Concentration of population into northern and southern extremes in Sinhalese period; evidence and reasons for the westward drift of population south westwards in Portuguese period.

A discussion of the Geographical factors of trade. Causes affecting the distribution of population in Ceylon.

Chapter III. The planting provinces. Geography of provinces; its varied agricultural products. Factors affecting efficiency of labour force; land, food, tools, education; healthiness, relationship to port of Colombo.

Chapter IV. The planting provinces. Geography of Central Province and Sabaragamuwa. Factors affecting the development of planting, particularly of tea and rubber. Dependence on Indian labour. Vital nature of planting industry.

Chapter V. The planting provinces. The geographical position of the planting provinces. The distribution of population in northern, north central and southern provinces. The densely peopled areas; the sparsely peopled areas.

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Parasitic invasions - ABSTRACT. prevalence of malaria; poor

communications. Research for improving health of provinces.

INTRODUCTION

Villages and towns in Ceylon. Factors affecting

Chapter I. General Geography of Ceylon. Its position, relief, soils, climate, agriculture and other industries, population at 1921 Census; administrative divisions.

Chapter II. Distribution of population in Ceylon before

British occupation. Division of history of island into 5 periods. Concentration of population into northern and south-eastern Ceylon in Sinhalese period; evidence and reasons for this. Movement of population south westwards in Portuguese period owing to attacks, and change in course of trade. Completion of this movement on introduction of planting by Dutch.

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Chapter IV. The planting provinces.

Geography of Central Province and Sabaragamuwa. Factors affecting development of planting, particularly of tea and rubber. Immigrant Indian labour. Vital nature of planting industry to Ceylon.

Chapter V. The provinces with an uneven population-

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Chapter VII. Villages and towns in Ceylon. Factors determining sites and size of villages. The large towns; position and trade of Colombo, Galle, Jaffna, Kandy.

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The Commission of Enquiry into the Government of Ceylon, which finished its deliberations in 1924, and the publication of the report of Mr. Ormsby-Jones, Parliamentary Under-Secretary for the Colonies, on the completion of his journeys in Ceylon, Malaya and Java in 1926, have brought the island of Ceylon into some prominence. In the last-mentioned report, a comparison between the three areas visited, which was not, on the whole, favourable to Ceylon, was attempted, and in view of the discussion on the development of the tropical colonies of Great Britain which followed its publication, it is hoped that the present discussion of the geographical factors affecting the distribution of population in Ceylon will not be wholly without interest.

In the following pages, a brief account of the general geography of Ceylon is given, followed by a discussion of the distribution of population in the island before the British conquest. The present distribution of population is then dealt with, and the future population of each province is treated separately. The population is divided into the towns and villages and the country population. The geographical factors which have influenced the distribution of population, a comparison with Malaya and Java, a nearby island offering some interesting geographical particulars. Finally, some suggestions are made as to the future distribution of population in Ceylon.

CHAPTER I
Geographical factors affecting the distribution of
Ceylon population in Ceylon.

Ceylon is an island, 25,481 square miles in area, south-south-east of India, INTRODUCTION. is separated by a strip of

water about 60 miles wide. It lies between latitudes 6 and 10° North, and longitudes 80-83° East, midway between Singapore and Aden, in the direct path of ships using the Suez canal in 1928, and the publication of the report of Mr. Ormsby-Gore, Parliamentary Under-Secretary for the Colonies, on the con-

The island may be divided into two parts according to his journeys in Ceylon, Malaya and Java in 1928, relief. There is a central belt of hill country, 2000 - 5000 feet high, formed of a series of scaly-folded, such as the last-mentioned report, a comparison between the three ridges running south-east north-west, and a low plain area visited, which was not, on the whole, favourable to rounding the hills, formed mainly of detritus brought down from Ceylon, was attempted, and in view of the discussion on the the higher ground, but in the north partly of marine deposits, development of the tropical colonies of Great Britain which chiefly coral. This plain is widest in the north and east, followed its publication, it is hoped that the present discussion of the geographical factors affecting the distribution of population in Ceylon will not be wholly without interest.

In the following pages, a brief account of the general the sea near Trincomalee on the north-west coast, all the geography of Ceylon is given, followed by a discussion of the larger and larger rivers flow out to the West coast between distribution of population in the island before the British Chily and Galle. The coasts of the island are straight and unbroken, good harbours being few.

dealt with. The rural population of each province is treated separately, and a chapter is devoted to the towns and villages Geologically, Ceylon resembles South India. The chief rocks composing it are granite, laterite and limestone, which of Ceylon. In summarising the geographical factors which have weathered out into soils which are on the whole poor, being helped to determine the distribution of population, a comparison is made between Ceylon and Java, a nearby island differing half of the island, the rapid loss of surface water, and the from Ceylon in several important particulars. Finally, some depth of the water-table assessment upon the possibility of the attempt to forecast the future distribution of population is made.

CHAPTER I

Ceylon; general geography.

Ceylon is an island, 25,481 square miles in area, south-south-east of India, from which it is separated by a strip of water about 60 miles wide. It lies between latitudes 6 and 10° North, and longitudes 80-82° East, midway between Singapore and Aden, in the direct path of ships using the Suez canal route to Eastern India, the Far East, and Australia.

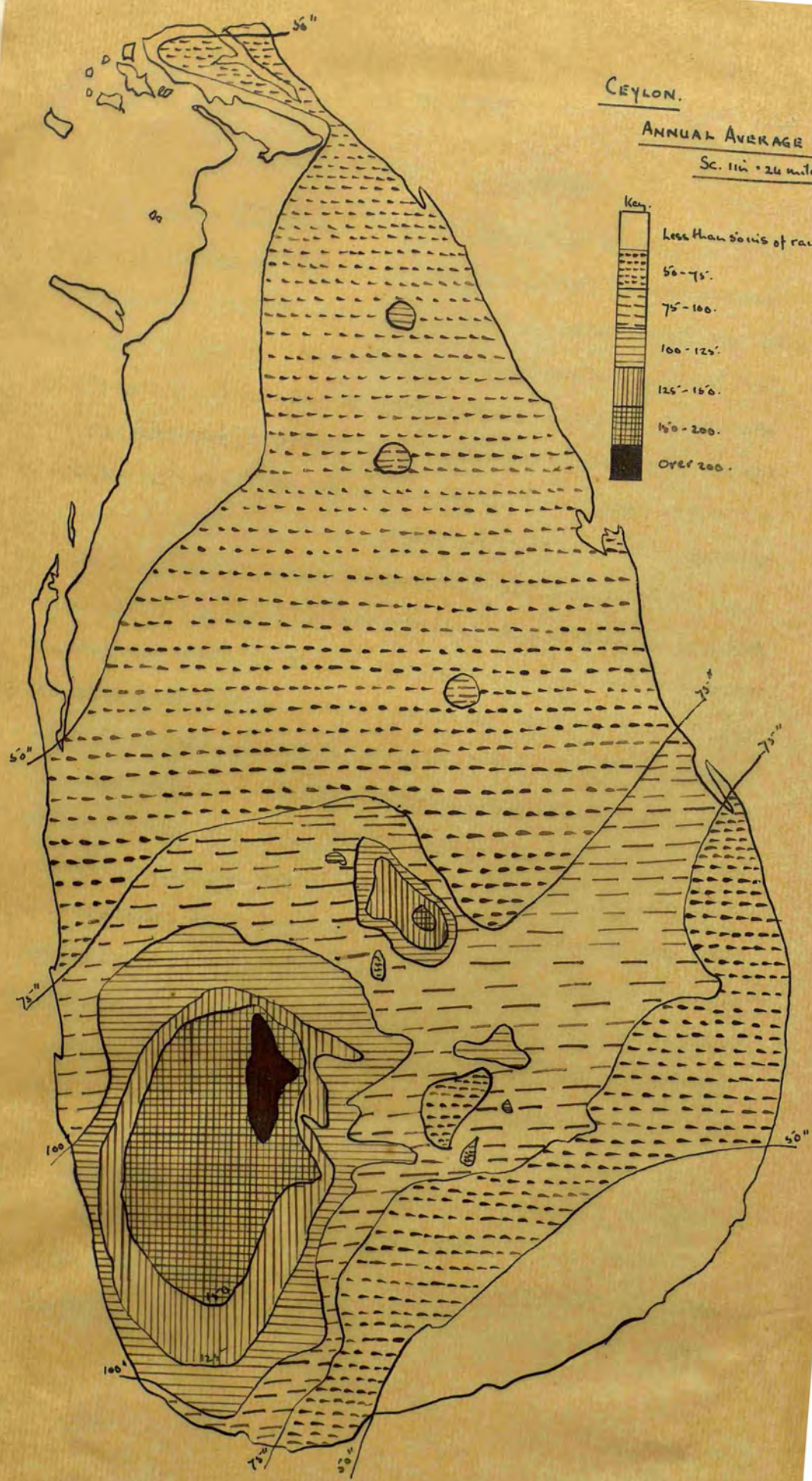
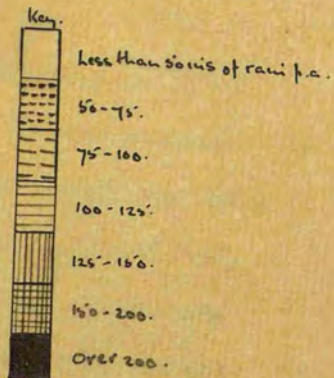
The island may be divided into two parts according to relief. There is a central belt of hill country, 2000 - 8000 feet high, formed of a series of acutely-folded, much denuded ridges running south-east north-west, and a low plain surrounding the hills, formed mainly of detritus brought down from the higher ground, but in the north partly of marine deposits, chiefly coral. This plain is widest in the north and east, narrowest in the west and south-west. Many rivers drain down from the hills in all directions, but with the exception of the Mahaweli Ganga, the longest river in Ceylon, which reaches the sea near Trincomalee on the north-east coast, all the longer and larger rivers flow out to the West coast between Chilaw and Galle. The coasts of the island are straight and unbroken, good harbours being few.

Geologically, Ceylon resembles South India. The chief rocks composing it are gneiss, laterites and limestones, which weather out into soils which are on the whole poor, being deficient in nitrogen and potash, and very porous. In the dry half of the island, the rapid loss of surface water, and the depth of the water-table consequent upon the porosity of the

CEYLON.

ANNUAL AVERAGE RAINFALL.

Sc. 1 in = 24 miles.

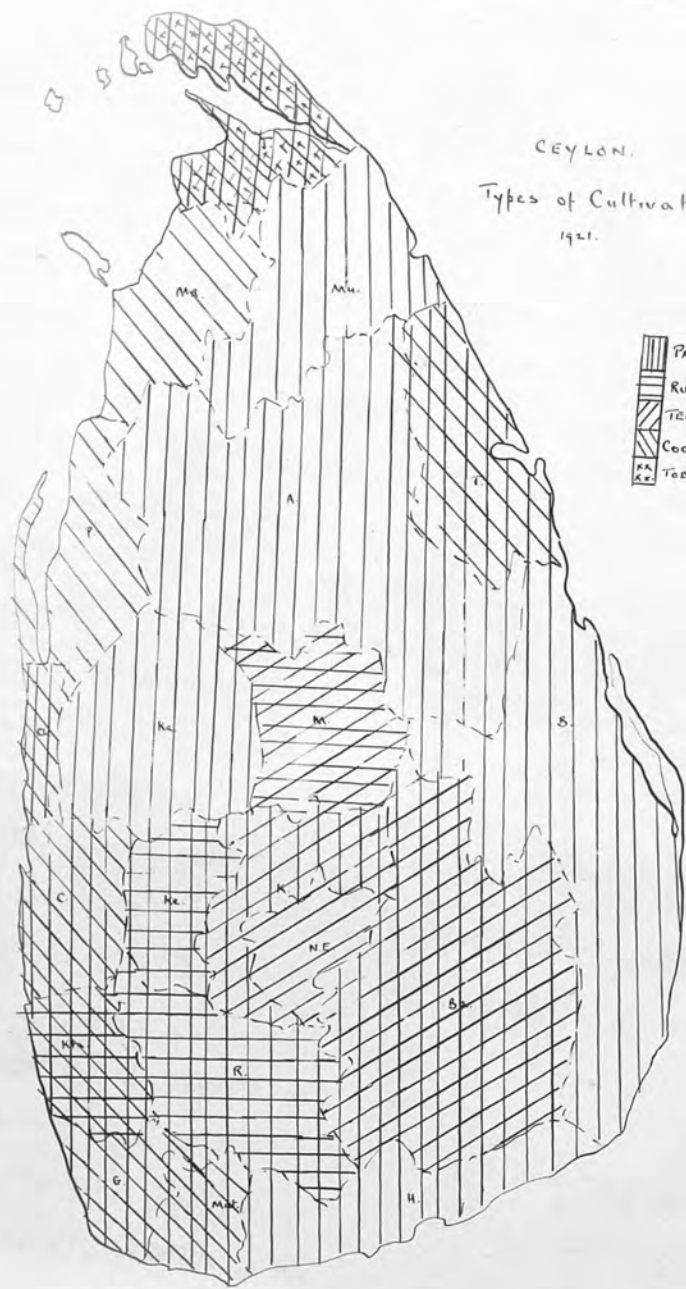


N.B. Heavy rainfall of S.O. Ceylon; 'wet' Ceylon and 'dry' Ceylon. light fall in n. and s.e. of island; hence division into

soil constitute grave problems.

In climate, Ceylon is very much like the other monsoon countries of South-Eastern Asia. In the plains, the average temperature for the year is 80° F., and the yearly range between 10-12°. In the hills, temperature depends on altitude; at Kandy, which is 1,692 ft. up, the annual temperature is 76.4°F., the range 13.9°; and at Nuwara Eliya, 6,188 ft. above sea level, the figures are 59.3°F. and 17.4°. The chief feature in the climate of Ceylon is the prevalence of the south-west monsoon from April to October, and the north-east monsoon from November to March.

The rainfall of the island depends on these winds, the south and west receiving most rain during the south west monsoon season, the north and east during the north-east monsoon season, though Western Ceylon receives some rain during the months November to April, and parts of the east some rain from April to October. As the velocity, constancy, and moisture content of the south-west winds are greater than those of the north-east winds, more rain falls in the year in Western than in Eastern Ceylon. Western Ceylon is usually known in consequence as "wet", and eastern Ceylon as 'dry' Ceylon. The accompanying map shews the distribution of rainfall during the year. It will be seen that the western hill-country is the rainiest region, with over 200 ins. of rain in the year; the south-west coast plain has between 100-200 ins. and the remainder of the island between 50-100 ins., except for the south-east and north-west, which have between 25-50 ins. There is no rainless area in Ceylon comparable to Sind, or even to the Upper United Provinces in India, but irrigation is neces-



CEYLON.
Types of Cultivation.
1921.

-  PADDY.
-  RUBBER.
-  TEA.
-  COCONUTS.
-  TOBACCO.

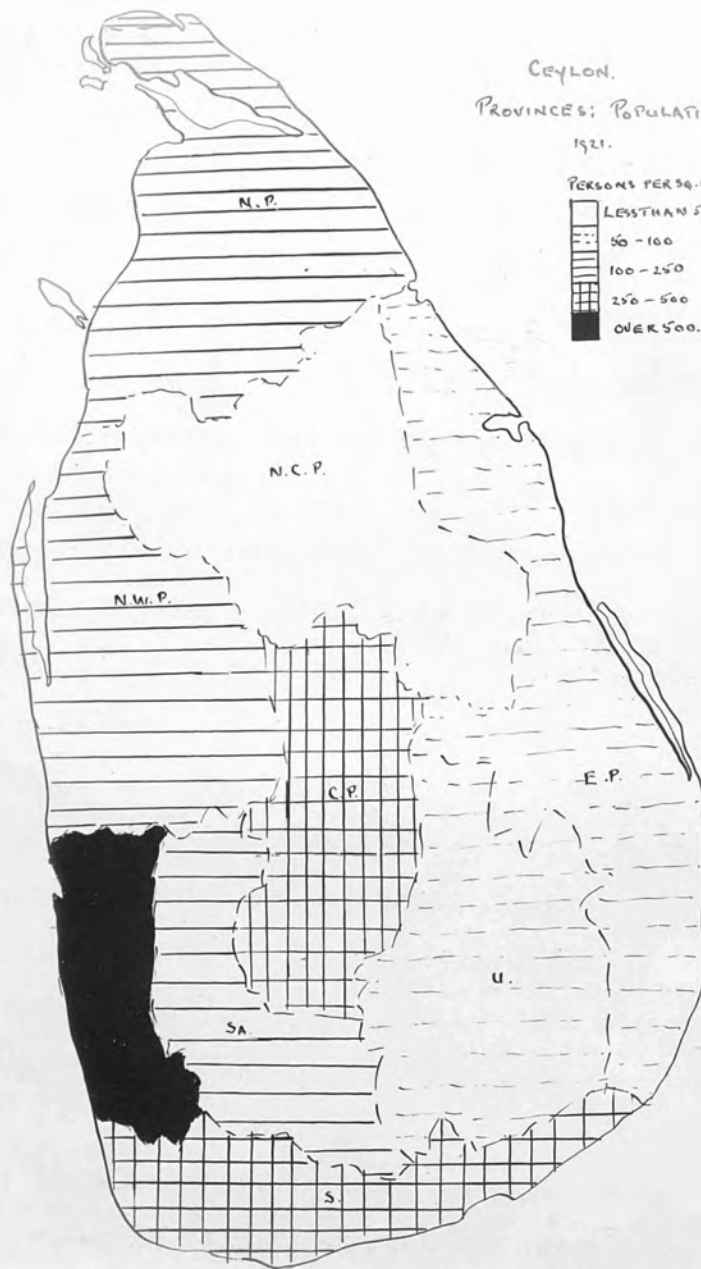
N.B. Concentration of estate crops. i.e. rubber, tea, coconuts, in centre and south-west of island.

sary before tropical crops such as paddy can be grown in the dry country.

"Wet Ceylon" was originally forest-covered, and in spite of careless deforestation, there are still large areas under forest. In uncultivated parts of "dry Ceylon", the typical vegetation is thick jungle or thorn scrub, according to the amount of water available. The jungle country is the home of one of Ceylon's worst scourges, malaria.

Like all tropical countries in which rainfall is adequate, the chief industry of Ceylon is agriculture. This is of two types, native agriculture, including paddy-culture, which has been practised in the island for many centuries, the growth of dry grains, vegetables, curry-stuffs, etc., and estate cultivation, about 150 years old, and now the most important branch of agriculture in Ceylon. On the estates are grown the coconuts, tea, cacao, and rubber which form the bulk of the island's exports. Estate cultivation is limited to 'Wet Ceylon', coconuts being grown in the low country, tea, rubber and cacao in the hills. Dependent upon the agriculture of the island are certain industries such as the preparation of rubber and tea for export, and the extract^{ion} of coconut oil, which occupy over 1,000,000 people. Other minor industries in the island are mining for g^ems and plumbago; fishery, less important than might be expected, and native crafts such as weaving and brass work. Over 160,000 people are occupied in transport, and in handling the trade of the ports, particularly that of Colombo.

The total population of the island at the last census,



N.B. Uneven population - distribution. Concentration of population in centre and south-west.

taken in 1921, was 4,498,605, this figure being made up of low-country and high country Sinhalese, employed chiefly in paddy and coconut cultivation; Ceylon Tamils, who form the bulk of the population in the dry country, and are cultivators and traders; Moors, Eurasians and Europeans, engaged in trade or on the plantations of the hill-country. 636,943 persons at the census of 1921 were returned as Indian Tamils, who emigrate from India to work on the plantations, so the opening up of estates on the island has considerably increased the total population.

As in most agricultural areas, there are few large towns in Ceylon. Twenty nine with a population over 5,000 appear in the 1921 census report; eleven of these have a population over 10,000 and only one, Colombo, has over 100,000 inhabitants. The typical settlement is the fair sized village, to be found throughout the island at intervals varying with the productivity of the country. The villages are linked by a network of roads, which are good in Ceylon, particularly in the Western half of the island, and the greater part of the trade of the island flows along these arteries, since there are only 952 miles of railway open to traffic.

For administrative purposes, the island is divided into nine provinces, the Western Central Southern, Sabaragamuwa, North Western, Northern, Uva, Eastern and North Central. The Western Province is now the most prosperous and well-populated, the North Central the most backward. The history of the island reveals, however, that this was not always the case, and in the next chapters it is proposed to deal with the historic distribution of population, before proceeding to the conditions revealed by the 1921 Census.

CHAPTER II.

The Distribution of Population in Ceylon before
the British occupation.

A study of the history of Ceylon suggests that in early days the distribution of population in the island was very different from what it is now, the present distribution of population dating from well-marked historical events. In this chapter it is proposed to reconstruct as far as possible the historical distribution of population, noting the geographical factors which determined the course of history, and so to lead on to the population distribution recorded by the Census of 1921.

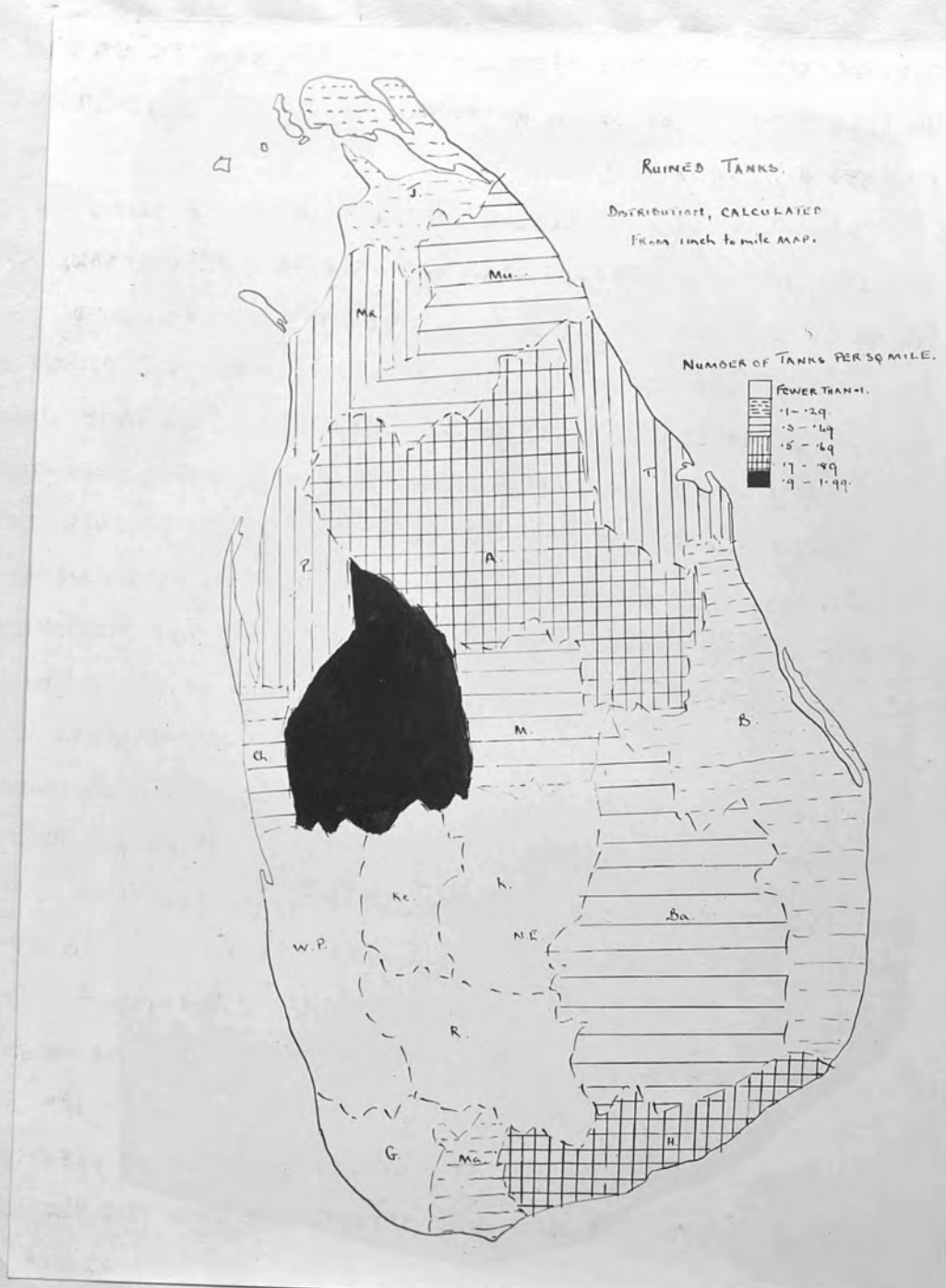
The history of Ceylon falls into five periods, the first before the invasion of Vijaya in 537 B.C., the second from the invasion of Vijaya to the Portuguese occupation in 1521, the third from 1521 to the conquest of the island by the Dutch in 1638, the fourth from 1638 to the British occupation in 1795, and the fifth from 1795 to the present day. No reconstruction of the probable distribution of population in the first period is possible, because there are no trustworthy historical records of events in it, and no traces of buildings constructed before the invasion of Vijaya; information about the Portuguese period is meagre, and the two periods about which most information is available are that of the Sinhalese kingdom and the Dutch occupation. Most attention will, therefore, be paid to the distribution of population during these.

Evidence as to the distribution of population between

587 B.C. and 1521 A.D. is provided by the chronicles of Ceylon; references to the island in the works of outside writers, and by ruins which are scattered throughout the island, and are unmarked on the 1 inch to the mile map. According to the Dipavansa, the earliest chronicle of Ceylon¹, the island was settled about 587 B.C. by a race of people from Guzerat in India, under the leadership of Vijaya, who landed near the mouth of the Modaragam Aru, in what is now the Gulf of Mannar. He is said to have founded Maichchiketti, near the Modaragam Aru; Anuradhapura, for long years the capital of the Sinhalese kingdom, and Magama, in Hambantota district, though this may have been founded by another stream of immigrants from Bengal. The earliest recorded settlements were, therefore, in the present North Central and Southern Provinces, the early settlement of the first being doubtless due to its nearness to the mainland of India.

About 300 B.C., reference is made to the island by Megasthenes, who was ambassador to the court of Chandragupta^P, where he may have heard of Ceylon¹. According to his record, Tampabanniⁿ was an island divided into two parts by a river, possibly the Mahaweli Ganga, one part infested^s by wild beasts and elephants, which were shipped to the King of the Northern Circars, the other producing gold and gems. The description suggests that two parts of Ceylon were settled by this time, the jungle-country in Northern Ceylon, from which elephants are still obtained, and the fringe of the highlands in the south or south-west, where the mines of Ratnapura, known to be very old, are still worked. The trade between India and Ceylon must have been carried on through ports on the north coast, and

¹ Tennent. Ceylon.



N.B. Large numbers of ruined tanks in north-centre, north-west, north-east and south-east. i.e. in areas at present sparsely populated.

the existence of a considerable population in Northern Ceylon at this date is testified by several ruins of the period preserved in Anuradhapura.¹

The chronicles of Ceylon record a period of peace under the rule of strong kings, from the accession of Devanampiya Tissa in the 4th Century B.C. to the death of Parakrama Bahu in the 12th century A.D. The reign of Devanampiya Tissa was marked by the introduction of Buddhism, which has ever since been the predominant faith in Ceylon, and is noted here because it forbade the taking of life, so that a nation professing it was driven to practise the art of agriculture, which seems to have been made possible in Northern Ceylon by the construction of a tremendous irrigation system, the ruins of which are still standing. There are numerous references to irrigation in the chronicles during the period 1st Century B.C. to 12th Century A.D., each of the largest tanks, Padawiwa, Minneriya, Kalawewa and Giant's Tank being mentioned by name.² Parakrama Bahu the Great's enthusiasm for the spread of irrigation is exemplified by the following passage from the Mahawansa.³

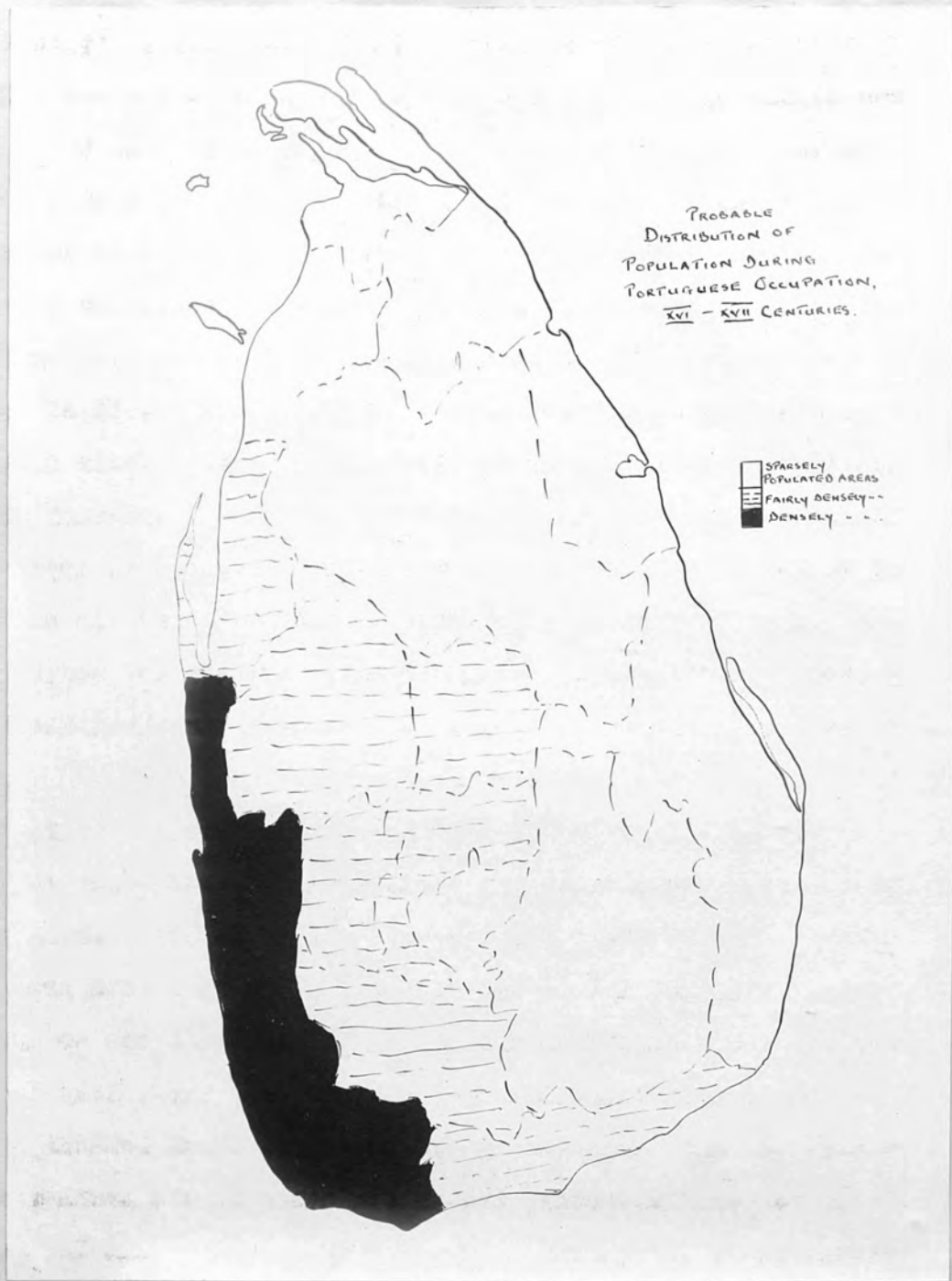
"All through this realm that belongs to me," he said, "besides the many corn lands that are ripened by the water of the rain-clouds, the fields maintained independence on rivers whose waters fail not, and on mighty rivers, are few, and the kingdom includes very many rocky mountains and thick forests and great far-stretching marshes. In such a land as this, surely not even the least drop of the water that the rain supplies should go to the ocean without bringing help to man."

After the death of Parakrama Bahu, there is no further

1 e.g. the Dagoba of Devanampiya Tissa, dated 307 B.C.

2 Mahawansa, chap. 39; (Translated by W. Rhys Davids, J.R.A.S. 1875)

3 Mahawansa, chap. 66. (Trans. by Coppleston, J.R.A.S. Ceylon Branch, 1893).

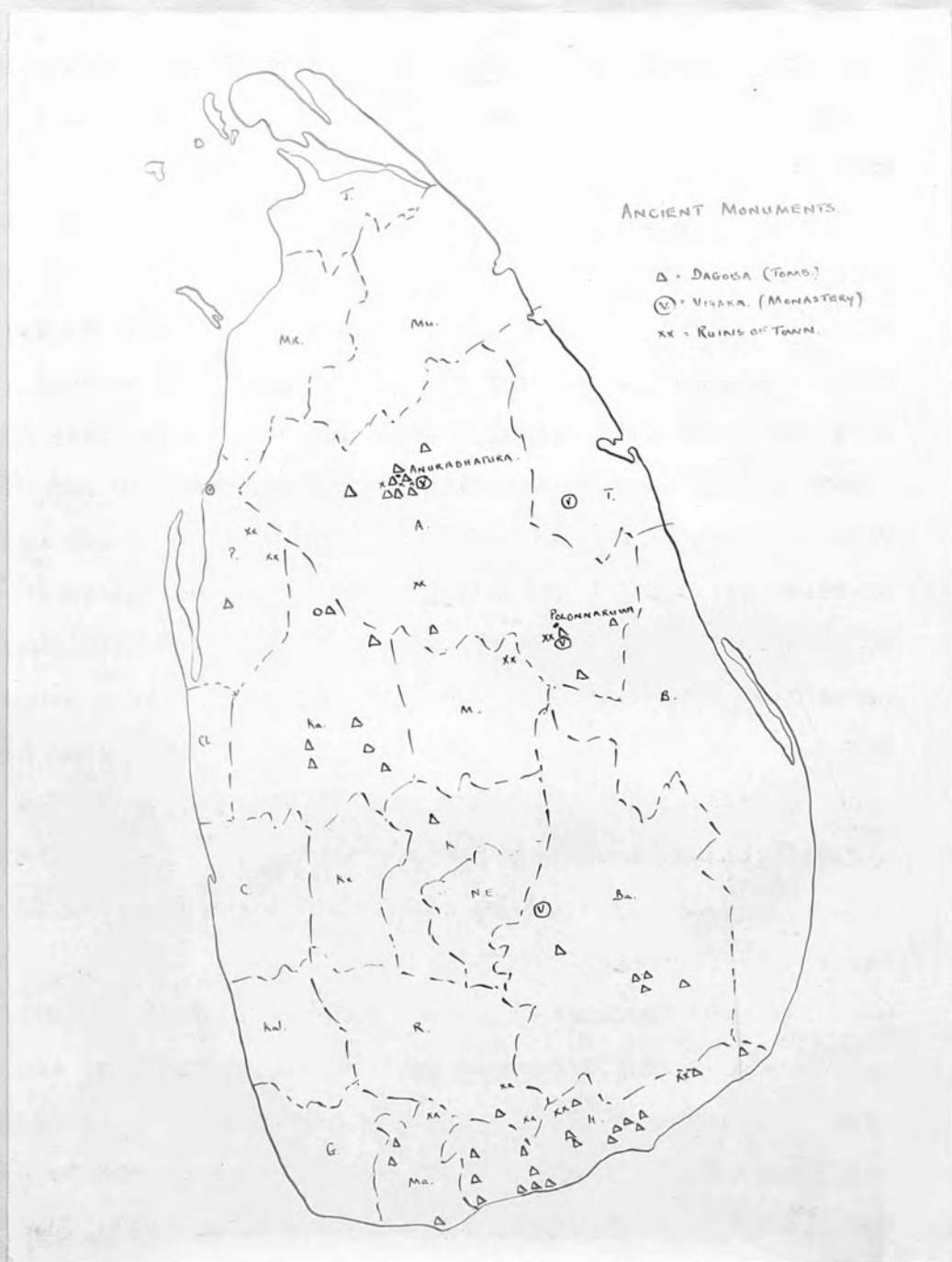


N.B. Complete change in population-distribution from XIIIth C. to XVIth C. Resemblance between distribution of population in Portuguese period and at present time.

further reference to irrigation in the chronicles; it is assumed, therefore, that the greater number of tanks now existing were built during the centuries of peace which came to an end with the Chola conquest of the 13th century, and that the distribution of tanks is fairly trustworthy evidence of the distribution of population in the first twelve centuries of the Christian era. The 1 inch to the mile map, compiled by the Survey of Ceylon between 1890 and 1911, shows 10,152 of these tanks, some ruined, some restored and in use. Their distribution is shown on the accompanying map, and the actual number of tanks in each district of the island is given in Appendix A. The map shows that they are most thickly scattered in the present North Western, North Central, Northern and Southern Provinces, but that there are few in the Central and Western Provinces, or the Province of Sabaragamuwa.

The buildings of the Sinhalese kings were not confined to irrigation tanks; there are records in the chronicles of viharas, (monasteries for Buddhist monks) dagobas (shrines for relics) villages and towns, ruins of which have been preserved, and are shown on the 1 inch map. From this, a map to show the distribution of ruins has been constructed; they, like the tanks, are most numerous in the Southern, North Central and North Western Provinces, though few occur in the Northern Province, where buildings not of strict usefulness may have been destroyed by invaders. The settlement of the Northern Province is noted by outside writers of the period; in the Chinese chronicles, ¹ which record journeys made by traders from Mantotte to China, and in the works of Ibn Batuta who refers to the Sultan of Jaffna in words which suggest that he must

¹ The Kwai-Yuen Catalogue of the Chinese Tripitaka, 730 A.D. Quoted in the J.R.A.S. 1903).



N.B. Numbers of ancient monuments in north-centre, north-west, north-east and south-east, evidence of early, and probably dense, settlement in these areas. Absence of ancient monuments in centre and west, now the most densely populated areas. Compare distribution of tanks, shown on map p. 12.

have been a sovereign of some importance - "I saw, one day, while I was on the Coromandel coast, a hundred of his ships, which had just arrived.¹

Putting together the data supplied by the distribution of tanks and other ruins, and references to Ceylon in the works of outside writers, it seems certain that between the 1st and the twelfth centuries, the parts of Ceylon most densely peopled were the north west, north, north-east and south-east, and the least densely peopled district the present Western and Central Provinces, which now contain most people. It is not necessary to store water for agriculture in the west and centre of Ceylon, so that absence of tanks alone would not be evidence that these areas were unpopulated in the days of the Sinhalese kingdom, but there are no references to the heart of the island in outside writers, and no ruined buildings of early date, and the three facts together seem to be conclusive. It remains to be seen why the early settlers chose to inhabit the part of Ceylon where there are now fewest people.

In order to understand the early settlement of northern and south-eastern Ceylon, it must be remembered that the Sinhalese were emigrants from a country in which rice-cultivation was practised; that agriculture was a necessary art to them, because of their religion, and that, in early days, facilities for trade with the mainland of India must have been desired by the Sinhalese settlers. The north of the island was only sixty miles distant by water from Southern India, so that trade with the mainland was easy in this district. The north and south-east were less rainy than other parts of the island, and were therefore covered in jungle, which could be more easily cleared for cultivation, and offered fewer obstacles to communications than the wet, forested lowlands of the west, or uplands

¹ Voyages d'Ibn Batuta. C. DeFrémery, Paris, 1879, quoted in the J.R.A.S. 1881)

of the centre. The few traces of ruins and tanks along a strip of the west ^{coast} ~~and east~~ from Mannar to Puttalam are explainable on the hypothesis that the Sinhalese were primarily cultivators, and their settlements determined by the east^e with which cultivation could be carried on, for this coast has an uncertain rainfall, varying greatly from year to year, never exceeding 40 ins., and poor, limey soils. This strip of coast is probably less well-watered than almost any other part of northern or south-eastern Ceylon, in most of which the annual rainfall, two thirds of which occurs in the north-east monsoon season, is between 40 and 75 ins. Though not enough for extensive cultivation without irrigation, the rainfall of these districts is sufficient in amount, and sufficiently concentrated in period of fall to make water-storage possible, a fact which was early appreciated by the Sinhalese, as has been shown. The chief factors determining the early concentration of population in northern and south-eastern Ceylon were, therefore, the nearness of northern Ceylon to the mainland of India, with which a considerable trade was carried on;¹ the relative ease of clearing jungle for agriculture and road construction, and the possibility of supplementing the small rainfall of the regions by irrigation.

