

# **A REGIONAL GEOGRAPHY OF CEYLON**

BY  
**S. F. DE SILVA**

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**A Regional Geography of Ceylon by S. F. de Silva**

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(Sgd.) **Gunapala Senadeera,**

*Secretary,*

**Educational Publications  
Advisory Board.**

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**Advisory Board,**

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BY  
S. F. DE SILVA, B.A.

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*REVISED AND  
ENLARGED EDITION*

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## FOREWORD TO FIRST EDITION

I have much pleasure in writing a foreword to this geography book on Ceylon.

Mr. S. F. de Silva is well qualified to undertake the writing of such a book. In addition to being a keen student of geography, he has for several years held the post of Lecturer in Geography at the Government Training College, Colombo. During this time he has inspired many students of the College to write monographs on different aspects of Ceylon geography. These monographs have entailed much research which has been organised and directed by Mr. de Silva who in this book gives to students of geography the benefit of his experience.

This book should be widely used to take away the reproach that Ceylon pupils are better acquainted with the geography of different parts of the world than they are with that of their own surroundings.

L. Mc D. ROBISON,  
*Director of Education.*

14-9-36.



## PREFACE

The present edition has been revised to bring it as far as possible, up-to-date. New material has been added and the maps and illustrations have also been revised and improved. Thanks are due to the Surveyor General and the Director of the Mineralogical Department for their assistance in regard to maps and diagrams.

It is hoped that this new edition will continue to help students of Ceylon Geography.

S. F. DE SILVA

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## CHAPTER I

### Ceylon—Its Location

The history of a country is the study of the rise and development of the human community living in it. The life of a community is influenced by many factors, the first, and perhaps most significant, is the means whereby the community gains its daily bread. Man does not live by bread alone, and so there are undoubtedly other influences that mould and fashion the thoughts of men and women.

The geographical factor comes into importance because no human society can live independent of its physical environment. This is the stage on which the play is acted, and the nature of the stage has a conditioning influence on the play itself. In fact, a society lives, and has its being by making use of what the geographical environment provides. Thus the position of any country is what no human effort can change, so that the environment of a people living in an island in the tropics can never be the same as that of people living in an island in the cold regions of the world. The two islands provide two different environments and the course of human development must inevitably differ.

Similarly, other facts such as climate, soils, minerals, must needs influence the lives of human societies. The food of men in tropical climates can never be the same as the food of people in temperate latitudes because what can be grown in one climatic environment cannot be grown in another wholly unsuited to it. Soils too play their part in the lives of men. People living in a poor soil habitat will get a poorer return to their efforts while rich soils may lead to prosperity. It has been proved how human societies have perished when it could not effectively check soil impoverishment. Perhaps this is *one* reason for the decay of the early Sinhalese Kingdom.

The presence of minerals has also had a profound influence on the lives of human societies. The deposits of iron and coal in areas like the Tyne and the Ruhr, Birmingham and Lancashire, have completely changed the face of those regions. Areas which were once rural with village gardens, fields and farms, are today densely populated industrial regions.

It is worth while examining the geographical factors behind Ceylon history and in this way understand the reasons for some of the traits of early and modern Ceylon history.

The most significant geographical fact in Ceylon's history is her position in the Indian Ocean. She is an island *close* to

India and is related to India as Britain is related to Western Europe and Japan to China. Ceylon is not too far to be left outside the range of Indian influences nor is she so close as to be completely absorbed in Indian history. This helped her to absorb much from India and yet maintain her individuality. What did India contribute to Ceylon's history?

In the first place, the people of Ceylon are of Indian stock. The earliest human settlers of Ceylon were hunters and these came to Ceylon from India in prehistoric times. The Veddas are descendants of these early hunters and they bear a close resemblance to the primitive hunters of the Deccan.

More important than these were immigrants from the borders of Bengal. They were *farmers* and settled down in the north-west and south-east of the island. In course of time they became the dominant settlers of the island and came to be known as the Sinhalese. These people had a North Indian script and language and for many centuries maintained close relations with India. In Asoka's days Buddhism came to Ceylon and to it the *beginnings* of Buddhist art and architecture can be traced. When the Andhras flourished in the Deccan, the people of Ceylon were linked to them by bonds of a common faith and Andhra influence in Buddhist art can be seen in the 'Ayikas' or ornamental facades of dagobas and in the earliest attempts at statuary in limestone. In later days when the Guptan civilization flourished in India, Ceylon too received the benefits of the Indian cultural renaissance. Sanskrit became the classical language and cultured men in Ceylon were steeped in it. This literature opened to men a wider vista of life and knowledge of the world than the Pali language had done. It helped people to study mathematics, politics, grammar, rhetoric, astronomy and medicine besides introducing them to a world of romance in the great Indian epics and the plays of Kalidasa, the love poetry of such writers as Bhartihari. To people whose outlook had been other-worldly, this literature of the world must have come with as much of an awakening into the beauty of this world as Greek literature awakened in medieval Christendom.

Guptan art with its love of the beauty of the world is reflected in the Sigiriya frescoes. Here is a light reflected from Ajanta. The theme is woman and it is interesting to note that a visitor to Sigiriya many centuries after Kasyapa's death, scribbled a verse on the parapet wall to ask whether these ladies had their hearts turned to stone after their lord's death, for why should they have no eyes for him. This is

a voice of the Italian renaissance. It is not the voice of medieval Buddhism.

Another link with Guptan India is the group of figures found at Isurumuniya. It shows a soldier with a lady seated on his lap. They were perhaps lovers, and their happiness has been immortalised in stone by some unknown artist.

'Bold lover, never, never canst thou kiss,  
Though winning near the goal—yet do not grieve  
She cannot fade though thou has not thy bliss,  
For ever wilt thou love and she be fair'.

From the eighth century A.D. South Indian influence began to play a great part in Ceylon's history. It was the era of powerful South Indian kingdoms and Ceylon was subject to frequent invasion until in 1015 North Ceylon became a part of the Chola Empire. It remained so till 1072 when Vijayabahu I freed Ceylon from Cholian rule.

These years of South Indian occupation brought Hinduism into Ceylon. Hindu deities of this period can still be seen at Polonnaruwa and the influence of South Indian architecture can be seen in the decorative designs on the walls of Polonnaruwa viharas. By invasion and perhaps more by peaceful penetration South Indian people soon made their home in the northern and eastern coastlands of the island.

Thus the framework of the history of early and medieval Ceylon is entirely Indian. The religions of her country, her people, her arts and crafts, her systems of administration, her philosophical and scholastic studies can be traced to Indian origin. What the island's debt to India is and how deeply her history has been coloured by Indian influences can be seen if one compares the history of Ceylon with that of other islands such as Socotra and the Andamans which remained outside the ambit of Indian civilization.

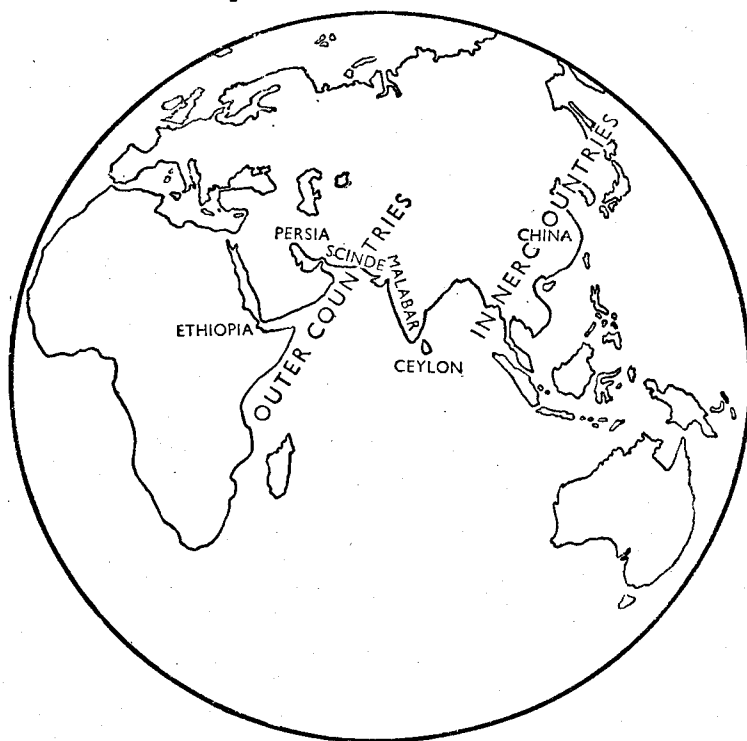
If one considers the relation of Ceylon to the lands round the Indian Ocean, the importance of the island's position will be apparent.

The Indian Ocean is divided into two sections by the peninsula of India, and Ceylon lies to the south of the peninsula. On the east is the Bay of Bengal with an eastern fringe of land extending from Burma to Australia. The Straits of Malacca form a significant gap in this land fringe giving access to the China Sea. On the west side is another fringe of land extending from Arabia to the Cape of Good Hope. This land fringe has an important gateway westwards to the Persian Gulf and another to the Red Sea.

Ceylon's position is thus mid-way between the eastern and western halves of the Indian Ocean and traffic lines have

gone past her ever since the remote past and will no doubt in days to come.

In very early times when ships kept close to the coast, vessels from the West, from Arabian and Persian ports sailed along the coast past 'Mahikurain', modern Makran—the coast of the fish eaters—to 'Erinon' or the Rann of Cutch and so arrived in Indian ports such as Calliana (Kalyan—Bombay) to Nelkynd or Nilakanta; and no ship could sail into the eastern ports of India without sailing past Ceylon.



Similarly, ships from the East sailed through the Straits of Malacca to the 'Golden Chersonese' the coasts of lower Burma and the Malaya Peninsula. On their way westwards they touched at ports at the mouth of the Ganges and sailed south along the east coast of India and in this way reached Ceylon. It is significant, that in the era of coastal traffic, headlands became important as 'signposts'. Two such are found in Ceylon—one on the north-west 'Kudramalai' and one on the north-east 'Trikonemalai'.