Judging by the number of tanks to the square mile, the areas in which settlement was densest were Wannī and Dewamedī pattus in Kurunegala district, Demala in Puttalam, Kalagam in Anuradhapura, Vavuniya South in Mullaittivu, Wellawaya in Badulla, Kaddukkulum West in Trincomalee, and Magam Pattu in Hambantota. The completeness of the change in population-distribution, if the density of tanks is a sure guide to this,

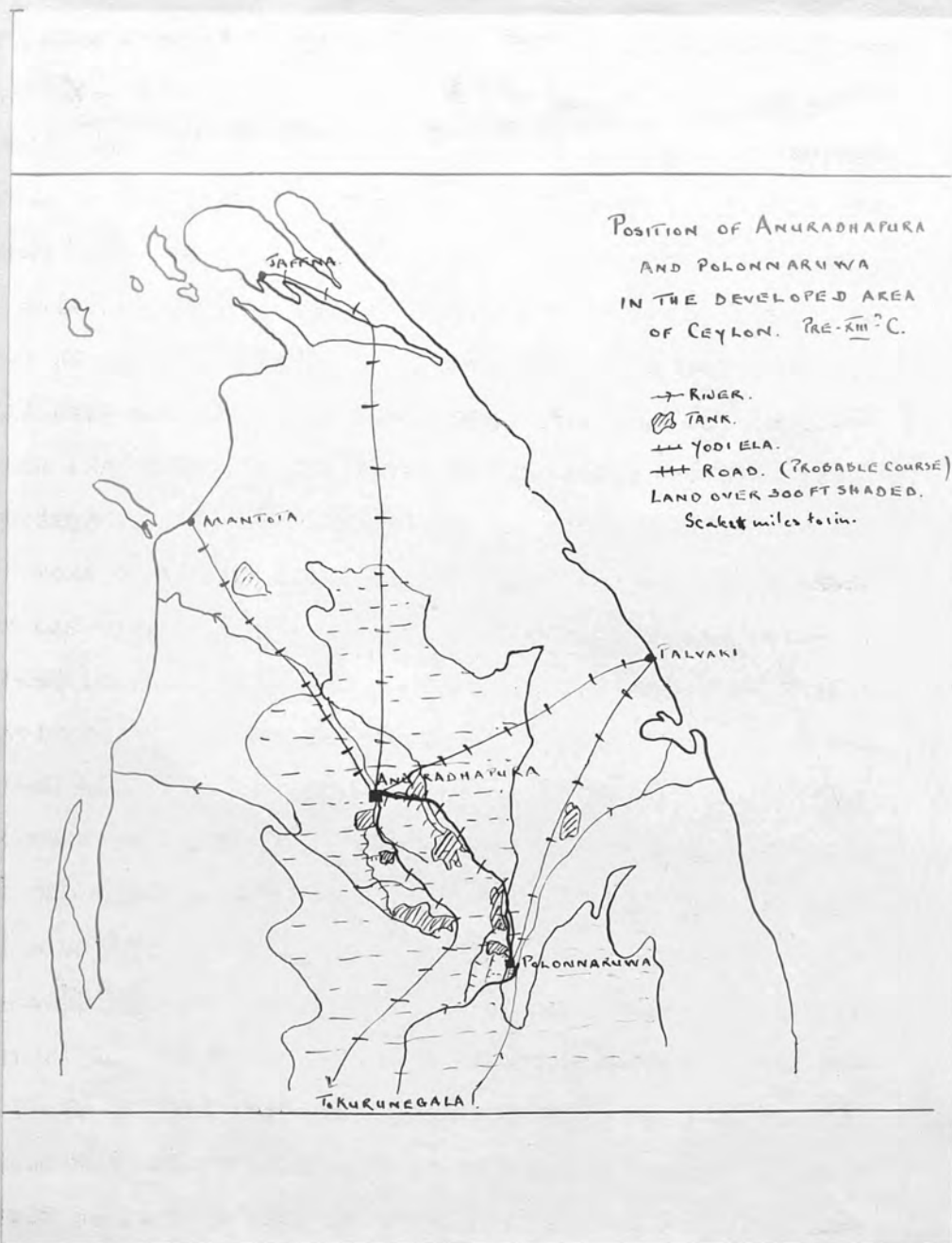
¹ The trade of Ceylon with India was said by Cosmo Indicā ^{plantes}, ^{rip} working in the 6th century, to consist in cloves, silk, aloes, sandalwood and elephants. (Tennent. Ceylon).

can be realised by the fact that, with the exception of Dewamededi and Kalagam, these are now the least populous pattus in their divisions. In the days of the Sinhalese Kings each of them had, however, certain factors in favour of its settlement. Wanni, Dewamededi, Demala and Kalagam slope gently down northwards and north-westwards from the Central Highlands; their soil is a coarse gravel with a very low water-holding capacity, particularly in Wanni, where it is only 18%, but otherwise fairly fertile, and they fall within the annual rainfall belt of 50-75". The rainfall is heaviest in Wanni, which compensates for the porosity of its soils. There are two rainfall maxima in the year in each pattu, one in April, the second in October, so that at least two paddy harvests could be reaped. Irrigation from the rivers Deduru Oya, in Wanni, Dewamededi and Demala, Amban Ganga, and Kala Oya in Kalagam is possible, and the land slopes sufficiently to allow easy drainage of the paddy fields without danger of loss of soil. The making of roads through the native jungle was easier in these districts than in others where the rainfall is heavier and the soil finer, and there are no obstacles except uncleared jungle between the pattus and Anuradhapura, which may have been the market for their produce. Conditions in Vaduniya South and Kaddukulum East are slightly less favourable for the support of a large population. Both lie in the low country, Vaduniya north of Anuradhapura, Kaddukulum on the coast north of Trincomalee; both receive less rain, about 50" in the year, mostly in November - April, the season of the north-east monsoon, very little in the months of June, July and August, during which the fields are now left fallow. It is possible,

however, that when the irrigation tanks were in repair, two crops of paddy, or one of paddy and one of a dry grain, were reaped. No particulars are available about the soils of these pattus, but where the jungle has been cleared and the tanks repaired, both produce good quality rice. Kaddukulum has a small fisher population to-day; this may have been larger in the past, and in the days of shallow-draught boats, the fishing ports in the lagoons may have carried on a flourishing trade with the Coromandel Coast, Bengal and Burma. Palvakki, from which Parakrama Bahu I despatched a ^{un}primitive expedition to Pegu, is assigned to this region, which supports the idea that there may have been a merchant population here.

The area in which the presence of a dense population is difficult to explain is Megam pattu, in the east of Hambantota district. This is now one of the least densely populated regions in Ceylon, most of its people being concentrated in Hambantota itself, and towards the western boundary of the pattu. But the numerous ruined tanks are thickly clustered in the east of the district, where there is nothing to attract an agricultural population.

The coast is a lagoon and salt marsh area unfit for settlement; the rainfall, about 25" in the year, is the lowest in Ceylon, the natural vegetation is a tough scrub, very difficult to clear, and the fever death-rate is the highest in the island. The soil of the pattu has a water-holding capacity of 58%, higher than any other area but the Central province, and this appears to be the sole favourable factor. A small volume of irrigation water applied to the land might work wonders; there does not seem to be any other explanation of the dense



N.B. Central position of Anuradhapura in developed area; ease with which it could be reached from three ports of Sinhalese period; possibility of bringing water to city from tanks connected to three rivers. Position of Polonnaruwa less exposed to attacks from India than that of Anuradhapura.

population of olden days. There appear to have been few large towns in Ceylon between the first and the twelfth centuries, and neither of the chief towns of the early Sinhalese period was in the most densely peopled districts. Anuradhapura, the first capital, may have grown to the size recorded by Pliny because it occupied a nearly central position in the old developed area. It could be reached with equal ease from Mantota, the west coast port, and Palvakki, the port in the east, from the southernmost divisions of Kurunegala district and the extreme north of the island. Modern irrigation engineers state that it would be difficult to find a site in Ceylon to which water could be more easily conveyed from the head waters of a number of streams. Five great tanks, Kalawewa on the Kala Oya, Nachchaduwa and Nuwaraweya on the Malwati Oya, a tributary of the Arsi Aru, and Tissawewa on the Modaragam Aru, connected to the city by long yodi elas, or channels, supplied the capital with water, so that Anuradhapura was built on one of the few sites in the dry country in which a large number of people could be supported. Its chief disadvantage was the ease with which it could be attacked, particularly from the north, from which the Tamil invaders usually came, and for this reason another city, Polonnaruwa, smaller than Anuradhapura, but still important, grew up further south, near the Mahaweli Ganga.

Polonnaruwa lies south-east of Anuradhapura, separated from it by spurs running northward from the central highlands, and on the northern limit of the flood plain of the middle Mahaweli Ganga, just below its confluence with the Amban Ganga. It was supplied with water by yodi elas from the two rivers.

During the South-West monsoon season, the Mahaweli Ganga is navigable for small boats, so that Polonaruwa was directly connected with the east coast ports from which cinnamon and elephants obtained in the hill country to which the Mahaweli and Amban Ganga gave access could be shipped to the mainland. The ground near the Mahaweli Ganga is marshy, and therefore unfit for cultivation, and Polonaruwa, near so much standing water must have been malarial, two factors which may have prevented it from reaching the size of Anuradhapura. Its period of prosperity was shorter than that of the early capital, and it is now only a place of historical interest, while Anuradhapura remains the largest inland town in the North. It is suggested that not only was the distribution of the three known ports of the Sinhalese period identified by Tennent from towns mentioned in the Mahawamsa have each had a different history. Palvat^{kk}ti has disappeared altogether so that its site cannot be identified, Mantota, the most important in early days, has sunk to the rank of a village, while Galle, the least important, grew steadily until it was eclipsed by Colombo. It was natural that when the north of the island was the most developed part, the bulk of its trade should be handled by a northern port. Mantota, now completely silted up, was built on the mainland opposite the southern end of Mannar island, which protected its harbour during the south-west monsoon season. It was fifty miles distant from Rajeswaram, the nearest south Indian port, and within easy distance of all the ports on the Malabar and Coromandel coasts. Its immediate hinterland, which suffered from drought, cannot be compared in size with the urban centres of to-day. On the whole, therefore, it is safe to conclude that the population of Ceylon in the early Sinhalese period was smaller than

¹ The Mahawamsa describes it as "the town of Kaly, a well one."

have been very productive, excepting the neighbourhood of Giant's Tank, but it was connected by a network of roads still remaining as paths through the jungle with Anuradhapura and other centres in the north and north west. The increasing draught of ships, and the depopulation of the country behind it which followed the Tamil invasions and the ruin of the old irrigation system must have combined to deflect the trade of the island from Mantota to Galle. In the Sinhalese period, Galle seems to have been a foreign settlement of little importance,¹ and consideration of the factors which made it one of the chief ports in Ceylon may be left until the later history of the island has been described.

It has been suggested that not only was the distribution of population in Ceylon different from what it is now, but that the total population of the island was much greater in the first eleven centuries A.D. than it has ever been since. The chief evidence brought forward in support of this view is the completeness of the old irrigation system, the number and size of the tanks found everywhere in the dry country. But the tanks were not all built at the same time; their building must have taken at least twelve centuries, and it is possible that when one tank fell into disrepair, the whole population of a district shifted within reach of a new one, so that the total area which could be watered from the tanks was never all under cultivation at once. Moreover, though parts of the island were more thickly peopled than they are at present, the centre and west were probably just as thinly populated as the north and east are now, and there is no evidence that the old cities were comparable in size with the urban centres of to-day. On the whole, therefore, it is safe to conclude that the population of Ceylon in the early Sinhalese period was smaller than

¹ Ibn Batuta describes it as "the town of Kaly, a small one."

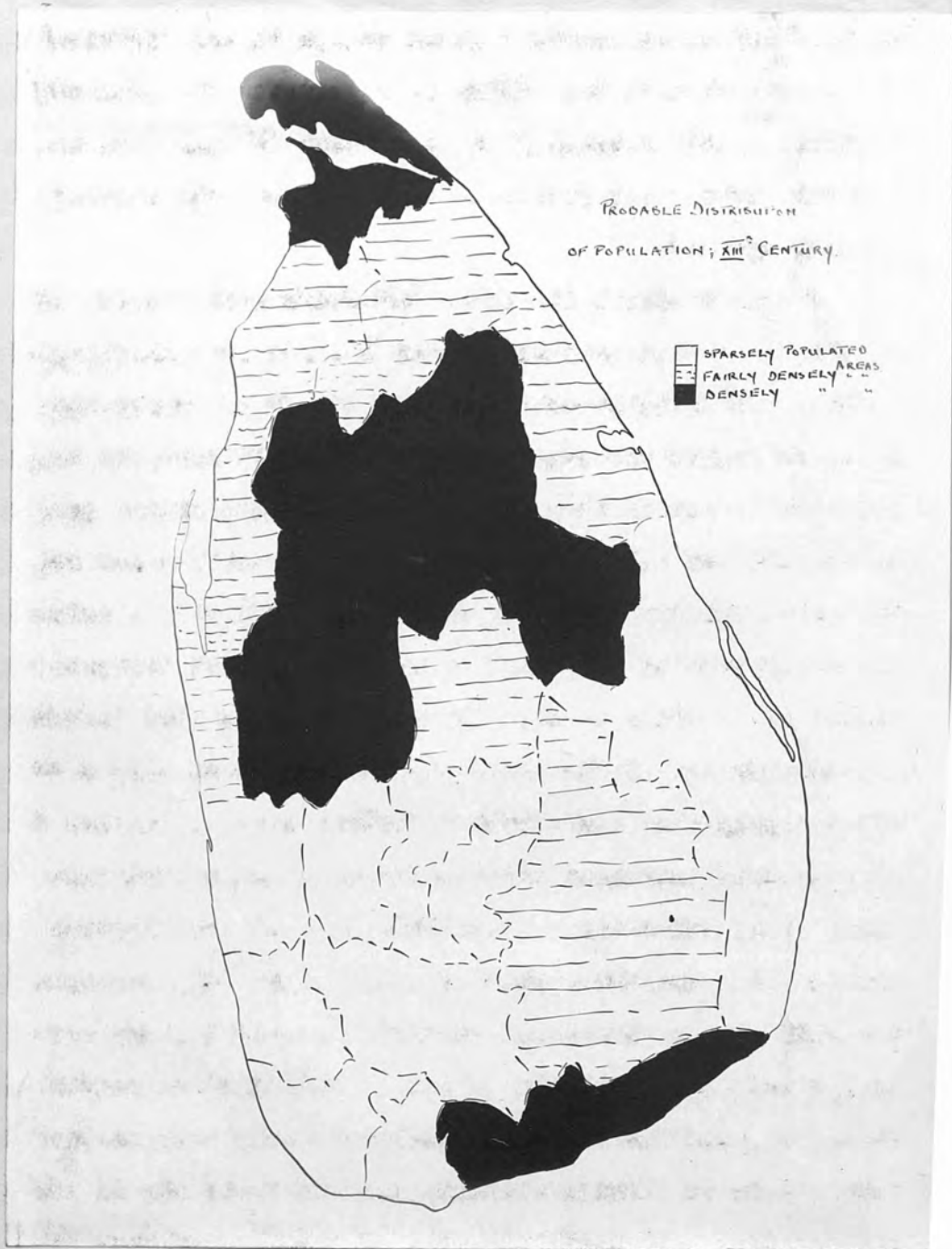
it is now, but was concentrated in the North Western, North Central, Northern and Southern Provinces, where the excellent irrigation system of the great Sinhalese kings made every available acre of ground in the moderate rainfall belt productive.

The decay of the irrigation system, which was followed by the depopulation of the dry country, and the shifting of population to the centre, west and south, started in the 13th Century. It was caused by the repeated invasions of Tamil peoples, Chotas and Pandians, from South India, to which there are many references in the chronicles of the 13th, 14th, and 15th centuries. The invaders entered the island by way of Mantota and Kantesantsai, in the north of the Jaffna peninsula; made their headquarters at Jaffna, which rose to prominence at this time, and speedily overran the whole of the northern low country. Ceylon is particularly exposed to attack from the north; no mountain ranges or impassable rivers protect it from invasion, and after many years of warfare, the Sinhalese appear to have seen the impossibility of defending the north, and to have abandoned it to the Tamils who still form the bulk of its population. Events recorded in the chronicles give clues as to the directions in which the Sinhalese moved; at first they seem to have moved south and west, for mention is made of the transference of the capital to Dambadeniya, of the cremation of a king at Attatagala, in Colombo district, and of a minor prince who made his headquarters in Kurunegala.¹ These places were all in the low country to the south west of Anuradhapura, but were considerably further south than the earlier centres of population. In 1344, when Ibn Batuta visited Ceylon he mentioned the existence of Colombo "the finest and largest city in Serendib" which he said was held by a Mahomedan pirate with an Abyssinian garrison. The chronicles of the same period

¹ Tennent, Ceylon - quotations from the Mahawansa.

record the building of a fort at Kotte, in the marshes near Colombo, and the capture of encampments of the king of Jaffna at Chilaw and Negombo, which suggests that the west coast between Puttalam and Colombo was becoming known and settled. In the late 14th century, the Sinhalese capital was transferred to Gampola in the highlands, and the building of viharas at Kandy is recorded, so that the Sinhalese must have been moving into the hill country. This ^mirrigation ^rproceeded fairly rapidly, for in the early 16th century, when the capital was transferred to Avissawella, in Sabaragamuwa, four kings, including an independent king of the hill country, were ruling in Ceylon. In 1528 the Portuguese, who had visited Ceylon under Almeida in 1505 built their first factory at Colombo, and the trade in cinnamon, which had been important possibly from the time of the Roman Empire passed into their hands. The Portuguese did not in any sense colonize Ceylon; a handful of soldiers remained in the island until 1656, when Colombo was captured by the Dutch, but the history of their occupation is a long series of wars against the Kandians in Kandy, Matale and Uva districts for the right to collect cinnamon, and they must have been too occupied in retaining their hold upon Colombo and the roads to the hills to explore the rest of the country. There are no available Portuguese records of the country in the time of their occupation, but an old map, assigned to the year 1627, and reproduced by Codrington, throws some light on the distribution of population at that time. Most names are marked on the west and south coasts, Puttalam, Chilaw, Negombo, Colombo, Panadura Galle and Magama being recognisable. Batticaloa, Trincomalee Jaffna and Kandy are marked, but the northern, north-western and north-eastern parts of the island are labelled "Desert^o."

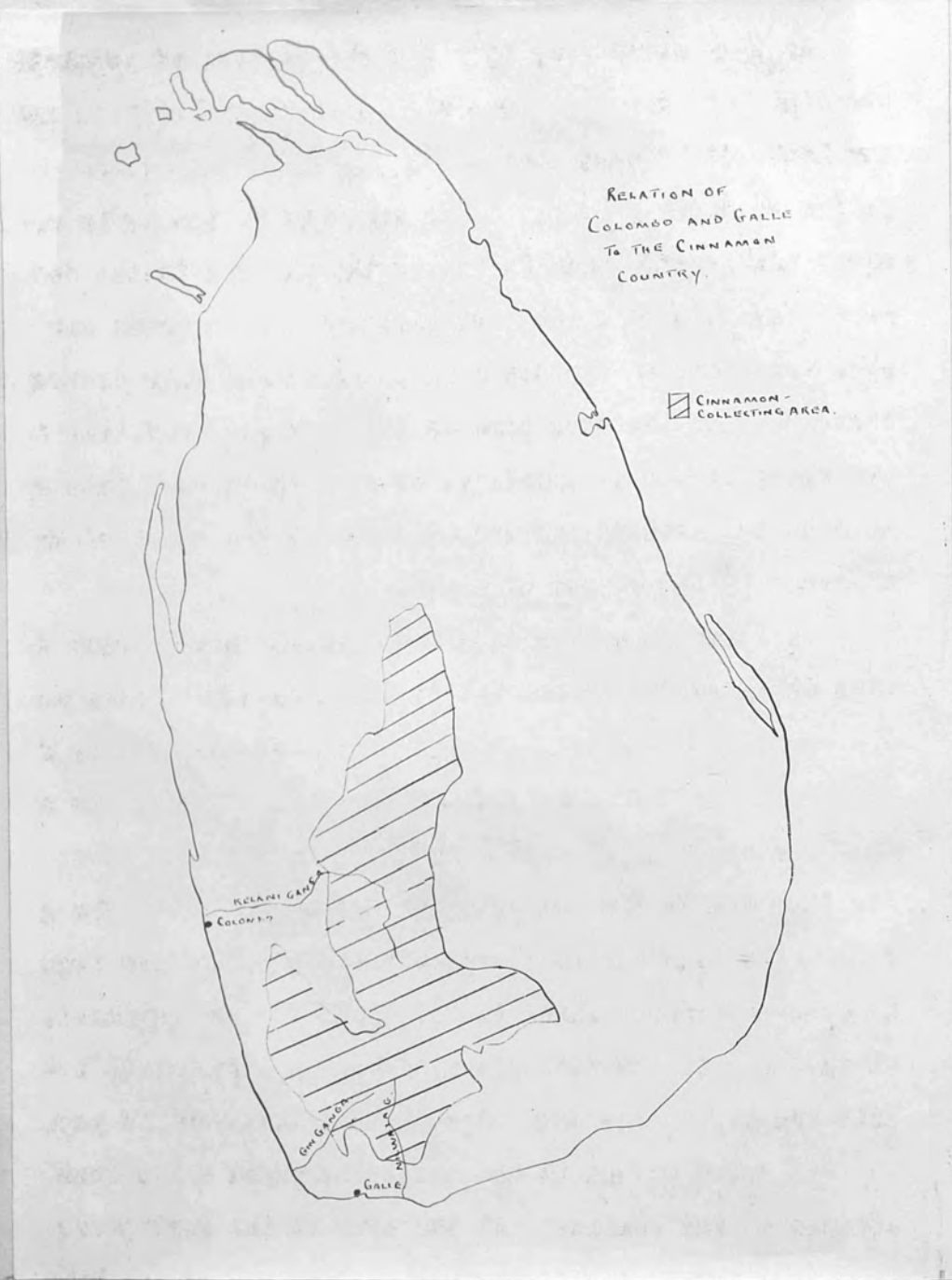
¹ Codrington. History of Ceylon.



N.B. Concentration of population in north, north-centre, and south-east of island . i.e. in areas easily accessible from India or easily irrigable. Small population of centre, west and south-west, now the most densely populated parts of Ceylon. Compare with map showing population in 1921, p. 9.

If this map is accurate, a great change in the distribution of population must have taken place between the 12th and 17th centuries; the northern provinces being depopulated, and the western and central provinces becoming the most thickly peopled, as they are now.

At first sight, it seems that historical events, and not geographical factors were responsible for this shifting of population, for there is no doubt that the chief reason why the north of Ceylon was depopulated was that it bore the brunt of repeated invasions from India. But to some extent geography determined the course of history, for it was the low relief of the north which made it so peculiarly difficult to defend, and the dependence of its chief industry upon tank irrigation which caused it to decay so rapidly when the tanks were destroyed. The destruction of the tanks cannot have meant only a deficient water-supply, for the north of Ceylon is not rainless, and its people could doubtless have grown other crops than rice upon their land; other serious factors, such as the flooding of arable land, and the spread of malaria probably accompanied the ruin of the tanks, and partly accounted for the movement of people away from northern Ceylon. Villages are proverbially tenacious, and the Sinhalese would probably have recovered from the effects of foreign attacks, just as their kin in South India recover from the yearly flooding of their river-bank villages, but it is difficult to grow crops on salty land, and malaria saps the determination of the most conservative. The prevalence of malaria in the Northern and North Central provinces is one of the chief reasons why these areas are sparsely populated to-day; it seems probable, therefore, that the spread of this disease helped to depopulate the country in earlier times.



N.B. Accessibility of cinnamon-producing country from south and west of island, one of the reasons for the transference of population to these areas in the Portuguese and Dutch periods.

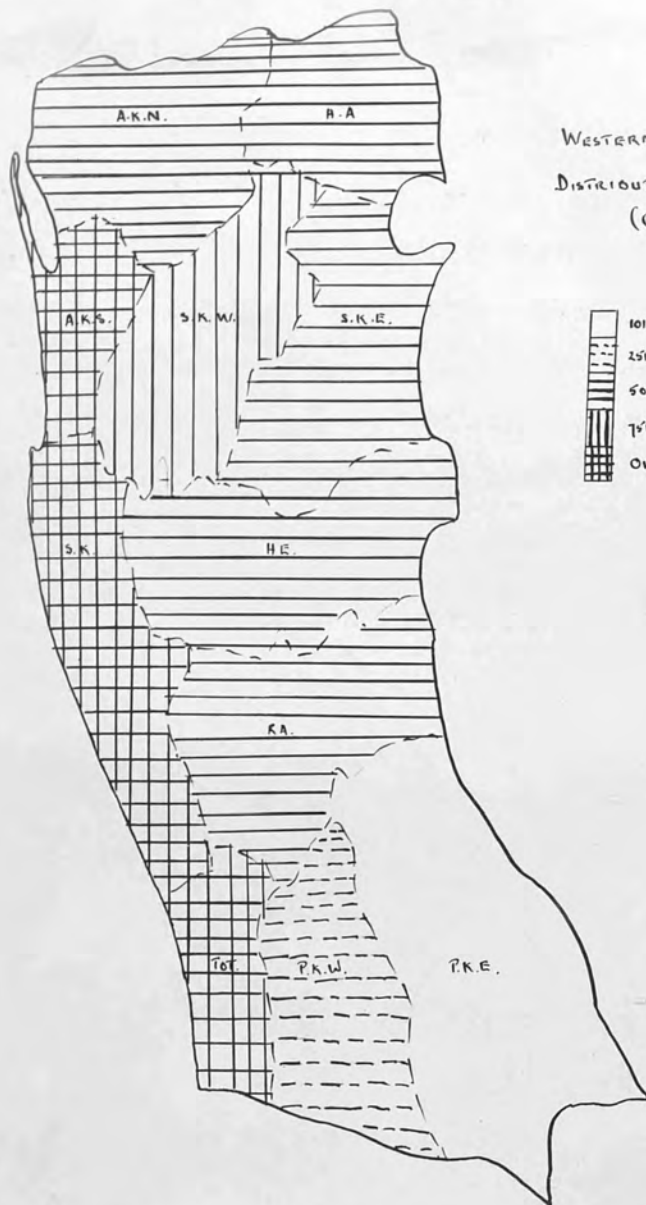
As they moved away from the old centres of population, the Sinhalese may have been attracted to the eastern and western lowlands because they could pursue in them their old occupation of paddy growing. The rainfall in the newly opened up areas was greater than in the north, the vegetation denser and more difficult to clear, but irrigation from tanks was not necessary, and an invader could, therefore, only destroy one harvest. At the same time as the movement away from the ^{north} ~~work~~ was being forced by invaders, other factors came into operation to make the western lowlands important, the chief of which was a change in the course of trade. ~~was, too, a slight revival of~~ In early days, the Sinhalese traded chiefly with S. India, with other Asiatic countries overland through India, and with the west, by means of Arab traders who reached Europe from Ceylon via the Red Sea. The trade with the west was chiefly in cinnamon, a plant which grew wild on the west coast ^{at} ~~and~~ lowlands and in the foothills of the highlands. The growing demand for cinnamon must have attracted collectors from the impoverished north first to the south-western lowlands, then, as the supplies of wild cinnamon became exhausted, into the hill country, where they added to the considerable population who had found refuge in the easily defended hills from the attacks of the Tamils. At the time of the Portuguese occupation, the trade in cinnamon was passing out of the hands of the Arabs who used the Red Sea route and the Northern ports of Ceylon, and was becoming a monopoly of the Portuguese, who had discovered the Cape of Good Hope route from Europe. For this route, Colombo and Galle, on the west coast of Ceylon, were more conveniently situated than northern ports like Jaffna; they were

The importance of cinnamon to Ceylon was emphasized by Aegidius Montanus, a Belgian Physician, who visited the island in 1607-09, and wrote, "Indeed not truth the whole island, and all that is in it, excepting the cinnamon tree, is not worth as much as the ordinary village in Portugal and Madeira." (Trans. Vargason, J. L. S. S., Ceylon Branch, 1907). This summary of the tales of Ceylon is a commentary on the state of decay into which the island had fallen under the rule of the Portuguese and later Sinhalese kings. It was, of course, made

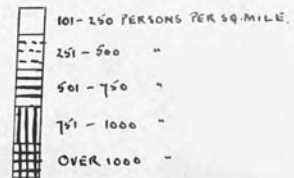
also nearer to the cinnamon-collecting areas, and rapidly became the most important ports of the island. Cinnamon continued to be one of the chief exports of Ceylon during the Dutch occupation, from 1656 to 1795.¹ Among other articles of trade in this period were areca and pepper, both collected in the cinnamon country, and precious stones, mined in the Ratnapura district. These products were exported to the mother-country from Colombo and Galle, or to Java, where they were collected at Batavia, and the eastern side of the island seems to have developed as a result of the Javanese trade. In this period, there was, too, a slight revival of prosperity in the north of Ceylon, where Jaffna became once more the headquarters of the pearl-fishery in the Gulf of Mannar, but except for Jaffna district the north remained thinly populated, for although attacks from India had ceased with the establishment of British rule, the damage done by invaders was not repaired, and the medical science of the day was unable to cope with the problem of malaria. It is probable that in the eighteenth and nineteenth centuries the north continued to lose population steadily, for in 1750 the Dutch introduced Coffee to the fringe of the central highlands, and in 1757 the first coconut gardens were planted on the sandy coast between Colombo and Chilaw. Until the great epidemic which wiped out the coffee plantations in the eighties, coffee and coconut cultivation grew in extent and importance, the most favourable districts for the two crops being those in which they predominate to-day, the western and south-western lowlands, and the lower westward facing slopes of the hills. The introduction

¹ The importance of cinnamon to Ceylon was emphasised by Aegidius Daetmans, a Belgian Physician, who visited the island in 1687-89, and wrote, "Indeed and truth the whole island, and all that is in it, excepting the cinnamon tree, is not worth as much as the ordinary village in Brabant and Flanders." (Trans. Ferguson, J.R.A.S. Ceylon Branch, 1887). This summary of the value of Ceylon is a commentary on the state of decay into which the island had fallen under the rule of the Portuguese and later Sinhalese kings. It was, of course, made before planting had begun.

of plantation crops completed the work begun by foreign invasions, the destruction of the old irrigation system, the decline of trade with India, and the growth of trade with the west via the Cape; it marked ^{out} on the south, west, and centre of the island as the most productive and wealthy, and relegated the dry country over which the old kings of Anuradhapura had reigned so gloriously, to a position of comparative unimportance. As the west, centre and south of the island have been steadily growing in importance at the expense of the dry country ever since the time of the Dutch occupation, it is proposed to deal with the present distribution of population in these areas first, and in greatest detail.



WESTERN PROVINCE.
DISTRIBUTION OF POPULATION.
(CENSUS. 1921.)



N.B. Density of population in province as a whole the highest in Ceylon. Very dense population of coastal korales. Population scantiest in s.e. i.e. in area which is highest, rainiest, and least easily accessible from coast.

CHAPTER III.

THE PRESENT DISTRIBUTION OF RURAL
POPULATION IN THE WESTERN PROVINCE.

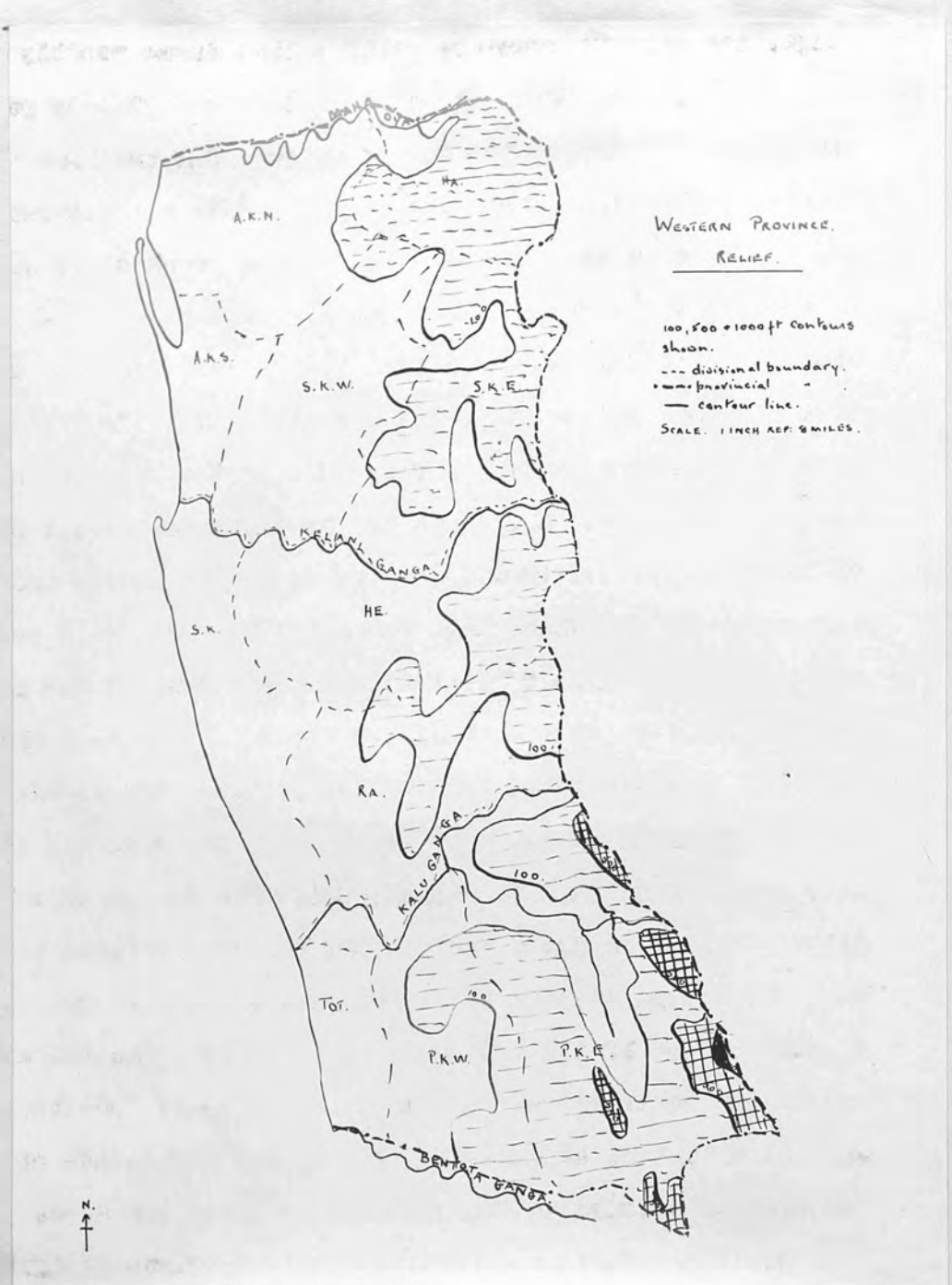
The western Province is now the most densely populated part of ceylon. At the 1921 census, it had an average population of 874 persons per sq. mile. The Central province, which stands second, has an average population of 314, and the North Central Province, the least densely peopled, 24 persons per sq. mile, so that the Western Province is markedly more densely peopled than the rest of the Island.

It is divided into eleven ^h latpattus, the distribution of population in which is shown on the accompanying map. The actual figures are as follows:-

Colombo and Kalutara districts; population at census 1921

<u>Headman's Division</u>	<u>Area in sq. miles.</u>	<u>No. of persons per sq. mile.</u>
1. Totamunee	88	1480
2. Salpiti Korale	40	1179
3. Alutkuru South	72	1044
4. Siyame Krale West	120	954
5. Alutkuru North	158	733
6. Rayigam	130	622
7. Hewagam	165	610
8. Siyame K. East	117	575
9. Hapitigam	81	527
10. Pasdun K. West	113	417
11. Pasdun K. East	281	168

The province lies between the Maha Oya and the Bentota

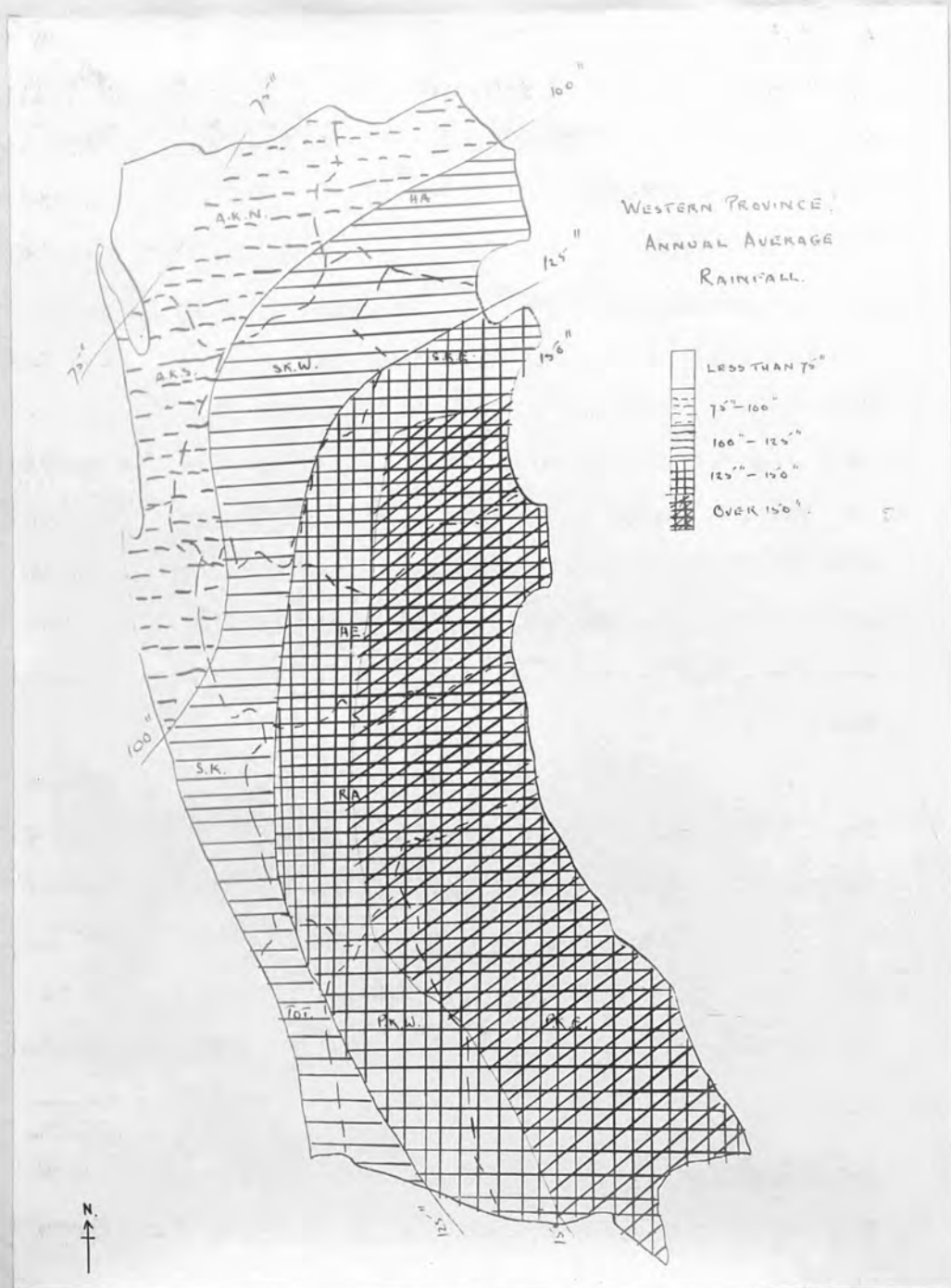


N.B. low relief of province as a whole. Highest land, consisting of low s.e. to n.w. running ridges, in s.e. of province. River valleys leading e. to Central Province and Sabaragamuwa.

Ganga, its eastern boundary being a line drawn roughly twenty-four miles inland from the west coast. The greater part of the province is below 100 ft. in height, but the land rises gradually to a belt of slightly higher country, between 100 - 500 ft. high in the east, the continuity of which is broken by the valley of the Kelani Ganga and Kalu Ganga. In the south east in Rayigam and ^sPa^ondun ^oKrale East, the land rises over 500 feet and in one point reaches over 1,000 feet. On such flat land as is found everywhere in the province excepting the south east, there can be no obstacles except possible flooding to the construction of roads and railways, and the communication map shows that there are numerous main roads, and a greater length of railway open here than in any other part of the island. None of the roads and railways are impassable at any season, so that the province has an adequate system of communication, (the development of which has been made possible by its low relief,) available for transport at all seasons. As the wealth of the Western province like the rest of Ceylon, lies in its agriculture, the high percentage of land fitted by its relief for cultivation, and the excellent system of transport, making the circulation of foodstuffs and the marketing of commodities easy and cheap, are of importance in accounting for the prosperity of the area.

Two other factors affecting the development of agriculture in the West are soils and climate. No geological or soil survey of Ceylon has been made, so that information about the soils of the Western Province as a whole is scanty, and no details whatever are available about the soils of the various

¹ Roads impassable for part of the year are indicated on the 8 miles to the inch map of Ceylon, 1927 edition. They are commonest in the North-Western Province.



N.B. Rainfall everywhere abundant, but heaviest in higher country to e. and s.e. of province; lightest in n.w.

divisions within the province. According to a report on the Paddy soils of Ceylon published in the Tropical Agriculturist of 1925, the soils of the West are light sandy or alluvial; they have a water-holding capacity of 60%, and a higher proportion of nitrogen than those of any other part of the island. The high water-holding capacity suggests that the soils must be fairly fine, their high proportion of nitrogen, that they must have a well-developed capacity for absorbing salts. It appears, therefore, that the soils of the Western Province must be fertile compared with those of other parts of Ceylon, which are generally coarse. The fertility of the ^{soil} ~~site~~ is an additional factor ~~is~~ accounting for the high proportion of land under cultivation, which is one reason for the dense population of the province.

The chief climatic peculiarities of Western Ceylon are its high annual average temperature, small annual and diurnal temperature range, and abundant, well distributed rainfall.

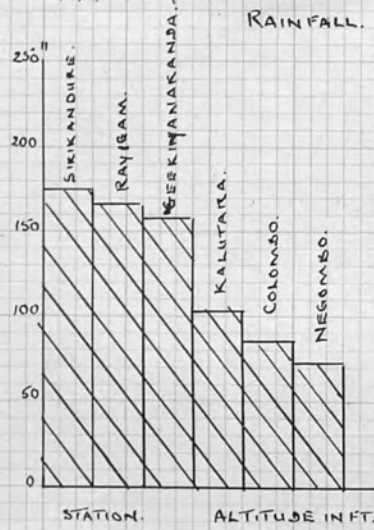
Temperature statistics are not available in detail for the whole province, but as no part of it is high or far from the sea, the figures for Colombo may be taken as typical:-

	<u>Max. Tem.</u>	<u>Min. Temp.</u>	<u>Ann.Range</u>	<u>Diur:Ra.</u>	<u>Yearly Av.</u>
Colombo	82.6°F.	79.1°	3.5°	12.3°	80.8°

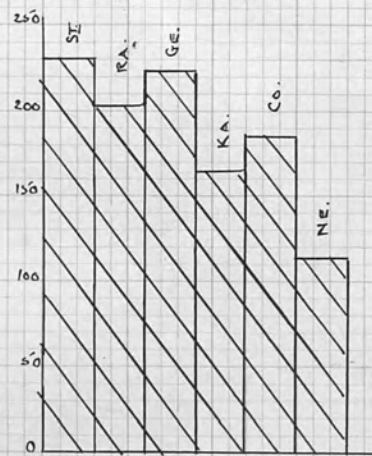
The annual range of temperature is so small that there is no universal resting season for plants, provided that water is available at all seasons, as it is in the Western province, which includes the wettest area in Ceylon. On the map showing rainfall distribution it can be seen that the greater part of the province has over 125 ins. of rain in the year,

WESTERN PROVINCE.

(i) YEARLY AVERAGE RAINFALL.



(ii) NO. OF DAYS ON WHICH RAIN FALLS.

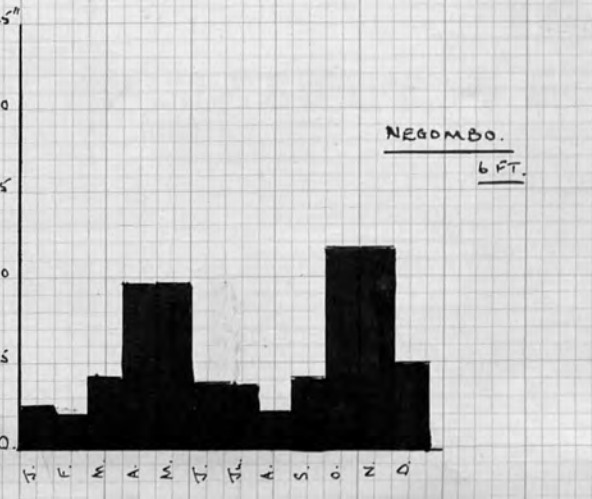
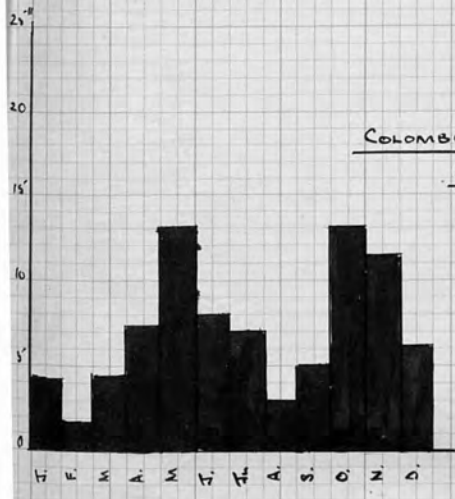
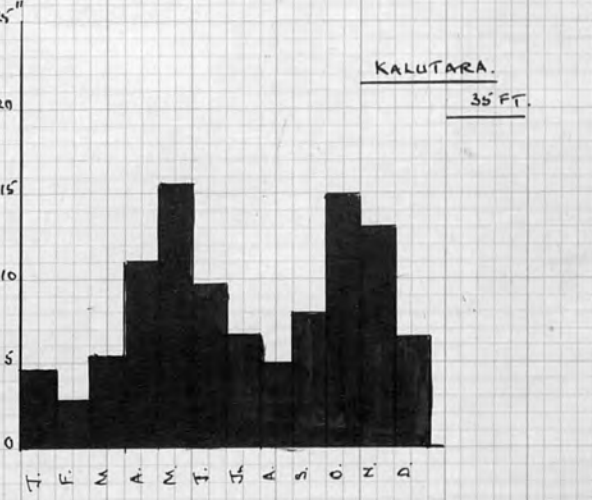
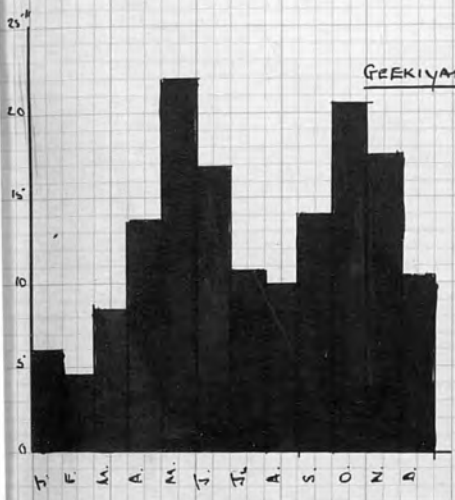
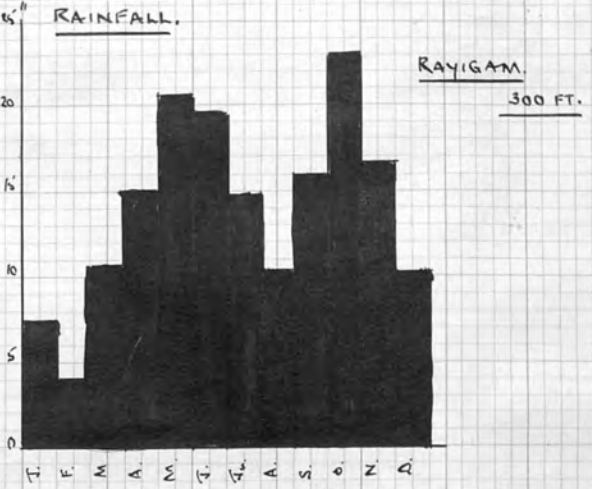
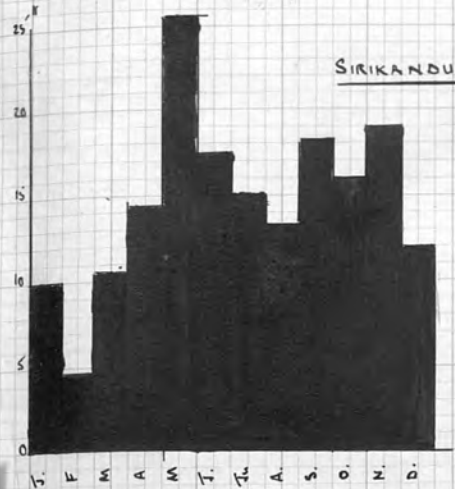


STATION.	ALTITUDE IN FT.
1. SRIKANDURE.	546.
2. RAYIGAM.	360.
3. GEEKIYANAKANDA.	300.
4. KALUTARA.	35.
5. COLOMBO.	24.
6. NEGOMBO.	6.

N.B. Marked effect of altitude (compare Srikandure and Colombo) and latitude (compare Kalutara and Negombo) on rainfall of W. Province.

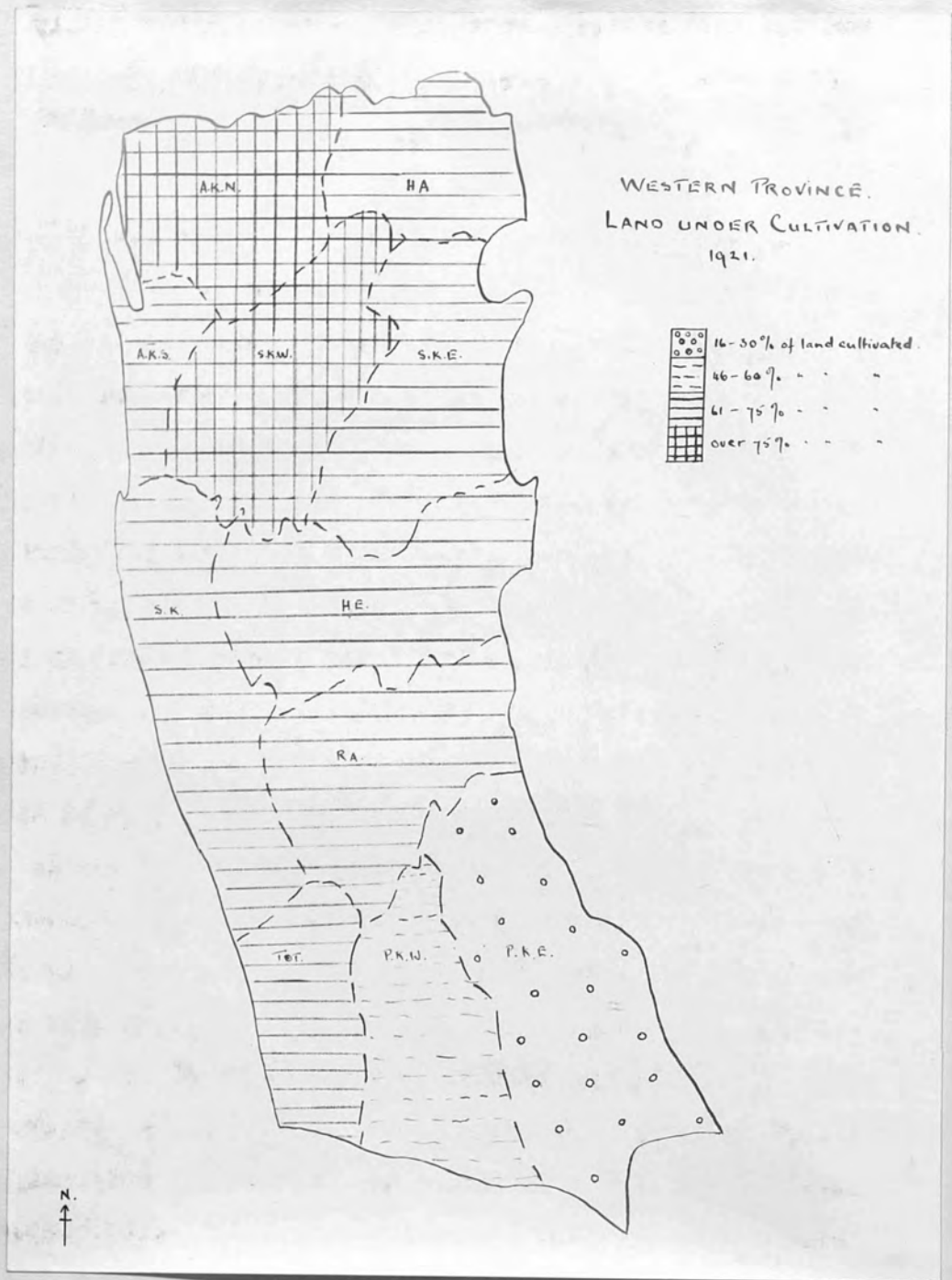
WESTERN PROVINCE.

MONTHLY RAINFALL.



N.B. Greatest rainfall during S.W. monsoon season, but no rainless month in W. Province.

though there is considerable diversity in the amount received in different parts of the province. The north-west has 50-75 ins, 70.5 being recorded in Negombo, in the south east, where the land is higher, Sirikandure at an altitude of 500 feet, records 175.ins of rain. The amount of rain received is controlled by latitude, the south-west rain-bearing winds being stronger in the south than in the north of the province, by altitude, and by the lie of the country. Although the eastern part of the province is not very high, the ridges here run at right angles to the monsoon winds, and partly for this reason, partly because the winds which reach the province are almost saturated, small difference of altitude between two stations make much difference in the amount of rainfall they receive. A diagram to show the amount of rain received at six stations of varying heights is appended. It shows that, though the amount of rain received in different parts of the province varies, the higher south-east being much the rainest, there is no area in which rainfall is deficient, a factor which must be kept in mind when the amount of land under cultivation is considered. Further, rainfall records for a number of years show that there is little fluctuation in the amount of rain received from year to year, and the graph representing the distribution of rain throughout the year reveals the fact that^{at} there is no rainless month, even in Negombo, the driest station. In the Western Province, therefore, there is no area in which the annual rainfall is insufficient for the growth of the usual tropical crops without water storage; no period of the year when ground

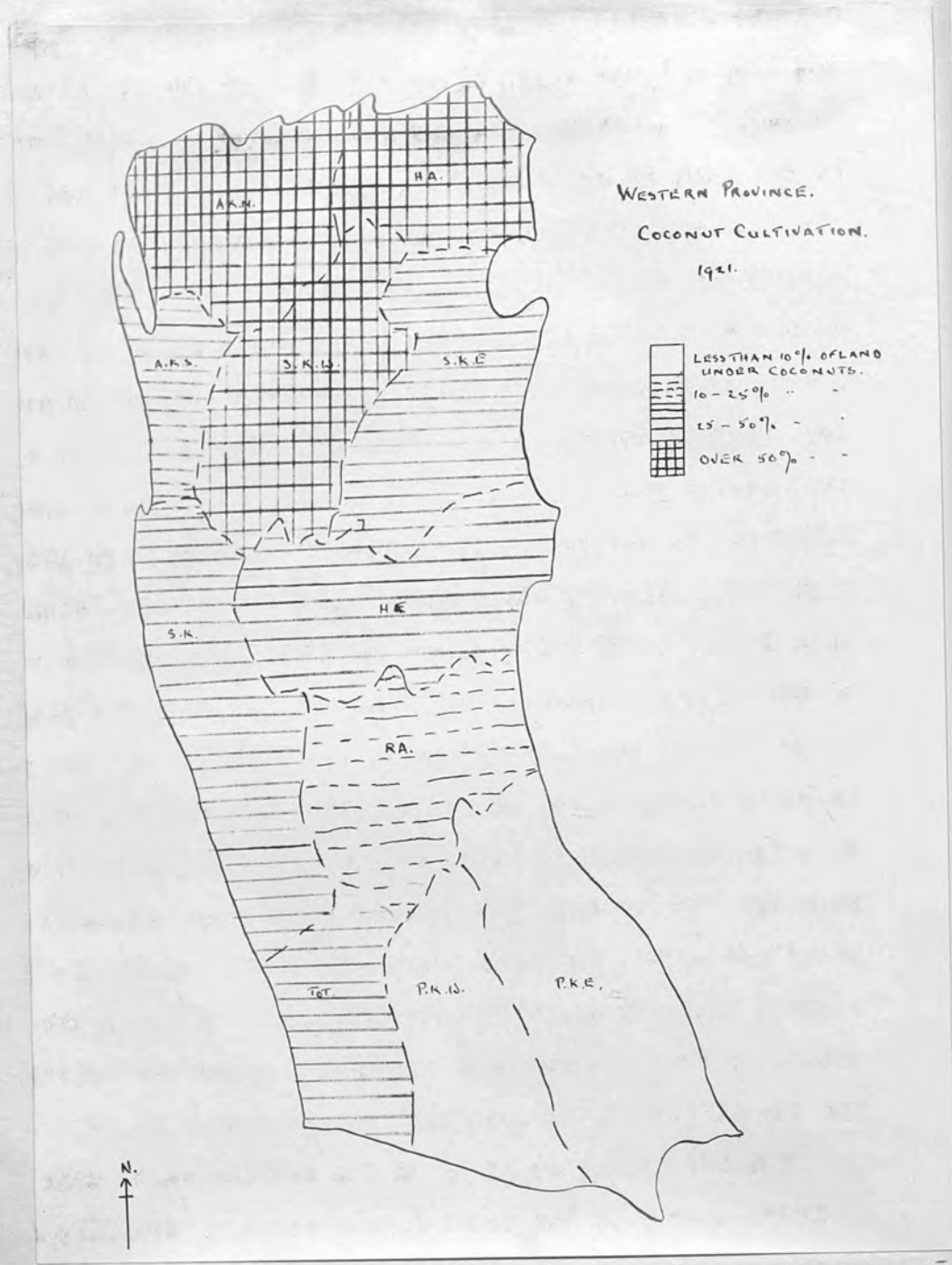


N.B. High percentage of land under cultivation except in hilly country with heavy rainfall, in s.e.

must be left fallow because the available water supply is insufficient for the crops, and no anxiety to be felt by the cultivator lest⁺ the yearly rainfall should be much below_h the usual amount.

It is undoubtedly the favourable climatic conditions which account primarily for the flourishing state of agriculture in the Western Province. 61% of the total area is cultivated, 20% more than in the Central and North Western provinces which rank next in point of extensive cultivation. Agriculture is not practised equally extensively in all parts of the province, the map shows that the two northern divisions in Colombo district, Alutkuru^o Krale North and Siyaneⁿ Krale West, are most completely cultivated. These appear in the map compiled from 1921 statistics as having 75% of their total area under cultivation, but the 1 inch to the mile map of cultivation prepared for the Ceylon Constitutional Commission in 1927, shows every acre of these two districts to be cropped. The two least developed districts are Paedun Krales East and West, which have the heaviest rainfall in the province, and are still largely forest covered. A combination of favourable circumstances - flat_h land suitable, when cleared of its original forest covering, for agriculture, fertile soils frequently renewed by the floods of Kelani^h and Kalu^G fanga; uniformly high temperature, abundant rainfall fairly evenly distributed throughout the year; accessibility from the coast and centuries of settlement and careful cultivation is responsible for the province's lead in agriculture.

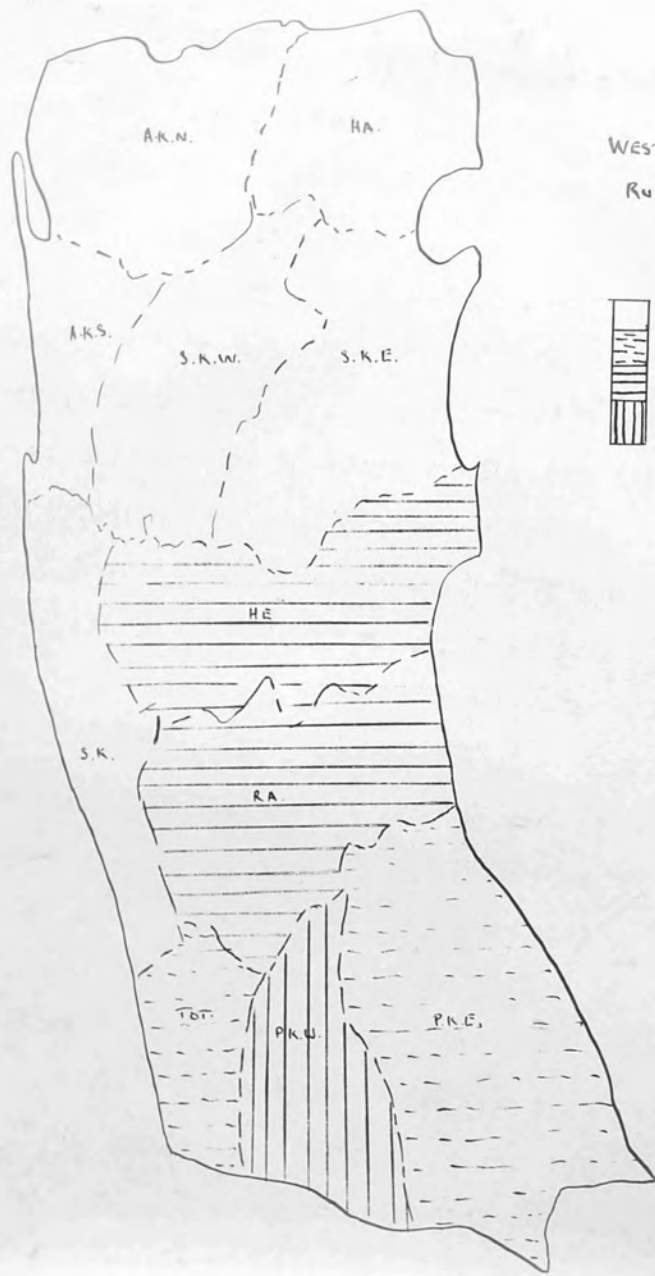
The chief cultivated crops are coconuts, rubber and paddy. In 1926, 291,918 acres were under coconuts, more than $\frac{1}{4}$ of the total island acreage of 883,480. 29.3% of the province^{car} bears coconuts, which are the most extensively grown crop in



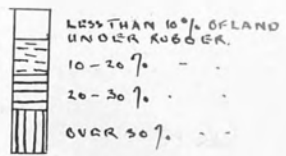
N.B. Enormous importance of coconut cultivation to province as a whole, particularly to northern, less rainy portion and coastal korales.

Colombo district, particularly in Alutkuru North, Hapitigam and Siyame ⁿ ^a _^ Krale West, where over 50% of the divisional area is devoted to them. In the four coastal divisions over 30% of the land is under coconuts; ^{and s} _^ ^o _^ Paḍun Krale East and West are the only two divisions in which less than 10% of the land is devoted to this crop. Coconut palms grow best in low land on alluvial soils along river banks where flooding takes place, or on sandy loams with water fairly near the surface. They need an average temperature of 80° or over, and a well-distributed yearly rainfall of 75-100 ins. These conditions exist in the western province, where there is very little high land; alluvial soils along the banks of the Kelani and Kalu Ganga, sandy soils along the coast; and average temperature of 80.8°, and a rainfall of 70 - 175", so that the proportion of land under coconuts is easily explained. The two districts in which coconuts are least important are those in which most clearing of forest would be necessary before plantations could be made, for coconuts grow spindley and bear little fruit under heavy shade, and in which transport of the relatively heavy coconut products would be most difficult, owing to the hilly nature of the country which accounts for the few existing roads, and the difficulty of constructing new ones.

134,541 acres, or 13.5% of the surface were under rubber in 1926, over $\frac{1}{4}$ of the total island acreage, ^{of} 475,051, and judging by the figures given in successive Blue Books more land is being taken for this crop every year in spite of competition between Ceylon, the Malay States, and other rubber-growing areas. Rubber is more important in Kalutara than in Colombo, 34% of Paḍun ^s _^ ^o _^ Krale West and 26% of Rayigam as compared with 20% of Hewagam ^o _^ ^o _^ Krale, the chief rubber producing division in Colombo,



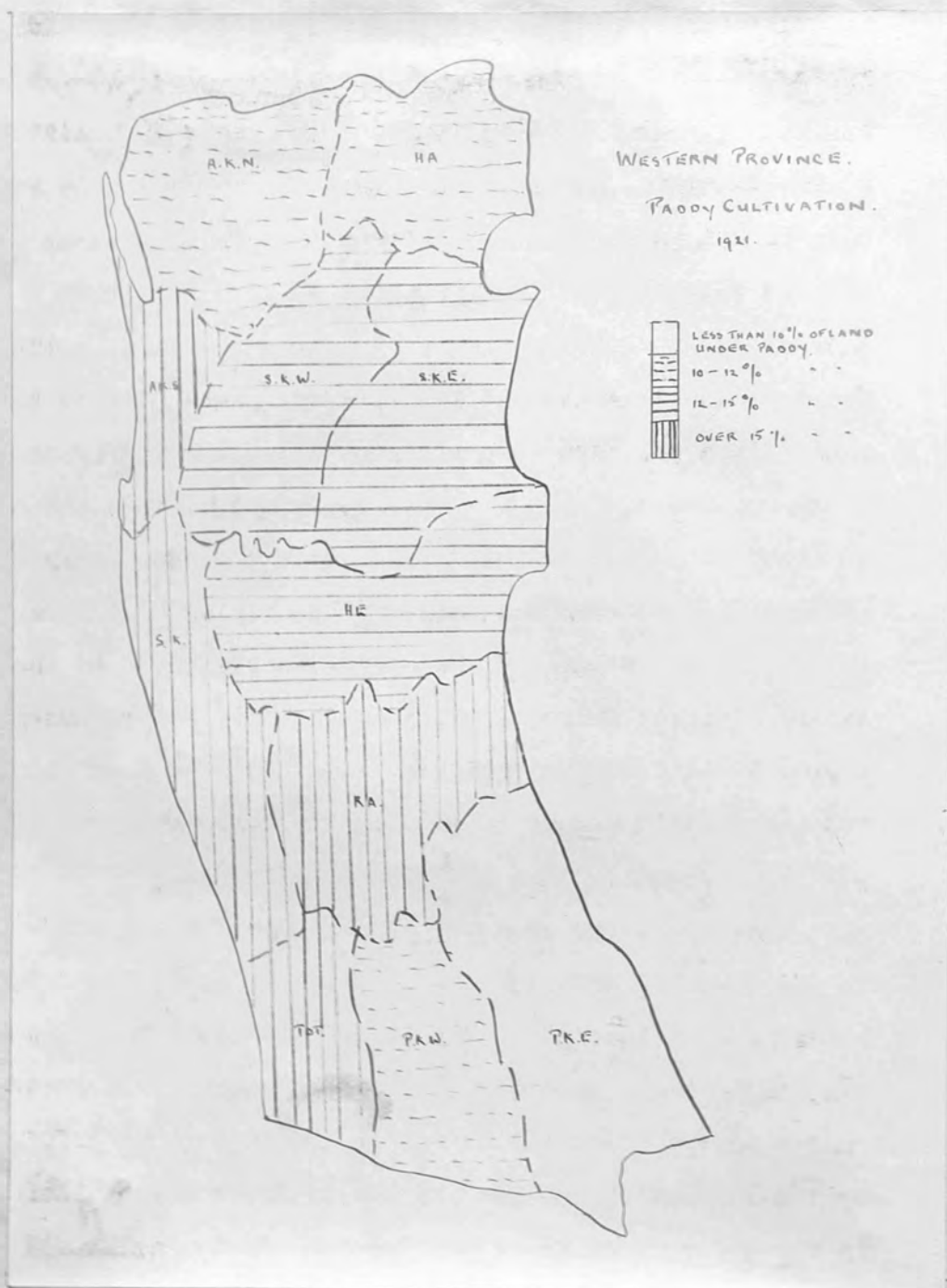
WESTERN PROVINCE.
RUBBER CULTIVATION.
1921.



N.B. Importance of rubber to higher parts of province, where rainfall is too heavy, and forest-clearing too laborious, for coconut cultivation.

being under it. ^{the} ~~H.~~ ^{ens} ~~Hevea~~ ~~Braziliensis~~, which has been acclimatised in Ceylon, is the chief rubber producing tree. In Brazil, this tree grows best below 1,500 ft. in an annual temperature over 75°, with a rainfall over 80 ins. Similar conditions can easily be found in the western province of Ceylon. According to the Green Book of Ceylon, published in Colombo in 1926, rubber can be planted in land less carefully cleared than that required for coconuts, and will stand heavy rains; this may account for the popularity of the crop in the higher and wetter parts of the western province.

So much of the available land is devoted to plantation crops that only a small proportion is devoted to native food crops, the chief of which is paddy. In 1926, 104,091 acres, or 12% of the province was under paddy, the acreage being $\frac{1}{8}$ of the island total of 834,325 acres. The coastal districts, and Rayigam ^o ~~Krale~~, had the greatest proportion of paddy-land, Alutkuru North, Hapitigam and the two ^s ~~Pa~~ ^o ~~dun~~ ^o ~~Krales~~ least. The soils of the coastal districts appear to be light and sandy, easier to drain than the alluvial soils of the river valleys, and the 1 inch to the mile map of cultivation in the western province shows that the rice-fields in Rayigam are clustered round the Kalu Ganga, the flood water of which has been regulated by the construction of a dam and canals, so that here, too, the land can be more easily drained than in other parts of the province. In Alutkuru and Hapitigam coconut plantations occupy so much space that there is little land for paddy, and in ^s ~~Pa~~ ^o ~~dun~~ ^o ~~Krale~~ East and West, the cultivation map shows extensive areas under forest, the clearing of which for paddy fields would be a formidable undertaking. There are

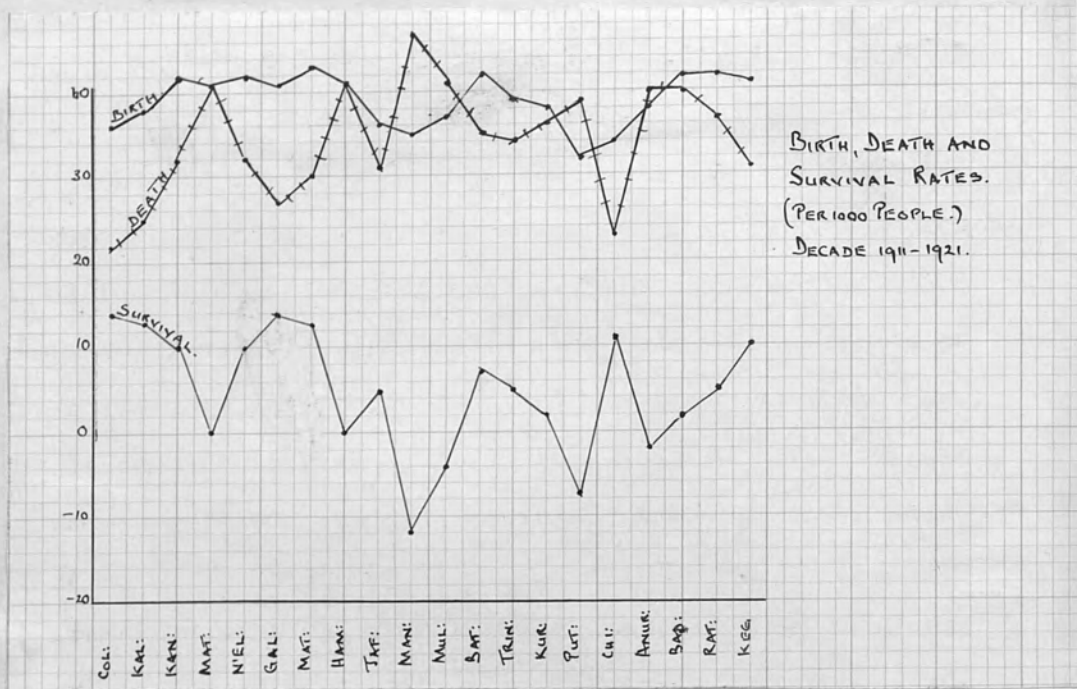


N.B. Small percentages of land under paddy, the only widely cultivated foodcrop in the province. Compare with map, p 58, showing paddy-cultivation in Central Province and Sabaragamuwa, which are even less completely self-supporting in foodstuffs.

no available statistics by which the yield of the paddy fields in the province can be compared with that of other parts of Ceylon, but the Report on Paddy soils and Paddy cultivation states that two, and sometimes three harvests can be reaped here in the year, so that whatever the yield it seems reasonable to suppose that the amount of paddy raised here in proportion to the land under the crop is greater than in other parts of the island. It is, further, probable that the paddy yield per acre is greater in the Western Province than in other parts of Ceylon. The crop yield must depend upon soil and climatic conditions, and upon the efficiency of the labourer. Detailed soil surveys not having been made, no argument can be based upon the soil superiority of the province. Its high annual average temperature, small range, heavy and evenly distributed rainfall are favourable to paddy-growth, and there is reason to think that the labour-supply in the province is better than that found elsewhere. It is possible that the efficiency of the labour-force in the West has been increased by agricultural education, and by efforts to improve the health of the province. Most of the plantations in Ceylon are European-owned, and controlled on the spot by European overseers and engineers. Judging by the reports of the Tea and Rubber Growers Associations, and by successive numbers of the Tropical Agriculturist, the organ of the Government Garden at Peradeniya, much work is being done here and on the estates to improve the productivity of the soil by careful irrigation, manuring, the growth of cover crops, experiments with new varieties of seed, and improved methods

of preparing crops for market. It is stated in the Estates Population, Western Province section of the Census report that most of the labourers employed upon the estates of the province are low-country Sinhalese, the natives of the district, who do not live on the estates ^s and the Indian Tamils of the tea estates do, but return to their village at night, and are less reliable estate labourers than the immigrant Tamils because of the irregularity of their work on the estates during paddy harvests. These labourers, part of whose time is devoted to growing paddy, have constantly before them methods of agriculture vastly superior to their own. It is at least possible that lessons learnt on the plantation may be applied to the growing of paddy, and that as a result of improved methods of cultivation, yields of this crop may be greater than in remote areas like Anuradhapura where European plantations do not exist, communications are poor, and methods of agriculture are handed down unchanged from generation to generation. Labourers in the West may therefore, be better educated than those in other parts of Ceylon, this would react upon the crop yields, and so upon the capacity of the province to support a dense population. This theory cannot be proved without statistics of crop-yield, which are not in existence at present, but it appears to be a logical deduction from the scale upon which plantations have been developed in the west.

If the influence of education upon the efficiency of the labourer in the Western Province be debateable, there is no doubt that it is increased by the fact that this province



N.B. High survival-rate in estate areas, particularly in W, C. and S. Provinces.
 High death-rate in 'dry' country.

is the healthiest in Ceylon. A graph, constructed from the figures given in the Report on the Census for 1921, shows the birth, death and survival rate in each district for the decade 1911-1921.

The figures for Colombo and Kalutara are:-

District	Birth Rate	Death Rate	Survival rate
Colombo	36.3 per mille	21.5 per mille	14.8
Kalutara	38.3 "	25.2 "	13.1

Colombo had the highest survival rate in the island. In the same decade, the infantile mortality rate, a good index of the health of a population, was 133 per 1,000 births in Colombo, and 130 in Kalutara district. These figures are much under the island average infant mortality rate, which is 220 per 1,000 births. The death rate from disease of the fever group including malaria, enteric, and diseases of the respiratory system, the commonest causes of death in the tropics, was 3.9 per mille in Colombo, 2.8 in Kalutara district, while the island rate was 6.5. These low figures may be due to a variety of causes, including the extensive clearing of forest, which retards the rate of drainage, the development of irrigation in the Western Province is regulated by facilities for importing and distributing food-stuffs, and by the purchasing power of the population. A healthy labourer is inevitably more efficient than an unhealthy one, and as an efficient labourer can produce more for a given acre of ground than a less efficient one, it appears likely that the crop yields in

Survival rate. Birth rate per 1,000 minus death-rate per 1,000

the Western Province are higher than those elsewhere in the island. High crop-yields would stimulate the development of plantations in the province, and ^{the large-scale} increased production of food-crops would increase the size of the population which ^{an} could be supported by home grown foodstuffs. The reason for the dense population of the Western Province is its climatic suitability for ^{combined} native and plantation agriculture. A large population is employed on, and supported by the produce of the paddy fields, and parallel with this element in the population is the immigrant labour employed on the plantations, which amounted in 1921 to 50,922. ^{in purchasing an adequate food-supply,} Labourers on plantations where crops other than food-stuffs are raised, and workers in other trades, cannot be fed by the paddy grown in the Province, for the percentage of land under paddy is only 12.7; the yield is not sufficient for the needs of the whole population, and many food crops, such as sugar and other necessities of life are not grown on any large scale. The growth of the population in any area is limited by the available food supply, and since the quantity of home-grown food is inadequate for a dense population, the size of the population in the Western Province is regulated by facilities for importing and distributing food-stuffs, and by the purchasing power of the population. ^{Revenue in rupees.}

The purchasing power of natives of the province depends upon their earnings, and these upon the demand for labour. The demand for labour in this part of Ceylon is great and varied, ranging through demand for agricultural labour on the

^{Jaffna}
1. For details of imported foodstuffs, see chap. viii.
^{Trincomalee}

83,199

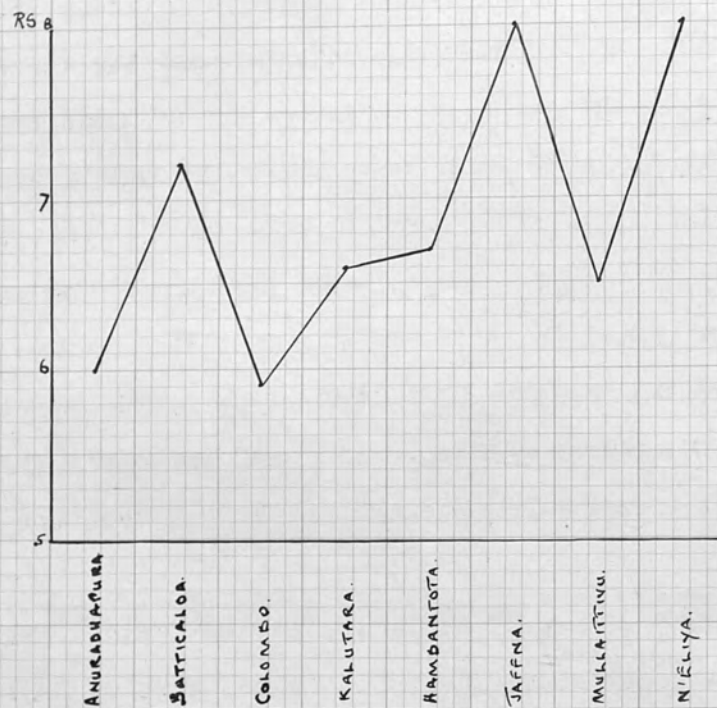
21,474

plantations, to demand for labour on roads and railways, and at the port of Colombo. The only kind for work for which details of wages paid in different parts of Ceylon is work upon the plantations, this was estimated in the Blue Book for 1926 as between 75 cents and 1 rupee a day in the Western Province, 25 cents higher than in other parts of the island. Since the demand for labour in other directions appears to be constant, wages may be correspondingly high in all trades. In this case the inhabitants of the Western Province must be relatively better off than those of the rest of Ceylon, and therefore more capable of purchasing an adequate food-supply, if this be available. The facilities possessed by the people of the Western Province for obtain^{ing} imported food-stuffs, etc., are unrivalled, for every part of the province has easy connection with Colombo, the great port of Ceylon. If facilities for obtaining grain alone be considered, the advantages possessed by the Western Province are manifest, for most of the grain entering the island comes through Colombo. No figures giving the tonnage of grain imported at separate ports in Ceylon are available, but the report of the Colombo Port Commission for 1927 stated that the revenue derived from grain imports, at the rate of 2 c. per cwt, was:-

<u>Port.</u>	<u>Revenue in rupees.</u>
Colombo	8,336,429
Galle	826,868
Kayts	206,968
Kantesanti ^{ur} ai	176,259
Jaffna	83,199
Trincomalee	21,474

PRICE OF RICE PER BUSHEL IN CERTAIN DISTRICTS.

FIGURES FROM BLUE BOOK, 1926.

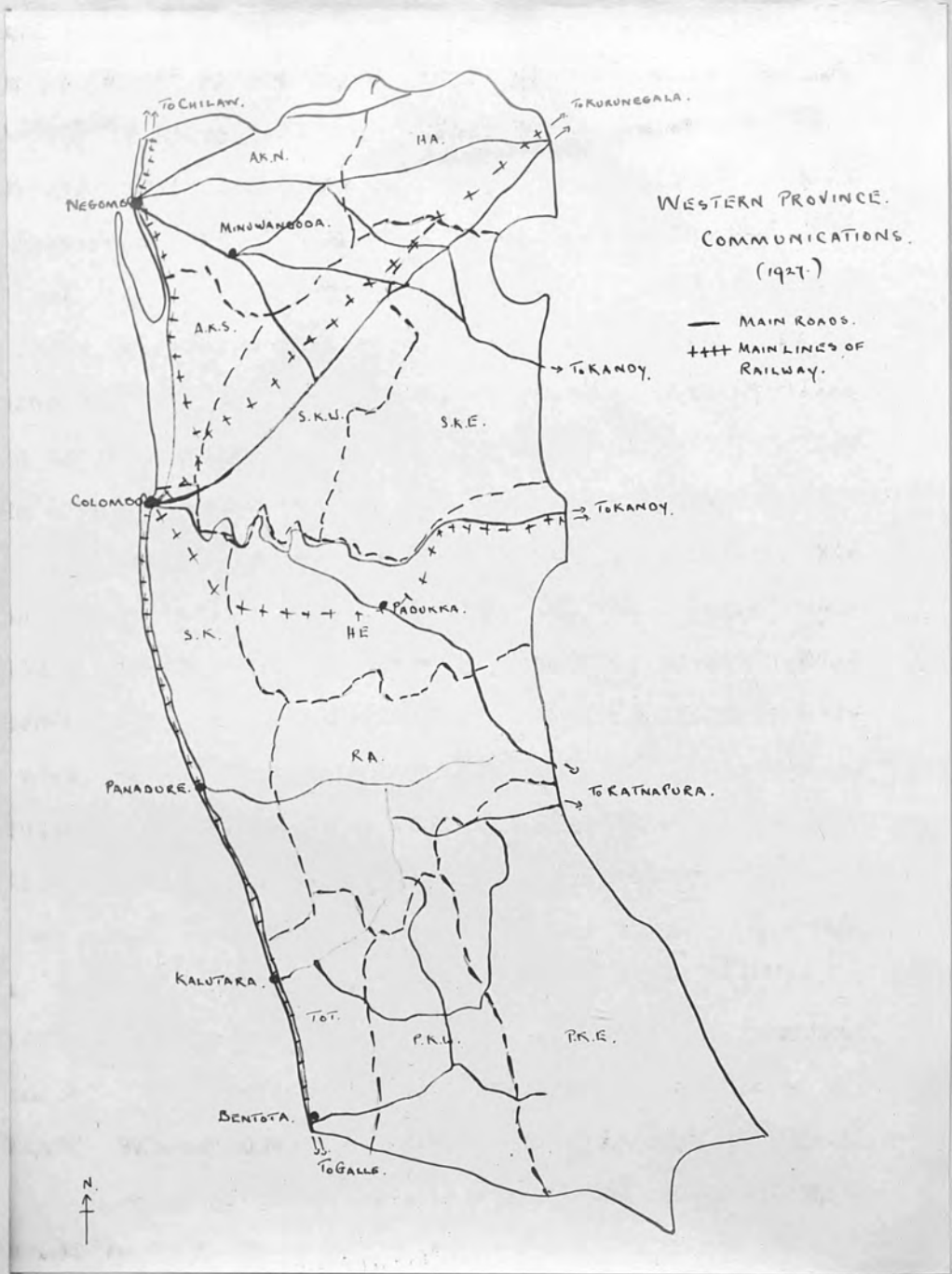


N.B. low price of rice in Colombo compared with other districts.