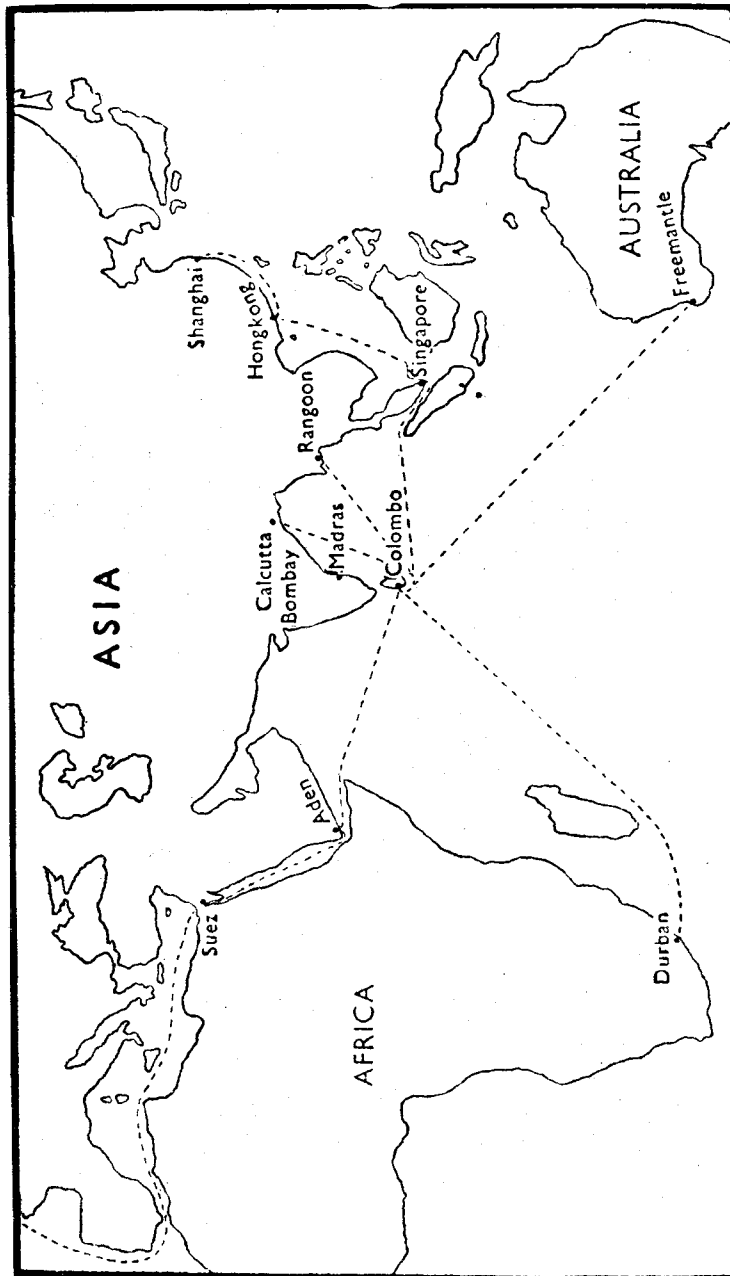
In the second century of the Christian era, a great discovery was made by a Greek navigator Hippalus. He understood that the south-west monsoon blew as a west wind off the south coast of Arabia and if a ship set sail with this wind it could cross the North Arabian Sea and reach India. In this way the long and tedious coastwise route could be avoided. But what was equally important was the discovery that a ship could come back with the north-east monsoon to ports at the mouth of the Red Sea or on the coast of Cape Guardafui. These discoveries were fully exploited by sailors and we learn that over 140 ships would assemble at Eudaemon Arabia or Aden to await the south-west monsoon and set sail on the 'India Voyage'. Similarly, ships from the Far East used to assemble at Takolamart (Kedah) at the mouth of the Straits of Malacca and set sail with the north-east monsoon for South Indian and Ceylon ports and return with the south-west monsoon.

Another fact of importance is that great ocean drifts are set in motion with the monsoons. Thus, when the south-west blows a great ocean drift starts past Cape Guardafui and sweeps across the Arabian Sea towards the west coast of Peninsular India. This swings south and goes *past the south of Ceylon* towards the head of the Bay of Bengal. It next turns south following the coast of Burma and the Malay Peninsula and enters the Straits of Malacca. Shipmasters use to set their ships in this drift and moved with it and in so doing they *inevitably* sailed past the south of Ceylon. When the north-east monsoon blows another ocean drift sets in from the coasts of Malaya and sweeps *past the south of Ceylon* westwards to Cape Guardafui. Ships could use this drift to sail West and in this case too they sailed past the south of Ceylon.

We know for certain that ships from the East and the West reached Ceylon, for sailors spoke of a great emporium in Ceylon. Sopater a Greek who visited Ceylon in the sixth century A.D. tells us:—

'This is the great island of the Indian Ocean, situated in the Indian Sea; which is called by the Indians Sielediba, by the Greeks Taprobane. Two kings reign in the island hostile to each other. It is frequented by a great press of merchants from far countries. In that island is established a church of Christ, of the sect of the Persians, and there is a presbyter sent from Persia and a deacon and the whole service of the church. But the natives and the kings are of other faiths . . . From all parts of India, Persia and Aethiopia come a multitude of ships to this island which is placed as it were midway





WORLD POSITION OF COLOMBO

between all lands; and it sends ships likewise hither and thither in all directions.

From the inner regions, that is from Tzinista and from the other market towns, are brought silk cloth, aloe-wood, cloves and sandalwood and it forwards them to those of the outside, that is to Male in which pepper grows, to Calliana, to Sinde, to Persia, to the country of the Homerites and Adulis.

And so this island placed in the midst of India receives goods from all markets and ships to all, being itself a very great market'.

It is also interesting to note that in much later times Galle was a port frequented by many merchants. A trilingual slab containing inscriptions in Chinese, Persian and Tamil was discovered in Galle. The Chinese and Persian inscriptions refer to money and material set apart by merchants for festivals connected with Adam's Peak, while the Tamil inscription refers to a great festival at Devinuwara or Dondra.

Ceylon was thus from the second century to much later times a sentinel of the Indian Ocean.

The conquests of the Mongols and the creation of a great empire extending from the Pacific to the borders of Europe and the Eastern Mediterranean, had a profound influence on the history of Asia. The Mongol rulers were not at all averse to foreigners who were invited to the court of the Great Khan; traders being specially welcomed. The great land routes across Asia were policed and kept safe so that people could enter and travel in the great empire without molestation.

Such a state of affairs greatly encouraged trade between the East and Europe. Venetian, Genoese and Byzantine merchants made frequent visits to the court of the Great Khan and we have the account of Marco Polo, the Venetian, to attest the splendour of the civilization of Cathay. The trade routes from China started from the Hoangho Valley and proceeded to the Sinkiang region. One route lay along the foothills to the south of the Tarim desert while the other went along the northern piedmont. These routes entered what is now called Russian Turkestan either via Kashgar or the Dzungarian Gate. The former route continued along the southern piedmont and entered Persia. Tabriz was one of the great market towns of the time and from here, landways led either to Byzantine ports or to those of the Levant.

The route entering Russian Turkestan via the Dzungarian Gate travelled westwards to the head of the Sea of Azov and from there by sea to Byzantium.



Along these routes, traders made their way without any interruption until an event took place which closed them to Europeans. By the fourteenth century the Mongols were converted to Islam and the routes across the Near East were not permitted to any save Muslim traders. The Europeans unwilling to lose the valuable eastern trade, began to direct their thoughts to reaching the East by travelling over the sea.

The Portuguese, inspired by Henry the Navigator discovered a way to the East via the south coast of Africa and so were the first Europeans to enter the Indian Ocean. They discovered that their trade could not flourish if their Moslem rivals were not destroyed. They set to work and very soon the Moslem rulers were reduced to impotence. The Portuguese realised that to *control* the trade of the Indian Ocean certain *key* positions were necessary. They were Ormuz on the Persian Gulf, Aden at the gate of the Red Sea and Malacca guarding the straits opening to the East Indies and the China Sea. Yet with all this the Portuguese could not wipe out smuggling and they then realised that without the conquest of Ceylon the control of the Indian Ocean trade was impossible.

A map of the winds and specially the currents and drifts across the Indian Ocean, shows that the trans-Indian Ocean currents whether in the south-west or north-east monsoon months all pass the south of Ceylon. Sailing vessels tend to travel with ocean drifts, so that ships sailing East or West across the Indian Ocean had to go past Ceylon.

Further, as Peninsular India juts south into the Indian Ocean, and as Ceylon is a further extension of the Indian Peninsula, all sea traffic naturally passed the south coasts of Ceylon.

The Portuguese realised all this and so decided to conquer Ceylon. The following letter sent by King Emmanuel to the Viceroy of Goa is quite clear about this decision.

#### Letter of King Emmanuel to Francisco Almeida

'On the return voyage, if it please God, according to the information we have, it appears to us that you can well take the course to Cejllam, which is a thing of such importance in India, as you know, and in which is much wealth and from which can be derived much profit. We think it well that you come to it and endeavour to make here in the said Cejllam a fortress and leave in it some men and vessels with which it can remain more secure: and it appears to us that you ought to use

all endeavour for it on account of the advantages that this island possesses; having in it the fine cinnamon and all the choicest of the seed pearls and all the elephants of India and many other wares and things of great value and profit; and being so near to Malacca and the Gulf of Bengala; and being near to Kayal; and *lying in the track of all the ships of Malacca and Bengala and none being able to pass without being seen and known of in that part*; and being near to the archipelago of the twelve thousand islands; and the fortress that may be made there being so near to India; and therefore it appears to us that *your principal residence ought to be there since it seems that you are in the centre of everything* and that your being there gives more authority to our service and to your person. If your principal residence be in this Island of Cejllam since it appears that from here you can better provide for and assist in all things than from any other part on account of your being in the centre of all the fortresses and things that we have there... We are pleased to command for the accomplishment thereof'.

The Portuguese therefore were anxious to occupy Ceylon not only because of the island's resources but also for its very valuable position. It was from Ceylon that the Portuguese could really police the trans-Indian Ocean routes and the island came to be the sentinel of the Indian Ocean.

The Dutch in their turn realised the value of Ceylon for the control of the trade in spices. They occupied the Cape of Good Hope, the Mauritius Islands and *Ceylon*. Dutch vessels entering the Indian Ocean were supplied with fresh food at the Cape and the south-west monsoon winds brought them direct to Ceylon via Mauritius. Ceylon was thus *central* to the trade routes of the Indian Ocean, when sailing ships used the 'Cape route' and the spices of the East were valuable cargoes.