Assuming the tax to be constant, Colombo must have imported 20,841,072 tons of grain, compared with 2,067,170 tons imported at Galle, and 1,304,504 tons through the Northern Ports. The reasons for Colombo's lead in grain imports and, indeed in all branches of traffic are discussed in Chapter VII, but here it must be pointed out that since the greater quantity of foodstuffs imported comes in through the port of Colombo, grain is more easily available in the Western Province than elsewhere, and is also cheaper, because the Western Province is near to the port of entry. A graph, made from figures given in the 1926 Blue Book, shows the retail price of rice in different parts of Ceylon. In Colombo district, rice is sold at Rs.5.91 per bushel, and throughout the province the price of grain is considerably under the average price for the island, Rs.6.87. The excellent system of communications existing ensures the rapid and easy transport of imported foodstuffs and other necessaries to the remotest part of the province. The food supply available in the Western Province is, therefore, greater than in any other part of Ceylon. More land is under food-crops here than elsewhere, and probably this land is, acre for acre, more productive than these^{at} of other areas, since the soils are good, climate favourable, and labourers healthy. The purchasing power of the people is high, because high wages accompany a widespread demand for labour, and the needs of the population can be easily and cheaply satisfied, because the province is in close contact with Colombo, the chief port of the island. As the resources

of the climatically favoured, easily accessible Western Province are developed by a growing population, so the increased needs of this population can be met, partly by foodstuffs produced locally, partly by increased imports. The amount of land under food crops in the province is greater than elsewhere, so that a larger population can be supported by the direct products of the soil; the position, relief, and climate of the area are suitable for the production of certain plantation crops, and the feeding of the labourers employed upon plantations and in other occupations is made possible by the facilities for importing foreign grown food. It is the ease with which the wants of an ever-growing population can be supplied, coupled with the natural richness of the area, which accounts for the fact that the Western Province is the most densely peopled part of Ceylon.

The effect of suitability for producing plantation crops, and for growing and importing foodstuffs upon the density of population is demonstrated by the population figures for different parts of the Province. The most densely peopled districts are the Totamunes, Salpiti Korale, and Alutkuru South, all on the coast, with 1480, 1179 and 1044 persons per square mile respectively. The land immediately behind the coast, which, in other parts of the island, is too marshy for cultivation, has been drained in these districts by irrigation channels constructed, to judge by the names of the estates bordering them, by the Dutch. The only unreclaimed areas are in Salpiti and Alutkuru, where there are areas of salt-marsh near Negombo and Bolgoda lakes, the presence of which may account for the



N.B. Advanced development of communications except in s.e. of province

slightly lower density figures of these districts compared with the Totamunes. On the lands reclaimed by drainage, paddy, coconuts, cinnamon and rubber have been cultivated for a considerable period of time. The three districts mentioned have more land under rice (see map showing paddy production) than any other part of the province, and are very important coconut producing areas. There is a network of roads and railways from Colombo, Negombo and Kalutara, round which villages cluster thickly, and because communications are so well developed, the marketing of plantation product, and the circulation of imports, must be easy in this region. Other occupations than agriculture employ a percentage of the population, fishing industries have developed along the coast; coast-wise trade is flourishing, particularly between Negombo and Colombo, and the number of factories handling coconuts and rubber is increasing. In the three districts, therefore a large percentage of the cultivated land is under food-stuffs plantation crops are extensively grown, employment can be found for a number of labourers in occupations other than agriculture, and imported foodstuffs can be easily obtained. The conditions which have made the Western Province the most densely populated part of Ceylon are seen in the Totamunes, Alutkura South and Salpiti Korale at their best. By contrast, conditions in the south east of the province, in Pasdun Korale East, which has a population of 168 persons per sq. mile, are much less favourable. This district is farthest removed from the sea coast, and has a greater percentage of land over 500 feet high than any other. Although it is no where

¹ This statement must be understood to be relative. In no part of Ceylon are there insuperable obstacles to the construction of roads and railways, but if the whole of the Western Province is under consideration, it is in Pasdun Korale East that the development of communications is most easy.

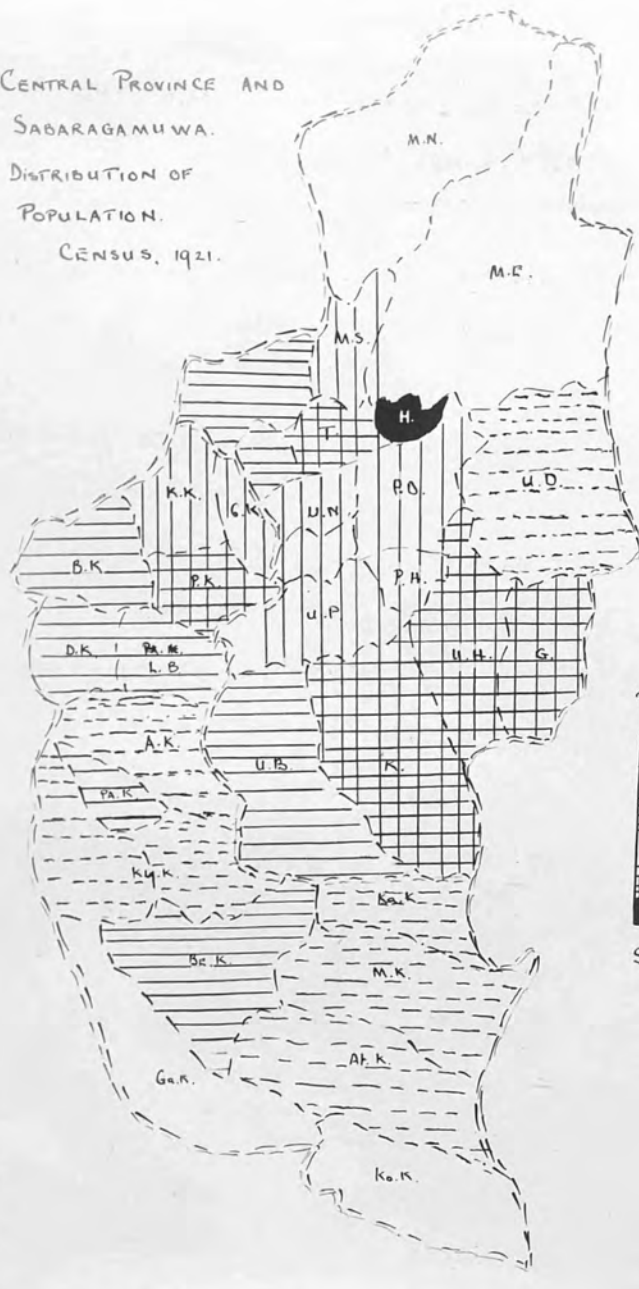
very high, the district is shown on the 1 inch to the mile map to consist of parallel south east to north west running ridges, separated from one another, and cut up into blocks by the narrow valleys of streams draining to the Kalu and Bentota Ganga. In spite of its low altitude, it is peculiarly difficult to construct roads in such country, and communications are noticeably less developed in Pasdun Korale East than in any other part of the province. Its increased height, and the strike of the ridges at right angles to the south-west monsoon, give this district a very heavy rainfall, everywhere over 150 ins. in the year, 200 or more ins. on the ridges. The ridges are forested, the valleys covered in thick scrub, difficult to clear for agriculture, which is confined to the drier valleys. Paddy is the chief crop, though rubber and tea could be grown. There is no great obstacle to the development of estates here but the difficulty of clearing land and the present poor communications, and in future, no doubt, Pasdun Korale East will take its place among the great planting areas. But at present the district is less developed than other parts of the province because it is farther from the coast, more difficult to clear for agriculture, and more difficult to open up by road. Peculiarities of position, relief and climate thus determine the smaller population of Pasdun Korale East relative to the coastal districts.

The distribution of population in the Western Province is, therefore, determined by the same geographical factors of relief, climate, and facilities for communication with outside markets and source of supply which account for the high total

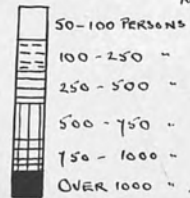
¹ This statement must be understood to be relative. In no part of Ceylon are there insuperable obstacles to the construction of roads and railways, but if the whole of the Western Province is under consideration, it is in Pasdun Korale East that the development of communications is least easy.

population of the province. Though these factors are most markedly favourable in the coastal districts, there is no part of the province barred by any one of them from extensive agricultural development and trade with other areas, and it is partly the lack of a really backward district which gives to the Western Province as a whole a greater density of population than any other part of Ceylon. Suitability for agriculture of various types, and the ease with which trade can be carried on are two other factors determining the dense population of the area. The second of these is more fully considered in Chapter VII, where the trade of Colombo and the coastal towns is dealt with in detail. The factors favouring agricultural development have been summarized in this Chapter, and the variety of crop grown in the Province suggested. It is in variety of crop and type of agriculture that the Western Province differs most from the Central Province and Sabaragamuwa, the two districts next to be considered, where advantages for agricultural development and trade are at most equally marked, but where much more attention has been paid to the development of plantation, as distinct from native agriculture than in the Western Province.

CENTRAL PROVINCE AND
SABARAGAMUWA.
DISTRIBUTION OF
POPULATION.
CENSUS, 1921.



POPULATION PER S.Q.
MILE.



SCALE 1 INCH = 8 MILES.

N.B. Dense population of tea and rubber growing areas. eg. N'Eliya and n. Kegalle. Sparse population in dry country of u. Matale and s.e. Raknapura, where no estates have been opened up.

<u>Division</u>	<u>Area in sq. miles</u>	<u>Pop. per sq. mile</u>
13. Baligal	153	393
14. Tunpane	77	392
15. Uda Hulstigama	229	374

CHAPTER IV.
The Distribution of population in the Central Province and Sabaragamuwa.

The Central Province and Sabaragamuwa cover areas of 2287.5 and 1892.5 square miles. Their total population was given in the Census Report of 1921 as 717,739, or 314 persons per sq. mile in the C.P; 471,814, or 249 persons per sq. mile in Sabaragamuwa. The C.P. is divided into three districts, Kandy, Matale, and Nuwara Eliya, with 419,120, or 330 persons per sq. mile; and Sabaragamuwa into two districts, Ratnapura and Kegalle, with 133 and 378 per sq. mile. The population of the Central Province ranks second in the island in point of density, that of Sabaragamuwa fourth. None of the districts has density figures comparable with the 765 persons per sq. mile of Colombo.

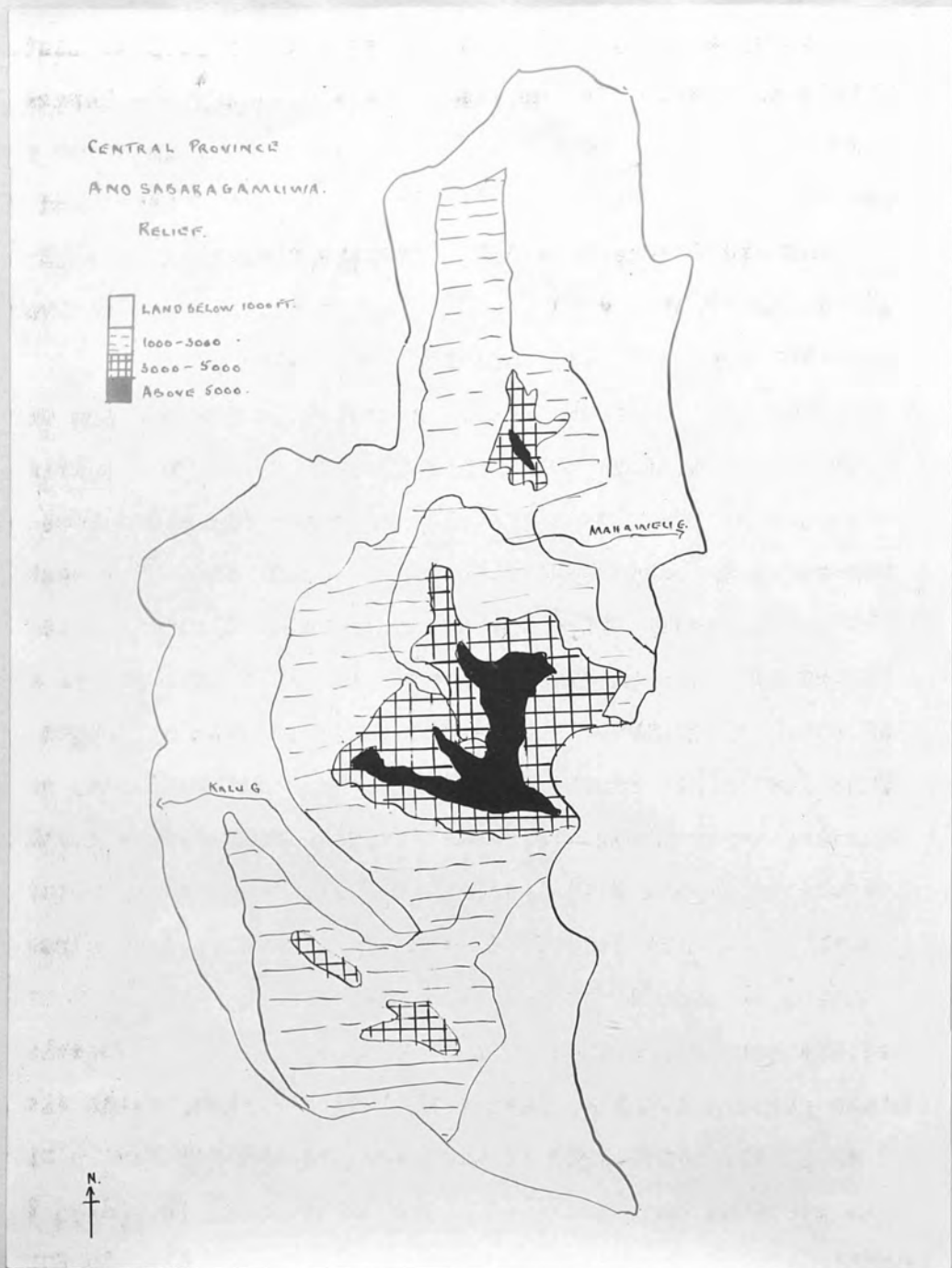
The five districts are divided into numbers of small headmen's divisions, from the population figures of which the population map of the provinces is made. Ranked in order of density, the divisions are:-

<u>Division</u>	<u>District</u>	<u>Area in sq. miles</u>	<u>Pop. per sq. mile</u>
1. Yeti Nuwara	Kandy (K.)	32	1,023
2. Harrispattu	K.	51	901
3. Parakuru	Kegalla (Ka.)	56	764
4. Udu Nuwara	K.	35	632
5. Pata Dumbara	K.	107	618
6. Kurigoda	Ka.	42	593
7. Pata Hewateta	K.	57	573
8. Galboda	Ka.	57	564
9. Uda Palata	K.	104	543
10. Kotmale	Nuwara Eliya (N.E.)	-	505
11. Dehigampal	Ka.	74	422
12. Panawal	Ka.	40	399

	<u>Division</u>	<u>District</u>	<u>Area in sq.miles</u>	<u>Pop. per sq. mile</u>
13.	Beligal	Ka.	163	393
14.	Tumpane	K.	47	392
15.	Uda Bulatgama	K.	229	374
16.	Matale South	Matale (M.)	161	350
17.	Uda Hewaheta.	N.E.		302
18.	Lower Bulatgama	Ka.	84	296
19.	Hawadun	Ratnapura (R.)	193	271
20.	Atulugam	Ka.	125	236
21.	Kuruwiti	R.	212	231
22.	Walapane	N.E.		224
23.	Atakalun	R.	171	177
24.	Kadawata	R.	122	160
25.	Gravets	N.E.		156
26.	Uda Dumbara	K.	238	124
27.	Meda	R.	157	122
28.	Matale East	M.	341	80
29.	Kolonna	R.	169	76
30.	Matale North	M.	401	63
31.	Kukul	R.	224	58

The density range in the two provinces together is 965, from Yati Nuwara with 1023 persons per sq. mile, to Kirkul with 58, and in each district the range is considerable:-

<u>District</u>	<u>Range of density of population</u>
1. Kandy	1023 - 124 (899)
2. Kegalla	764 - 236 (528)
3. Nuwara Eliya	505 - 156 (349)
4. Matale	350 - 63 (287)
5. Ratnapura	271 - 58 (213)



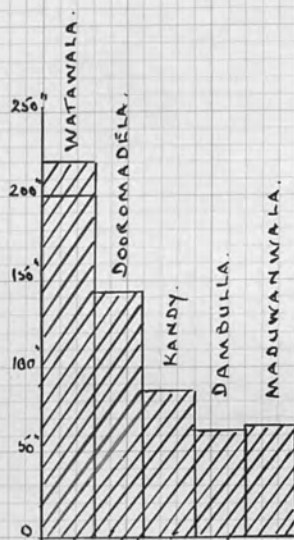
N.B. Division of provinces into (1) central belt of hill-country, (2) belt of low country draining westwards, (3) belt of low country draining eastwards. Compare with rainfall map.

Kandy and Kegalla are the most densely peopled districts, Matale and Ratnapura the least, Matale having the largest proportion of its land with a population less than 100 persons per sq. mile. Compared with the Northern, Eastern and North-Eastern Provinces, in which districts with less than 10 persons per sq. mile are to be found, no part of the Central Province or Sabaragamuwa is very sparsely populated.

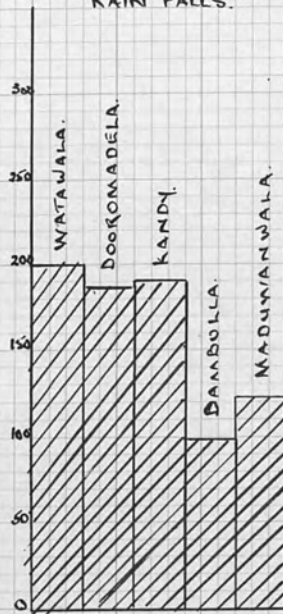
The two provinces differ somewhat in relief, the Central Province being much the higher of the two. This province consists of two blocks of hilly country over 3,000 feet high, separated by lower land between 1000-3000 ft. The southern block, in Nuwara Eliya and southern Kandy districts, is the higher and more extensive of the two. It consists of a series of parallel south-east to north westward running ridges 5000-7000 feet high in the south east, near Nuwara Eliya, but getting lower north westwards towards Kandy. The northern block, in Matale East, consists of north-southward running parallel ridges, 3000-5000 feet high, separated by streams running northwards to join the Amban Ganga, the chief tributary of the Mahaweli Ganga. These ridges die out in Matale north into plateau country, just over 1000 ft. high, which slopes down gently northwards to the level of the northern plain. The province can be divided into three parts according to its relief: (1) the hill country over 3000 ft. high, in Nuwara Eliya, Kandy and Matale East. (2) The lower land, between 1000-3000 ft. high bounding the two hilly regions on the west, and draining westwards to the Kelani Ganga or Maha Oya. (3) The lower land 500-3000 ft. high to the north-east of the central hill-country, draining to the Mahaweli Ganga and its tributaries.

CENTRAL PROVINCE AND SABARAGAMUWA.

(i) YEARLY AVERAGE RAINFALL.

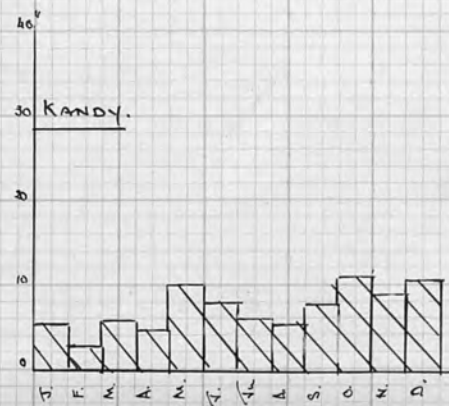
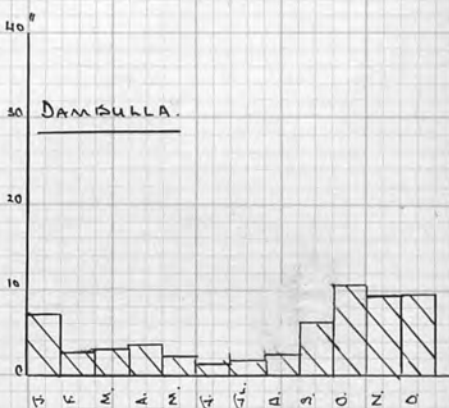
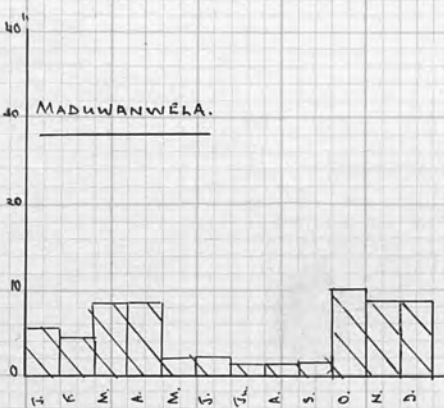
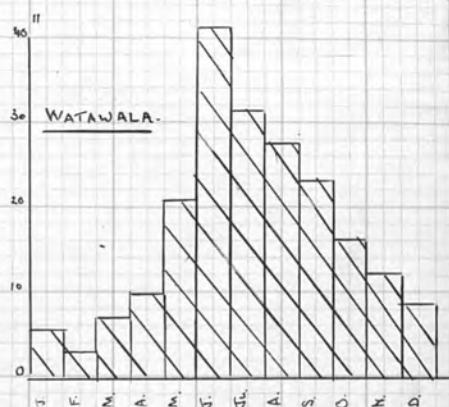
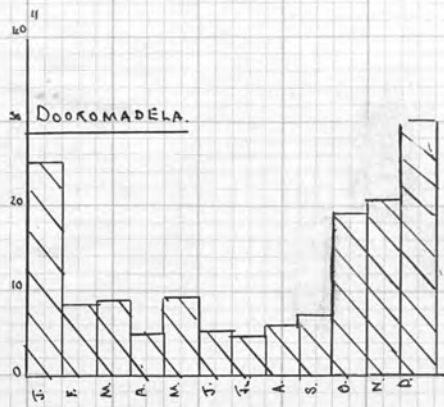


(ii) NUMBER OF DAYS ON WHICH RAIN FALLS.



STATION.	HEIGHT IN FT.
1. WATAWALA	3,259.
2. DOOROMADELA	2,740.
3. KANDY	1,654.
4. DAMBULLA	400.
5. MADUWANWALA	750.

N.B. Effect of altitude and exposure; (i.e. Dambulla and Maduwanwala are on eastern side of main axis of high land) on rainfall of province.



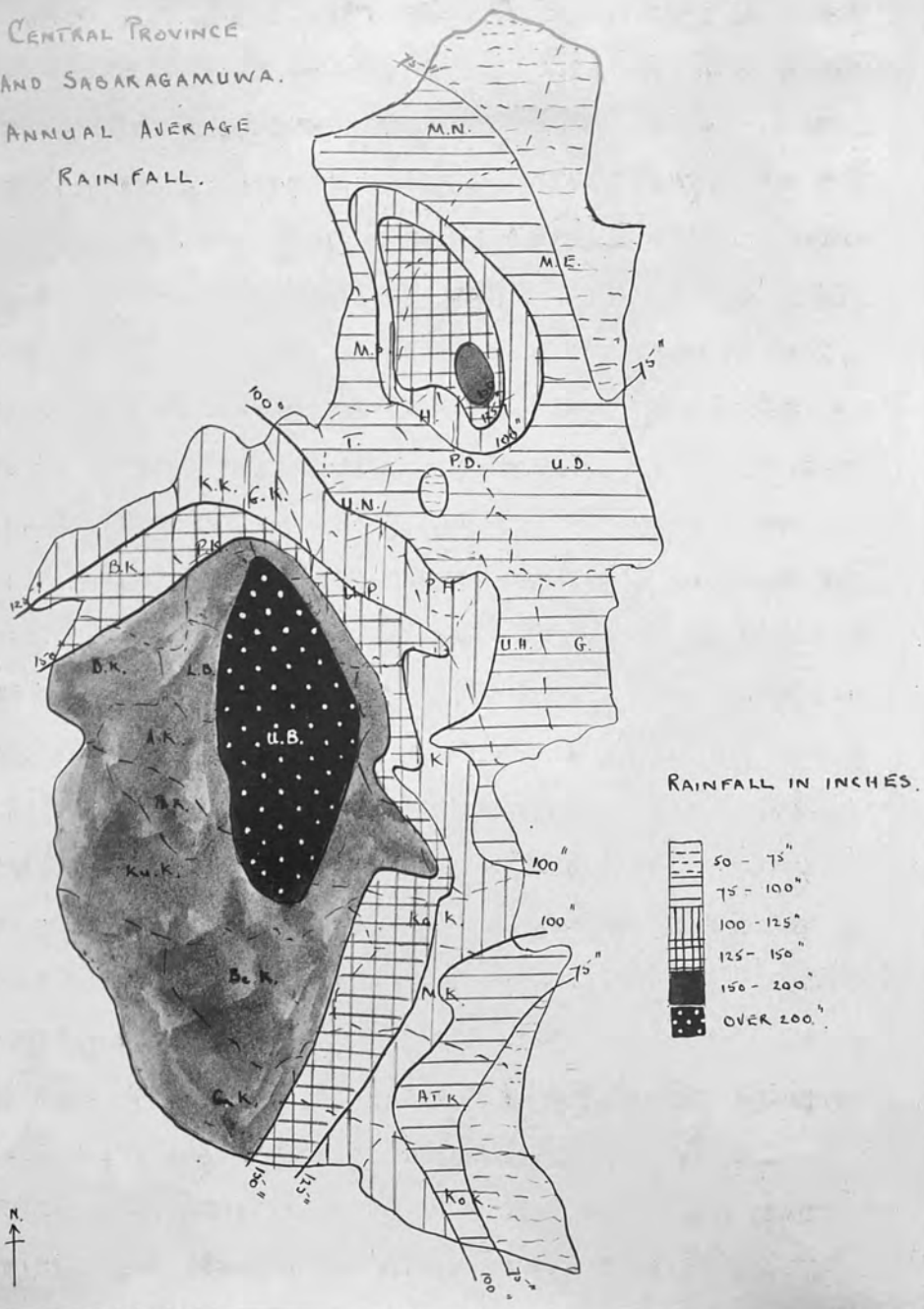
RAINFALL OF CENTRAL PROVINCE AND SASARAGAMUWA; (2) DISTRIBUTION THROUGHOUT THE YEAR.

- N.B Existence of three rainfall regimes in province:-
- (a.) stations with pronounced maximum during s.w. monsoon. eg. Watawala.
 - (b.) stations with maximum fall during we. monsoon. eg. Dooromadela.
 - (c.) stations with rainfall almost uniformly distributed. eg. Kandy.

A belt of hill-country similar to that in the Central Province occupies the greater part of the district of Ratnapura, the southern division of the province of Sabaragamuwa. The parallel south-east, north-west running ridges in this district are not much above 3,000 feet, but are separated from one another by deep valleys draining north westwards to the Bentota or Kalu Ganga. North west of Ratnapura the Kalu Ganga cuts across the ridges to the coast, and north of its valley, the ridges almost disappear, but continue northwards through Kegalla district as low hills, divided up into blocks by many streams draining to the west coast. Except for these low hills, the western part of Kegalla district is similar to the Western Province in its low relief; the eastern part of the district being similar to the hilly parts of the Central province. There is a larger proportion of low country in Sabaragamuwa than in the Central Province, but like the central province, it can be divided into three districts:- (1) the hill-country of central Ratnapura and eastern Kegalla. (2) the low country of western Kegalla, draining westwards to the Kelani Ganga and Maha Oya. (3) the low country of southern Ratnapura, draining south-eastwards to the Walawa Ganga and other streams flowing to the south coast. In both provinces there are (1) belts of hill country (2) lower country draining westwards. (3) lower country draining east, north east, or south-east. It is this diversity of relief and aspect that accounts for the variations in yearly rainfall and rainfall distribution which are among the most striking characteristics of the two provinces.

On the map showing annual average rainfall, it will be seen that the greatest rainfall, 200-250 ins. in the year, occurs in

CENTRAL PROVINCE
AND SABARAGAMUWA.
ANNUAL AVERAGE
RAINFALL.

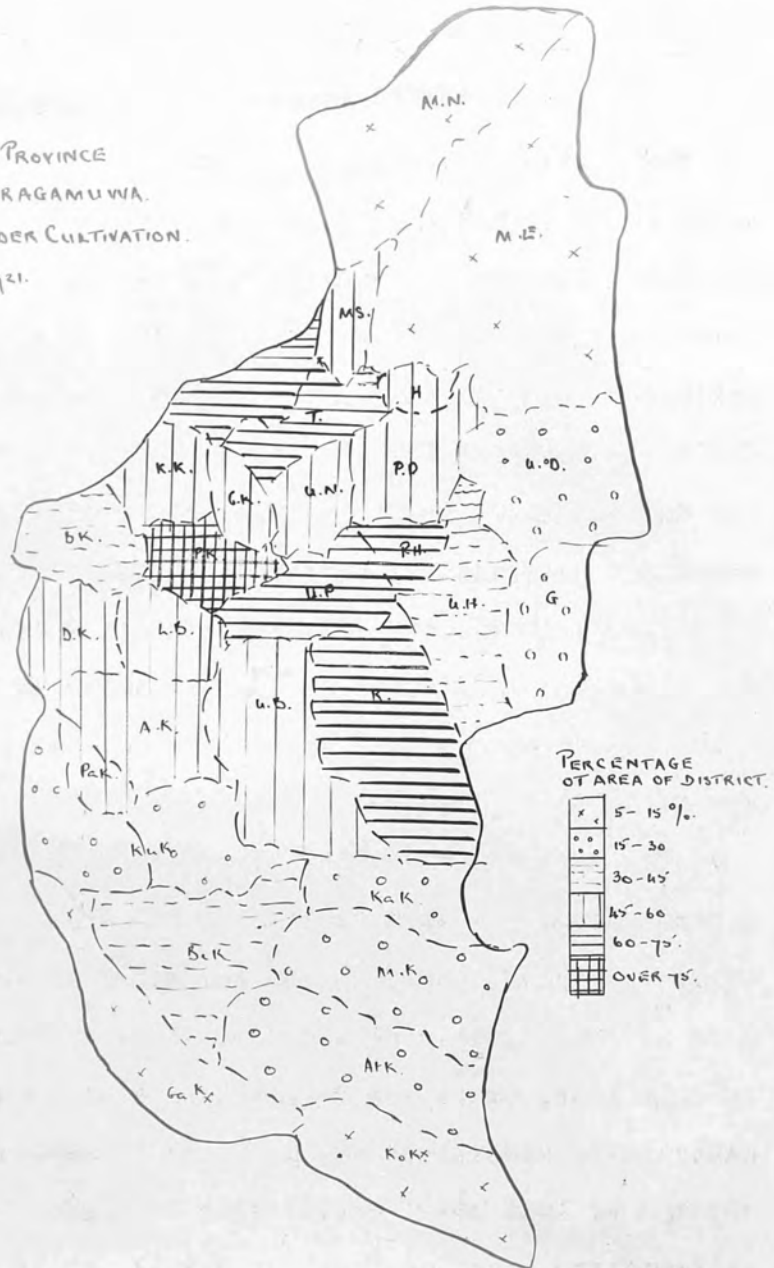


N.B. Close connection between rainfall, altitude and exposure.
Heavy rainfall in hill-country and lowland draining west; lighter
fall in eastward-draining lowland.

the hill country of Sabaragamuwa and the high western part of the Central province. The greater part of this fall is seen from the distribution graph of Watawala to take place during the south-west monsoon season but there is no absolutely dry month. This district is as a whole between 3000-6000 feet high, and the hill ridges previously mentioned run at right angles to the direction of the monsoon wind. No high land separates this area from the west coast, so that altitude, exposure, and the strike of the hill ranges combine to account for its heavy rainfall. West of the area of maximum rainfall in the lower country, the annual average is still heavy, Ratnapura at a height of 129 ft. in the upper Kalu Ganga valley, having an annual rainfall of 159 ins. Another area of heavy rainfall occurs in Matale East, where 143 ins. are recorded at Dorromadela. This estate is on the hill-country east of Matale, draining south-east to the Mahaweli Ganga. The lower altitude of the Matale hills, and the fact that they strike north-south, instead of north west-south-east at right angles to both monsoon winds, account for the lower rainfall averages here as compared with those of the hill country south west of Kandy.

Between these two areas of very heavy rainfall, the annual average decreases, owing to lower altitude and shadowing by highland to east and west, in the country near Kandy, which has 86 ins. of rain annually. The yearly rainfall is least in amount, and falls in fewest days in the year, being concentrated mainly into the north-east monsoon season, in south-eastern Sabaragamuwa, and Northern Matale. Here is the low country, draining eastwards, to which reference has already been made; its rainfall regime may be exemplified by the figures for

CENTRAL PROVINCE
AND SABARAGAMUWA.
LAND UNDER CULTIVATION.
1921.



* N.B. High percentage of land under cultivation in Kandy, and N'Eliya and Kegalle districts; lower percentage cultivated in dry country of Matale and Ratnapura.

Dambulla and Maduwanwela. Correlating relief and rainfall, it will be seen that there are three types of country in the two provinces; (1) the hill-country, in which heavy rainfalls in most months of the year; (2) the low country, draining westward; less rainy than (1), but receiving some rain from both monsoons, (3) the low country draining eastward, distinctly less rainy than (2), and receiving its rain mainly during the north-east monsoon season. Climatic statistics are not sufficiently numerous for more detailed study of the climate of the Central Province and Sabaragamuwa to be made; there are certainly considerable varieties in amount and distribution of rainfall in the three belts, some of which are suggested by the alternative ^{on} of scrub and jungle shown on the 1 inch to the mile vegetation map, but this division into regions seems generally to hold good.

The type and intensity of cultivation in the two provinces depends primarily upon relief and rainfall. The interdependence of relief, rainfall and intensity of cultivation can be seen if relief, rainfall, and cultivation maps be compared. In high land, where the rainfall is heavy, and fairly evenly distributed throughout the year, as in Nuwara Eliya, the percentage of land under cultivation is high. In lowland, less well-watered, such as Northern Matale, or in highland difficult of access, as Central Ratnapura, the percentage of land under cultivation is much lower. As in these two provinces the chief industry is agriculture, there is a close connection between the percentage of land under cultivation and the density of population.

The percentage of land under cultivation in any part of the province was very successful crop was most marked in Kegalle and Ratnapura. The destruction of the estates had been so complete that the district took longer to recover than Kandy or Nuwara-Eliya, and the increase in population due to the replacement of the old by new crops were not marked until 1901-1911.

Continued on next page

the central Province and Sabaragamuwa depends upon the suitability, from the point of view of relief and rainfall, for one of the four important crops cultivated in the hill country of Ceylon, tea, rubber, cacao, and paddy, the fourth being considerably less important than the other three. Only 6.4 % of the total surface of the provinces is under hill or low-country paddy, the quantity of food stuffs grown being noticeably small, so that the percentage of land under cultivation depends mainly on the suitability of the country for tea, rubber, and cacao, the three plantation crops, the estates under which are usually owned by Europeans, managed by Europeans, and worked by imported Tamil labour. The importance of the planting industry in regulating the growth of population in Central Ceylon is illustrated by figures showing the intercensal increase in population, which can be correlated to the development of the plantations. The figures,¹ given in the 1921 Census report,

¹ The difference between the percentage increases in population in the various districts during the same decade are interesting. In 1871-1881, coffee had just been introduced, and plantations were being opened up rapidly in the two districts most easily accessible from the West coast via the Kelani Ganga valley, i.e. in Kandy and Nuwara Eliya. The population consequently increased most in these districts. In 1881-1891, the decade in which differences in population growth are most marked, the coffee plantations were almost wholly ruined by disease, and in Matale district, with the highest proportion of cultivated land under coffee, the population declined by 11.7%, a striking example of the danger of confining agricultural development to the production of one crop. The decline was less marked in Kandy, where more land had been put under paddy, and in Kegalle and Ratnapura, which had few coffee plantations, but were being opened up by the extension of roads and the development of irrigation schemes, the population increased considerably. It has been pointed out in the text that tea was introduced in the decade 1891-1901, and caused a steady growth in population in all the planting districts. When rubber was first planted, in 1901-1911, much of the available land in Kandy and Nuwara Eliya was already under tea, so that the growth in population due to the introduction of this new, and very successful crop was most marked in Kegalle and Ratnapura. In Matale, where a 17.5% increase in population was recorded, tea and cacao were replacing coffee on the estates abandoned in 1881-1891. The destruction of the estates had been so complete that the district took longer to recover than Kandy or Nuwara-Eliya, and the increase in population due to the replacement of the old by new crops were not marked until 1901-1911.

Continued on next page

are as follows: of the plantation crops at the present time in the District values in Ceylon per Decade.

	1927-1928	1911-1921	1901-1911	1891-1901	1881-1891	1871-1881
Kandy	26.1%	7.0%	33.2%	5%	24.3%	
Matale	7.6%	17.5%	20.5%	11.7%	15.2%	
N'Eliya	7.5%	1.2%	39.2%	11.2%	68.8%	
Ratnapura	22.2%	24.8%	22.9%	12.8%	2.0%	14.9%
Kegalle	10.9%	28.5%	25.5%	25.6%	13.8%	

In the decade 1871-1881, coffee plantations were being rapidly opened up by the Dutch, chiefly in the Central Province, and the population increased rapidly in consequence. In the next decade, the coffee plantations were almost wiped out by disease, and the increase in population was very small, except in Kegalle district, which had fewer estates wholly devoted to coffee, while in Matale a considerable decrease in population took place. Between 1891 and 1901, tea was introduced, the prosperity of the provinces revived, and the population once more increased rapidly. 1901-1911 saw steady agricultural development and growth in population, which was slower in 1911-1921, partly because most of the easily accessible and suitable land had been opened up, partly because trade was checked by the war, and partly because of the competition of other countries, which particularly affected the rubber growing areas. It can be seen, therefore, that the growth and present density of population in the Central Province and Sabaragamuwa are dependent upon the planting industry, and that the development of each of the major plantation crops depends upon certain geographical factors.

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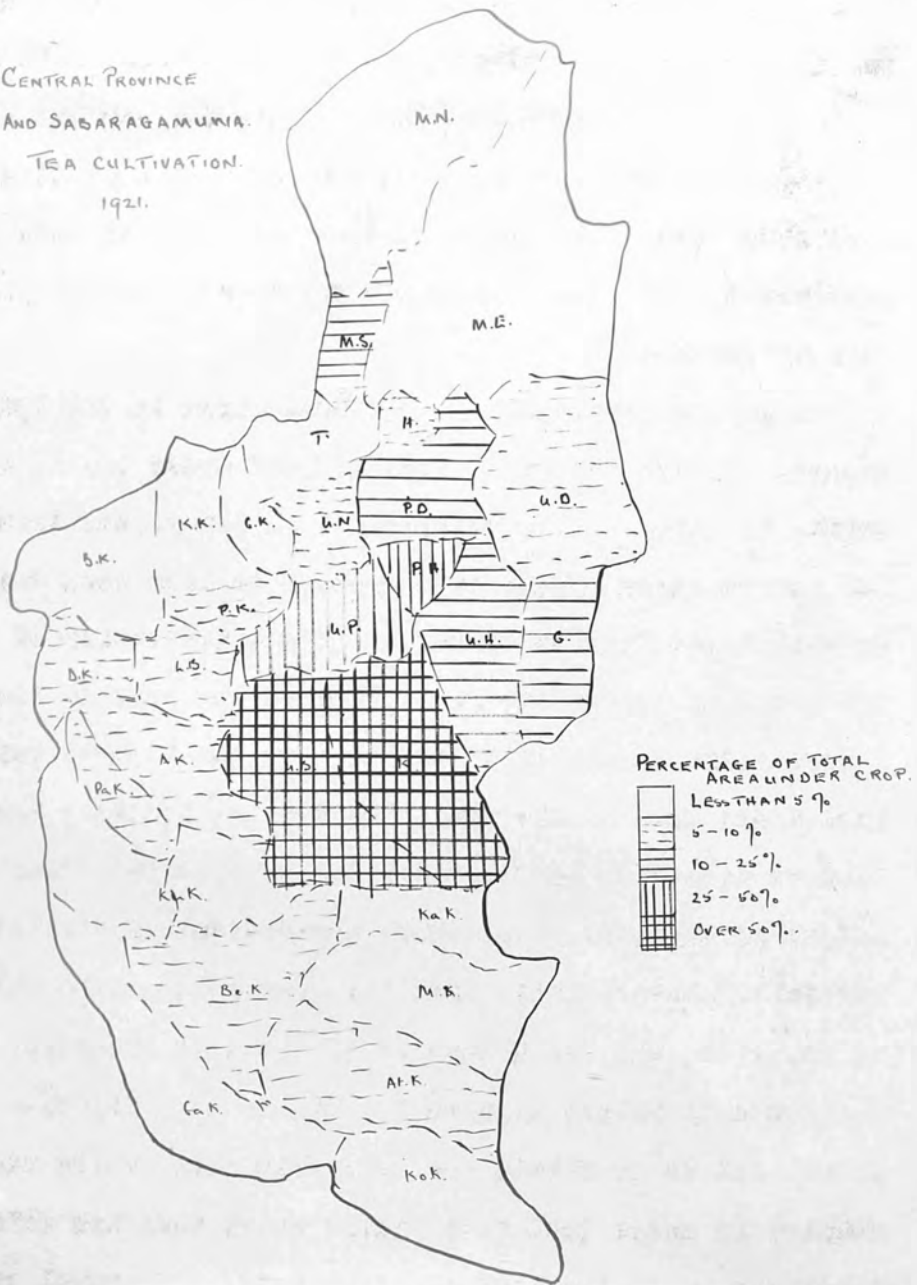
The decade 1911-1921 was everywhere one of steady progress, which was, however, less marked in the older planting areas, Kandy, Matale and Nuwara Eliya, most of the easily cultivable land in which was already cropped, than in the newer districts of Kegalle and Ratnapura, which profited by the extension of irrigation schemes, and an increased demand for rubber in the world's markets.

The chief of the plantation crops at the present time is tea. The value ^{of tea} to Ceylon can be estimated from the fact that in 1927, 418,000 acres were under the crop, and 227,100,000 lbs. valued above 220 millions of rupees were exported. The crop is of greatest importance in the Central Province, where in 1921 there were 1074 tea estates, employing 290,105 labourers. 26.3% of the total population in Kandy, 12.8% in Matale, and 46.4% in N'Eliya were employed in 1921, on tea plantations. By far the greater number of the 284,290 immigrants ~~from~~ South India who enter Ceylon yearly, are bound for the tea plantations, on which both men and women are employed. The indigenous population of the Central province is still small, just as it was in the days of the Sinhalese kingdom; immigrants ^{or} ~~from~~ 35.9, 30.0, and 60.8% of the total population of Kandy, Matale and Nuwara Eliya districts respectively, and most of these are employed in some capacity on the tea plantations. It is obvious, therefore, that the position of the Central Province second on the list of densely-populated provinces is due to the combination of factors favourable for tea-production in it.

Tea thrives best under cover, on sloping, well drained land between 3000-5000 feet high, in which there is an annual temperature about 60°F, and 80-250 ins. of rain, well distributed throughout the year. The ground on which the plant grows needs constant fertilizing, and the plant requires much attention, so that an abundant supply of labour is necessary on tea estates. The conditions necessary for the cultivation of tea are all to be found in the Central Province, where there is the largest proportion of high land in Ceylon, and, over the greater part of the province, an abundant, well distributed rainfall.

1. For effect of immigration upon growth of population in Ceylon, see Appendix B.

CENTRAL PROVINCE
AND SABARAGAMUNA.
TEA CULTIVATION.
1921.



N.B. Strict localisation of extensive tea-growing. Importance of tea to N'Eliya and Kandy districts. No tea in low, dry country.

Access to the west coast, from which labourers, the immigrant Tamils, enter, from which fertilizers and foodstuffs are obtained, and to which the produce of the tea gardens is sent, is easy, for there are numerous river valleys leading from the west coast into the Central highlands. Tea is not, however, cultivated with equal intensity and success in all parts of the Central Province. Distribution of estates can be detected upon the A map, constructed from figures given in the 1921 Census Report, showing the percentage of land under tea in each district, is given. The development of tea plantations since the introduction of the crop appears to have been fairly steady, so that these figures convey a correct impression of the distribution of tea-estates in Ceylon at the present time. Nuwara Eliya and Kandy districts have the highest percentage of land under tea, Matale and Ratnapura the least. The chief factors affecting the distribution of estates appear to be the height of the land, the amount and seasonal distribution of rainfall, accessibility from the west coast, from which the tea is exported, and the steepness of slope of the land. The influence of height is seen in the Gravets division of Nuwara Eliya, and in N. Matale and S.E. Ratnapura, where much of the country is under 3000 feet, below which teas are said to be tasteless. In the last two districts, the annual rainfall is insufficient, and is too completely concentrated into the north-east monsoon season, for successful tea-cultivation. The relief of the Central Province and Sabaragamuwa is not such that any area is practically inaccessible, but Kegalle, Kandy and Nuwara Eliya districts are most easily reached from the West Coast by way of the Kelani and upper Mahaweli Ganga valleys, while eastern Nuwara Eliya and the deeply dissected high land

¹ The relief of Ceylon is not such that access to the Central Highlands is only possible by means of a river valley. In fact, however, most of the main roads to the highlands, e.g. the Colombo-Kandy road, do follow river-valleys.

of Ratnapura are relatively difficult to reach, and are consequently less developed. Ease of communication with the west coast implies easy marketing of estate products, and ease of obtaining imported foodstuffs without which the population labouring on the tea estates could not be fed, so this factor is of great importance. The importance of steepness of slope in determining the distribution of estates can be detected upon the 1 in. to the mile map of Ceylon, on which relief and estate boundaries are shown. It is noticeable that, e.g. in north-east Kandy, moderately sloping hill-sides are covered in tea gardens, while on the south-west of the district, in very rainy, deeply eroded and steeply-sloping country draining to the Kalu Ganga, there are few estates. This is due to the fact that the rate of soil-erosion on hill-sides on which much rain falls depends largely upon their gradient, particularly in areas where there has been careless deforestation. Soil-erosion is one of the greatest difficulties facing the Ceylon planter, for the problem is made more acute than it would normally be by the native practice of chena-ing, or burning off forest to grow paddy-crops, the area so burnt being allowed to revert to jungle after a year or two. There is no legislation in Ceylon protecting forests below 5000 feet, so that the tea planter is driven to develop estates on gently-sloping land where previous careless deforestation can have done the minimum of damage. It was not only the native who destroyed valuable forest; the early planters were equally guilty, and the present distribution of estates is partly due to the necessity for avoiding areas in which early plantations were made, greatly to the detriment of the surface soil. There are, for instance, parts of southern

Matale, which would be suitable, from the point of view of relief and climate, for tea, were it not for soil-erosion on the deserted coffee estates. It is where all the factors mentioned, height, amount and seasonal distribution of rainfall, accessibility from the west coast, and the condition of the surface soil dependent upon slope, are combined favourably, that the highest percentage of land under tea is to be found. In Western N'Eliya, where 58.8% of the total surface is under tea, the whole countryside lies between 5000-8000 feet, and is drained by numbers of streams running north-westwards to join the Mahaweli Ganga, which leads to Kandy, and thence via the Kelani Ganga valley to the west coast. Roads and a railway follow these streams to Kandy, and down to Colombo, so that access to and from the West coast is easy in N'Eliya district. The annual rainfall of the area is between 75-100 ins., distributed throughout the year, the greatest fall occurring in the south-west monsoon season, but there being no dry month. The total rainfall is less here than in Kandy district, to the west, which lies nearer the sea from which the S.W. monsoon winds come, and the smaller annual rainfall of N'Eliya, combined with the fact that the country is much less deeply dissected here than in, for example, Ratnapura, must make the rate of soil-erosion relatively slow for Ceylon. Soil-conditions, absolute height, rainfall conditions, and relationship to the west coast are all favourable to the extensive cultivation of tea in N'Eliya, and have enabled it to become the chief tea-growing area in the island.

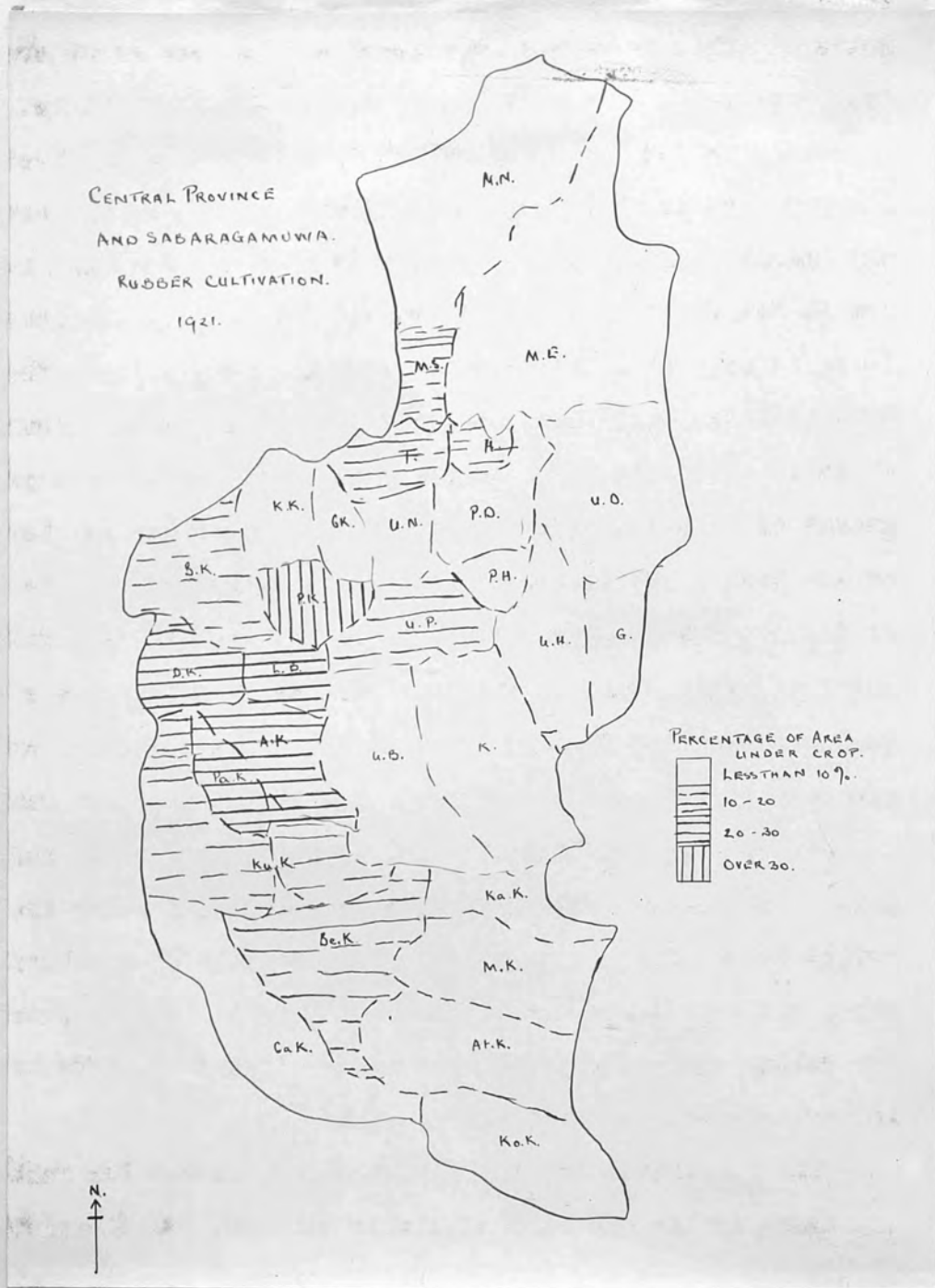
Tea estates are fewest in Northern Matale, because the factors controlling the tea-growing industry are, on the whole,

	<u>1913</u>	<u>1914</u>	<u>1915</u>	<u>1916</u>	<u>1917</u>
<u>Quantity in lbs.</u>	191,509,414	193,583,592	215,632,727	203,256,347	195,231,592
<u>Price in £s.</u>	3,852,528	5,981,733	8,163,855	7,017,764	6,377,565
	<u>1918</u>	<u>1919</u>	<u>1920</u>	<u>1921</u>	
	180,817,744	208,560,943	184,770,231	161,610,966	
	5,545,077	11,650,864	8,078,154	7,513,846	

When it is remembered that the years for which figures are quoted were years of war, the fluctuations in the amount of tea exported do not appear to be very great. In consequence of this steady demand for Ceylon tea, the number of estates under the crop has grown fairly steadily from 508 in 1891 to 612 in 1921, and the fact that steady employment is open to them on the tea estates must attract a large number of immigrants to the Central Province. It has been shown that immigrants form the bulk of the population in this part of Ceylon; the density of population in the Central Province is, therefore, mainly dependent upon the success with which tea can be cultivated in it, the amount of labour required on tea estates, and the possibility of continuous development for which the steady demand for tea in the world's markets is responsible. Factors increasing the density of population are the possibility of cultivating other plantation crops, cocoa and rubber, on the lower land in the province, particularly in Matale South and the country south-west of Kandy, the altitude of which is between 1000-1500 feet, and which, lying to the west of the main axis of highland, receive 70-75 ins. of rain in the year, and of growing paddy, on land unoccupied by other crops, almost everywhere except in northern Matale, which is too dry for paddy-growth without irrigation.

In Sabaragamuwa, particularly in Kegalle district, tea is less important than the second of the great plantation crops,

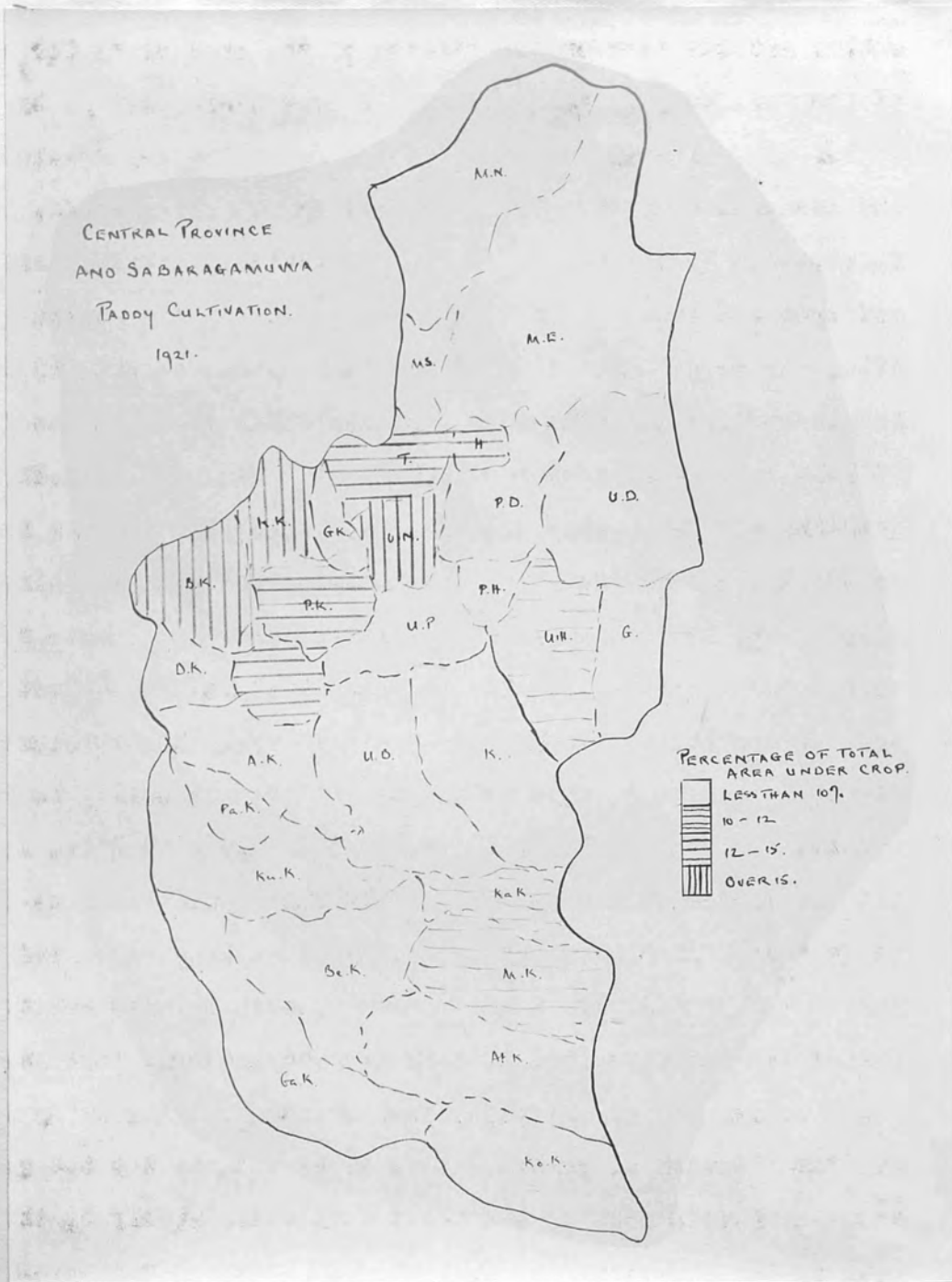
1. Percentage of land under {rubber. (1921) 5.2.
 1. - - - - - {cacao. " 2.5.
 2. - - - - - {paddy. " 6.5.



N.B. Importance of rubber to well-watered, low hill-country, particularly in Kegalle and n. Rajapura. Little rubber in tea-growing areas or dry country.

rubber. This is because the level of the land in Sabaragamuwa is, in general, lower than that of the Central Province, being between 300-3000 feet high, which is too low for the best teas. The province is, however, well watered, except in the south-east, the annual rainfall being heavier than in the Central Province, for in Ratnapura district it reaches 250 ins. in the year, but being equally well-distributed throughout the year. The Hevea ^{ens} ~~Brazilien~~sis, which has been introduced into Ceylon, flourishes at lower altitudes than the tea plant, and can stand a greater amount of rain coming with greater force than the smaller, frailer tea bush. It is admirably suited, therefore, to the province of Sabaragamuwa, and particularly to the higher, well-watered parts of Kegalle and Ratnapura. The map showing rubber cultivation shows that it is grown most in southern Kegalle and northern Ratnapura, least in northern Kegalle and southern Ratnapura. The controls of this distribution appear to be relief and rainfall. Thus, in northern Kegalle, coconuts and paddy are more suited to the flat, slowly draining land, and in southern Ratnapura, the annual average rain-fall, about 50 ins. is insufficient for rubber growth, while in the centre of the province, relief is more varied, and rainfall greater.

The population map shows that Sabaragamuwa, the rubber-growing area, is less densely populated than the tea districts. Rubber was introduced into Ceylon later than tea, so that the province has not had as long to develop as the Central Province, which may partly account for its smaller population. The great rainfall, nearly half of which falls in four months of the year, must make the problem of soil-erosion on estates very acute, and may retard the opening-up of plantations, thus keeping down the population. Possibly fewer men are employed on rubber.

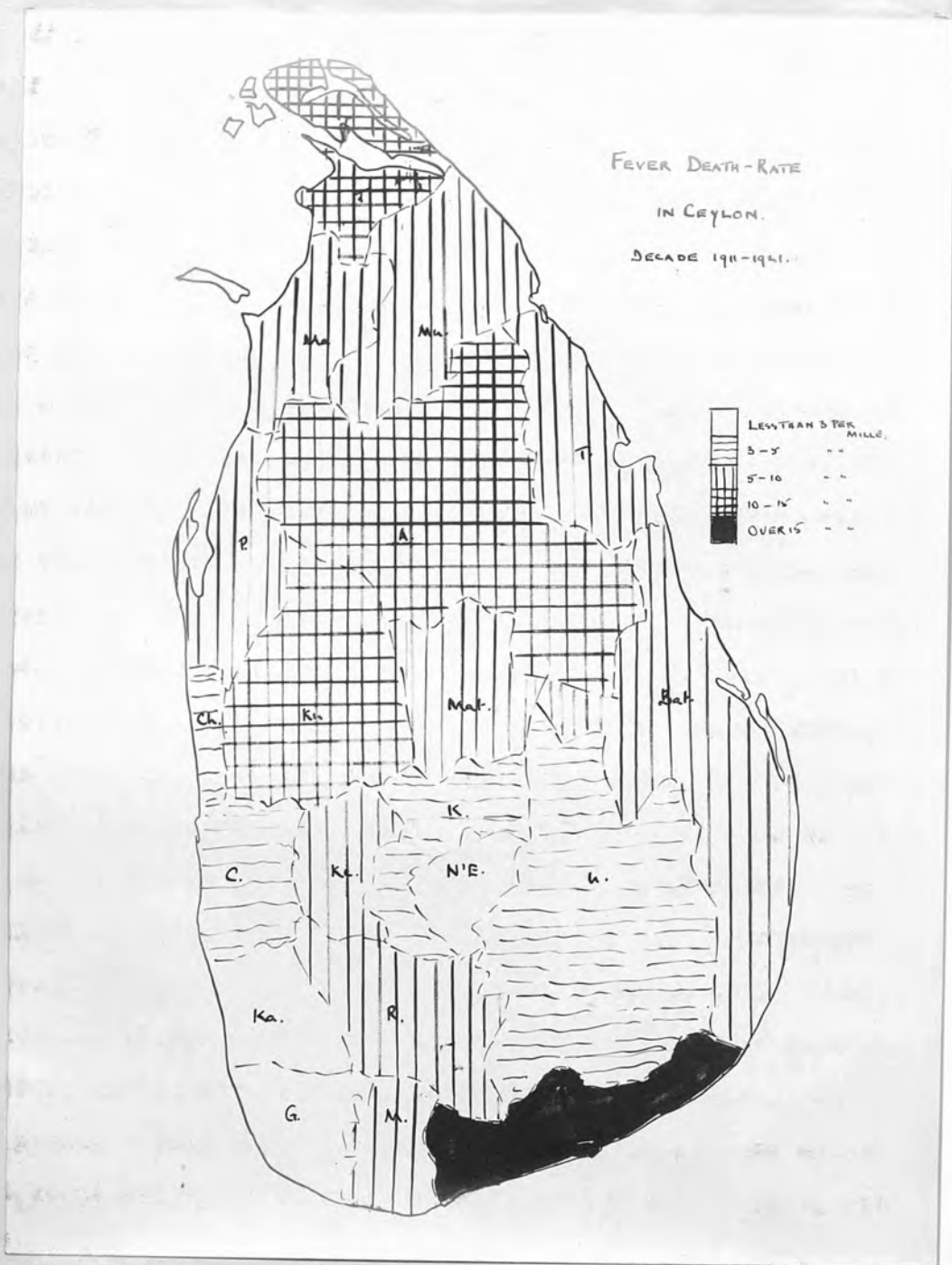


N.B. Small amount of land under chief food-crop in comparison with other provinces. Paddy grown most extensively near Kandy and in Kegalle.

rubber estates than on tea estates of the same size, for much of the work of preparing rubber for export can be done by machinery. Probably the major factor retarding the development, and the consequent growth of population in Sabaragamuwa, is the fluctuation in the demand for Ceylon rubber. Kegalle district suffered considerably in the rubber slump which occurred just after the war. According to the 1921 census report, 62,518 labourers were employed on the rubber plantations in the decade 1901-1911; 56,411 in decade 1911-1921, a decrease of 9.8%. The quantity of rubber exported fell from 1,008,221 centals in 1919, to 881,254 centals in 1921, the value of the exports being £13,207,141 and £3,440,101 in these years. The recent rubber restrictions, which affected the output of Malayan competitors, and the increased consumption of rubber with the development of motor transport, have helped to restore prosperity to the estates, but these have not recovered entirely from the slump, and the effect of the removal of the Rubber restrictions remains to be seen. While rubber prices and quantities exported fluctuate, the prosperity of the rubber estates is not assured; fewer immigrants are attracted to work on estates where employment is not certain, and so the population in the rubber growing areas is, for a number of reasons, less dense than in the tea growing areas. Rubber growing has added very considerably to the population of Sabaragamuwa, for in 1921, there were 240 estates in Kegalle, and 163 in Ratnapura, upon which 56,411, and 48,517 men were employed, but the most densely populated parts of the province are those in which the largest percentage of land is under alternative crops, rice and tea, for which the demand is steadier. Parakuru Korale, a region of varied relief and heavy rainfall, is a good example of a small, densely populated area with varied crops.

1. Percentage of land in Parakuru Korale, under various crops. (1921)

Tea.	Rubber.	Cocoa.	Cocoanuts.	Paddy.
8.8.	31.5	.85	8.5	14.3.



N.B. High fever death-rate in 'dry' Ceylon; low rate in estate areas, particularly Galle, Kalutara, N'Eliya, Kandy, Colombo and Chilaw. Compare with map. p q, showing present distribution of population.

Estates are so widely distributed in all parts of the provinces except Matale North and south-eastern Ratnapura, the two least populous districts, and the estate population forms such a high proportion of the total population in each district, this proportion rising to $\frac{5}{8}$ ths of the total in N'Eliya, that the work done on the estates for the physical well-being of the labourers must be important in determining the density of population in the provinces. Estate labourers are paid 10 cents a day more than the ordinary agricultural labourer; they are provided with rice-rations also much below market price that "losses on rice" figures prominently in the budgets of most estates; free rations are given to children, and to labourers unfitted by illness for work. Quarters are provided, and are periodically inspected by Government Inspectors, who condemn buildings which are too small for the number of people occupying them, or which are placed back to back, as most dwellings in an ordinary Indian city are. Other details showing the care taken of workers on the estates are given in the 1927 report of the Director of Immigration. Free medical attendance in case of illness is provided on most estates; facilities for inoculation against malaria and other diseases exist, and simple lectures and demonstrations on topics such as the danger of stagnant water near dwelling houses are given. Apart from efforts to improve the health of individual labourers, some efforts are being made to control malaria, eradicate hook-worm disease, and stamp out epidemic diseases. The result of direct and indirect efforts to promote the health of the labourers on the estates is to be seen in the greater healthiness of the estate areas compared with other parts of Ceylon. A map is given to show the fever death rate, one of the best indexes of the health of a district, in different parts of

Ceylon. It will be seen that in the Central Province and Sabaragamuwa, Nuwara Eliya and Kandy, the districts with most estates, have the lowest fever death-rate. Figures for each district in the two provinces are:-

<u>District</u>	<u>Fever Death-rate per 1000 persons</u>
Nuwara Eliya	1.2
Kandy	3.2
Ratnapura	5.6
Kegalle	6.9
Matale	8.4

The health-work done on estates cannot be the only factor affecting the fever death-rate, but it is significant that, throughout Ceylon, the healthiest districts are those in which the largest number of estates is to be found.

The suitability of the Central Province and Sabaragamuwa for tea and rubber cultivation is of enormous importance in determining the density of population in the two provinces. Not only do the estates provide a means of livelihood for many immigrant labourers, but they increase the general prosperity of the provinces, and so their capacity for supporting a large number of people. This fact is recognised by the Director of the census for Ceylon, who writes at the end of his report in 1921, "The estates have an indirect bearing on the development of the population ... They furnish employment to considerable numbers of the indigenous population; in the subsidiary industries - banking, engineering, transport, etc., - which depend largely upon their estate business, also provide numerous opportunities for employment, while the rapid development of the island which resulted from the importation of foreign capital and the extension of its resources, has gone far to establish the condition

of prosperity which the general population now enjoys." It can therefore be concluded that the density of population in the central Province and Sabaragamuwa is due to geographical factors such as relief, accessibility from the west coast, temperature rainfall and soil conditions, which make the provinces suitable for estate crops. Where these conditions are combined favourably, as in Nuwara Eliya, population is dense; in less favoured areas such as Matale, the population is smaller. A demand for the crops which can be produced most easily in the provinces exists in the modern world, and in response to that demand, the provinces have been developed to their present level. Were the demand for the products of the estates to fail or any disaster to overtake the plantations, the Central Province and Sabaragamuwa would speedily become as scantily populated as they were when Sinhalese kings ruled in Anuradhapura.



N.B. Uneven distribution of population within each province.

CHAPTER V.

The Southern, North-Western, and Northern Provinces, Areas
of Uneven Population Distribution.

The provinces so far considered are areas in which the population is dense, and fairly evenly distributed. Though differences of density exist, e.g. in the central Province, between Nuwara Eliya and Matale North, they are not obvious until a large scale population map is examined. There are, however, three provinces in Ceylon, in which the population is so unevenly distributed that differences of density are visible on a small scale map showing districts. These are the Southern, North-Western, and Northern Provinces. For these, the 1921 Census report gives the following figures:-

<u>Province.</u>	<u>Pop. per sq. mile</u>	<u>District</u>	<u>Dist. pop. per sq. mile</u>
Southern	313	{ Matara	496
		{ Galle	424
		{ Hambantota	118
North-Western	163	{ Chilaw	334
		{ Kurunegala	192
		{ Puttalam	39
Northern	109	{ Jaffna	327
		{ Mannar	27
		{ Mullaittivu	13

A population map of the three provinces is appended.

From this it will be seen that in the Southern Province there are two densely populated districts, Galle and Matara; in the North-Western one, Chilaw, and in the Northern one, Jaffna.

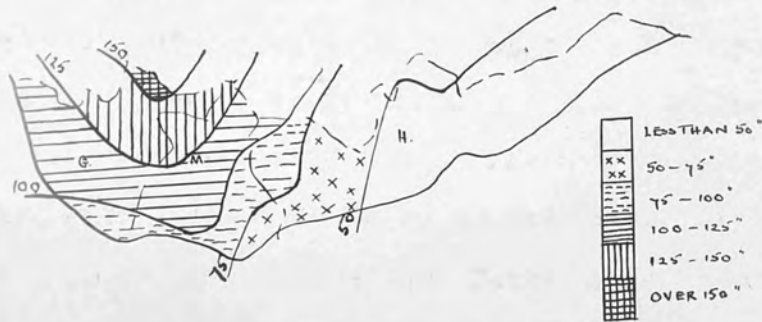
SOUTHERN PROVINCE.

RELIEF.

SCALE: 1 INCH REPRESENTS 4 MILES.



ANNUAL RAINFALL.



CHIEF CROPS.
1957.



N.B. Diversity of relief and rainfall over small area; consequent diversity of cultivation. Absence of cultivation in Hambantota, the driest part of the province.

Galle, Matara and Chilaw probably owe their dense population to the suitability of the districts for certain kinds of agriculture. Chilaw is a district with one predominant crop, coconuts; Galle and Matara grow more varied crops than any other area in the island of the same size, the crops including coconuts, paddy, rubber, cinnamon, citronella, and tea.

The variety of crop cultivated in Galle and Matara is due to the varied relief and rainfall of these two districts. They are like the Western and Central Provinces in miniature. The relief map shows that the districts consist of a low, in the main sandy, coastal plain, crossed by numbers of streams draining southwards from ranges of hills over 1000 feet high, to which the coastal plain gradually rises. The flat coastal plain characteristic of the Western Province, the low hills of Sabaragamuwa, and the higher hills of the Central Province are all to be found within the small area of Galle and Matara, the relief of which is more varied than that of any other area of the same size in Ceylon. The rainfall of the two districts is as varied as their relief; the western end of the hill ranges, which here strike south-east north-west at right angles to the monsoon winds, receives over 150 ins. of rain p.a; the eastern end, where the hills strike west-east, over 100 ins. The coastal plain in Galle receives abundant rain all through the year, during both monsoon seasons, but the fall decreases rapidly eastwards, being below 75 ins. in S.E. Matara.

Many different crops are to be expected in an area so varied in relief and rainfall. There is no part of Galle and Matara, with the possible exception of the inter mont valleys in ⁱⁿ Hapidum pattu, to the north of Galle, where the rainfall is too little for agriculture, and the country too steeply sloping, or so inaccessible from the coast as to make cultivation impossible. In

Rubber 100
Cinnamon 100
Paddy 100

consequence, 44.7% of the total area in Galle, and 50.6% of the Matara district are under cultivation. Two types of agriculture, native and plantation, have been developed here as in the Western Province. The chief native crop is paddy, 17.0% of the total cultivated area in Matara, and 12.2% in Galle being under this plant, which is grown under irrigation from the Ben-tota and Gin Ganga in Galle, and from channels cut to connect the Palwatta and Hilwala Ganga in Matara. The high proportion of land under paddy in Matara, in spite of the fact that this district has a smaller rainfall than Galle, is probably accounted for by the higher water-holding capacity of the soils (68%) in the former district. The chief estate crops are cinnamon and citronella, still grown in the hill-country of both districts, though much less important now than in the days of the Portuguese and Dutch occupation; tea, grown on the higher hill-slopes in northern Galle, but of lower quality than the teas of the Central Province because there is no ground high enough for the production of the best teas; rubber, grown fairly extensively on land between 300-1500 feet, and coconuts, grown along the coast, and by the banks of many streams in both districts. In 1921, there were 97 estates in Galle, 33 in Matara, employing 11,253, and 5,330 labourers respectively. Thus, while estate agriculture is relatively less important, and paddy-growth more important in the Southern than in the Central Province, the development of estates has considerably increased the total population of the Province. Two other factors favouring agricultural development are the existence of an excellent system of communications, which is only surpassed by that of the Western Province, and the nearness of

1. Percentage of land in Galle and Matara under chief crops. (1921)

	Galle.	Matara.
Tea.	2.2.	1.2.
Rubber.	8.4	5.2.
Coconuts.	15.6	14.9.
Paddy.	12.2.	17.0.

all parts of Galle and Matara to the port of Galle. Except in ⁱⁿ Hufidum pattu, there are no obstacles to road-building; roads are, in consequence, many and good, and by means of them estates are brought into speedy touch with the port of Galle. The trade of the port is discussed in greater detail in a subsequent chapter; it is sufficient to point out here that a large percentage of the export and import trade of the Southern Province still passes through this port, in spite of the competition of Colombo, and the nearness of the estates to it in point of actual distance and time by road, must considerably reduce the cost of transporting the products of Galle and Matara districts, and consequently their price in the world's markets. As the demand for any commodity is partly dependent upon its price relative to prices ruling elsewhere, the ease and cheapness of transport within it may partly account for the agricultural development of the Southern Province, particularly for the development of estates, the products of which are destined for export. It has already been pointed out that the density of population in Galle and Matara, as in other parts of Ceylon, is largely dependent upon the degree of agricultural development reached by these districts.

As in the Western Province, occupations other than, but connected with agriculture, employ a small percentage of the total population of the areas under discussion. Among these, the preparation of foodstuffs, e.g. the extraction of coconut oil, husking of paddy, collecting of toddy, must be mentioned, as well as the preparation of rubber, citronella, and coconut products, such as coir, for export. Most of the exported products of Galle and Matara are subjected to the first processes of manufac-

Occupation Statistics for Each District.



N.B. High percentage of people occupied in industrial undertakings in Galle and Matara districts.
 Relative unimportance of agriculture, and importance of industrial occupations, trade and unspecified occupations, which include fishing, in Paltua district.

facture before they leave the districts. The Census Reports do not furnish occupation statistics in detail for each district of Ceylon, but major occupations, with the percentage of population engaged in each, are listed. According to the General Report on the Census of 1921, the percentage of the population engaged in manufacturing industries was 10.9 in Galle and 8.8 in Matara. These are much larger percentages than are found in any other part of the island, Jaffna district ranking next with 1.3%. There is no very obvious reason why the products of these two districts should be manufactured locally on a larger scale than in other parts of Ceylon, e.g. the Western Province, where similar crops are grown, but manufacturing industries appear to be more developed in the Southern Province than elsewhere, and their presence partly accounts for the population density of the districts. Other industries followed are fishing, particularly important in Matara, where 1.2% of the total population is engaged in this occupation, work in connection with transport service, banking, etc., dependent upon the relationship of Galle and Matara to Galle port. The effect of fluctuations in the trade of Galle upon the population of its immediate hinterland is shown by a decrease of 6,000 in the population of Galle district during the decade 1911-1921, in which the improvements to Colombo harbour were completed, with consequent loss of trade to Galle. Of importance in maintaining the high population is the healthiness of Galle and Matara. As in other parts of 'wet' Ceylon, they have a low fever death-rate, 2.9 in Galle, 6.2 in Matara, and the survival rate is higher here than in any other part of Ceylon than the Western Province.

It should be interesting to see if the percentage of estates, particularly coconut-gardens, owned by Europeans, is higher here than in other parts of the island, and if the percentage of agricultural products actually exported is also greater. Either of these factors, together with the long-continued contact of Galle and Matara with European nations through the port of Galle, might account for the development of manufacturing industries. More varied statistical information about Ceylon than is at present available is needed, if one part of the island is to be compared in detail with others.

1. These have since become available. See graph facing page.

It appears therefore, that gentle and varied relief, abundant rainfall, the two factors making different types of agriculture possible, good communications, nearness to a port, facilities for engaging in work other than agriculture, and the healthiness of the areas, together account for the dense population of Galle and Matara.

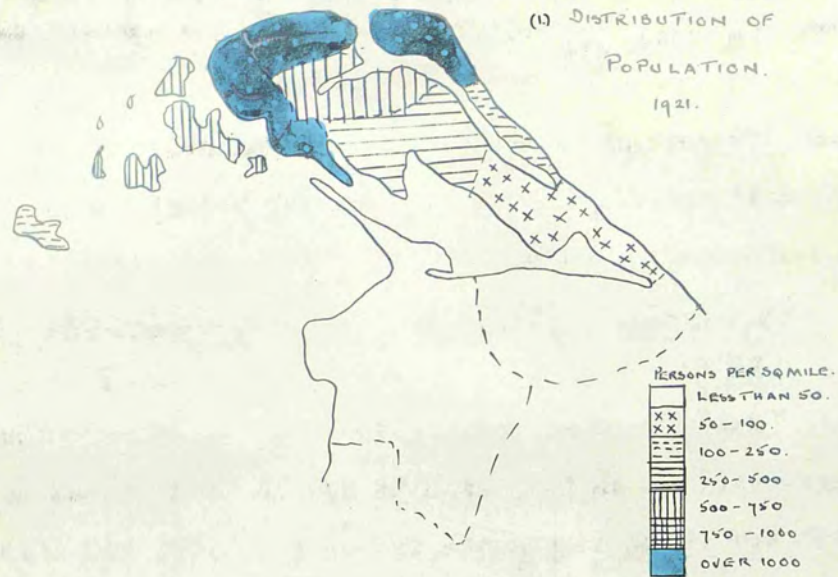
Chilaw is a tract of country all under 100 ft. high, along the west coast between the southern end of Puttalam lagoon and the Maha Oya. Its soils are light, sandy loams, and its rainfall small for Ceylon, ranging between 50 ins. in the north of the districts to 65 ins. in the south. Most of the rain falls in the N.E. monsoon season, and June and July are sometimes rainless. It is very extensively cultivated, 87% of S. Chilaw being under the plough, but it has only two crops of importance, paddy and coconuts, the percentage of land under each being as follows:-

<u>Crop</u>	<u>District</u>	
	N. Chilaw	S. Chilaw
Coconuts	34.8	77.2
Paddy	6.3	10.7

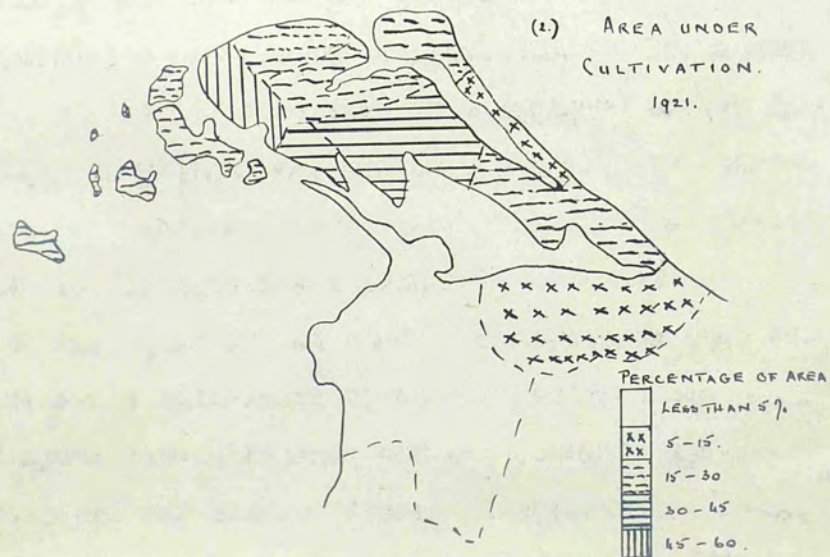
The enormous importance of coconuts to the district is at once apparent, the reasons for the prosperity of the industry being the suitability of the soil, which is said to be the best in the island for coconuts, and the valuable help given to cultivators by the Irrigation department, under whose auspices a large number of the old tanks of the district have been restored. The water stored in these can be used to supplement the rainfall of the district in such a way that ideal growing conditions are created. The coconut industry of Chilaw is not dependent upon the vagaries of the monsoon as in wetter parts of the island

JAFFNA DISTRICT.

(1) DISTRIBUTION OF POPULATION.
1921.



(2) AREA UNDER CULTIVATION.
1921.



N.B. (1.) Uneven distribution of population in district. Areas of densest population all on w. + n. coasts of Jaffna peninsula. i.e. in position most suitable for trade with India.

(2.) Much more extensive cultivation of peninsular than of mainland part of district.

Imperfect correlation between (1) + (2) suggests some cause other than agricultural development determining density of population in district.

where irrigation is not practised, and the fact that a steady water-supply is available when it is needed has undoubtedly much to do with the prosperity of the Chilaw coconut gardens. The work of restoring tanks was done during the decade 1881-1891, and its immediate effect on the population of the district is seen in the figures giving the percentage increase of population in successive decades:-

<u>1911-1921</u>	<u>1901-1911</u>	<u>1891-1901</u>	<u>1881-1891</u>	<u>1871-1881</u>
16.4	17.8	17.7	26.9	18.8

Other factors helping to make Chilaw prosperous may be the ease with which its products can be transported to Colombo, and its low fever death-rate of 4.7 per 1000, but these are subsidiary to the fact that a crop has been found which exactly suits the soils of the district, to the cultivation of which all the ingenuity of eastern farmers and western scientists is devoted. 23% of the population of Chilaw is directly connected with the coconut and paddy crops, and the density of population is closely correlated with the prosperity of these.

The factors underlying the prosperity of Jaffna district are more complicated. This is the only part of northern Ceylon which has retained its dense population since the days of the Sinhalese kingdom, and the population-map shows that there are marked differences in density within the district. This falls naturally into three parts, the Jaffna peninsula proper, the islands close to it, and the north of the mainland. Round the towns of Jaffna, and along the north coast of the peninsula, there are districts with as many as 1,114 persons to the square mile; the islands have over 500, while Panunkari-Tunnukai, the north-western part of the mainland, has only 14 persons to the square mile.

¹ Chilaw is a good example of a district in which artificial conditions are more favourable to agricultural development of a particular type than natural ones which appear at first sight to be more suitable. The percentage of land under coconuts in Colombo district, which has a greater rainfall than Chilaw, is 66.1, 33.1% less than in S. Chilaw.

No part of the district is very extensively cultivated, because soil, climatic, and labour conditions are not as favourable as in other parts of Ceylon. The islands and the western end of Jaffna peninsula are composed of loose coral overlaid with sand, and the remainder of the peninsula is of limestone formation. The land is everywhere low, and cut-offs and salt marshes abound. Rainfall varies from about 30 ins. in the year on the mainland, to 52 ins. at Jaffna, and falls almost entirely in the N.E. monsoon season, June, July and August being dry months. This means that only one harvest can be reaped in the year, while two are usual in other parts of Ceylon. The district has the very high fever death-rate of 10.8 per 1000, third highest in the island, and is described by the Provincial Commissioner in his report on the occasion of the 1921 census as "rotten with malaria." The population consists chiefly of Ceylon Tamils, descendants of early immigrants to the island from South India, who have a lower birth and higher death and infantile mortality rate than any other race, so that their physique must be poor, and the quality and quantity of work they are able to accomplish low. The chief crops of the area, in the production of which about 20% of the total population appears to be occupied, are paddy and dry grains, chiefly millet, coconut and palmyra, and tobacco. Paddy is grown round Jaffna, in the islands, and in the north-east of the mainland, dry grains wherever there is any cultivation, since these are the staple food of the people, coconut and palmyra along the north and west coasts of Jaffna peninsula, and tobacco in Delft and round Jaffna. All these crops are grown under irrigation from wells 15-30 feet deep, the water table being nearer the surface here than in other parts of Ceylon.