The occupation of the island by the British was in the first place not connected with any desire to control the trade of the Indian Ocean. The wars of the French Revolution also led to war between the French and British East India Companies. In this struggle the British East India Company discovered that ships damaged in a naval engagement in the Bay of Bengal could not be effectively repaired in any port on the Bay of Bengal owned by the British.

The best harbour for this purpose was Trincomalee and the Dutch held it. Negotiations for the use of the harbour

were completed with the Dutch king then in exile in England, but the newly formed Dutch Republic would have no friendly relations with the British as she was allied with the French.

When the British in accordance with the exiled king's order attempted to enter Trincomalee they were resisted by the Dutch. The British then occupied Trincomalee by force of arms and later occupied all the important harbours of Ceylon lest they should fall into the hands of the French.

The British held the Maritime Provinces expecting, when hostilities were over in Europe, to hand over the island to the Dutch. But by the Treaty of Amiens, Ceylon was ceded by the Dutch to the British. This was how the British came to acquire the Maritime Provinces of Ceylon.

The importance of Ceylon's location did not diminish with the passing of time. The opening of the Suez Canal made Ceylon an important half-way house for ships bound for Australia or the Far East. It will be seen that Galle is the nearest point to a great circle sailing south from Aden to Australia and the Far East. Thus Galle became the most frequented port of call in early British times and it was when coffee, tea and rubber developed in the south-west that a more convenient port had to be constructed at Colombo which was more centrally situated to the planting districts than Galle.

The great strategic value of Ceylon was re-emphasized when the second world war broke out and Japan joined the hostile powers. When Singapore fell by a sudden swoop overland, Trincomalee was the only naval base left to the Allies. The headquarters of the South-East Asia Command were established in, and the counter offensive was planned, from Ceylon.

Ceylon is vital to the defence of India. If an enemy power occupied Ceylon an invasion of India by air and land would be a matter of a few days. Air power plays such an important part in modern war that Ceylon would be an air base for hostile attacks on Indian ports and industrial centres.

Ceylon is for the same reason vital to the policing of sea routes from Britain to Australia and East Africa. In fact, if Ceylon falls into the hands of an enemy with powerful air and ocean fleets, that power will control the Indian Ocean.

Ceylon is thus one of the key points in the system of the British Commonwealth defences and this is primarily based on the fact that Ceylon has been for all time the sentinel of the Indian Ocean.

## CHAPTER II

### The Relief of the Land

A study of the map on the next page will reveal the important surface features of the island. In the centre is found land over 1,000 feet in elevation and we may aptly call this the hill country of Ceylon. The rest of the island from sea level to 1,000 feet may be called the plain or lowlands of Ceylon. It should be noted that although the 1,000 feet contour has been selected as a convenient boundary between the lowland and the hill country, the boundary between these divisions is more a zone than a line. The plain gradually arises from the 1,000 feet contour to the higher land and the contour line must not be taken as a clear-cut boundary line.

The lowlands of Ceylon can be sub-divided into *three* sections:

1. The south-western plain.
2. The south-eastern plain.
3. The northern plain.

### THE LOWLANDS

#### 1. The South-Western Plain

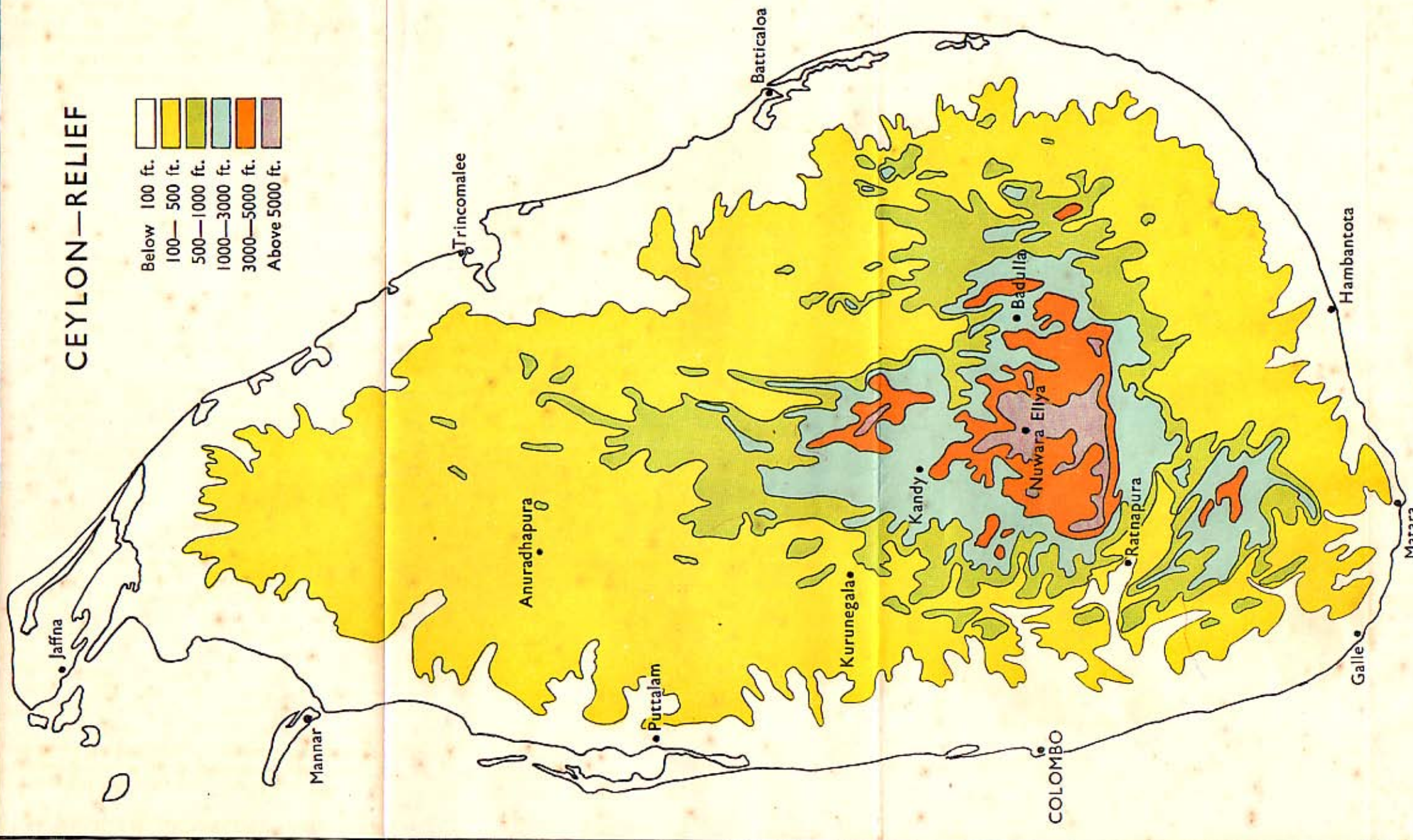
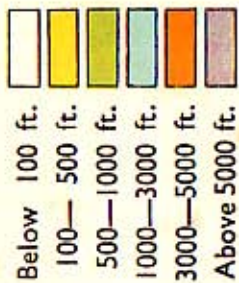
The boundaries of this part of the lowland are the sea on the west, the Deduru Oya on the north, the hill country (1,000 feet and above) to the west and the Walawe Ganga to the south-east.

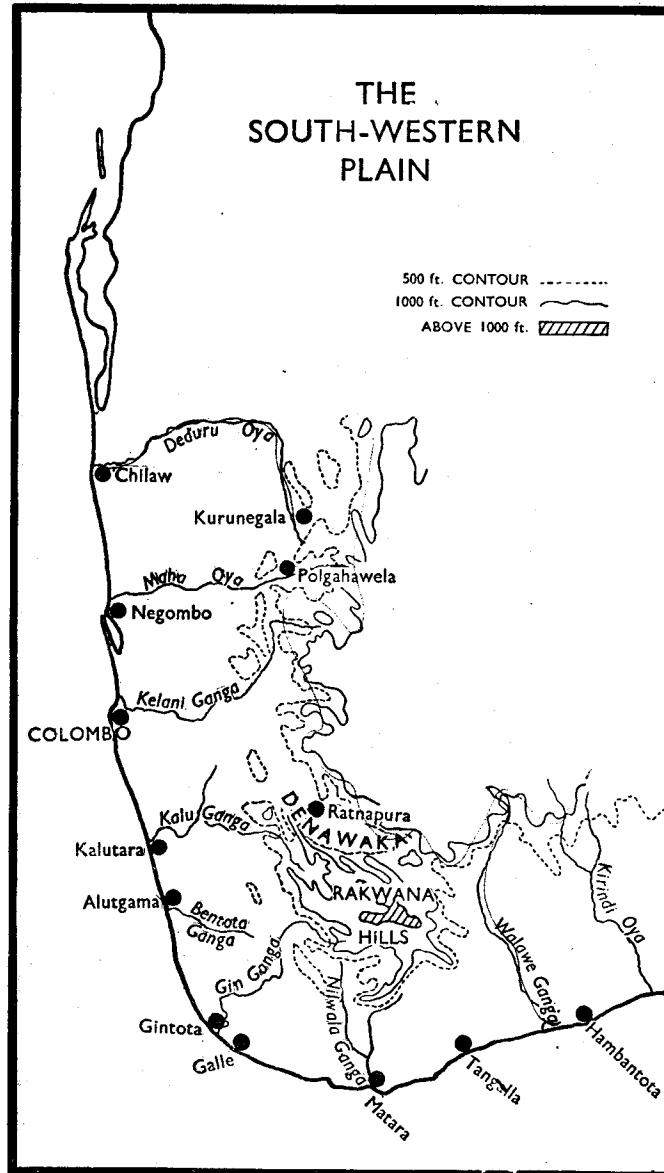
An examination of the map on the next page shews that there is an elevated mass of land over 1,000 feet in the Rakwana area. These hills often called the Bulutota Hills, appear to have been detached from the hill country by a corridor, drained westward by the Kalu Ganga and south-east by the Walawe Ganga. The corridor was known in early times as Donivagga or Denawaka and in the middle ages of Ceylon history, it offered a convenient means of travel from the plain watered by the Walawe to the western part of the plain.

The Bulutota Hills are the highest section of the south-western lowland. The map also shews that ranges of hills radiating from the Bulutota mass extend north-west and south-east, in parallel ranges in the direction of Morawaka and Deniyaya as well as into the Ratnapura district. North of the Kalu Ganga a range of low hills (500 feet) can be traced on the map extending to the headwaters of the Deduru Oya.



# CEYLON—RELIEF





Below the 500 foot contour the plain to the sea is marked by low hills extending in ranges parallel to one another and to the coast line. These are very low close to the coast, being a few feet above sea level. The Galle-Colombo railway line runs on one of these low ridges. The Galle-Colombo road runs on another slightly higher and parallel to the first. As one goes inland these ridges rise higher and higher until the 500 feet level is reached and then to higher elevation leading to the Bulutota Hills and the hill country. If one travels on the road from Colombo to Avisawella, one observes how the road rises and falls as it crosses the ridges and goes down into the valleys between the ridges. Such valleys stretching north to south between the parallel ridges are characteristic of the south-western lowland. The traveller continuing his journey from Avisawella to Ratnapura will travel along a series of valleys lying between parallel ridges. If he leaves Ratnapura by road for Panadura, he will cross the ridges westward by following the valley of the Kalu Ganga.

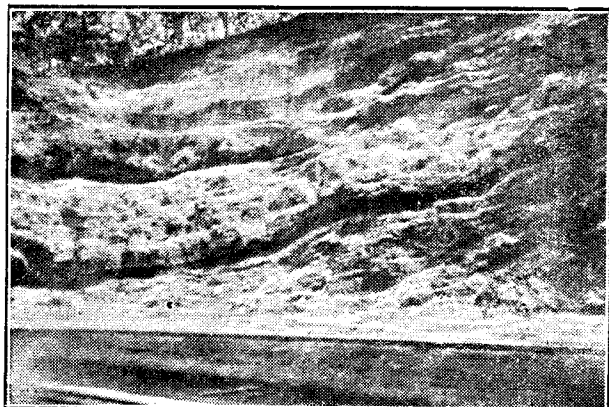
The south-western plain is watered by many rivers. Some, like the Walawe, Nilwala, Kalu and Gin Gangas rise from the Bulutota Hills. The map on the opposite page shows how the Gin Ganga and Kalu Ganga flow across the ridges by carving a way across them. These valleys are very useful for the construction of roads from the coast inland. For example the Panadura-Ratnapura roads makes use of the Kalu Ganga valley. The Matara-Deniyaya road runs up the valley of the Nilwala Ganga. The towns of Polgahawela and Kurunegala stand at the gaps across ridges carved by the Maha Oya and a branch of the Deduru Oya respectively.

In their lower courses the rivers of the south-west plain have built extensive flood plains. These plains are very noticeable in the lower courses of the Nilwala, Gin and Kelani Gangas and the Maha Oya and Deduru Oya. These flat lands have been for a long time used for the cultivation of paddy.

The south-western plain is fairly narrow to the south and west but north of the Kalu Ganga, the 500 feet contour swings eastward so that the plain broadens to the basin of the Deduru Oya. This part of the plain has sandy soil, save where low valleys are found. On the sandy soil cinnamon grew in early days, which in Dutch and early British times was cultivated in gardens. Today the coconut palm thrives on these sandy soils. On the low-lying land where the soil is alluvial, paddy is grown.



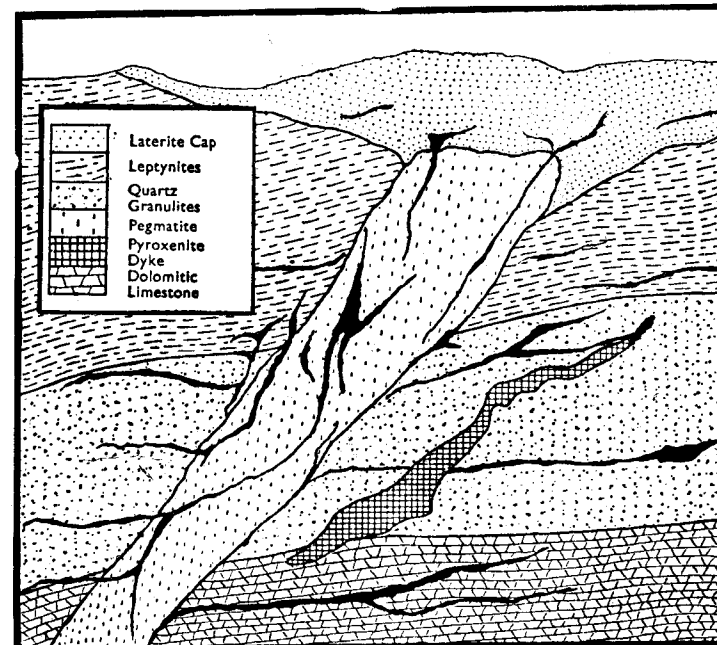
South of the Maha Oya the ridges are higher and swerve nearer the coastline. The ridges are the remnants of erosion of much higher land long ago. They are made up of ancient rock (Archæan) which has undergone very considerable decay. The resulting red rock is called *laterite* from the latin for a brick. The rock is soft and can be cut into bricks, locally called *kabook* (Portuguese, *cavoque*). At most road cuttings in the south-west one can see sections of this rock. On the surface is a thin layer of red soil into which the roots of plants penetrate. Below it is a harder subsoil which in its present decayed stage yet reveals the foliation lines of the parent rock. Below this section is the hard gneiss or granite. The picture below illustrates decayed gneiss rock and trees can be seen



DECAYED GNEISS ROCK

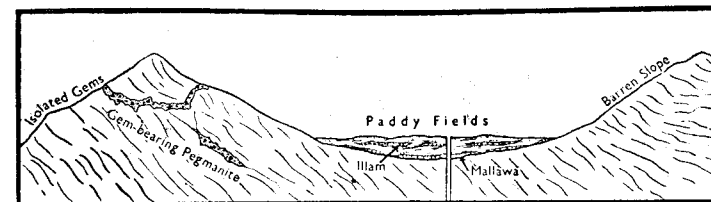
on the top left of the picture. On the red soil of the elevated land in the south-west plain, rubber is extensively cultivated, while forests cover the areas not under cultivation, e.g., the Sinharaja forest of the Sabaragamuwa Province. The valley floors have been for centuries covered with alluvium and on this soil paddy is grown in most parts of the plain.

The rock out of which the greater part of the higher section of the plain has been excavated is called *khondalite*. This rock is rich in useful minerals such as plumbago and iron as well as in precious stones. The plumbago is found in veins and pockets in the rock and is dug out in mining centres such as Ragedera, Bogala and Migahatenna. The gems however are found in the valley floors. When a pit is sunk in a valley floor, one notices a top layer of clay and mud.



Courtesy Dept. of Mineralogy

Below this at a depth of six to ten feet is a gravelly bed called by the Sinhalese *illama*. The sand in the layer is dug out and washed and precious stones such as the ruby picked out.