¹ The small patta, Valikaman West, has 47% of its total area under cultivation. This is the highest percentage in the district; the average for which is 22.6%, which may be compared with 64.0% in Colombo district.

or from tanks of Sinhalese kingdom date, which have been recently restored.

The agricultural products of Jaffna give occupation to a number of primitive craftsmen, who manufacture the 'biddie' or cheroot beloved of the Tamil, weave mats, spin coir yarn, and make baskets, but a large proportion of the population of Jaffna is not dependent upon agriculture or its associated industries, but on fishery and trade. It is significant that the parts of Jaffna most densely populated are the western and northern seaboard of the peninsula, where fishing and trade with the mainland of India can most easily be carried on. The fisheries are of two types, the ordinary food-fishery, which helps to reinforce the small food supply of the district, and pearl-fishery, for which the Gulf of Mannar has been famous since the days of Marco Polo. There are no detailed occupation statistics available for the district, but the fact that a failure of the pearl-fisheries causes a migration of people from the Jaffna peninsula southwards into other parts of Ceylon suggests that a good many people get their living by it. ^{secondary factor accounting for the density} Trading is even more important than fishery. The Jaffna peninsula is separated from India by a strip of water only 60 miles broad, and as India supplies Ceylon with two of her chief needs, grain and labour, a very large volume of trade naturally flows through the Jaffna peninsula. There are four considerable ports in the peninsula, Jaffna, the second city in Ceylon, ^{or} Kankasant^{ai}, Point Pedro, and Kayts. Their import trade may be guessed from the following figures which represent revenue collected on imported grain in 1927.

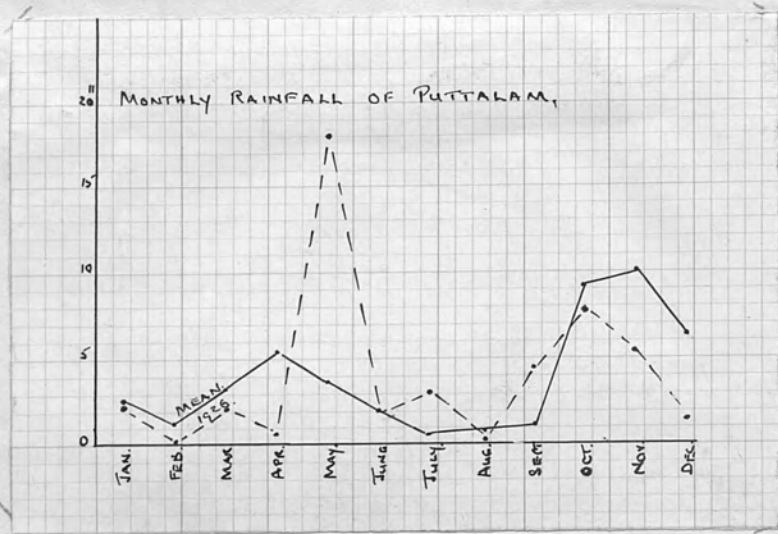
1. See page 66. The relatively small percentage of earners engaged in agricultural pursuits, and the high percentages in transport, trade and miscellaneous occupations, should be noted.

<u>Port</u>	<u>Revenue in rupees.</u>
Jaffna	83,199
Kankesant ^{ur} sai ...	176,259
Point Pedro	54,560
Kayts	206,968

Practically all the tobacco exported from Ceylon, valued in 1929 at £40,541, is exported through Jaffna to S. India, where it is manufactured, and through Jaffna and Kankesant^{ur}sai pass half the annual quota of 284,293 immigrants into the island. A maze of main roads and railways h^{ave} been built to cope with the traffic of the peninsula, and there is no doubt that the majority of the people in the district are engaged in trading or handling traffic between Ceylon and India.

In two of the most densely populated districts, Galle and Matara, and Chilaw, therefore, the large population is due to features of relief, soils, rainfall, and position with regard to the coast, which have enabled these areas to develop extensive agricultural industries. In Jaffna district, agriculture, though practised, is a secondary factor accounting for the density of population, which is more directly due to the facilities possessed by the peninsula for trade with India. The nature of this trade is more thoroughly discussed in Chapter VII, where the town of Jaffna is dealt with.

The districts in the Southern, Northern and North-Western provinces where there are fewest people are Hambantota, Mannar, Mullaittivu and Puttalam. Each of these is primarily an agricultural district in which there are serious drawbacks to the development of agriculture. The chief of these are a small and fluctuating rainfall, and an insufficient labour supply.



N.B. Considerable deviation of amount of rain received in any one year from the normal.

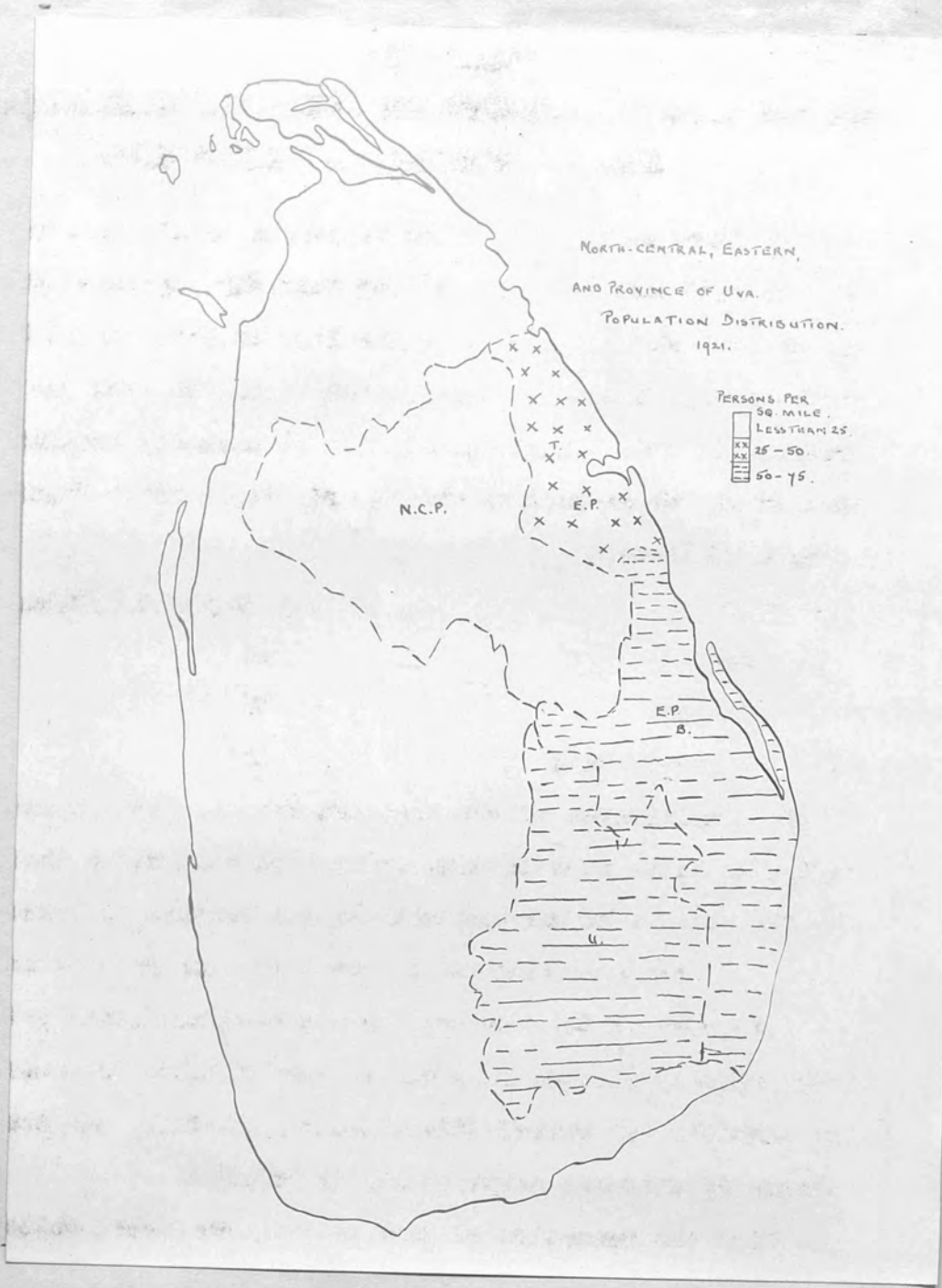
and with the exception of Mullaittivu, which has slightly more, the sparsely populated districts have been ^{to} 25-50 ins. of rain, most of which falls in the north-east monsoon season. As the temperature of the districts is round about 80°F. all the year, and the surface soils are coarse, much of the rain is lost by evaporation and percolation. More serious than the small annual fall is the fluctuation in season and amount of rainfall from year to year. An example of the departure of the rainfall from the mean, calculated over 58 years, is given for Puttalam in the accompanying graph. In 1926, the rainfall in May was 15 ins. in excess of the mean; in October, November and December, 10 ins. less than the mean for the three months. In an area where the annual fall is so small, and the fluctuations from year to year so large, irrigation is essential to the cultivation of crops on any large scale. This fact was recognised by the Sinhalese kings, who constructed an enormous number of tanks in the districts under discussion, particularly in Mannar, where every square mile of country abounds in them. When this irrigation system was in existence, the districts were flourishing paddy-growing areas, and the population much denser than it is to-day. Unfortunately, most of the tanks are now in ruins, and the work of restoring them goes on slowly, so that the amount of land under cultivation, and consequently the population of the districts, is small. In Mullaittivu district, only 3.4% of the total surface is cultivated; in Mannar, 7.2%; these percentages must represent only a very small fraction of the land which could be brought under cultivation if facilities for irrigation were extended. The value of the work of restoring tanks, and its effect upon cultivation and density of population is shown in Hambantota district, where old tanks

and channels connected with the Welawa Ganga are being restored, the percentage of land under cultivation is 19.2, and the density of population 118 per sq. mile compared with 13 in Mullaittivu. Bound up with the question of restoring irrigation works is the healthiness of the districts, which governs the available labour supply. It has been argued that in parts of the districts under discussion, it is not worth while to restore tanks, because the population is too small to make use of the water so provided. The main reason for the smallness of the population is the prevalence of Malaria. In Hambantota the fever death-rate is 15.6 per 1000, the highest in the island; in Mannar it is 8.3, and in Mullaittivu 7.9. The evil wrought by epidemic malaria cannot be measured in terms of the deaths directly traceable to it only; its effects in undermining the constitutions of all those living in districts where it is prevalent is shown by the fact that in Mannar and Mullaittivu the death-rate from all causes exceeds the birth-rate by 11.5 and 3.1 per 1000. In his report on Malaya, Ceylon and Java, published in December, 1928, Mr. Ormsby-Gore states that "The future progress, prosperity and happiness of Ceylon are more bound up with the eradication of malaria and anklostomiasis than with politics, transport, agriculture, or any other problem. So far from the incidence of malaria decreasing, it would seem to be increasing. The health and efficiency of the majority of the population are being undermined by these two diseases. I regard organisation for war on the malaria parasite as having precedence in importance over everything else in Ceylon at the present time." districts was their prosperity to varied relief, good soils, abundant rainfall, the development of irrigation, and the existence

It is not possible to assign the prevalence of malaria in the districts under discussion to any one cause. The low relief of the areas may partly account for it, for the anopheles^s mosquito lives chiefly below 2000 ft., and the nearness of the northern districts to the mainland of India, from which immigrants infected with malaria enter Ceylon yearly, may spread the disease. But its prevalence must be partly due to the amount of stagnant water, in which the mosquitoes breed, present in the ruined tanks of Hambantota, Puttalam, Mullaittivu and Mannar, so that if the old irrigation systems were restored, a decrease in the incidence of malaria would be probable. Once these areas were more or less free of fever, settlers from more populous parts of the island, or immigrants from crowded South India, might be attracted to them, so that the population would increase, and certainly the natural rate of increase of the present population, as well as their efficiency as a labour-force, would rise. The argument against the restoration of tanks owing to the absence of population appears, therefore, to be fallacious. The extension of agriculture in the drier parts of the Southern, Northern, and North Western provinces hinges upon the development of irrigation, which will increase the supply of water available for the land, and improve the quality and quantity of the labour supply.

It is clear, therefore, that the marked differences in population-density in the three provinces are due to differences in controlling geographical factors, such as position with regard to the mainland of India, relief, rainfall, and, partly dependent upon the foregoing, healthiness. The most densely populated districts owe their prosperity to varied relief, good soils, abundant rainfall, the development of irrigation, and the existence

of facilities for transport and trade with other countries. The sparsely populated districts remain backward because their rainfall is small and uncertain, irrigation-systems derelict, and fever everywhere prevalent.



N.B. Sparse population of these, compared with other provinces in Ceylon.

CHAPTER VI.

THE NORTH, CENTRAL & EASTERN PROVINCES, AND THE PROVINCE OF
UVA, THE SPARSELY PEOPLED PROVINCES.

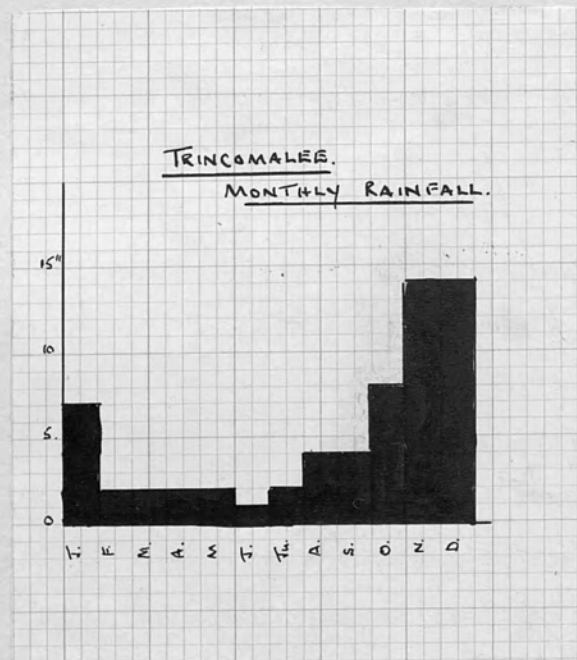
In three of the provinces of Ceylon, conditions unfavourable to agriculture, noted in the sparsely populated parts of the provinces discussed in the last chapter, exist almost everywhere. These are the North-Central, Eastern and the Province of Uva. Their population is markedly smaller than that of any other part of the island, the density figures being as follows:-

<u>Province</u>	<u>No. of persons per sq. mile.</u>
Uva	71
Eastern	57
North-Central	24

If the completeness of the contrast between Western and Eastern Ceylon is to be appreciated, it must be remembered that there are 874 persons to the sq. mile in the Western Province, thirty six times as many as in the North-Central Province.

The reasons for the small population are identical with those already studied in parts of the Northern Province. They include low relief, insufficient rainfall, and the prevalence of disease, particularly of malaria.

With the exception of part of Uva, discussed below, the height of the land in the three provinces is nowhere much above 500 feet. Near the coast, which is fringed with lagoons, the largest of which is the almost enclosed Batticaloa lagoon, the land is very low lying, and stagnant water collects upon it rapidly. Swampy conditions similar to those near the coast

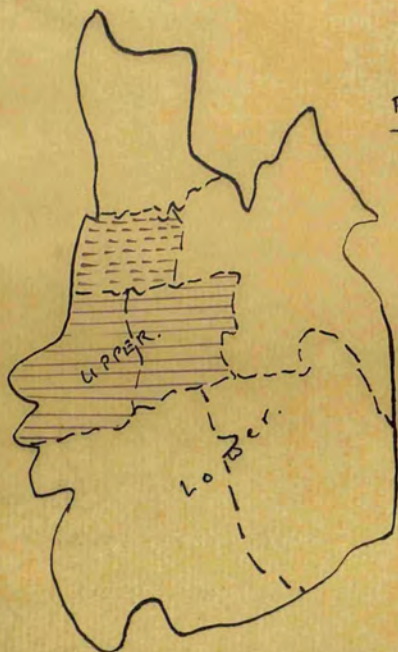


N.B. Concentration of rainfall into months of October, November, December and January.

extend far inland in Trincomalee district, in the north of the Eastern Province, where is the low alluvial plain crossed by the Mahaweli Ganga and its distributaries. Much of the surface, therefore, requires drainage before it can be used for agriculture.

The rainfall of the provinces varies in amount and distribution with latitude and degree of exposure to the monsoon winds. In the North-Central province, the annual rainfall is about 55 ins., in the Eastern province and Uva, 60-70 ins. From the rainfall graph of Trincomalee, which can be taken as typical of the whole area, appended, it can be seen that two-thirds of the total rainfall occurs in the months October to January, when heavy downpours take place, but that the amount of rainfall in any other month is small. On land as low as that of the greater part of the three provinces, such a rainfall regime converts the country into swamp for half the year, this swamp drying out and baking land during the comparatively rainless south-west monsoon season. Between October and January, too much water is lying upon the ground for agriculture to be practised extensively unless the ground is drained, and from February to September, the rainfall is insufficient for agriculture unless it can be supplemented by irrigation water. The problem in the three eastern provinces is, therefore, that of storing water during the north-east monsoon season, thus removing surplus surface-water from the land, and applying it to the crops during the south-west monsoon season, when the rainfall is slight. Agriculture is more dependent upon irrigation in this than in any other part of Ceylon.

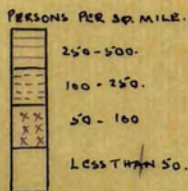
PROVINCE OF UVA.



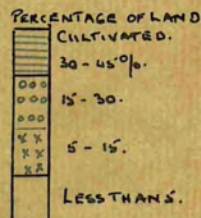
POPULATION.
1921.



RELIEF.



LAND UNDER CULTIVATION.
1921.



N.B. Sharp contrast between land under cultivation and density of population between upper and lower Uva, owing to greater healthiness of higher, well-watered country.

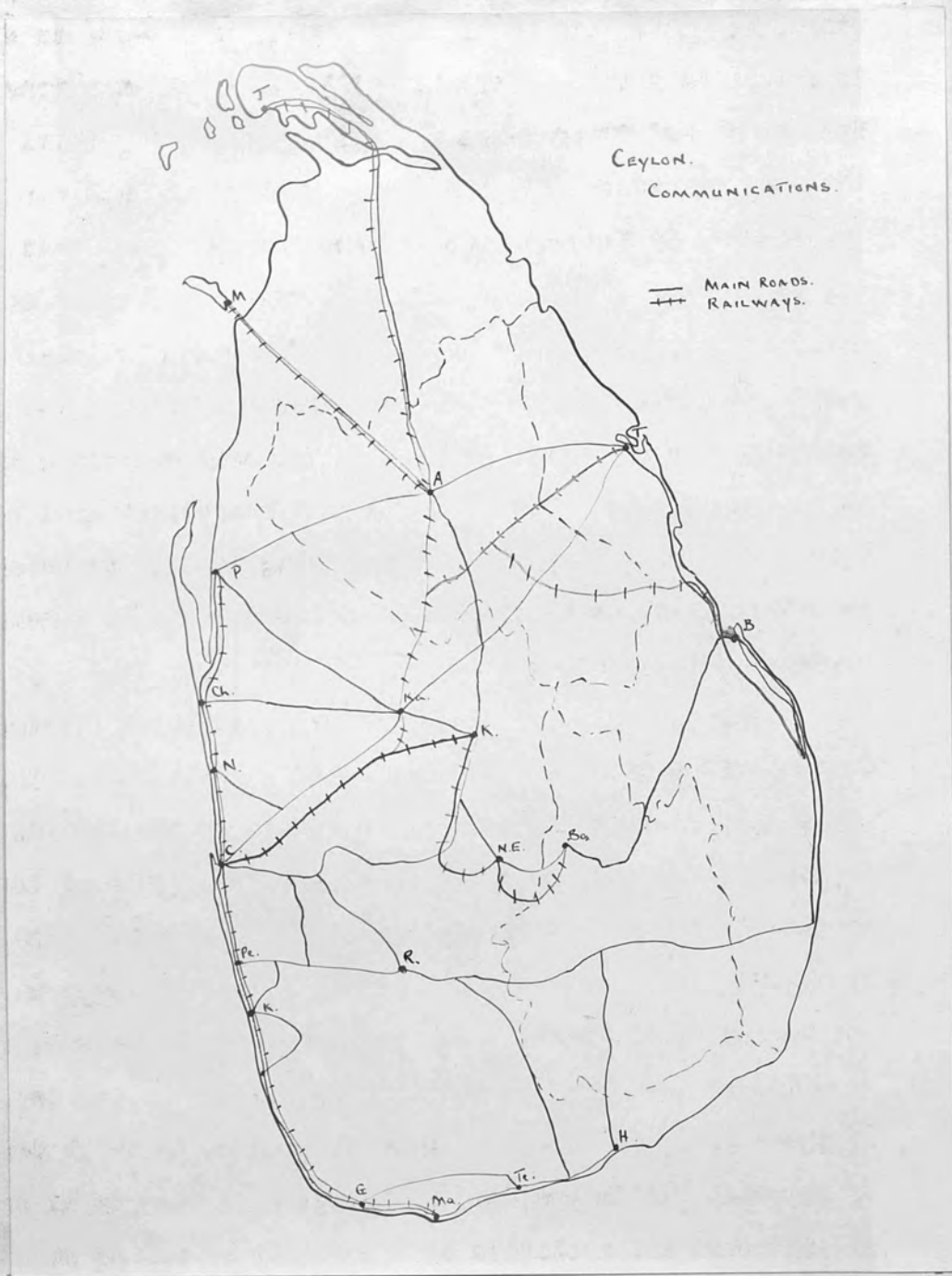
But it is not only crops which are dependent upon the development of irrigation. The swampy nature of much of the east of Ceylon during half the year accounts for the high death rate from diseases of the fever group, 10.5 per 1,000 in Anuradhapura, 9.9 in Batticaloa. The effect of disease in retarding development can be clearly seen in the province of Uva, which is divided into two parts, upper and lower Uva, by its relief. Upper Uva forms part of the Central highlands, its average height being between 1,500-5,000 feet; lower Uva lies to the east and south east of this, and has an average height of 700 ft. Upper Uva receives 110 ins. of rain distributed throughout the year, its rainfall regime being similar to that of Kandy; it has a low fever-death rate, since the slope of the land allows of quick drainage, in the three patus into which it is divided, 33.6, 21.1 and 18.3% of the total surface is cultivated, chiefly with tea and paddy, and the population reaches 328, 279 and 176 persons per sq. mile. Lower Uva has an annual rainfall of 50-75 ins, sufficient for the growth of thick jungle which is difficult to clear for road-making, elephant infected, and malaria ^s ~~sett~~ⁱⁿ; in no part is more than 6.3% of the surface cultivated, and the population density varies from 19 to 45 persons per square mile. The prevalence of malaria is the chief reason for the backwardness of Lower Uva, which, though the major plantation crops could never be grown might be made to produce large crops of paddy, dry grains, & fruits and vegetables for the eastern markets. In the last two decades, there has been a steady tide of emigration from this area, which must continue until malaria is controlled.

The best way of tackling the problem of malaria eradication appears to be the extension of existing irrigation systems, which would not only decrease the amount of stagnant water lying on the land, thus limiting the breeding places of malarial mosquitoes, but would make cultivation on a larger scale possible by providing water needed for crops in the dry season. At present, the only areas in which irrigation is practised on a considerable scale are the neighbourhoods of Batticaloa, Trincomalee and Anuradhapura. The effect of facilities for irrigation upon the degree of cultivation, and so upon the population of these areas is most marked. 56% of Erivil pattu, near the town of Batticaloa is under cultivation, because the area is irrigated from shallow wells and small tanks. In Bintenna, west of Erivil, where the annual rainfall is slightly smaller than in the coastal pattu, and where few facilities for irrigation exist, the percentage of land under cultivation is only 18.4. In Erivil there are 46 persons to the sq. mile, in Bintenna, 7. The method of extending irrigation facilities which is being adopted at present is that of restoring tanks built ^{about} at the twelfth century. South-east of Anuradhapura, Kalawewa Tank, capable of irrigating 60,000 acres of land, has been restored, and south-west of Trincomalee, Kantalai tank is in process of restoration. As a result of this work, and of the larger crops of paddy which have been raised under the water so supplied, the population of Anuradhapura and Trincomalee of plantations, some of which were made in the years 1901-1911,

districts increased in the decade 1921 at a rate of 4.5% and 3.3% in excess of the average rate of increase for the decades 1871-1911. It is clear, therefore, that though eastern Ceylon is not so rainless that cultivation is impossible without artificial watering, facilities for irrigation increase the productiveness and healthiness of the land, and so the density of population, very markedly. As little has as yet been done to extend irrigation in the three provinces, their present small population is partly accounted for. It is obvious from the increased population of Trincomalee and Anuradhapura in the last decade that an expenditure of public money on irrigation works is amply justified by results; it remains to be seen whether the Government of Ceylon will sanction expenditure upon what could be a productive and densely peopled agricultural area. ~~As is discussed in a later chapter, but~~ here Once irrigation schemes and public health work are sufficiently advanced to make extensive cultivation by an efficient body of labourers possible, the future of eastern Ceylon seems to lie in the growing of food crops and coconuts. It has been pointed out in previous chapters that the plantations of rubber, tea, and coconuts, are the basis of the present prosperity of central and western Ceylon. There is no climatic or physiographic reason why at least one plantation crop the coconut, should not flourish in eastern Ceylon. It grows to perfection in the flat irrigated coastal districts of Chilaw, which has ^{ve} 10 ins of rain less in the year than Batticaloa. The one factor which discourages the development of plantations, some of which were made in the decade 1901-1911,

but have since disappeared, is the fact that eastern Ceylon lies away from the main flow of traffic on the island, at some distance from the chief port, to which it is very poorly connected by roads and railways. Eastern Ceylon was not always isolated; in the time of the Dutch occupation, the trade of the island was chiefly with India and Java, and much of the Javanese trade went through Trincomalee and Batticaloa. But even at the end of the Dutch period, the eastern ports were losing their trade to Colombo and Galle, both of which were closer to the newly opened coffee plantations which were being made in the wetter areas, and since the British occupation, the tendency of the trade of Ceylon to flow westwards out of and into the port of Colombo has become more and more marked. The nature of the island's trade, and the reasons for the supremacy of Colombo are discussed in a later chapter, but here it must be stated that for at least one hundred and forty years Ceylon's commodities have been taken most largely by Western Nations, and her needs, except the need of food-stuffs, supplied from the same sources. When it is remembered, further, that the Western part of the island is naturally the more productive, because the better watered part, it is obvious that the bulk of the trade of Ceylon must flow through a western port.

As they were opened up the planting areas were connected first by a network of roads, then by railways, with the port of Colombo, but the development of communications in eastern Ceylon was much slower, because this area was not naturally



N.S. More complete development of communications in western than in eastern Ceylon.

very productive, and it did not have to be crossed in order to reach the port. There are still only two main roads in Batticaloa and Trincomalee districts, connecting these with the road system of the island as a whole; the railway linking Trincomalee to the west was finished in 1925, and that connecting Batticaloa to Colombo only in 1927. Poverty of communications has emphasised the isolation of eastern Ceylon, and partly accounts for the slow development of plantation agriculture which needs facilities for easy marketing if it is to be successful. Now that the east has been linked to the west by railway, it will be interesting to see how quickly industries such as coconut cultivation develop as a result of improved communications.

Geographically the three sparsely populated provinces of Ceylon suffer from two disadvantages, a small annual rainfall, and a position off the main trade routes of the island. Neglect of drainage problems which are the result of the provinces' relief and rainfall régime has added a third disadvantage, unhealthiness. To these three, the present small population of the Eastern and North-Central Provinces, and the Province of Uva, must be attributed, and the future development of these areas is dependent upon the degree to which deficiencies of rainfall can be overcome by irrigation; malaria by public health work, and isolation by the speedy extension of communications.

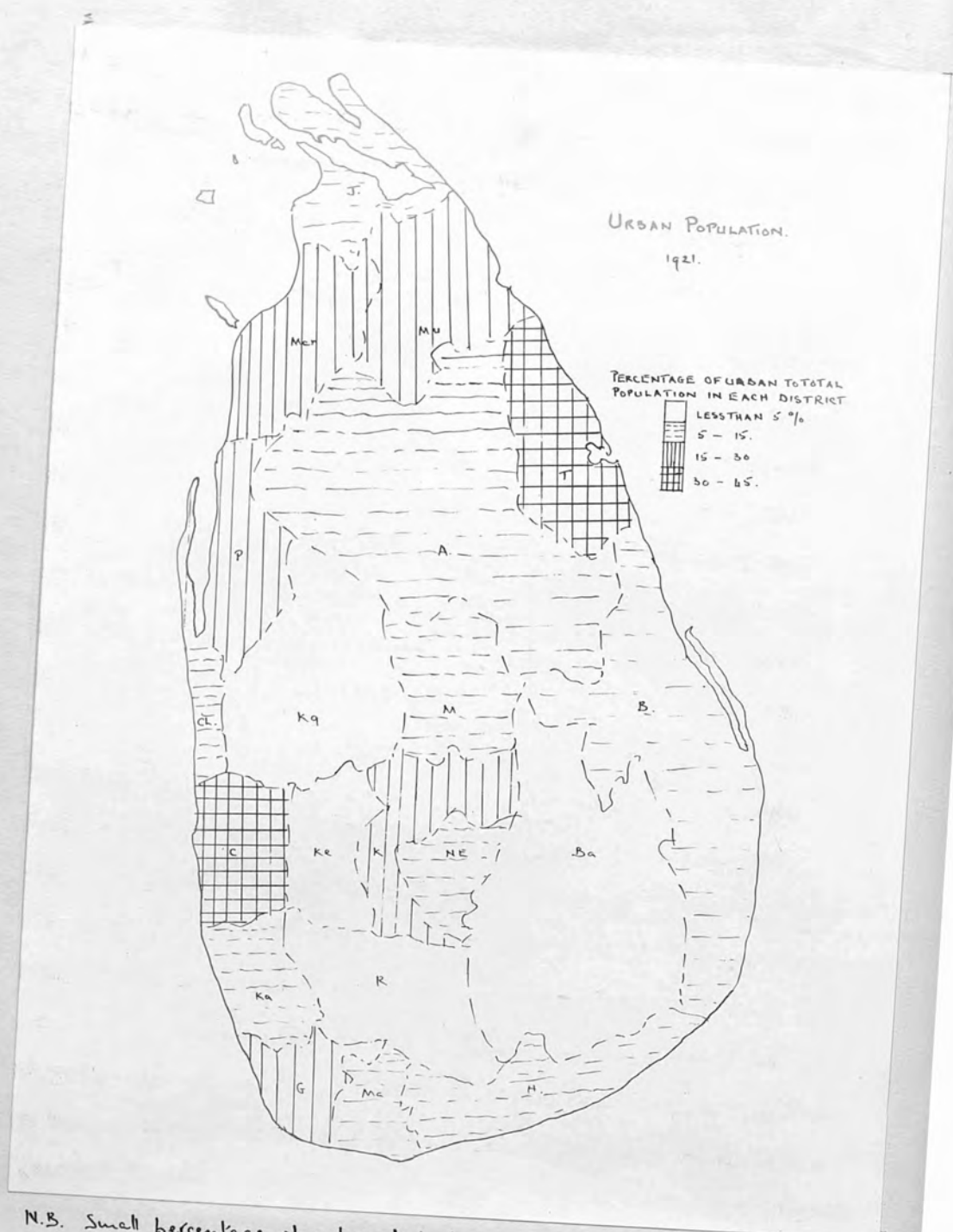
¹ The Eastern Province ~~was~~ is nearly three times as large as the Western Province; but it has only 594 miles of road open to traffic, compared with 522 miles in the Western Province.

CHAPTER VII.

TYPES OF SETTLEMENT IN CEYLON; VILLAGES AND URBAN
CENTRES.

The word 'town' is not defined in the report on the census of Ceylon, but taking the British census definition any collection of 2,000 or more than 2,000 people, there are few towns in Ceylon. Agriculture is by far the most important occupation, and as in all agricultural areas, cultivators tend to collect in villages, varying in size from 50-2000 people, distributed thickly over the countryside in prosperous districts, but with intervals of 20-30 miles between each in poor districts such as Hambantota and Mannar. In dry Ceylon, it is easy to see the connection between village sites and water supply, for the villages are aligned along small streams and old yodielas, or in close proximity to irrigation tanks, though not immediately beside them. One concludes that the factors controlling the village-site were the necessity of obtaining water for man, beast and field, together with the advisability of avoiding very low ground which would be malarial. This would explain the arrangement of villages along, but at a short distance from, the water courses. In wet Ceylon, villages are so numerous that it is difficult to discover even from a large scale map, any general law governing their arrangement.

The predominance of village settlement, as opposed to settlement in towns, in the island is shown by the following figures from the report on the 1921 Census, which give the percentage of rural and urban to total population in each



N.B. Small percentage of urban population in every part of Ceylon except Colombo district, (town of Colombo; dependent towns; hinterland of port) and Trincomalee district (small total population; poor agricultural area.)

province. In default of any definition of the words 'rural' and 'urban', it is assumed that urban population includes people collected in groups of 2,000 or over, and rural population those being in groups of less than 2,000.

<u>Province.</u>	<u>Percentage of urban population.</u>	<u>Percentage of rural population</u>
Western	25.5	74.5
Northern	13.0	87.0
Eastern	11.7	88.3
Southern	11.3	88.7
Central	8.4	91.6
North Central	8.1	91.9
North Western	5.2	94.8
Uva	4.4	95.6
Sabaragamuwa	2.2	97.8
Ceylon	12.9	87.1

Clearly, in every part of Ceylon, the urban population is very small compared with the rural population. This is not surprising in a country in which land fit for cultivation is valuable, and transport in rural districts still primitive, so that the distance from a centre at which land can be cultivated is limited, and small villages dotted over the cultivable area make more convenient headquarters for cultivation than one large central town. There are, however, differences in the proportion of urban to rural population in different parts of the island, and less strongly marked differences in the size of villages in different agricultural areas, both of which are interesting.

The fact that the Western province has the largest

percentage of urban population may be explained by the development of communications, making the collection of agricultural produce at fairly large nodal points possible; by the development of factories preparing the products of the whole island for export, e.g. the coir yarn factories of Negombo, and by the presence within the province of the great port of Ceylon, through which a very large proportion of the total trade of the island passes. Similar reasons may account for the relatively high urban population percentage of the Southern Province. In the Northern and Eastern

Provinces, the urban population percentage may be as high as District with less than it is because these provinces are relatively unfertile and

Columbo	23	81	840	270	128
Kalutara	18	36	881	122	49
Ratnapura	702	487	970	87	16
Kegalle	100	200	530	80	2

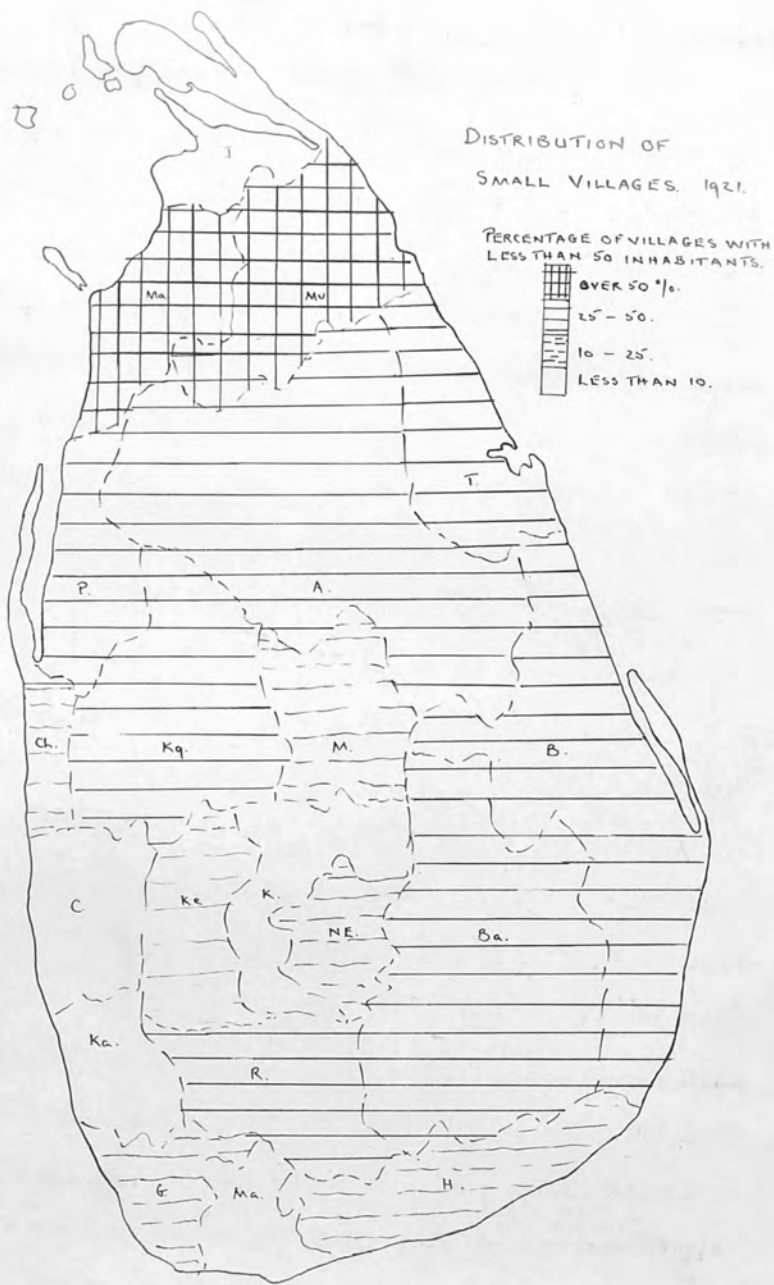
a larger proportion of the total population is in consequence engaged in trade, or in capitalist undertakings such as the pearl-fishing of Jaffna and the trawler-fishing of the Batticaloa, which have their headquarters in one town and employ a number of men. The proportion of settlements with over 500 inhabitants to the total number of settlements is markedly higher in Jaffna district than in any other part of Ceylon, but in the two Sabaragamuwa districts there is a larger proportion of very small, and a smaller proportion of large villages than in the Western province. It is impossible, however, to separate the influence of the type of crop grown the mainland of India. The increased number of possible occupations open to villagers of this part of the country thus increases the optimum size of the villages.

In contrast to Jaffna, Uva and Sabaragamuwa, the two provinces with the smallest percentage of urban population, are both primarily agricultural. Neither has any coastline, so for the chief crops limits the size of settlements in Uva and

that fishery and coast-wise trading cannot be carried on. The chief crops of the two areas are rubber and tea, and it is possible that these, particularly rubber, require less^s labour, acre for acre throughout the year, than paddy. If this be so, the smaller size of the settlements in Uva and Sabaragamuwa may be due to the fact that fewer labourers are needed to raise the staple crops on a given area than are necessary in the lowland paddy growing areas. Statistics giving the number of villages of different sizes in each province seem to support this theory, e.g.

<u>District</u>	<u>No. of villages with less than 50 people</u>	<u>50-100</u>	<u>100-500</u>	<u>500-1000</u>	<u>1000-2000</u>
West- ern Prov: { Colombo	23	61	546	270	128
{ Kalutara	15	26	281	126	49
ab: { Ratnapura	702	467	996	97	15
{ Kegalle	106	206	596	65	9

In Ratnapura and Kegalle, as in Colombo and Kalutara, the greatest number of villages have between 100-500 inhabitants, but in the two Sabaragamuwa districts there is a larger proportion of very small, and a smaller proportion of large villages than in the Western province. It is impossible, however, to separate the influence of the type of crop grown upon the size of the village from the factors such as the fertility of the soil, and the development of communications, so that the effect of geographical suitability for one type of crop upon village size cannot be directly proved by these statistics. It is probable that the amount of labour needed for the chief crops limits the size of settlements in Uva and



N.B. Large number of small villages in districts, e.g. Mullaitivu and Mannar, dependent upon irrigation from small tanks.

Sabaragamuwa, but a more obvious limiting factor is the poor development of communications here compared with that in other parts of the island. The paucity of roads and railways, due partly to the hilly and difficult nature of the province, and partly to the fact that plantations in these districts are newer than those in the Central Province, so that until lately there has been no need for adequate transport facilities, must limit the number of villages so placed that they can become collecting and distributing centres for wide areas, and thus increase in size. In districts where the number of possible occupations is limited, and communications poor, large settlements are naturally few.