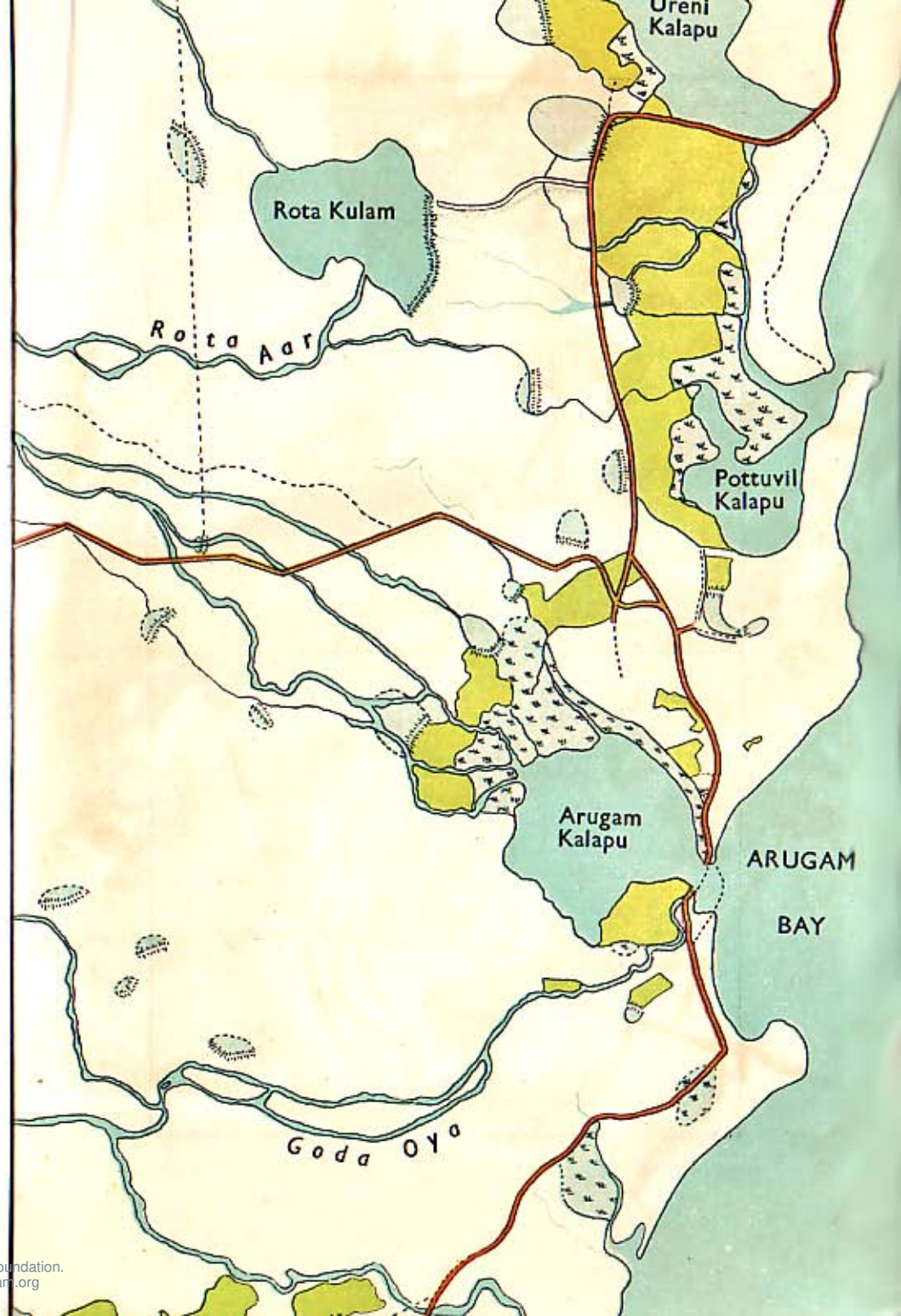
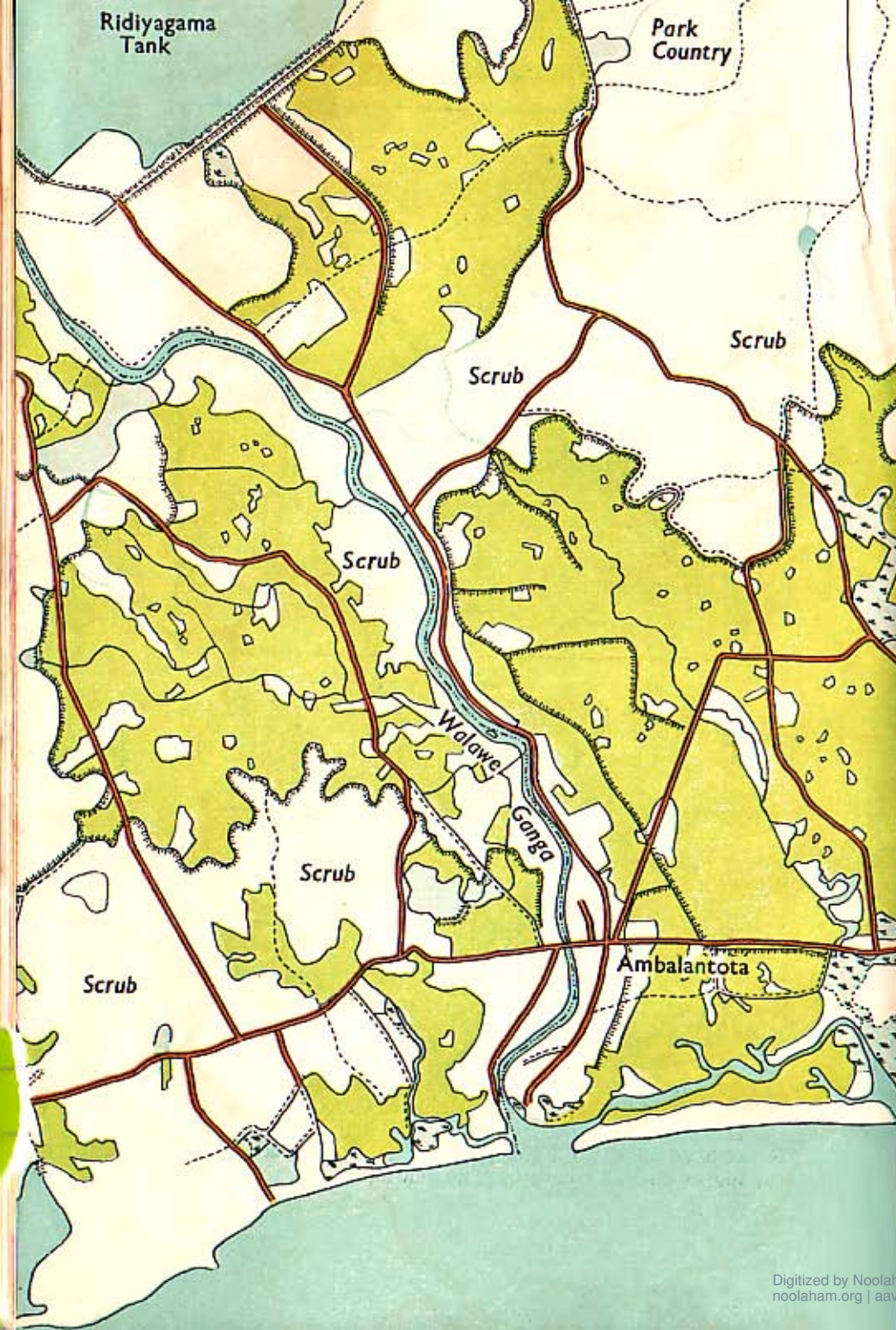


Courtesy Dept. of Mineralogy

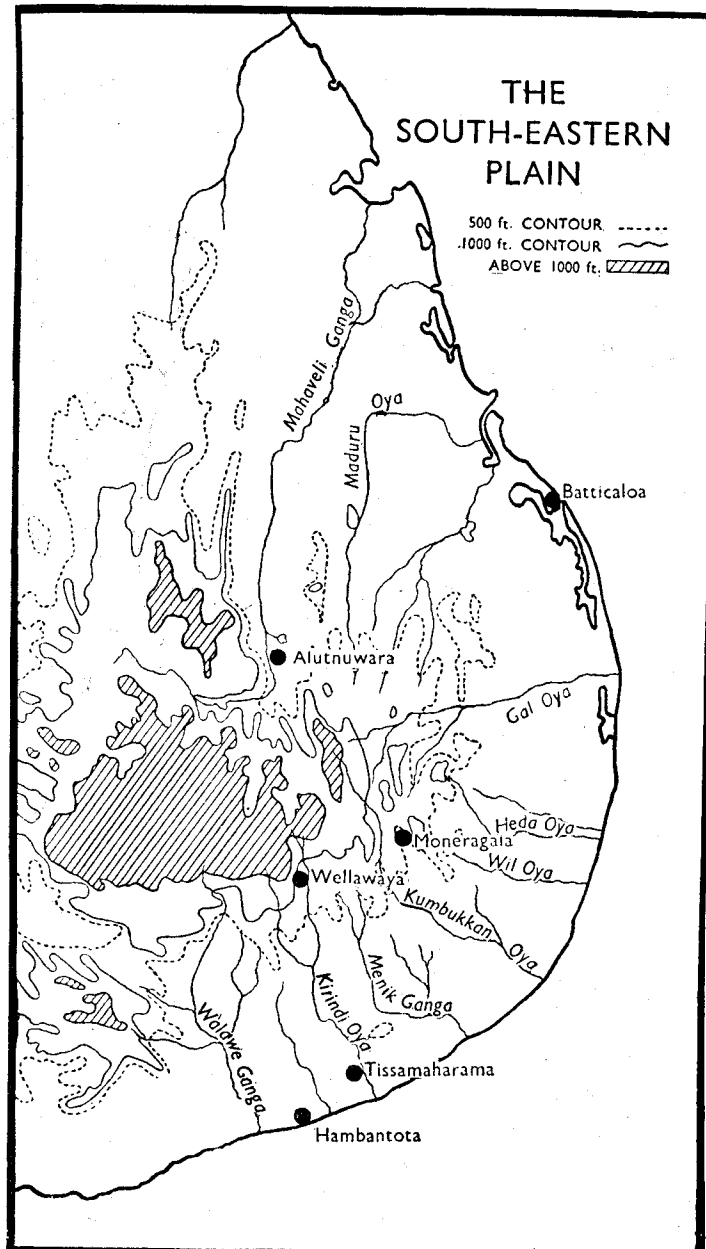
## II. The South-Eastern Plain

On page 18 is a map of the south-eastern plain. The boundaries are the Walawe and Mahaveli Gangas, the sea and the hill country (1,000 feet contour). The higher sections of the plain consist of a low platform 500-1,000 feet lying at the foot of the hill country. This platform is narrow to the









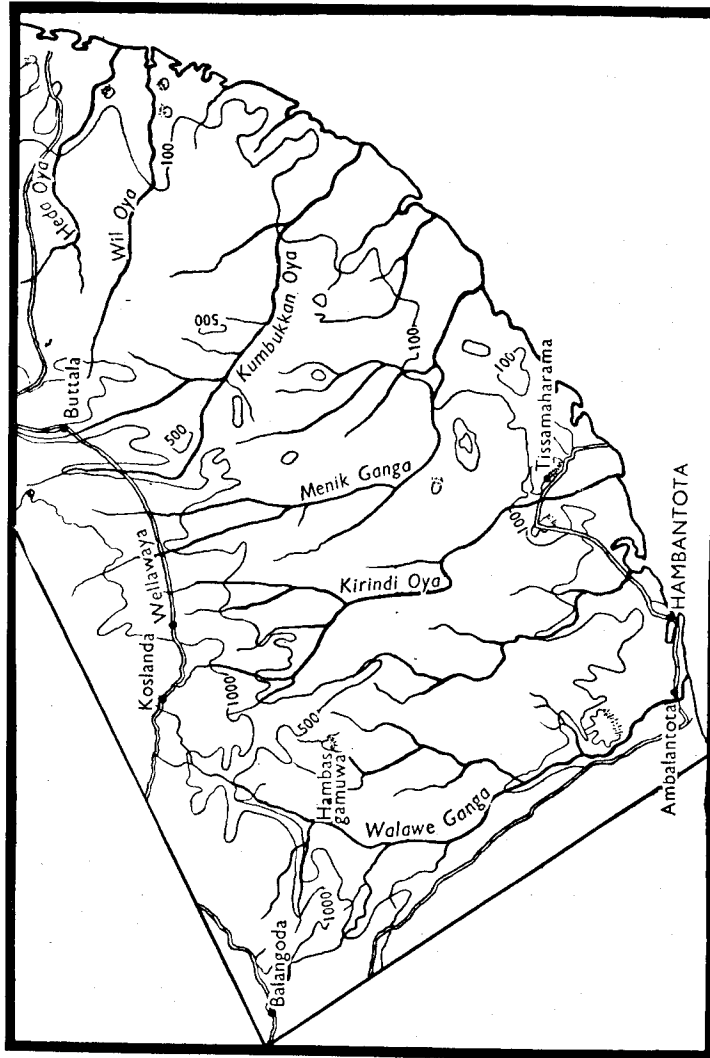
south and north but extends seawards on the east. Most of the rivers draining the plain have their source here, e.g., the Gal Oya, Maduru Oya and Heda Oya. The rest of the plain is below 500 feet. There are two sections which are relatively broader than the rest, namely the basin of the Mahaveli and the basins of the Walawe and Kirindi Oyas. Between these two areas lies the central part of the plain. This is studded with hills which are for the greater part rock masses. Some of these have well known names. They are the Nuweragal Kanda which bears traces of ancient ruins, Friar's Hood, and Westminster Abbey. Kataragama Peak is another. All these hills have in the history of Ceylon been the sites of fortresses naturally protected and easy to defend. A study of the Nilgala sheet of the one-inch map will repay study as it illustrates the hills described here.

The south-eastern plain has a coastline characterised by lagoons. Of these the Batticaloa Lagoon is the one best known. Some of these lagoons have been silted up by the debris deposited by streams flowing into them. In course of time some of the lagoons have been almost completely silted up and have been converted into paddy fields. Most of the extensive paddy fields of the Batticaloa district consist of silted lagoon.

The map on page 23 shows you the lagoon extending from Batticaloa to Kalmunai. Streams such as the Gal Oya and the Andella Oya spread their waters widely in many channels to the lagoons. At flood time much of their lower courses get flooded and much alluvium has been deposited for many centuries. The land on the western margin of the lagoon is made of silt deposited by rivers and these are now excellent paddy lands, (*vide map on page 17*).

The rivers draining the plain flow from the central upland area north, east and south. The Mahaveli and Maduru Oyas flow north and in their lower courses have built broad flood plains. The Gal Oya and Heda Oya flow east and their lower basins contain most useful paddy land. Recent land development schemes in these basins indicate as much as 120,000 acres of land available under irrigation schemes based on the Gal Oya and Heda Oya.

The Walawe-Kirindi Basins too are very extensive and flat. These are admirably adapted for paddy cultivation provided the land is irrigated, (*vide page 16*). The soils in this part of the plain are easily worked. The surface soil which



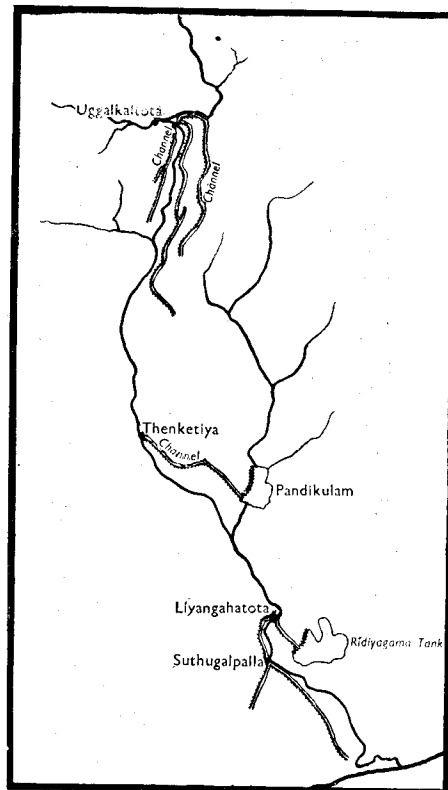
is reddish merges into a sub-soil of a distinctly clayey nature. When the rain falls much of it will seep through the surface soil and come to rest on the clay layer beneath. This water will not be lost by evaporation and is thus available for use by plants. Paddy, cotton and fruit trees, like the orange, are likely to grow well in the region. Long ago these river basins were the homes of multitudes of people. Magama was once a flourishing city. The number of abandoned tanks attest the presence of scores of villages and the very extensive ruins near Habessa and Maligavela indicate the existence long ago of large monastic establishments. The large number of inscriptions going back to pre-Christian time prove that this area was then occupied by people. In the Polonnaruwa period (1070-1215 A.D.) the south-eastern plain which bore the name of the Ruhuna Rata was sub-divided into two sections—the Atadas Rata with the capital at Udundora (Moneragala) and the Dolosdas Rata with its capital Mahanagakula on the Lower Walawe.

The south-eastern plain can be divided into two subdivisions. They are shown on the map on the opposite page. One section has its slope to the south-east and this is clearly seen by the direction in which the Walawe, Kirindi, Kumbukkan, Wil and Heda Oyas flow. The basins of these rivers are broad and the greater part is between sea level and 500 feet in elevation. The land between 100 feet and the sea contains the largest tanks and this is proof that the low-lying areas here were cultivated as they are the flood plains of the rivers. The land between 100 feet and 500 feet is for the most part 'dry' upland and cannot be irrigated except along the river banks. One excellent irrigation scheme of long ago illustrates the way in which a river can be tapped and its water lead along a canal to irrigate land away from the river sides.

The map on page 22 shows how the waters of the Walawe Ganga have been turned into the canals. The river is tapped in its upper reaches at Uggalkaltota. The middle stream is again tapped at Thenketiya and the lower stream at Liyangahatota and Suthugalpalla. The Walawe is a stream fed by the heavy south-west monsoon rains and is thus a reliable source of water. In the days of Vijaya Bahu I (1072) Mahavagakula the provincial capital was situated on the lower banks of the Walawe. The plan to begin a large irrigation scheme in the Walawe-Kirindi Oya is no doubt very sound. The south-east sub-section dealt with here is a land capable of great development, once the land *between* the rivers have been irrigated.



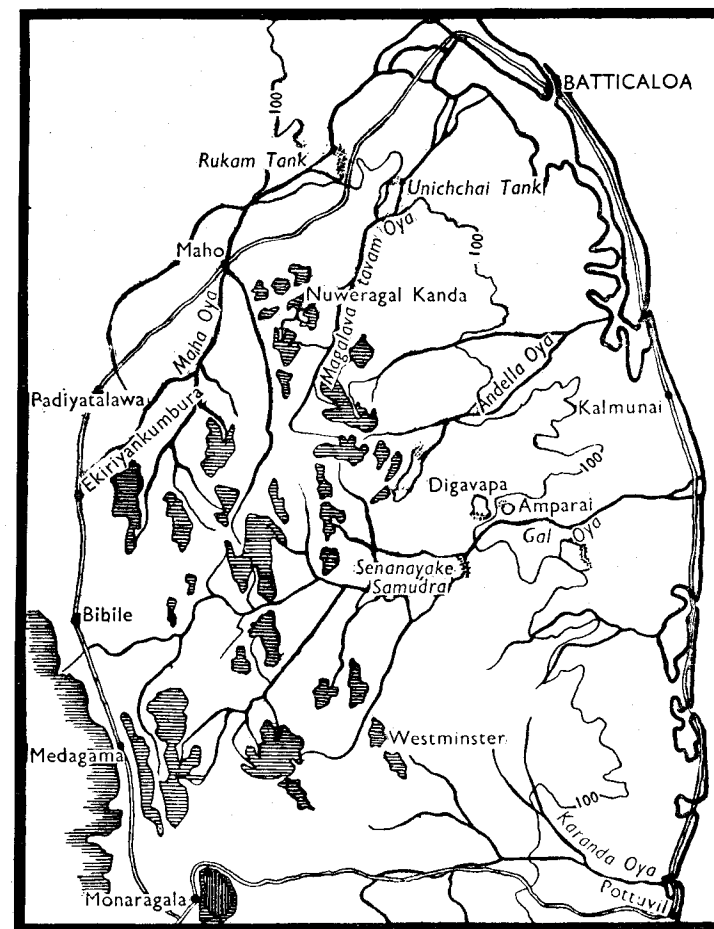
The next sub-section lies between the Heda Oya in the south and the Manduri Aru to the north. The central stream is the Gal Oya (*vide map opposite*). Here too the land that can be used for paddy cultivation lies between the 100 feet contour and the sea. The streams are not perennial and the extent of land below 100 feet is not extensive. Paddy cultivation was thus concentrated in this narrow coastal strip and the silted lagoons provided the best areas.

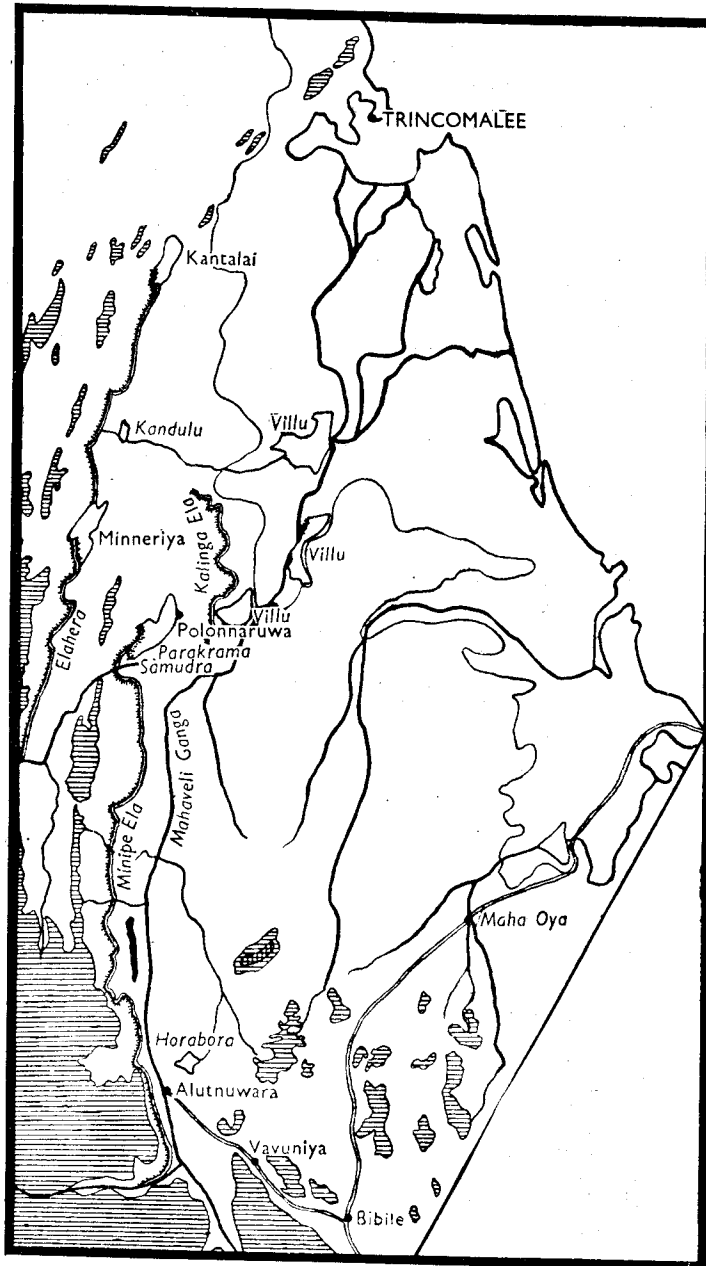


The land between 500 feet and 100 feet is more rugged than in the first section. The centre area is studded with rocky crags and peaks, several of which are famous in history. Such are Nuweragal Kanda, Govindahela (Westminster Abbey) Dunihitagala and 'Friars Hood'. In very early times these rugged plains had centres of importance based on tanks. The most famous is Digavapi—now the Mahakandiya Wewa. The most recent is Gal Oya where for the first

time high level canals will enable upland areas to be brought under cultivation. Such upland areas which hitherto were used as chenas can become centres of perennial cultivation under sugar-cane, cotton and fruits, such as the orange, grape fruit and the mango.