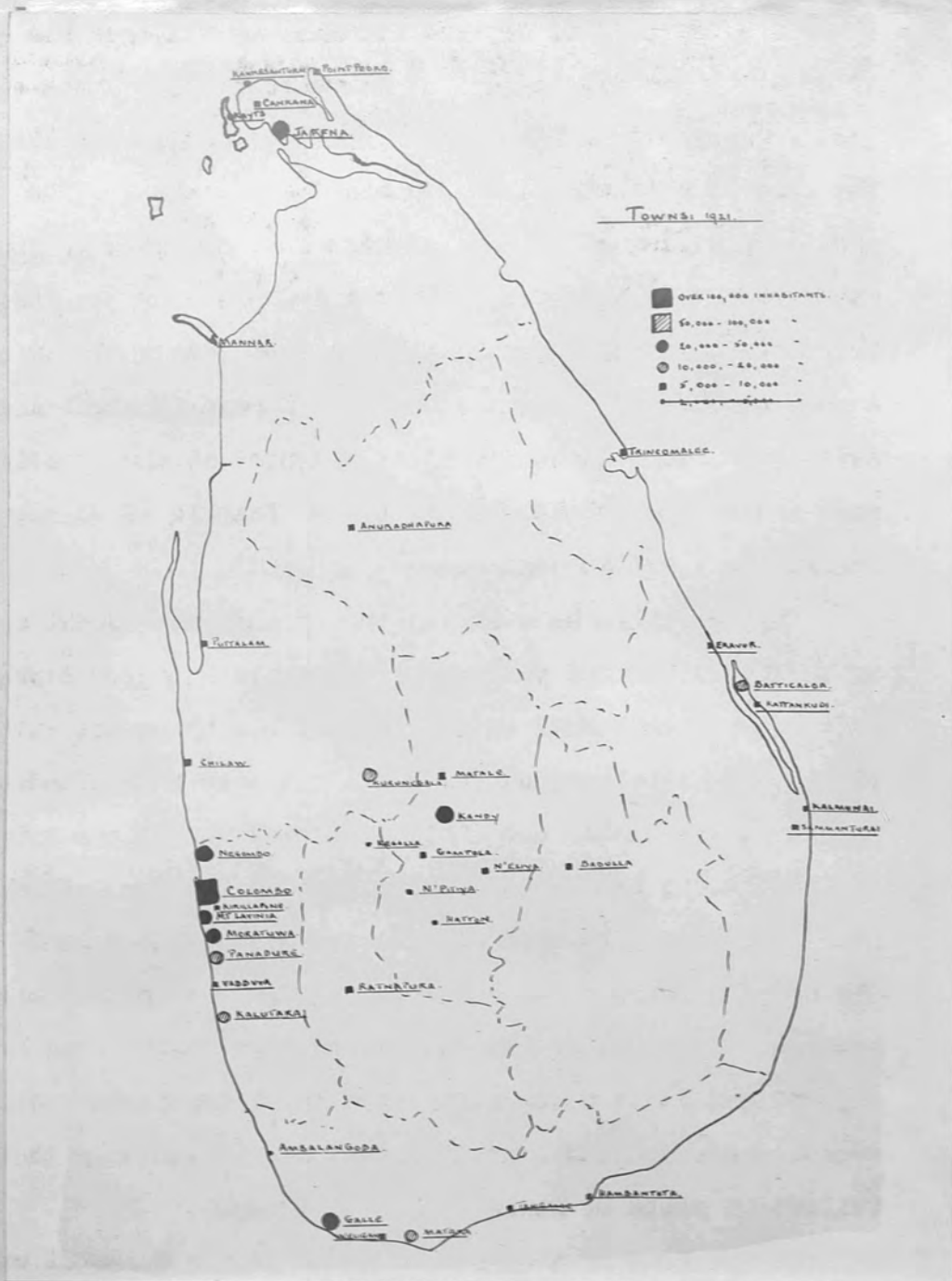
In dealing with Uva and Sabaragamuwa, it has been pointed out that the type of crop cultivated may affect the size of the villages. Other factors affecting village-size in Ceylon appear to be the amount of water naturally available, and the type of irrigation adopted in dry districts. The accompanying map shows the percentage of villages with less than 50 inhabitants to the total number of settlements in each district of Ceylon. If this be compared with the rainfall map, it is obvious that the districts in dry Ceylon have a larger number of small villages than in 'wet' Ceylon. In 'dry' Ceylon, unless irrigation is practised extensively only one harvest can be reaped during the year; in 'wet' Ceylon the amount and distribution of rainfall make the gathering of two harvests possible. In 'dry' Ceylon, fields have to be left fallow for half the year, and the amount of food that can be grown upon them will only support half as many people as the

same amount of land in 'wet' Ceylon. Therefore, even if the higher nutritive value of paddy, the crop of 'wet' Ceylon, compared with millets, one of the chief crops of 'dry' Ceylon be neglected, the size of settlements in 'dry' Ceylon tends to be smaller than that in 'wet' Ceylon.

In 'dry' Ceylon, the type of irrigation practised also affects the size of villages. The 1 inch to the mile map of the island shows that the districts of Mannar, Mullaittivu and Puttalam are dotted with small tanks which can only store enough water to irrigate a small patch of land. In Anuradhapura and Trincomalee, large tanks such as Kalawewa and Padiwewa are more common; these are capable of irrigating much larger tracts of country. The percentage of villages with less than 50 people in the districts is as follows:-

<u>District</u>	<u>Type of Irrigation</u>	<u>% of villages with less than 50 people.</u>
Mullaittivu	small	69
Mannar	tank and	51
Puttalam	channel	45
Anuradhapura	large tank	38
Trincomalee	and long yodiela.	29

The type of irrigation adopted in each district must have been dependent upon the configuration of the land and upon the amount and distribution of rainfall. In Anuradhapura and Trincomalee the yearly rainfall is, for example, greater than in Puttalam, so that larger tanks are needed to store this water. The size of villages in dry Ceylon depends therefore, upon fundamental geographical conditions.



N.B. Concentration of towns in south-western Ceylon (the estate country.)
Great size of Colombo relative to other towns in the island.

In every part of Ceylon, the size of villages has been affected by the development of communications. ^{Reference has been made to} ~~lack of the~~ ^{bad} ~~good~~ communications has been referred to as a cause limiting the size of settlements in Uva and Sabaragamuwa. The growth of villages situated at main road or railway junctions may most easily be observed in the Western Province, in which there are 398 villages with a population between 500-2000. A good example of a large village at a road-junction is ~~the~~ ^{the} Avissawela, in Colombo district, situated at the junction of main roads from Colombo to Kandy, and Kegalle to Ratnapura, and having 1,624 inhabitants. ^{the traditional occupation of} Taking Ceylon as a whole, the typical settlement appears to be the fair-sized village. There are only 100 towns of over 2,000 inhabitants in the island, but there are 2,770 villages with 50-100 inhabitants, and 6,171 villages with 100-500. Even the towns are small, and there are few really large urban centres. The only towns with a population over 20,000 are Jaffna, Galle, Kandy, Moratuwa, Mt. Lavinia and Negombo, while Colombo passes the 200,000 mark. The large village is the type of settlement most usual in prosperous agricultural areas such as Ceylon, and it is interesting to examine the factors which have caused the seven towns mentioned so far to outstrip their fellows in point of size. ^{the most fertile} At the head of the list of towns stands Colombo, with, in 1921, a population of 244,163. Jaffna, next in rank, has only 42,436 inhabitants, so that Colombo is a giant among Ceylonese towns. It is the chief port of the Island, the collecting centre for the products of the whole country, the

distributing centre for the island's imports, as a port, it has international as well as domestic importance, and is the only manufacturing town of any size in Ceylon. Its role of manufacturing town is, however, strictly subordinate to its development as a port, for the hinterland of Colombo produces mainly foodstuffs, exported after very little preparation, not raw materials which might be manufactured at the port, as Deccan cotton is in Bombay, wholly manufactured articles, rather than raw materials for manufacture are imported, too, possibly because there is no fuel or metal available for manufacture in Ceylon, ^{or} because the traditional occupation of the Ceylonese is agriculture, not ^{manufacturing} industry, and in consequence occupation statistics show that the greatest number of people in Colombo are employed in transport service connected with the trade of the port, or as ^{therein} merchants, not as workers in mills and factories. The size of Colombo can [^] best be accounted for by considering the factors which have made it a great port. [^] In previous chapters it has been shown that Ceylon is primarily an agricultural country, with few manufactures, and that many of its agricultural products, like tea, are grown not for home consumption but for export. The planting districts, where these crops are grown, are the most fertile, best watered, and generally best developed parts of Ceylon; there is, therefore, a large surplus of agricultural products for export. In 1927, the quantities and values of the chief exports of Ceylon were as follows:-

1. Including deerskin accounts, coffee and cardamom
2. Including fresh coconuts, coco yams and yams, brussels and other fibre, coconut fibres
3. The percentage of tea and rubber relative to that of other exports of Ceylon, as a slight commentary on the relative importance of the planting industry to the island

<u>Article</u>	<u>Quantity</u>	<u>Value in rupees.</u>
Tea	227,037,856 lbs.	213,774,632 ^{5.}
Rubber	125,062,578 "	119,174,347 ^{5.}
Major coconut products ^{1.}	3,528,140 cwts.	68,894,135
Minor coconut products ^{2.}	773,690 "	7,471,416
Cinnamon	42,415 "	4,786,243
Arecanuts	118,278 "	3,001,268
Cacao	9,049,339 lbs.	2,747,247
Plumbago	257,686 cwts.	2,525,700

For an island the size of Ceylon, the volume of export trade is very large, and it should be noted that the four chief exports are all heavy and bulky products, needing heavy tonnage for their shipment. A large port or series of ports, is obviously needed to deal with the export trade of the island.

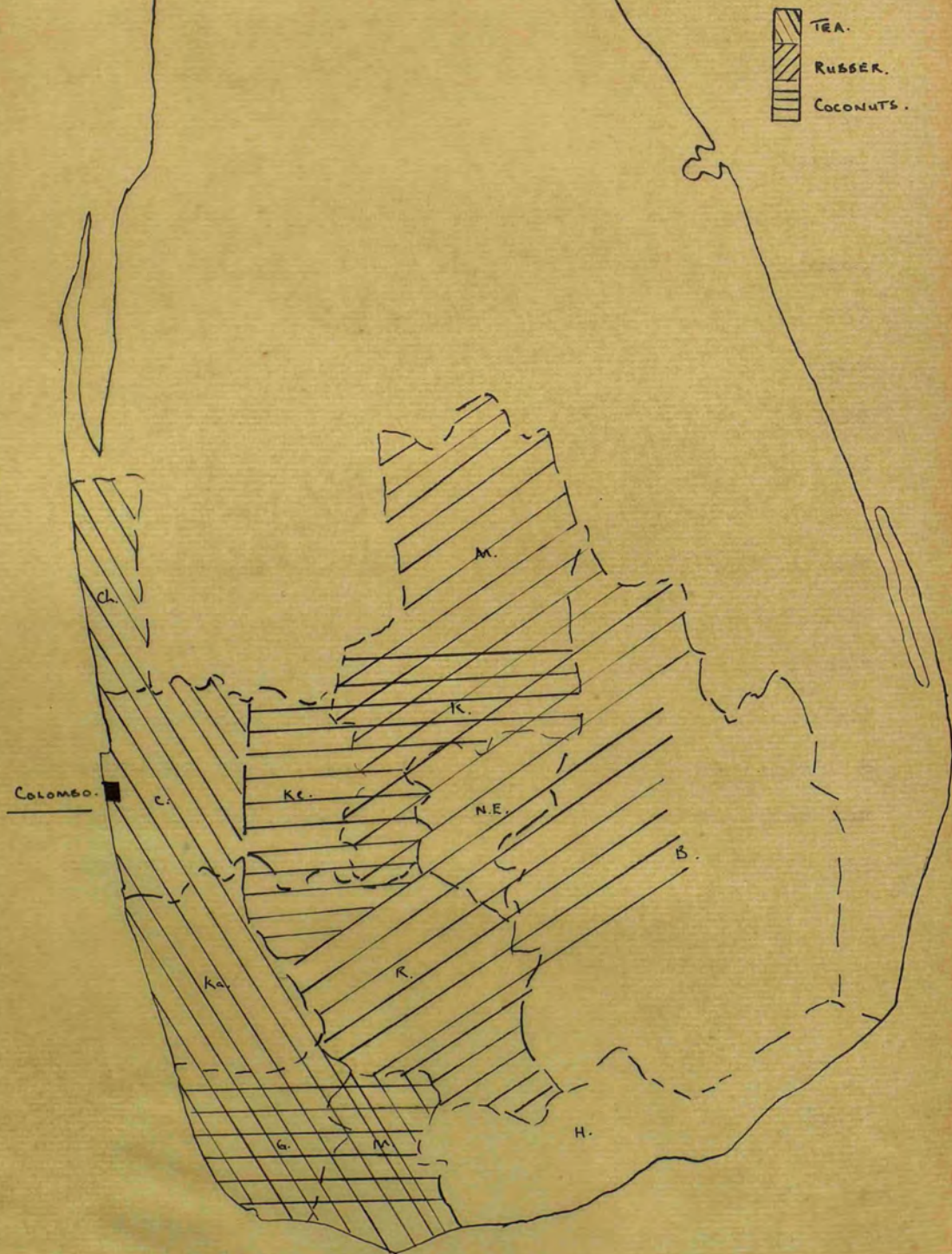
Moreover, a large proportion of the island is devoted to raising crops other than foodstuffs. 31.1% of Ceylon is under cultivation, and of this, only 7.9% is under rice, the chief food-crop. The accompanying graph, on which are represented the percentage of land cultivated, and the percentage under paddy in each district, shows that in many districts e.g. Colombo, Kandy and Chilaw, the percentage of land under paddy is very small compared with the total land under cultivation. The three districts quoted are among the most densely populated of Ceylon, and the amount of paddy produced in each must be totally inadequate for the needs of the population. The graph shows that in some areas, e.g. Mullaitivu, Batticaloa, Trincomalee, the percentage of land

1. Including desiccated coconuts, copra and coconut oil.
2. Including fresh coconuts, coir yarn and rope, bristle and mattress fibre, coconut husks.
3. The great value of tea and rubber relative of that of other exports of Ceylon, is an eloquent commentary on the importance of the planting industry to the island.

under paddy is very nearly equal to the total percentage of land under cultivation, so that it would not be true to say that in no part of Ceylon was enough paddy produced for local needs. But in the provinces in which plantation products occupy most space, e.g. in the Western, Central, Southern and North Western provinces, the amount of paddy grown locally is not nearly sufficient for the population. In consequence, while some of the paddy needed in Ceylon is home-grown, a large proportion of this grain has to be imported. In 1927, the acreage under paddy in Ceylon was 834,000; to this was added 104,000 acres under other grains. No exact information as to the quantity of grain produced in Ceylon is available, but assuming the yield of the paddy fields in the island to be nearly that of similar fields in Java, the quantity of paddy grown in Ceylon must be about 14,000,000 cwt. In 1927 9,087,264 cwt. of rice and 944,714 cwt. of other grains were imported, so that the amount of rice alone imported was nearly three fifths of the amount grown. Moreover, there are other foodstuffs, notably sugar, of which Ceylon produces only a very small quantity. In 1927, 1,057,046 cwt. of sugar was imported. The import trade of the island in foodstuffs is, therefore, very large.

Further, manufactures are little developed in Ceylon. Raw materials, such as coir, produced locally, are partially manufactured in the island, but the manufacture of universally necessary articles, such as cloth, implements and metals ware is very restricted. Manufactured articles generally, as well as foodstuffs and fuels, have, therefore, to be imported. In 1927 the value of the imports of Ceylon, including manufactured articles and foodstuffs, was Rs. 406,663,799. Adding exports and imports together, the total value of the trade of Ceylon

RELATIONSHIP OF COLOMBO
TO THE PLANTING COUNTRY.



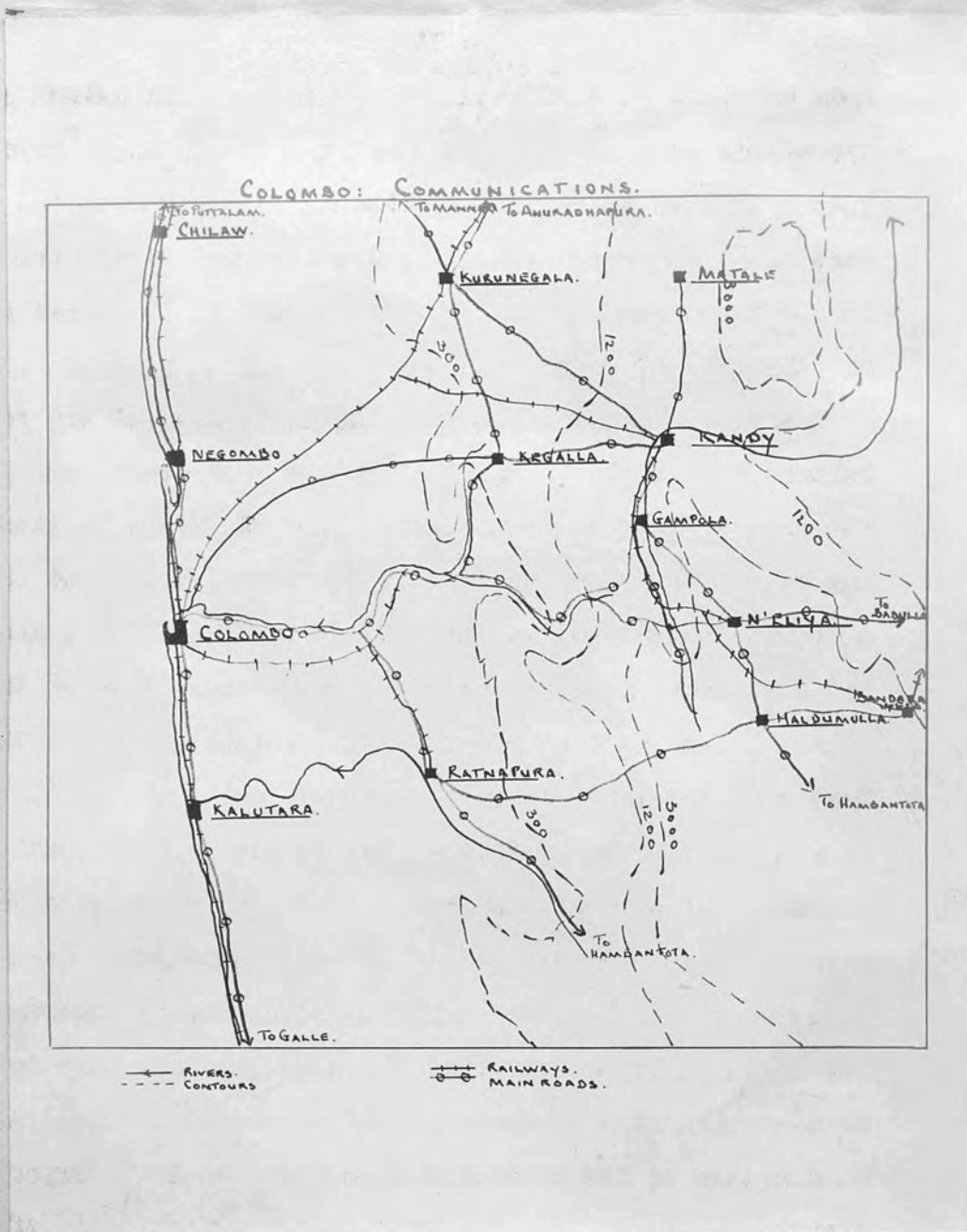
N.B. Central position of Colombo with regard to chief planting areas.

in 1927 was 8,798½ lakhs of rupees. It is obvious that port facilities are need^{ed} to handle so valuable a trade; it remains to be seen why the bulk of this trade passes through the one port of Colombo.

The chief reasons for the concentration of Ceylon's import and export trade at Colombo are, first, its facilities for collecting the products which are to be exported, and in return, distributing imports to the areas in which they are most needed, secondly, its relation to the countries which are the chief buyers of Ceylon's produce, and suppliers of the island's needs, thirdly, the fact that there is no other possible site for a port along the west coast of Ceylon, and finally, that its natural advantages for handling shipping have been greatly improved by artificial harbour-works, so that it has become the safest and best-equipped port in the island.

In estimating the facilities of Colombo for acting as the chief collecting and distributing centre of Ceylon, it must be remembered that all the exports, with the exception of arecanuts, and the products of the west, south and centre of the island. The accompanying map shows that Colombo occupies a nearly central position in the tea, rubber, coconut, cinnamon and plumbago-producing country. An examination of a relief map further shows that it is very easy to reach Colombo from all parts of 'wet' Ceylon, for to the east of it lies a broad, flat plain, offering, since the marshy parts of it have been drained, no obstacle for road and railway building. From there, the Kelani and Kalu Ganga valleys, and the gap in the hills west of Kandy, lead far into the central highlands.

For the value of these valleys, see footnote to p. 52.



N.B. Well-developed system of communications between Colombo and planting districts in Central Highlands.

From no other part is such a large part of the island easily accessible as from Colombo, it is not surprising, therefore, that a network of roads and railways radiates from it, and that along these routes the products of wet Ceylon are brought to the port, and imported foodstuffs and manufactured goods are distributed from it.

Another factor increasing the importance of the port of Colombo is that it is situated on the west coast, and it is the west with which most of the trade of Ceylon is done. This has been true since the days of the Arabs, who found the cinnamon they wanted in the west of Ceylon, and who also found the west coast harbour easier to reach than those of the east coast during the stormy south-west monsoon season. The fact that the west coast is the most easily accessible coast is not as important now as it was in the days of boats of small tonnage, but even if the modern trade of Ceylon were not mainly with the west, the fact that the west coast ports developed early might enable them to retain considerable importance, for it is an axiom that when trade routes have once developed in a certain direction, they tend to remain in it. An examination of the countries purchasing Ceylon's exports reveals clearly, however, that the bulk of the export trade of Ceylon is still done with the west. The following figures show the percentage of the total exports of the island taken by the first thirteen countries in the list of purchasers in 1927.

both Ceylon's import and export trade than an east coast port, and though this factor might not be very important of itself, for the distance between the east and west coasts of Ceylon is

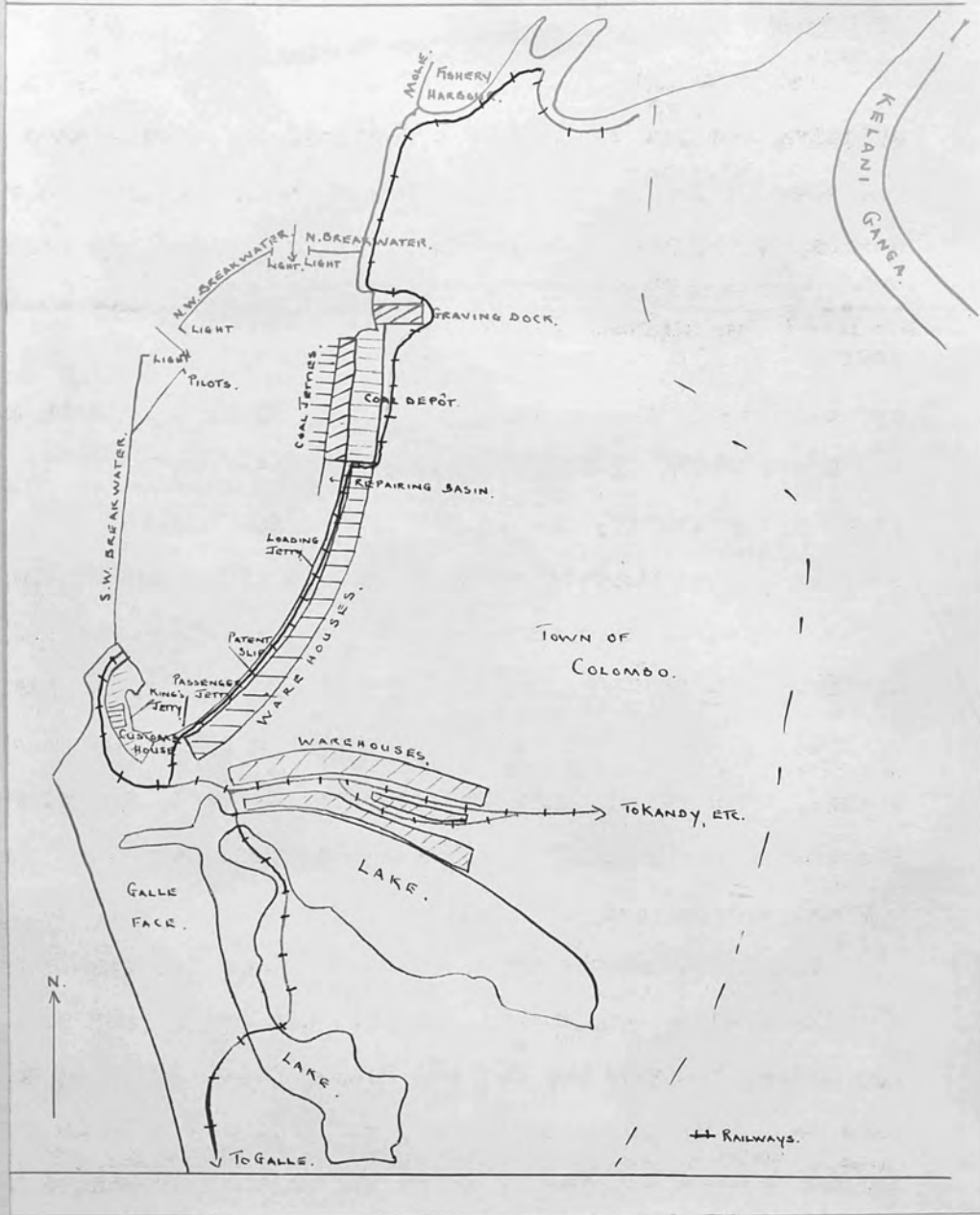
<u>Country</u>	<u>% of total exports taken.</u>
U.K.	42.96
U.S.A.	23.04
Australia	5.13
Germany	4.91
Italy	2.52
Br. South Africa	2.05
Br. India	2.05
New Zealand	1.93
Egypt	1.66
Canada	1.51
Denmark	1.43
Norway	1.37
Holland	1.15

All but three - Australia, British India and New Zealand, are connected to Ceylon by routes which lead westwards from the island. A port on the west coast is, therefore, best fitted to handle traffic destined for them. Similarly, the imports of Ceylon are chiefly derived from British India through the port of Bombay, which sends wheat and cotton to Ceylon, from the U.K., the U.S.A., Germany and other European countries, though countries lying to the east of Ceylon, such as Burma, Java, Sumatra, the Straits Settlements and Japan have a much larger proportion of the import than of the export trade of Ceylon. Still, on the whole, a port on the West coast is more conveniently situated to handle the bulk of both Ceylon's import and export trade than an east coast port, and though this factor might not be very important of itself, for the distance between the east and west coasts of Ceylon is

small, it does reinforce the position of the west coast ports, which have already been shown to be closer to the areas of supply and demand and to have been developed earlier than those in the east.

On the west coast, Colombo occupies the only possible site for a harbour, and it is this factor which enables it to control in so marked a fashion the whole trade of the island. It has been shown that the total trade of Ceylon is large, and that it naturally flows to the west coast. An examination of the west coast shows why there is only one port along its whole length. Like all the coasts of Ceylon, the west coast is regular and almost unbroken. Actually, it has three marked irregularities, three lagoons cut off from the open sea by south-north growing sand spits built up by the currents during the stormy south-west monsoon season. These are Puttalam lagoon, Negombo lake and the lagoon which formed the nucleus of the harbour of Colombo. Ports grew upon each of these lagoons, but only one became great, because Puttalam lagoon has a very shallow opening, and the immediate hinterland of Puttalam is singularly unproductive owing to drought; and Negombo lake, as its name implies, became completely cut off from the sea. The lagoon on which Colombo harbour was first built is the smallest of the three indentations, and is very shallow because it is filled up by the silt brought down by the Kelani Ganga. But the sand spit to the west protects the harbour during the south-west monsoons, and the Kelani Ganga valley renders access to a fertile hinterland easy. It was, therefore, the best possible site for a harbour on the the west coast, from Jaffna in the north to Galle in the South.

DIAGRAM OF COLOMBO HARBOUR.



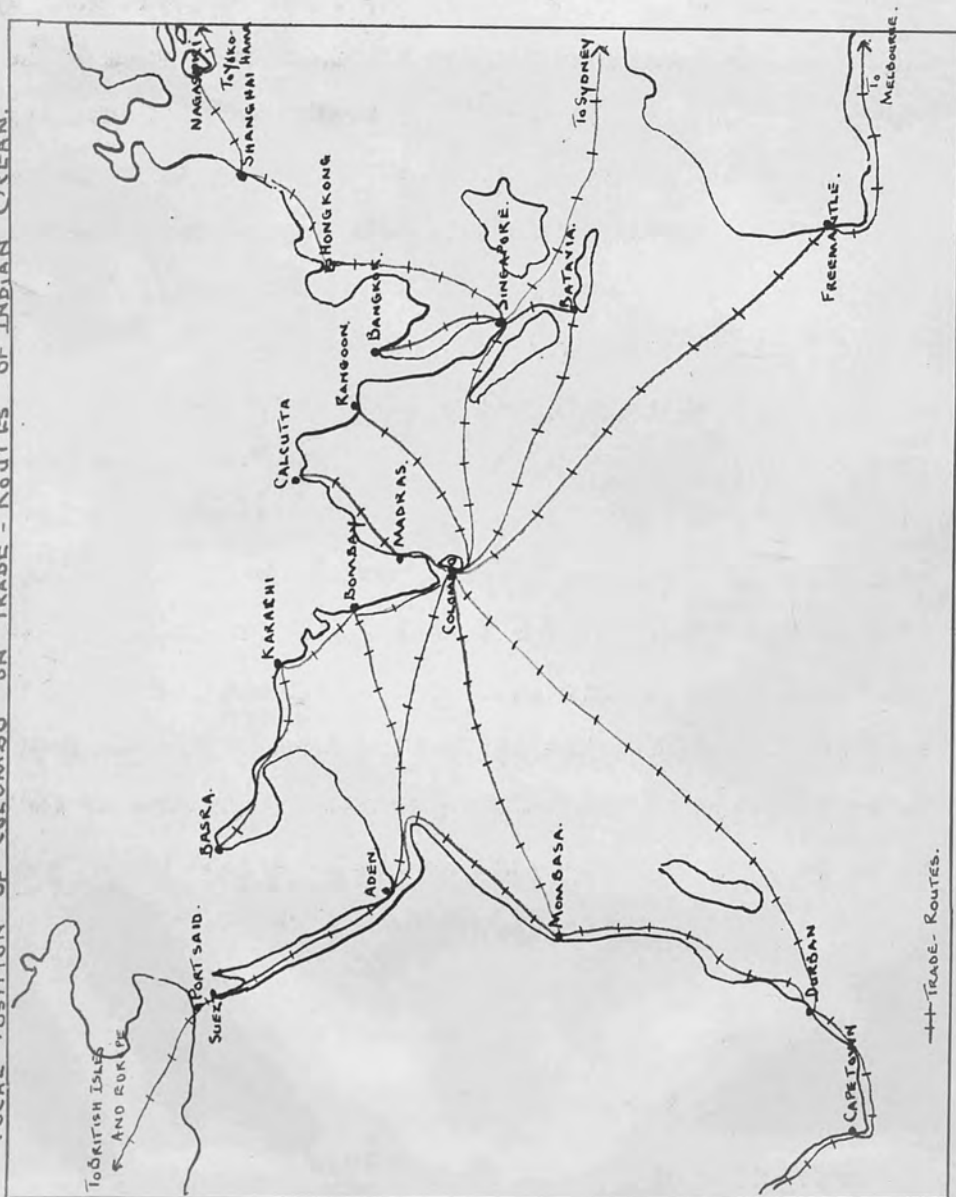
N.B. Extension and protection of harbour by breakwaters. Efficient arrangements for accomodating ships, storing and transporting goods.

Neither Jaffna nor Galle was central to the productive ^a port of the island, so that Colombo naturally became the chief port of Ceylon.

And although its natural facilities for sheltering shipping are not great, the efficiency of Colombo as a port has been increased by money spent on building protective breakwaters, which have enabled the port to spread into deep water south of the lagoon, on providing deep-water quays and dry docks, facilities for bunkering (with coal or oil) and warehousing goods, and on dredging the harbour. Colombo harbour now has a width of 800 ft. at its entrance, a depth of 57 ft at the entrance, and ^{of} 33 ft. at the six berths. It can, therefore, accommodate boats of over 20,000 tons. There are extensive warehouses, a graving dock, and three recently equipped oil jetties. No other port in the island has any wharves, piers, docks, or facilities for bunkering oil-burning ships. The recent harbour improvements have, therefore, increased the tendency for the whole trade of Ceylon to flow through the port of Colombo.

But the domestic trade of Ceylon does not wholly account for the size of Colombo. Its position south-east of India and midway between the Far and Nearer East, seems to have made Ceylon an emporium in very early times. It is reputed to have been the point at which the Chinese exchanged their products for those of India in far off days, and it is known to have been visited by Arabs from the Persian Gulf, bent on exchanging European goods for those of the islands and of China. Now, Ceylon lies midway along the Suez route from Europe to the Far East and Australasia, so that ships from

Focal Position of Colombo on Trade - Routes of Indian Ocean.

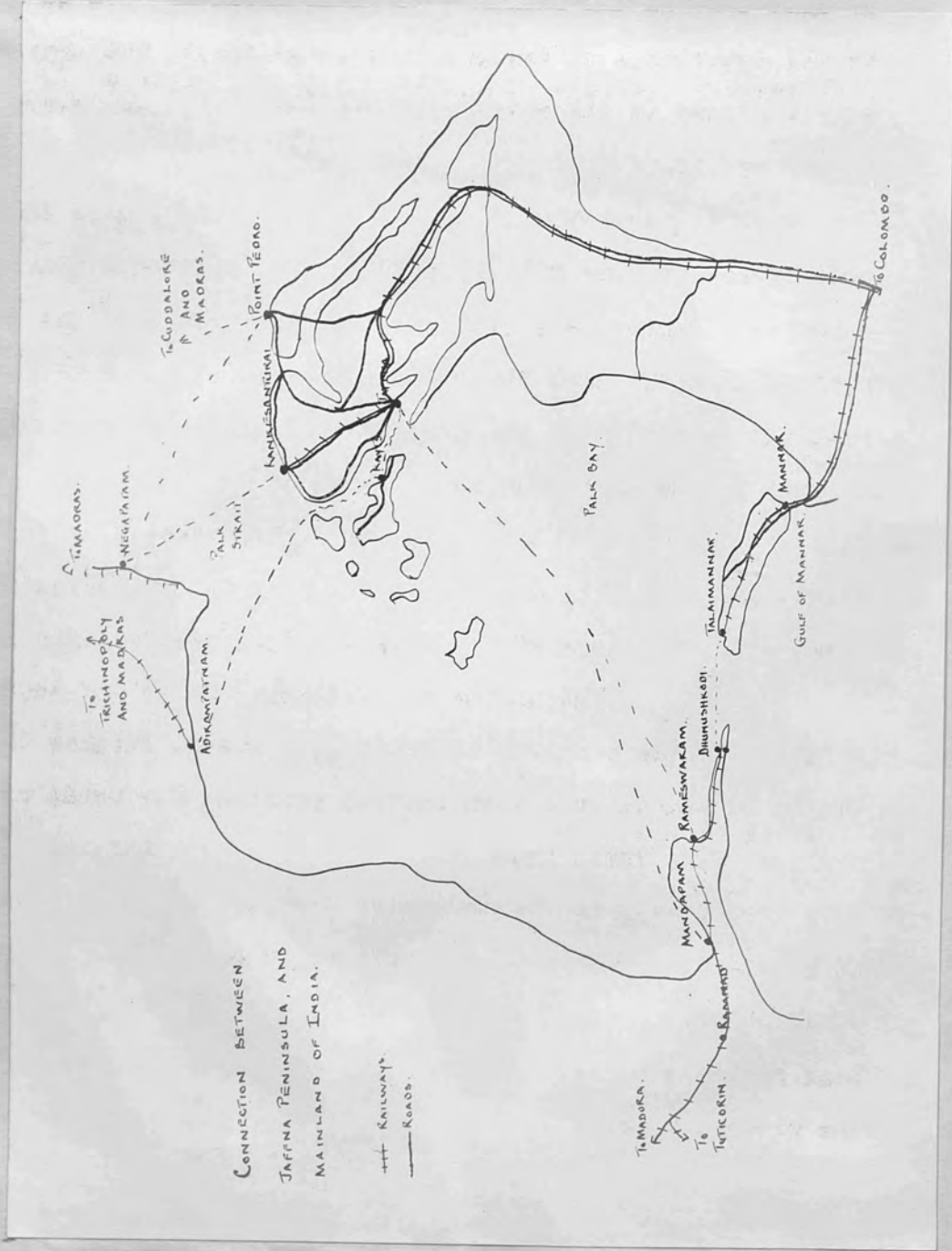


N.B. Concentration of routes from Europe, Near and Far East, Africa and Australia on Colombo.

Europe and America, the Far East and Australasia, naturally converge upon Colombo, the chief port of the island. In 1927, re exports transhipped in the harbour of Colombo from the United Kingdom, British India, the United States, the Maldivé Islands, the Straits Settlements, France and Germany, were valued at Rs.18,052,160. This branch of the trade of Colombo is not nearly as important as the domestic trade of Ceylon, which was valued in 1927 at Rs.854,399,439, for Colombo is overshadowed as an emporium by the near neighbourhood of Singapore, but its position on ^{one of} the main east-west trade routes of the world materially increases its prosperity.

Since the volume of trade of Ceylon is so large, and since it is concentrated in Colombo, upon which trade-routes from other lands converge, it is not surprising that Colombo should be by far the largest town in Ceylon. Nor is it strange that other towns should have grown up in proximity to the chief port. Negombo, Moratuwa, and Mt. Lavinia, all on the coast within twenty miles of Colombo, are examples of towns with over 200,000 people which have grown up under the shadow of Colombo. All three are collecting and manufacturing centres dependent upon the products of the coconut plantations, and each has a considerable coast wise trade with Colombo. As no information is available about their particular industries, it is impossible to account for their growth more fully than by reference to the fertile areas in which they are situated, which provide raw material for manufactures such as that of coir-rope, and to their nearness to Colombo, which may supply other raw materials, e.g. cotton, to their factories. The

N.B. Advantageous position of Jaffna peninsula for trade with mainland of India.



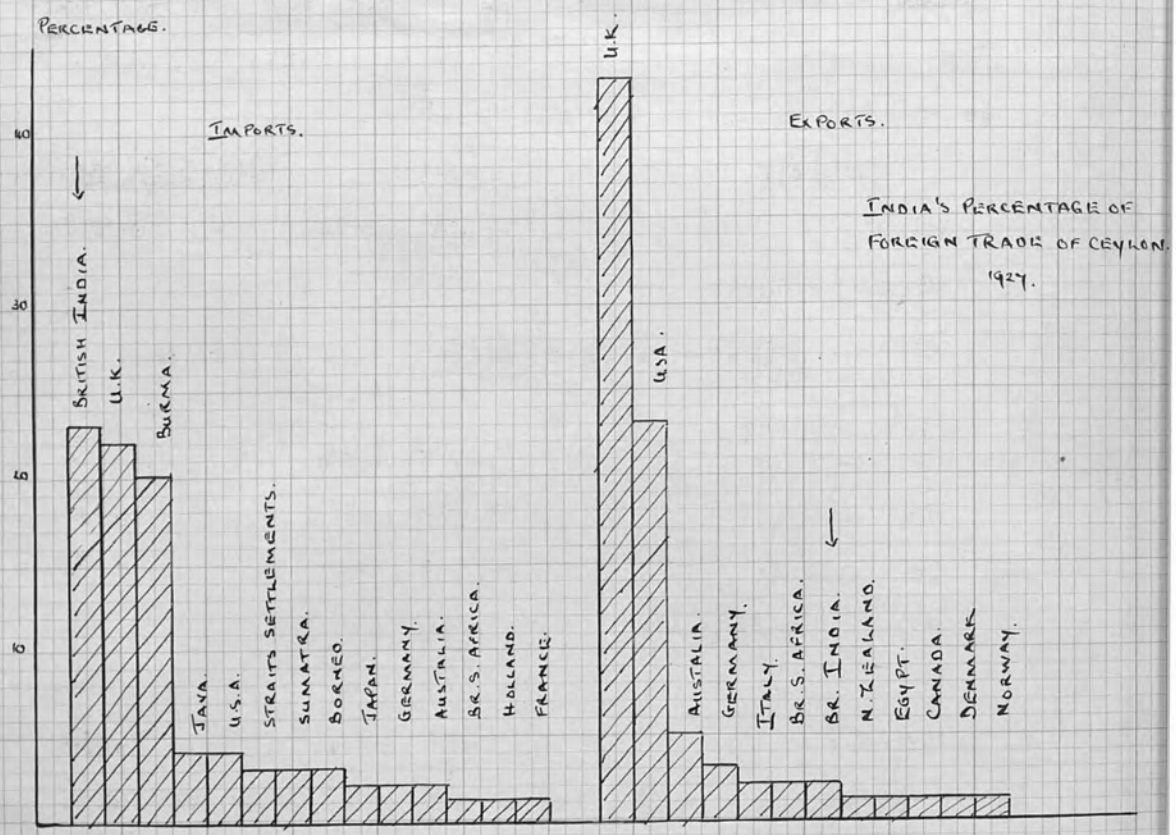
445 ships enter it and depart from it during the year. growth of smaller industrial areas dependent upon the imports of a great port is a common phenomenon the growth of Port Sunlight in dependence upon the oil imports of Liverpool may be cited as an example and it is probable that a similar explanation accounts for the growth of Negombo, Moratuwa and Mt. Lavinia. These can be regarded in some measure as suburbs of Colombo, a further proof of the pre-eminence of that town in the island. Nothing which appears to add to the importance of Colombo is extraordinary, but what is extraordinary is the great gulf between it and any other town in the island. This is particularly true of Jaffna, the second largest town in Ceylon, but with 201,727 fewer inhabitants than Colombo. Jaffna is situated to the south-west of the peninsula which forms the most northerly extension of the mainland ^{of} Ceylon in the direction of India, on a channel between the mainland and the islands of Karaitivu and Velanai. It has an extensive and well-protected waterfront, and is an old town which has been for centuries in touch with the ports of South-East India, particularly with Rameswaram, Negapatam and Madras. It is not actually as close to the mainland of India as Mannar, further South, but it is placed in a more central position for trade with the whole of S.E. India from Tuticorin to Madras. Ceylon lies immediately in the shadow of Southern India, separated from it by narrow easily navigated strips of water from 20-60 miles wide, yet the largest town in northern Ceylon, and the one most favourably placed for traffic with the great country to the north west of it, has only 42,436 inhabitants, and only

445 ships enter it and ports close to it during the year.

The explanation of the small size of Jaffna relative to what might be expected of the chief port of the part of Ceylon near to India, seems to lie in the similarity of Ceylon and South India, and the consequently small trade between the two areas.