The third sub-section of the eastern plain consists of the basins of the Maduru Oya and the Mahaveli Ganga *vide map on page 24*. These are marked out by the range of



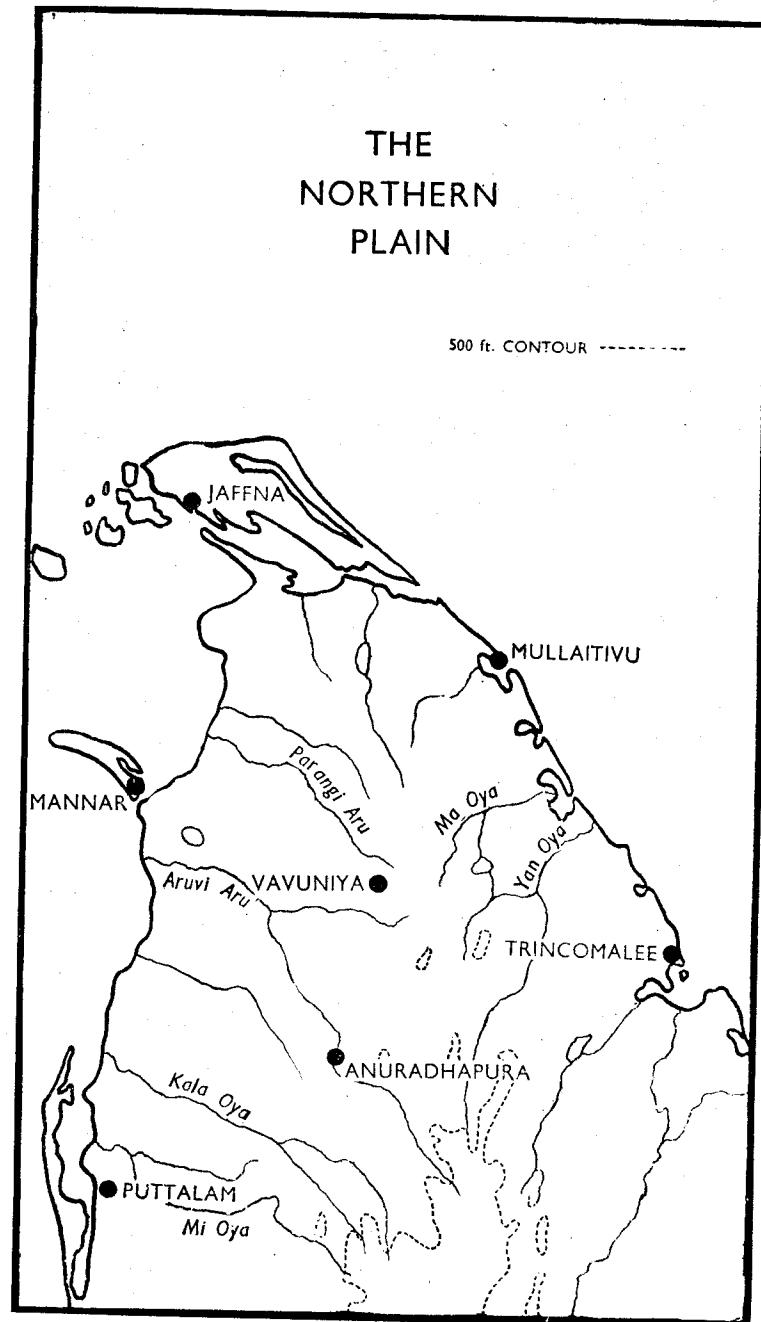


low hills running north-east on the one hand, and the rugged country on the south. Two of the largest of the ancient tanks—the Minneriya and 'Parakrama Samudra' are in this area. It was once an area of great agricultural production which made Polonnaruwa a capital. Proof of the extent of land cultivation is to be found in the long *canals* such as the Minipe, the Kalinga and the Elahera.

### III. The Northern Plain

The northern plain is the largest of the three plains of Ceylon. Its boundaries are the Deduru Oya, the Matale foothills and the Mahaveli Ganga on the one hand and the sea on the other. This plain is below 500 feet for the greater part, save where the Matale foothills are. The map on page 26 shows these foothills. All the larger rivers draining the plain take their rise here, e.g., the Yan Oya, the Kala Oya, the Malwatu Oya and the Amban Ganga tributary to the Mahaveli. The northern plain is high to the south and slopes away west, north-west, north-east and east. There is thus a clear slope to the west and north-west on one hand and north-east on the other. This explains the general direction of the flow of the rivers. Take for example the Yan Oya and the Malwatu Oya. Their source is in the Matale foothills but their mouths are on the eastern and western coast lines of the plain.

Beside the general slope to the north-west and north-east, the plain has another striking feature. One-inch maps show these clearly. On the north-west side of the plain there are low rocky ridges which stretch north-north-west. The rivers in this part of the plain flow in the low land between such ridges and often cross them on their way to the sea. The Kala Oya has for example been dammed up by the Kalawewa bund just where it crosses a rock ridge. In fact the makers of the bund used the ridge for the foundation of the bund. Similarly the Minneriya Oya has been dammed to form the Minneriya Wewa where the Oya crosses a rock ridge. Best of all is the example of the Amban Ganga. This river flows north parallel to a northern ridge and crosses it at Angamedilla to flow to join the Mahaveli Ganga. The Mahaveli too flows due north for about fifty miles after leaving the hill country and then at Dastota crosses a rock ridge to flow north-east to the sea. This drainage pattern is quite different to that of the south-eastern and south-western plains. In the northern plain the rock ridges spread out from the Central Matale foothills fanwise to the west and east. Thus the rivers starting



from the hills fan out west and east in harmony with the general lay out of the land.

The rock that goes to make up the greater part of the plain is *Khondalite*. There is then every prospect of the northern plain containing veins of plumbago. Certain areas in the North-Central Province have already been surveyed. Iron ore may also be found, because we have traces of iron ore workings by the Sinhalese in the Wannī.

From Puttalam, along the coast to Elephant Pass and beyond to the Jaffna Peninsula, is a belt of miocene limestone. Geographically, its importance lies in the type of soil it gives rise to and the fact that it has abundant supplies of water underground. The second factor has been vital in the settlement of the Jaffna Peninsula as well as in cultivating the land.

Very little can be said about the soil of the northern plain because it has been surveyed only in areas where colonisation schemes have been worked out along the coast.

The rivers that flow across this plain rise from the central hills and flow north, west and east. One interesting feature deserves to be mentioned. A careful examination of the rivers, e.g., the Mahaveli, will show that at least in their upper tracts, the rivers have a straight northward course. But as they leave the 500-feet contour they swing to the east or west to reach the sea. This is due to the fact that the hills and ridges referred to already, are the 'grain lines' of the land. Hence the rivers tend to flow between these north-south hills and ridges and when the lower land is reached, these hills and ridges sink below the land surface and the rivers have to cut their way across the grain lines to flow into the sea. In such places the rivers reveal the hidden grain line by rapids. Thus, for example, the Mahaveli flows along the grain from Alutnuwara to Dastota. At this point, the river cuts across the grain to flow north-east and at Dastota one can see the hard rock cut across by the river, thus forming the Dastota Falls or rapids. Other examples of such rivers are the Yan Oya flowing into the sea south of Kokilai Lagoon and the Malwatu Oya or Aruvi Aru flowing into the sea south of Mannar. The rivers of the northern and the eastern section of the great plain are poorly supplied with water during the dry months of the year. This necessitates water storage which was effected by the ancient Sinhalese by the construction of bunds across valleys and the storing of the water in large tanks. Thus the Kala Oya has had a dam built across the valley in its upper tract and the Kala Wewa and Balalu Wewa formed. But more of this later.

Along the coast for two to three miles inland the soil is very poor and sandy. But elsewhere the soil is loamy, light and rich in lime. Most of the surface soil is reddish and this red loam is best suited for dry cultivation. In the Wannī and Kala Wewa areas there is found a dark vegetable mould which must have raised some of the wonderful harvests that helped to make Ceylon at one time the granary of the East. This same vegetable mould is found on the left bank of the Mahaveli Ganga where once irrigation canals like the Minipe Ela supplied fields with water. In the Puttalam, Trincomalee and Batticaloa districts the soils have a hard formation three to four feet below the surface and under this pan the water supply is ample. In the North-Central Province, the soils vary from place to place as the land here is more undulating than other sections of the plain. Omitting the ridges where the soil is so stony as to hardly deserve the name soil, we find four types of soil: (a) A light sandy or gravelly soil with gravel underneath, (b) a heavy thick clayey soil mixed with coarse gravel, fit only for paddy, (c) a loamy soil of good depth, (d) a light loam with heavier but still friable loamy subsoil underlain between two to three feet from the surface by a gravel which in turn is above decomposing rock.

In the North-Western Province the soils are the products of the disintegration of gneiss detritus from the hills and alluvium carried down by the rivers. The greater portion of the soil of the maritime districts of Chilaw and Puttalam is a silicious sand. Here and there are to be found black paddy land and potters' clay. Where granite rock exists, a reddish loam occurs and on the margins of rivers and lakes a rich black mould well adapted for paddy cultivation is found.