Structurally, South India resembles Ceylon. There is the same broad, flat coastal plain, and the same hilly areas, behind the plain, exemplified in India by the Annamalai and Nilgiri Hills. Climatically, the sameness of the two areas is just as marked, for in South India there ^{are} is the small range of temperature, the high yearly average, the seasonal winds and the heavy rainfall, derived partly from the south-west, and partly from the north-east monsoon, which are characteristic of Ceylon. The yearly rainfall in S. India is in most places slightly, and in some places much smaller than the Ceylon average, but the yearly average in Northern Ceylon is smaller than the average for the island, so that the two adjacent areas correspond in this respect also. The typical crops of both are similar, in the lowlands of S. India rice is the chief crop, intermingled with sugar, curry stuffs, vegetables and fruits, while in the hills, tea takes first place. Like Ceylon, South India is mainly agricultural, but it grows a larger proportion of foodstuffs with which to feed the dense population of Tamil people who are akin to the people of Northern Ceylon in race, and who occupy the land of S. India in rather greater numbers than it is able to support, than Ceylon does.

When the chief buyers of Ceylon produce were listed, with reference to the trade of Colombo, it was noted that



N.B. large percentage of imports furnished by India; small percentage of exports taken by India.

India purchased very little from Ceylon. The plantation products which form the bulk of Ceylon's exports can be grown in Southern and Northern India, and India has no need to import them in consequence. But India heads the list of countries supplying Ceylon's needs, and it might be imagined that a large town would grow up where Jaffna is situated, to deal with imports from India. When the articles sent from India to Ceylon are examined in detail, they are seen to consist mainly of the following:

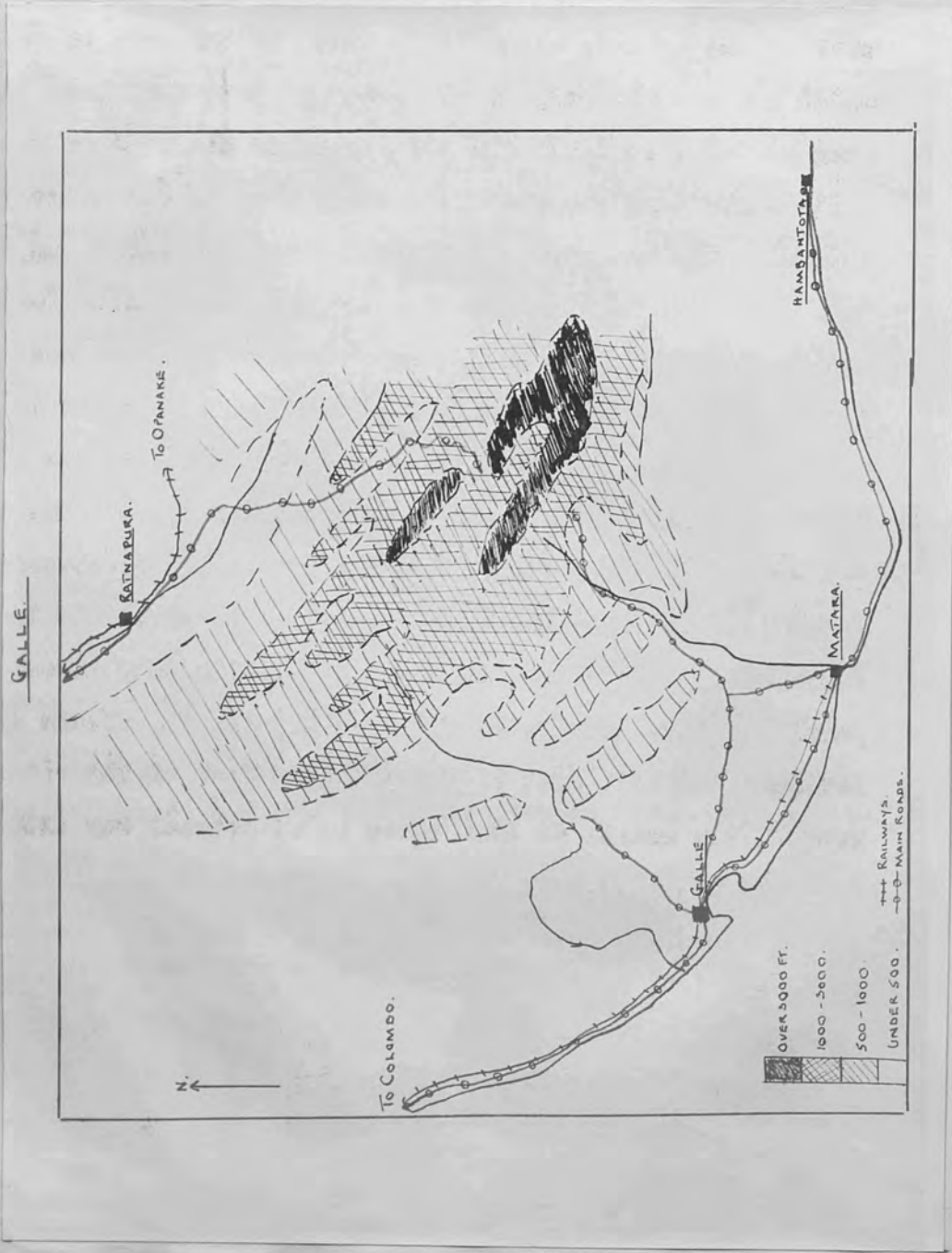
Article	Quantity	Value in rupees (1927)
Rice	1,899,281 cwts.	18,992,810
Wheat products	76,627 "	-
Feeding stuffs for animals	382,966 "	-
Manufactured tobacco	75,687 lbs.	-
Raw Cotton	23,670 "	1,094,121
Cotton yarn	15,871 "	-
Cotton piece goods	14,777,223 yds	-
Coal	337,400 tons	-
Manures	994,656 cwt.	5,354,524

Of these, a proportion of the total rice imports and the whole of the manufactured tobacco, probably come from South India, the other articles come from lands behind the northern ports, e.g. raw cotton, ginjelly and ground nuts forming the basis of animal foods and manures from behind Bombay, which can trade more easily with Colombo than with Jaffna for the former is more easily accessible from the open sea. The trade between South India and Northern Ceylon is, therefore, small in spite of the close proximity of the

two areas. Rice, manufactured tobacco, curry-stuffs and indentured Tamil labourers going from crowded South India to work on the Ceylon plantations, come into Ceylon by way of Jaffna or ports close to it, and the products of Northern Ceylon, chiefly unmanufactured tobacco and shark shells, are sent to India through Jaffna. The total trade between the two areas is sufficient to account for the fact that Jaffna, which is most advantageously placed for trade with South India, ranks next to Colombo, but it is not large enough to warrant the growth of Jaffna to anything approaching the size and importance of Colombo. What is true of the limited size of Jaffna to-day has probably been true all through the history of the island, for the town does not appear to have been very important at any period except when Northern Ceylon was politically subject to South India, at which time the whole trade of the island was deflected to the shores of the conquerors.

In contrast to Jaffna, which is probably more prosperous now that Ceylon needs more imported foodstuffs and labourers supplied from South India than at any time in its previous history, Galle, once rivalled Colombo, though it now ranks only as third town in the island. Even in 1871, the date of the first census, when Colombo had already taken the lead among island towns, Galle had a population of 47,945 persons, while in 1921 it had fallen to 39,073. The reasons for the decline in the population of Galle appear to be, first, the change in the chief products of Ceylon which has taken place since the Dutch occupation, and the relationship of Galle to the present planting districts, and secondly, the loss of

N.B. Difficult hill-country separating Galle from planting districts in centre of island. Poor development of communications in area.



trade due to the improvements made to Colombo harbour in the last decade. ~~as the road has to be carried up ridge and down~~ When Galle was the chief port of Ceylon, throughout the period of the Sinhalese kingdom and the Portuguese occupation, the chief products of the island were cinnamon and citronella. Both grew wild in the low hill-country in the south-west, and when it became necessary to plant them, the cinnamon and citronella ^{an} plantations were made in the south-west of the island, within easy reach of the port of Galle, which had the monopoly of the trade in both articles. As long as these remained the most valuable products of Ceylon, Galle maintained its position as chief port, and consequently largest town, but when the Dutch introduced coffee, and, later, tea became the crop of greatest value, Galle lost its pre-eminence, for the hill-country behind the port was too low for the new crops, and the central hill-belt was inaccessible from the south-west. It was noted in the chapter on the Central Province and Sabaragamuwa that the ranges of the Ceylonese highlands run in a south-east - north-westerly direction, and that the highest part of the hills is in the south-west. No river has cut a valley directly across the parallel ridges that lie behind Galle, all the rivers of the Southern Province rise in the southern face of the ridges nearest the coast, so that there is no natural way into the heart of the highlands from the south-west coast. But though there is no river running across the system of ridges, there are many running in the valleys, generally opening north-westwards away from Galle, between ridge and ridge, and a road builder attempting to make a road from Galle to

the tea growing district is confronted by a series of very steep gradients, as the road has to be carried up ridge and down valley again and again. Hiniduma, a town in this area, records a yearly rainfall of 177 ins. distributed fairly evenly throughout the year, with no really dry season, and this heavy rainfall, falling on a steeply-sloping surface whose soils are stated to contain the highest proportion of clay in the island, must cause frequent landslides of the type occurring in the Himalayas during the rains. In such a district, roads are liable to be washed out at frequent intervals, and when climatic and topographical disadvantages are considered, it is not surprising that there is still no main road fit for wheeled traffic from Galle to the Central Highlands. Even the road which negotiates the Bulutota pass in a series of terrifying corkscrew bends deteriorates into a footpath about ten miles before reaching the main road from Ratnapura. The Central Province produces rather more than half the tea, and one sixth of the rubber exported from Ceylon, Sabaregamuwa produces nearly half the rubber and one sixth of the tea exported, these two articles are among the chief exports of the island, but the districts in which they are produced are inaccessible from Galle. When the difficulty of reaching the central hill-country from Galle is contrasted with the extreme ease of penetrating into it from Colombo, it appears certain that as the hill-country developed the trade of Galle would have declined in favour of that of Colombo, even if the improvement to its harbour had not given Colombo an added advantage for overseas trade. One

though a large percentage of the coconut products are sent

of the most productive parts of Ceylon turns its back upon Galle, it opens widely towards the west, to the rival port of Colombo. Galle is, therefore, dependent for its trade upon the products of the coastal plain and the low hills in the Southern Province.

In spite of the competition of Colombo, the trade of the port of Galle is still very considerable. Its chief exports are coconut products, rubber, tea, and citronella oil. Figures for these exports for the years 1922-1926 are given below.

Exports	1922	1923	1924	1925	1926
Coconut oil cwt.	66,318	64,481	56,699	61,061	52,337
Copra "	492,127	925,877	595,519	748,601	20,715
Coir Yarn "	68,989	168,999	97,003	108,214	88,777
Rubber lbs.	145,054	142,255	84,943	217,877	228,977
Tea "	115,877	138,804	98,579	201,495	194,762

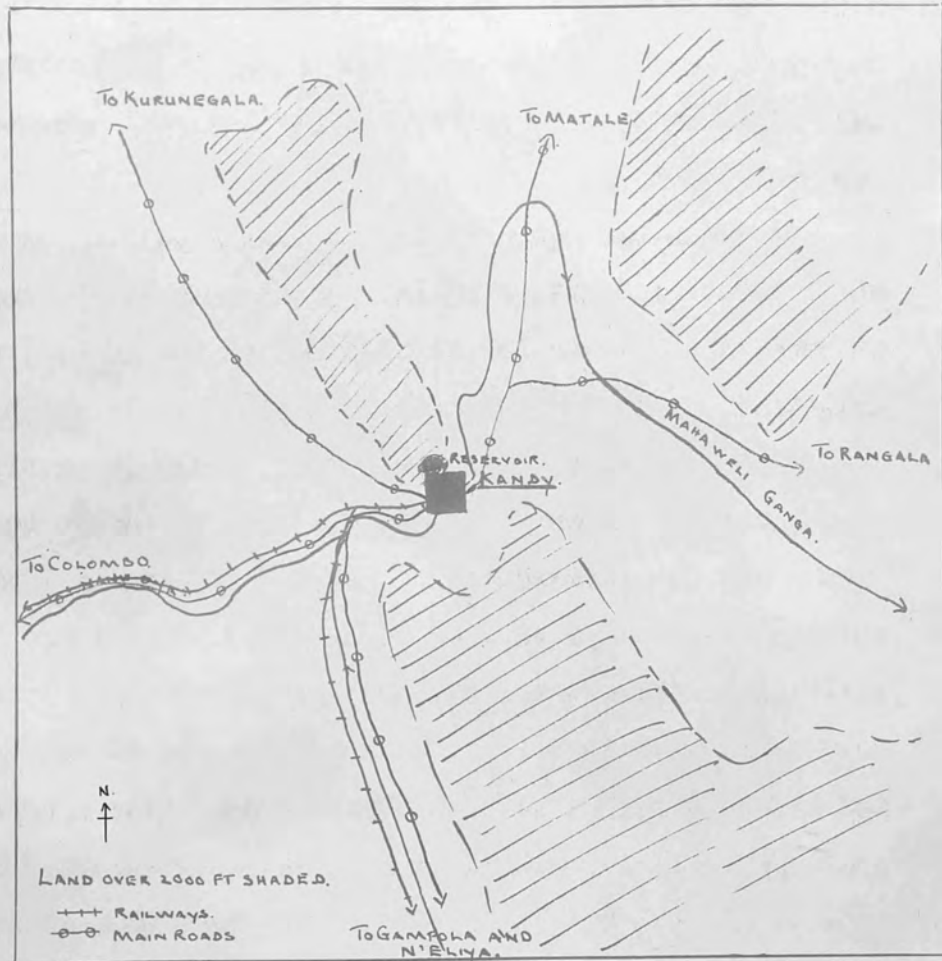
The figures show considerable fluctuations in the volume of trade going out through Galle; these may be due partly to bad rainfall years, such as 1924, when every export except coir yarn showed a decrease; partly to economic developments outside Ceylon, such as the imposition of the restriction on rubber in 1924, but on the whole they are very large. The explanation seems to lie in the fertile, well-watered, and well-developed country behind the port. 44.7% of Galle district, and 50.6% of Matara district are under cultivation, - figures nearly as high as those for Colombo, Kalutara and Kandy, and in the two districts together 25.7% of the land under cultivation is growing crops for export. Even though a large percentage of the coconut products are sent

out through Colombo, there is a very considerable surplus for export via Galle, and practically the whole tea and rubber crop of the Southern province is exported through this port. The western part of the Southern province is densely populated, Matara district having 496, and Galle 424 persons to the square mile, and though 17.0% of Matara and 12.2% of Galle are under paddy, the home supply of foodstuffs is insufficient for the needs of the population. In order to meet this need, foodstuffs, particularly grain and sugar, are imported through Galle. Figures for the imports of grain and sugar in the years 1922-1926 are given below:

<u>Imports</u>	<u>1922</u>	<u>1923</u>	<u>1924</u>	<u>1925</u>	<u>1926</u>
Grain - cwt.	492,125	660,870	694,000	767,964	942,453
Sugar "	-	1,907	1,744	7,451	12,789

The figures showing the import of sugar appear to have grown suddenly since 1925, and may not be reliable as indicating the trade of Galle in an average year, but the growth in grain import has been steady, and grain is an important item in the trade of the port. The harbour of Galle is an open roadstead very exposed during the south-west monsoon season, with no facilities for accommodating ships, in such circumstances the volume of trade done is surprising, and can only be due to the productive ness of the port's immediate hinterland, and the needs of the large population settled there. The work available in preparing agricultural products for export, and handling the port's trade, are enough to account for the assembling of 39,073 people in the town of Galle, but the fact that the port has easy access to a very limited hinterland, developed nearly to its maximum capacity, must prevent

KANDY.



N.B. Kandy's control of north-south and east-west routes; its possession of an assured water supply; ease with which town can be defended from spur to north of it.

Galle ever again rivalling Colombo in size and importance. It does not appear that Galle is losing its position as the chief port for the Southern Province, but its trade is local, while that of Colombo concerns the island as a whole, and no change in the character of the trade of Galle is likely to take place until port facilities and landward communications are much improved.

Of the seven towns in Ceylon with a population over 20,000 six are on the coast, a striking testimony to the importance of overseas trade in the development of the island, and only one, Kandy, with a population of 32,562, is in the heart of the country. Like Galle and Jaffna, Kandy is an older town than Colombo, and was originally a city of refuge for Sinhalese people against raiders from S. India. It had all the necessary qualifications of a city of refuge, being built far in the hills in forest-covered country, overlooked by a spur from the north, from the top of which it was easy to defend the town, and provided with a constant water-supply from a series of small lakes in natural hollows on the sides of this spur. It owes its present importance to the fact that it is the great collecting and forwarding centre for the products of the central Province, Sabaragamuwa, and the planting districts of Uva. The accompanying sketch shows that Kandy is built in low hill-country between the two main masses of the central highlands, at a point where the Mahaweli Ganga and its tributary, the Nanu Gya, cut through the hill ranges from west to east, making an easy through route from Colombo via the Kelani Ganga - Mahaweli Ganga valley to Kandy and to the east coast. The town thus lies in the centre of the only

The sketch is not to be understood as a map. See sketch on p. 61.

good west-east route across the heart of the highland belt. North-west of Kandy, a small valley, sufficiently wide to carry a road, leads towards Kurumegala; north-east, the bend of the Mahaweli Ganga cuts through to Matale, and south west, the upper Mahaweli Ganga valley leads to Gampola, Nawalapitiya, Hattu^{on}, and on to Nuwara Eliya and Badulla, right in the heart of the tea-growing districts. Kandy stands, therefore, at the crossing place of north-south and east-west routes, it is surrounded by fairly low ground on which enough hill-paddy can be cultivated to support a considerable number of the labourers who handle the tea, rubber and cacao brought into the town, and west of it lies an easy route, followed by road and railway, to Colombo, to which the hill products are forwarded, and from which imported foodstuffs can be obtained. The convergence of routes from very productive country upon it undoubtedly accounts for the size of Kandy.

It is clear, therefore, that the site of each of the seven large towns of Ceylon has certain favourable geographical factors, which have enabled the town to outstrip the majority of settlements in point of size, and develop a definite function with regard to the island as a whole. Jaffna has become the northern port of Ceylon, Galle is still the southern port, Kandy is the market for the central highlands, and, because of its accessibility and good climate, the summer administrative centre of Ceylon, while Colombo combines the functions of port, manufacturing city and capital in much the same way as London, but with more than London's pre-eminence among other towns in the island.

¹ This statement must be understood relatively. See footnote pp. 41.

CHAPTER VIII.

A summary of the factors affecting the distribution of population in Ceylon.

In summarizing the distribution of population in Ceylon, two facts appear; first that Ceylon, a tropical island 25,331 square miles in area, has a population of 4,504,549, or only 178 persons to the square mile, and secondly that this population is distributed very unevenly throughout the island, the Western Province having 874 persons to the square mile, while the North Central Province has only 24.

In order to realize the significance of the average density figure, it is necessary to compare the population of Ceylon with that of some similar area. One that suggests itself as being in similar latitudes, though south of the Equator, and as having been developed partly by native agency and partly by European capital and enterprise, is Java, an island in the Dutch East Indies, with an area of 50,745 sq. miles, and a population of 30,098,008 at the census of 1921. The average density of population in Java is 689.4 persons per sq. mile, four times as many as in Ceylon, and if the two areas are contracted with a view to finding an explanation of the different population figures, the factors encouraging and limiting the growth of population in Ceylon can be clearly seen.

The most obvious difference between the two islands is their relationship to the mainland of Asia. Java lies about five hundred miles distant from the southern end of the Malay peninsula, about six times as far from the mainland as Ceylon, which is in close proximity to Southern India, and it was this

factor which determined the relatively uneventful history of Java. The island was settled at an unknown date by people of Malayo-Polynesian stock, and visited at intervals after the 5th Century by traders from India, some of whom settled permanently in the country, and modified its civilization considerably, but Java does not appear to have suffered any considerable invasion or interruption of its progress by war until the coming of the Dutch in the XVIIth Century. By contrast, it has been pointed out that Ceylon lay perilously near to the over populated plains of S. India, and that time and again, from the XIIth to the XVIIth Centuries, it was invaded by Tamil peoples from South India, whose continued attacks were so destructive that in the north of Ceylon the practice of agriculture, the staple industry, became impossible; the country was deserted, and has never recovered from the epidemics of malaria which devastated it as a result of the wide-spread destruction of the Sinhalese irrigation tanks. The position of Java enabled it to enjoy centuries of quiet progress; the nearness of Ceylon to India was so dangerous in early days that one part of the island, and that the part in which development was naturally most difficult owing to adverse climatic factors, was permanently harmed by the contact between the two countries.

Structurally, there is a superficial similarity between the two areas. Like Ceylon, Java has a backbone of highland composed of west-east running ridges, to the north and south of which are low coastal plains built up by rivers draining down from the highlands. Geologically, however, the two islands are very different. The highland core of Ceylon is composed of old, hard crystalline rocks, metamorphised from an older series distributed throughout the year than it is in the east.

of sands and clays, into which bands of massive limestones have been intruded. These rocks are slow weathering, and form a soil lacking in elements such as nitrogen, potash and phosphorus, needed for plant food. The highland backbone of Java was originally made up of sandstones and limestones similar to those in Ceylon, but these have been breached by volcanic action, and largely covered by ^oflaws of recent lava, which weathers quickly into a very rich and fertile, if somewhat porous soil. Probably the most fundamental difference between Java and Ceylon is the difference in the quality of their soils. No detailed soil-survey of Ceylon exists, amazing as this seems in an area where rather more than half the total population is engaged in agricultural pursuits, but from information that is available, it seems certain that the soils of Ceylon, compared with those of ^{other} ~~the~~ tropical areas, are definitely poor. If this be the case, the crop yields, about which, again, there is little available information, must be correspondingly low, and the capacity of the land to support a dense population, either directly by supplying food, or indirectly by providing a money crop, lower than that of other tropical areas in consequence. One reason for the large population of Java is certainly the richness of the island's soils, and the comparatively low density of population in Ceylon may be attributed partly to the general poverty of the soils.

Climatically, the two islands differ very little. Both are monsoonal areas in which one portion of the country is better watered than the rest. The following figures, taken from a series of rainfall stations along the north coast of Java, show that in the west the annual rainfall is greater and more evenly distributed throughout the year than it is in the east.

Stations	Rainfall in inches												
	J.	F.	M.	A.	M.	J.	Ju.	A.	S.	O.	N.	D.	Total
Cheribon (Java)	17.1	14.7	14.7	8.0	5.3	4.3	2.7	0.9	1.2	2.4	6.1	14.8	92.1
Semarang	14.6	14.1	8.9	7.4	5.0	3.4	3.1	2.6	3.7	5.4	7.3	10.5	85.9
Surabaya	12.1	11.0	10.4	6.6	4.5	3.5	2.0	0.8	0.6	1.6	4.6	9.7	67.2
Probolinggo (Java)	9.3	9.7	6.1	4.0	2.5	1.8	0.8	0.4	0.2	0.5	2.4	6.5	44.0

The figures for stations in western or 'wet' Java, could be paralleled, allowing for the difference in season of maximum rainfall caused by the fact that Java lies south of the Equator, by figures from south-western or 'wet' Ceylon, Galle and Colombo approximate very closely, both in amount and distribution of rainfall, to Cheribon and Semarang. But rainfall stations like Marichchukkadi, in 'dry' Ceylon, record a lower yearly rainfall than Probolinggo, which may be taken as typical of eastern Java. In dry Java, the annual rainfall is between 40-45 ins; in parts of dry Ceylon, figures of 30-35 ins. as an average, though individual years may record rainfall much below these, are more usual. Thus, though there is a definitely dry area in Java as in Ceylon, this area appears to have more water naturally available than 'dry' Ceylon, so that, factors such as the capacity of the soil for absorbing and retaining water being neglected for lack of sufficient data, the area of land capable of cultivation without the aid of artificial watering must be greater in Java than in Ceylon. It follows, therefore, that the number of people who can be supported on the land in eastern Java must be greater than that in northern, north-eastern and south-eastern Ceylon.

The natural advantage for supporting a larger population possessed by 'dry' Java has been increased by the remarkable cultivation, crops varying from rice and sugar cane, to Soya

development of irrigation in the less well-watered parts of that island. Tropical areas which have a small annual rainfall concentrated into one season in the year are dependent for their agricultural development, and therefore, in areas where minerals are lacking, for the density of their population, upon the careful storing of water during the rainy season, and the application of this, together with any water brought down by streams from rainier districts, to the land when it is needed by the crops. In Java, the development of irrigation is so advanced that of the 41% of the cultivated land needing artificial watering, 21% is provided with permanent irrigation works, and for 6%, permanent works are under construction. The 1924 Handbook of the Netherlands East Indies, from which the foregoing figures were taken, does not state the percentage of "land needing artificial watering" which is in 'dry' Java; it is presumed that some of this land may include sawahs under rice in 'wet' Java, but as the figures are given in juxtaposition to a discussion of the development of irrigation in the dry country, it seems fair to conclude that irrigation in eastern Java has made very considerable progress. By contrast, in dry Ceylon, the science of irrigation is in its infancy. Thousands of ruined tanks and blocked yedi elas, the relics of the efficient irrigation system of the Sinhalese kings, under whom 'dry' Ceylon was extensively cultivated and densely settled, are to be found, but tanks and channels which have been restored so that they serve once more the purpose for which they were intended, might almost be counted upon the fingers of two hands. It is not surprising to find, therefore, that whereas in eastern Java, a large amount of land is under cultivation, crops varying from rice and sugar cane, to Soya

¹ One of the most obvious differences between Java and Ceylon is the fact that agricultural development in Java has been much more varied than in Ceylon. There is one reason for this, the greater fertility of Java, and may largely account for its greater population. For further discussion of this point, see Appendix 2.

bean, ground nuts, tobacco and kapok being raised, in 'dry' Ceylon the percentage of land under cultivation is very small. In Mannar district, 7.2% of the total area is cultivated; in Trincomalee, 6.3; in Anuradhapura 4.0; in Mullaittivu 3.2; and though the quantity of water available from rain and streams might not be sufficient to enable crops to be grown in the whole of 'dry' Ceylon, there is no doubt that the development of an efficient irrigation system would improve the present very low percentages of land under cultivation. Where so little land is cultivated, it follows that few people can live, for it has been shown that Ceylon like Java, is primarily an agricultural country, with few other sources of wealth, and at present no crop can be grown in northern and eastern Ceylon in sufficient quantity to support a large population. The growth of the population is strictly limited by the amount of land available for raising foodstuffs, for it has been shown in an earlier chapter that owing to the poverty of communications, the circulation of imported foodstuffs is not easy in the dry country. If this area is to develop, therefore, it is essential that an efficient system of watering and draining the land needed for food and money crops should be devised as soon as possible.

It has also been pointed out that the development of an adequate irrigation system would increase the prosperity of the dry country by lowering death from diseases of the fever group. In eastern Java, where the science of irrigation is thoroughly understood, the fever death-rate is 7 per 1000; in Anuradhapura it is 10.5, and in Hambantota 15.6, over double the rate for eastern Java. Taken as a whole, the north and south-east of Ceylon are lower than eastern Java, which may

¹ One of the most obvious differences between Java and Ceylon is the fact that agricultural development in Java has been much more varied than in Ceylon. This is one reason for the steady prosperity of Java, and may largely account for its greater population. For further discussion of this point, see Appendix D.

partly account for the higher fever death-rate, since the malarial mosquitoes breed at low altitudes, and water can more easily collect on a slightly sloping surface than in an area of more varied relief. But it is probable that the appalling death-rate in dry Ceylon is partly due to the presence of numbers of ruined tanks in which stagnant water collects, for the fever death-rate is highest in districts like Hambantota and Mullaittivu, where the number of ruined tanks is greatest. The fear of fever repels intending settlers in the drier areas, and drives out the indigenous population, a fact commented upon by the Commission for the Northern Province in the Census Report of 1921. The disease lessens the efficiency of the remaining population, and causes them to become apathetic and unprogressive. From the point of view of the health and efficiency of the cultivators it appears highly desirable that more attention be paid to problems of land drainage and water storage. Because it has a small rainfall, has suffered constant invasion from India, is at present badly provided with facilities for irrigation and is unhealthy, the dry country is underpopulated. The extent of this underpopulation can be realised when the density of population in the Northern or Eastern is compared with that in the Western or Central Provinces. In Puttalam, Anuradhapura, and Mullaittivu districts, there are 39, 24 and 13 persons to the square mile; in Colombo there are 856, and in Kandy 445. In the centre and west of the island, the density of population is as high as it is in Java, for these areas are the estate areas, producing tea, rubber, and coconuts for export, favoured by abundant rainfall, easy transport, good

communications, and closeness to India, from which an abundant supply of cheap labour can be obtained. It is the existence of what is termed the 'dry' country, with its agricultural backwardness and low population density, which accounts for the relatively small total population of Ceylon, and its low density figure compared with that of Java.

Fundamentally, the densely and the sparsely populated parts of Ceylon differ from one another in the amount and distribution of their rainfall. No other factor appears to be so potent in determining the degree and type of agricultural development, and so the density of population in the island. Northern, Eastern and South-Eastern Ceylon do not differ widely from Central and Western Ceylon in relief, for though the hill-belt of Central Ceylon, which has become the great tea-planting area, is not present in the dry country, much of the prosperous Western, Southern and North Western Provinces resembles this. Position with regard to main trade routes has partly influenced the progress of agriculture in different parts of Ceylon, but the main trade routes grew up as a result of agricultural development which was chiefly determined by rainfall. Ceylon is divided into two distinct parts according to the amount of rain which falls in the year, and the season of the fall. In the centre, west and south west, the annual rainfall is between 75-200 ins. in the year, and occurs at all seasons; in the north, east, and south east, the fall is between 30-75 ins., and is concentrated much more completely into one half of the year than in the rest of the island. As a result of this difference in rainfall regime, the whole of the surface in the centre, west and south-west can be utilised to grow food or plantation crops without

are very thoroughly explored. It cannot be determined whether,

General Development of Agriculture in Ceylon, see Appendix C.

water storage being necessary. In the north, east and south-east, crops cannot be grown extensively without facilities for irrigation, and these are ^{absent} ~~absent~~. ^{still inadequate!} It follows that in an area dependent upon agriculture, such as Ceylon, the centre, west and south west are densely populated, while the population of the north, east and south east is sparse. No account is taken in this statement of many factors, already discussed, which have determined the type and degree of agricultural development in the two halves of Ceylon, and which have, in consequence, determined the absolute density of population in each area. But as the most striking fact about the distribution of population in Ceylon is its unevenness, so the most fundamental cause of this uneven distribution is the variation in the amount and periodicity of Ceylon's rainfall.

It is doubtful whether the present sharp difference in population-density between 'wet' and 'dry' Ceylon will continue to exist. In a country such as Ceylon, where the annual rainfall is everywhere respectable in amount and fairly well distributed throughout the year, deficiencies of rainfall can be largely corrected by irrigation. As facilities for irrigation in dry Ceylon are extended, the country will become more extensively cultivated and more densely settled. Given possibilities of irrigating large tracts of land, there is no reason why the two parts of Ceylon should not become complimentary, the present 'wet' area being more and more completely devoted to the raising of plantation crops, upon which the wealth of the island depends, and the 'dry' country being devoted to growing food crops for the plantations as well as for its own population. Until the possibilities of irrigating dry Ceylon are very thoroughly explored, it cannot be determined whether,

¹ For recent developments of irrigation facilities, see Appendix C.

even if irrigation were developed to its fullest extent, the present backward areas could produce enough food to supply the whole island. That is probably unlikely, but it is certain that the demand for food in Ceylon could be much more completely satisfied from home supplies if the dry country were to be developed by irrigation, health work, and extended communications than it is now. The development of the dry country by these means might change the whole economy of Ceylon; it would certainly increase the total population of the island, and cause a radical change in the distribution of population. So much attention has been given to the problem of the dry country by recent Commissions, that the time for its systematic exploitation cannot be long distant. The present distribution of population in Ceylon is due to geographical factors, discussed in foregoing chapters, among the chief of which are position with regard to the mainland of Asia, and to world trade-routes relief, soils, and climate. The distribution of population in the future, in so far as it is radically different from that of the present time, will depend upon the capacity of the inhabitants of Ceylon to regulate to their own advantage the geographical factors which are unfavourable to the close settlement of part of the island.

	Musal	66	.2	
	Jaffna	Tanukhari- Yunukhai	72	.2
	"	Karalchchi	28	.2
North	Kachchitota	Nagas Pattu	610	.9
"	"	Siruma West	176	.7
"	"	" East	74	.6
"	Kotara	Wallaboda	5	.1

Appendix A. No. of Tanks in each district in Ceylon.

<u>Province.</u>	<u>District</u>	<u>Division</u>	<u>Total no. of Tanks.</u>	<u>No. of Tanks per sq. mile.</u>
North Western	Kurunegala	Wanni	1048	2.0
"	"	Dewameddi	273	1.4
"	"	Hirigala	294	.8
"	"	Katugampola	248	.7
"	"	Weudawili	15	.08
"	Puttalam	Demala	543	1.2
"	"	Puttalam	90	.6
"	"	Kalpitiya	44	.1
"	Chilaw	Pitigal South	57	.5
"	"	" North	42	.2
North Central	Anuradhapura	Kalagam	560	1.8
"	"	Hurulu	948	.8
"	"	Huwaragam	831	.6
"	"	Tamankaduwa	256	.2
Northern	Mullaittivu	Vavuniya South	421	1.0
"	"	" North	459	.8
"	"	Maritime	24	.05
"	Mannar	Mantai	417	.6
"	"	Musali	66	.2
"	Jaffna	Panukkari-Tunukkai	72	.2
"	"	Karaichchi	28	.2
Southern	Hambantota	Magam Pattu	610	.9
"	"	Giruwa West	176	.7
"	"	" East	74	.6
"	Matara	Welleboda	5	.1

<u>Province</u>	<u>District</u>	<u>Division</u>	<u>Total No. of tanks.</u>	<u>No. of tanks per sq. mile</u>
Uva	Badulla	Wellawaya	635	1.0
"	"	Buttale	378	.4
"	"	Bintenna	94	.2
"	"	Wellawassa	27	.03
Eastern	Trincomalee	Kaddukulum West	315	1.0
"	"	Dewamedi	138	.4
"	"	Damgadeni	63	.2
"	Batticaloa	Panawa	160	.4
"	"	Bintenna	136	.2
"	"	Eravur	121	.2
"	"	Akkarai	65	.2
"	"	Sammanturai	46	.2
Central	Matale	Matale North	169	.4
"	"	" East	67	.2
Northern	Ratnapura	Kolonna	14	.08

Year Total Population Increase % on figures of previous census.

1871	2,405,576	-
1881	2,763,984	14.9
1891	3,012,224	9.0
1901	3,573,333	18.8
1911	4,119,367	14.9
1921	4,504,549	9.5

It is obvious that the rate of increase in the total population corresponds closely with the rate of increase in the number of Tamils in the island. The variation in the number of Tamils entering and remaining in the island depends upon the state of the planting industry. Thus, in the decade 1871-1881,

Appendix B.

Immigration into Ceylon

The effect of the opening up of plantations in the population of Ceylon can be gauged by the following figures, which represent the flow of Tamil labourers into the island since 1871. Many of the labourers entering Ceylon leave the island after their term of indenture is completed; the third column below represents the rate of increase in the number of Tamils actually resident in Ceylon during each decade.

<u>Decade</u>	<u>No. of immigrants</u>	<u>Mean rate of increase</u>
1871-80	1,025,113	9.2
1881-90	578,564	3.6
1891-1900	1,214,840	10.3
1901-1910	953,240	4.6
1911-1920	873,385	2.1

The number of Tamils entering Ceylon varies considerably from decade to decade, and the influence of immigration on the growth of population can be seen if the number of immigrants and the mean rate of increase of Indian Tamils be compared with the total population of Ceylon in each decade.

<u>Year</u>	<u>Total Population</u>	<u>Increase % on figure of previous census.</u>
1871	2,405,576	-
1881	2,763,984	14.9
1891	3,012,224	9.0
1901	3,578,333	18.8
1911	4,110,367	14.9
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It is obvious that the rate of increase in the total population corresponds closely with the rate of increase in the number of Tamils in the island. The variation in the number of Tamils entering and remaining in the island depends upon the state of the planting industry. Thus, in the decade 1871-1881,

during the coffee boom, many labourers entered Ceylon, while in the decade 1881-1891, during the failure of the coffee crop, the number of immigrant Tamils was small. The introduction of tea in 1891-1901 caused a steady flow of labourers from S. India to Ceylon, which was maintained from 1901-1911. The unsettled state of the world's markets, and the rise of freight costs during the war, affected the prosperity of the estates, and caused a drop in the number of Tamils entering Ceylon, and a corresponding drop in the rate of increase of the total population.

The immigrant Tamils are an important element in Ceylon, forming over one-seventh of the total population, and are attracted into the island solely by the prospect of work on the estates, chiefly in the tea and rubber growing districts. The importance of the estates in contributing to the growth of population in Ceylon, as well as to the wealth of the island, cannot be over-estimated, but it must also be remembered that without a near-by supply of cheap and skilful labour, the opening up of estates would have been impossible. Immigration, the development of estates, and the growth of population are interconnected in Ceylon.

of population in the districts of Ceylon during the decade 1911-1921. This seems to prove the beneficial effect of improved irrigation facilities upon the growth of population, and suggests that as facilities for irrigation are extended, the growth of population in 'dry' Ceylon will be very rapid. In Mannar District, in spite of the restoration of tanks, the population decreased by 1.3% in the last decade; this must be due to Malaria, and shows that public health work must go hand in hand with the extension of irrigation schemes if prosperity is to be restored to the dry country.

Appendix C.

Existing facilities for irrigation in dry Ceylon. (from the Report of the Dept. of Irrigation 1926)

<u>Province & District</u>	<u>No. of tanks restored</u>	<u>Acreage rendered cultivable.</u>
Central (1) Matale	141	2,017
Southern (1) Hambantota	192	870
Northern (1) Jaffna	2	681
(2) Mannar	46	12,445
(3) Mullaittivu	79	2,283
Eastern (1) Batticaloa	36	6,148
(2) Trincomalee	9	1,955
North-Western (1) Kurunegala	1,123	99,059
(2) Puttalam	120	4,415
(3) Chilaw	100	7,158
North-Central (Anuradhapura)	813	58,309

It will be seen that the greatest progress in restoring tanks has been made in Kurunegala, Anuradhapura, Mannar and Chilaw districts. Of these, Chilaw ranks second, Kurunegala fourth, and Anuradhapura sixth in the list showing the increase of population in the districts of Ceylon during the decade 1911-1921. This seems to prove the beneficial effect of improved irrigation facilities upon the growth of population, and suggests that as facilities for irrigation are extended, the growth of population in 'dry' Ceylon will be very rapid. In Mannar district, in spite of the restoration of tanks, the population decreased by 1.3% in the last decade; this must be due to Malaria, and shows that public health work must go hand in hand with the extension of irrigation schemes if prosperity is to be restored to the dry country.

Appendix D.

Agricultural development in Java and Ceylon.

The chief difference, apart from the amount of land under cultivation, between the agricultural development of Java and Ceylon, lies in the diversity characteristic of Javanese agriculture, and the uniformity of crop over large areas in Ceylon. In 'wet' Ceylon, two important crops, tea and rubber, are grown in the highlands, and two, coconuts and paddy in the lowlands. These are also grown in Java, but to them are added coffee, cinchona, cacao, sisal hemp, sugar and oil-palm. The acreages under the crops in the two countries are as follows:-

	<u>Ceylon</u> (1921)	<u>Java</u> (1923)
Tea	442,034	198,571
Rubber	475,851	420,937
Cacao	34,566	5,385
Coffee	-	238,100
Cinchona	-	40,777
Sisal hemp	-	12,845
Paddy	834,325	7,771,038
Sugar	-	401,553
Oil-palm	-	933
Coconuts	883,480	24,433

In the dry country of Ceylon, the chief crops are palmyra palm, arecanuts, millets and tobacco. In Java, maize, millets, cassava, sweet potatoes, peanuts, soy beans, tobacco and Kapok are the chief crops. The acreages are as follows:-

	<u>Ceylon</u>	<u>Java</u>
Millets	26,981	Unspecified
Maize	-	4,027,882
Cassava	-	1,837,209
Sweet potatoes	-	435,165
Peanuts	-	458,650
Soy beans	-	409,594

Tobacco	13,072	303,048
Arecanuts	68,476	-
Palmyra	49,480	-
Kapok	-	4,298

The variety of crop cultivated in both parts of Java is seen to be much greater than that in Ceylon. No doubt the fertility of Javanese soils is partly responsible for this, but the work of the Department of Agriculture in experimenting with new crops, e.g. oil-palm and sisal, and in assisting native agriculturalists with advice as to crops suitable for given localities, must be taken into account. Of recent years, too, the Dutch Government has assisted in establishing new crops, e.g. gutta-percha, by granting bounties for their cultivation.

It is much to be desired that similar assistance and education should be given to agriculturalists in Ceylon, for the prosperity of an area with varied crops is far more assured than that of an area with one or two crops predominating, since the latter is more seriously affected by fluctuations in the world's markets. The temporary eclipse of Ceylon's prosperity during the decade 1881-1891, in which disease attacked the coffee plantations, showed the danger of confining agricultural development to one crop. Though Ceylon is not so markedly a one-crop area as in 1881-1891, there is still room for the introduction of new crops, particularly in the dry country, where increased irrigation facilities are making more land cultivable, and in the rubber-growing areas, which are being affected by Malayan and Javanese competition. At present, the Department of Agriculture in Ceylon appears to be devoting its attention to improving existing crops, which, though a valuable work, should not entirely take the place of experimenting with new cultures.

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