About fourteen miles off Mankulam (Northern Province), commencing from the village of Tunakkai is a region of black soil. It extends westward for about four miles and four miles north and south making an area of sixteen square miles. It is believed that this black soil is most suited for the growth of cotton. The Jaffna Peninsula is of special geographical interest. According to the geologist, Adams, that part of Ceylon north of a line from Puttalam to Mullaitivu is a limestone region now quite covered over with debris. But this limestone crops up to the surface in the Jaffna Peninsula which can very truly be called a low-lying limestone block. On the northern side where it is exposed to a strong sea erosion, the block ends in a low cliff, but a limestone shelf runs out for some distance below the sea. On the east, west and south, the limestone surface sinks gradually below sea level. Deposits of sand, wind-blown and water-borne, enter the sand

belt round the margins of the limestone rock. In the western part of the plateau where tobacco cultivation is carried on, deposits of red soil are found. Sand dunes are to be seen on the north-east and south-west margins of the peninsula. We will have more to say of the soils of Jaffna later.

One-inch maps such as the Dambulla, and Gal Oya sheets illustrate the minor details of the surface of the northern plain.<sup>1</sup>

### THE HILL COUNTRY

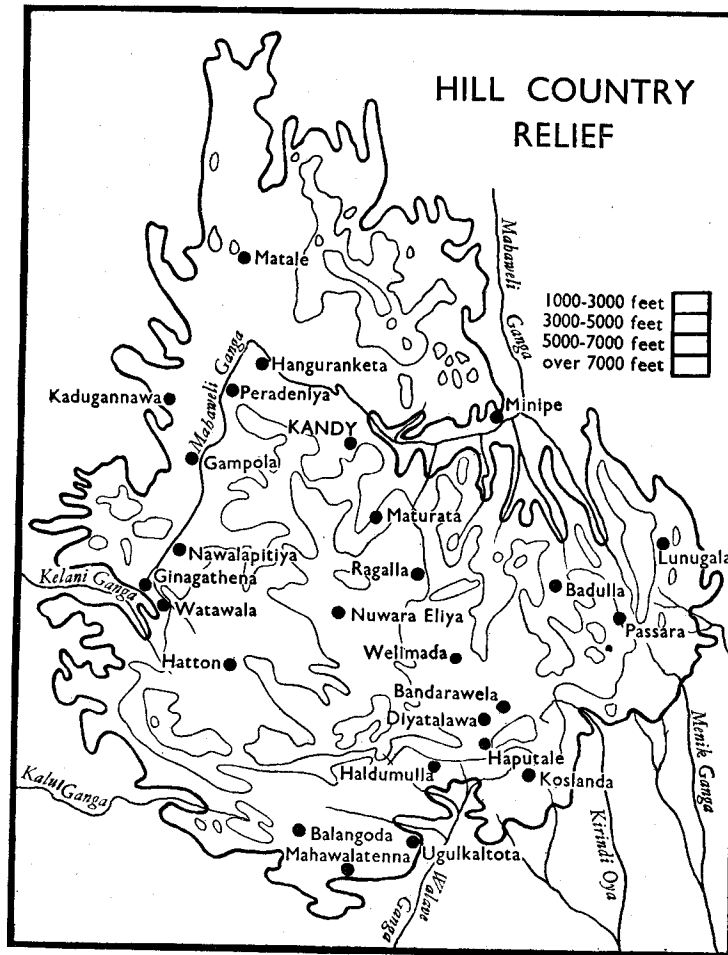
The map on page 30 shows the major surface features of the hill country. The land is everywhere over 1,000 feet above sea level. The highest section which is between 5,000-7,000 feet consists of high ranges. On the southern side one range with Adam's Peak extends east to the Horton Plains and is continued beyond it past Haputale to Namunukula Kanda. This eastern high range is not as continuous as the western. It is broken up by well-known gaps—the Indalgashinna, Haputale and Ella Gaps. But one is inclined to think that millions of years ago the range did extend east past the modern Passara Gap to the present Madulsima Ranges.

From Horton Plains another high range extends north to Pidurutalagala and then slopes down to the valley of the Mahaveli Ganga. Beyond this valley the land rises to the Matale Ranges which stretch in a north-west-south-east direction. If we leave the Matale Hills out, the rest of the high ranges resemble the figure of an anchor or the letter T inverted.

Half enclosed by the Adam's Peak ranges and the Horton Plain-Pedro ranges is a plateau of 3,000-5,000 feet above sea level. This was aptly called the 'wilderness of the Peak' by the early coffee planters but is today best called the Hatton Plateau. This plateau slopes north-west and is drained by the head streams of the Mahaveli Ganga. On the eastern side almost enclosed by the high ranges to the east and the Horton Plain-Pedro ranges to the west is the Welimada Plateau. This slopes northwards and is drained by Badulu Oya, Uma Oya and Loggal Oya.

From the Hatton and Welimada Plateaus the land descends to a lower plateau of a 1,000-3,000 feet in elevation. This is best called the Kandyan Plateau as it has been the home of the Kandyan Sinhalese. The plateau extends to the north-west, north-east of the higher Hatton-Welimada

<sup>1</sup>. Consult the Dambulla and Polonnaruwa sheets for further details.



Plateaus. On the north-west are the towns of Nawalapitiya, Gampola, Kandy and Matale, on the north-east are Kandyan towns of lesser note, such as Teldeniya, Madugoda to the north of the Mahaveli, and Hanguranketa and Badulla to the south.

The hill country thus slopes gradually to the north and north-west from high ranges to the plain in a series of plateaus. To the south however, the slope is not gradual. As the map shews, the Adam's Peak, Horton Plains, Haputale Ranges slope precipitously to a narrow platform of 3,000-5,000 feet. This in turn dips steeply to a lower plateau of 1,000-3,000 feet. On the plateau stand Balangoda and Koslanda. The former is actually on what has been long known as the Mavalatenna Plateau and the latter may be described as the Koslanda Plateau. The Mavalatenna Plateau drops to the basin of the Walawe Ganga to form a very steep escarpment. A study of the one-inch Haputale sheet illustrates the land features here described.

The hill country is drained on the south side by the head-streams of the Walawe, Kirindi and Kumbukkan Oya. The head water of the Kirindi Oya tosses down the high ranges to form the lovely Diyaluma Falls.

The Mahaveli Ganga is the master stream of the hill country. It drains the Hatton Plateau and the western half of the Kandyan Plateau, and passing Kandy, enters the picturesque Dumbara Valley, and in its eastward course is fed by the streams draining the Wellimada Plateau.

As the hill country is made up of a series of plateaus, rivers crossing them have to leap down from one plateau to another. This accounts for the series of falls found right round the hill country. On the south is the famous Diyaluma Falls. On the west about the 5,000 feet contour are the Devon and Ramboda Falls; at a lower elevation of about 3,000 feet are the Aberdeen, Laxsapana Falls. On the eastern side of the hill country are the Dumhinda, Kurundu Oya, Manawela Falls. These are all on the streams draining the Wellimada Plateau. These falls are of great economic importance as hydro-electric power can be easily developed with their aid.

There are important gaps leading to the hill country, thus briefly described. These gaps have been rendered historic, for all movements of men, peaceful as well as hostile, have made their way through them to the hill country. Through them have come foreign influences, races, customs and manners as well as crops, and all these have changed the lives of men in the hill country. For many centuries, when the



plains were peopled by the Sinhalese, the hill country stood out like an island from the sea, isolated and uninhabited. But in course of time things changed and people settled down in the lower parts of the hill country and when the plains of the north had become a forest land, the hills provided a home for the last of the independent kings of the Sinhalese.

From Anuradhapura, the line of easiest approach appears to have been, in the past, through the Nalanda Gap. Today the Kandy-Anuradhapura road runs through Nalanda and it is not at all unlikely that in the future a road may run from Nalanda via the Amban Ganga to Polonnaruwa. In the days of Parakrama Bahu I, it was possible to approach Polonnaruwa this way, and this was one of the reasons why he built a fort at Nalanda.

To the east is what may be called the Alutnuwara Gap. The Mahaveli issues out of the Kandyan Hills through the Dumbara Valley and thus creates a natural way from the east to the hill country. At the mouth of the gap is the town of Alutnuwara, once a flourishing city. In the days of the Kandyan Kingdom, it was as Valentyne described it, 'one of the handsomest cities in the whole island'. The trade route from the Kandyan Kingdom to Trincomalee and Batticaloa passed through this town, bringing in salt and grain. In the days to come, if the dry zone becomes a populous land there is no doubt that Alutnuwara will once more command the road from Trincomalee and Batticaloa to the Kandyan Hills.

The valley of the Badulu Oya can also be considered a gateway to the eastern section of the hill country. In early British times, there was a road from Kandy past Hanguranketa to Badulla via the Badulu Oya, and Badulla was in Kandyan times the capital of a principality. From Badulla the roads go to Welimada and so on to Nuwara Eliya or to Bandarawela and thus to the hill country.

Further to the south-east is Passara and through the break between the Namunukula and the Madulsima Hills the road from Batticaloa to Badulla makes its way. This gap is very obviously a break in the southern rim of the highland that hems in the Welimada Plateau on the south-east.

As the south slope of the hill country is very steep and as the mountain wall is hardly broken, there are few gaps or passes of importance. But there is one of the greatest interest—the Haputale Gap. It stands on a high rim of land and on one side looks down on to the Welimada Plateau and on the

other side to the depths of the southern edge of the hill country. Through the Haputale Gap runs the one road to the hills from the south. It climbs the mountain wall from Madola to Balangoda and enters the Welimada Plateau on the inner side, at Haputale.

The western side of the hill country has a number of important and historic passes. One of these is the Galagedera Pass. This was yet another of the outlets of the Kandyan Kingdom. In those days traders from Puttalam made their way to Kandy via the Weuda Kadawata and through the Galagedera Pass. The Kadawata was built by the Kandyan kings as a frontier fortress and we know that in 1765 when Van Eck invaded the Kandyan Kingdom, he led his army through the Galagedera Pass. Today the Kandy-Kurunegala road utilises this gap.

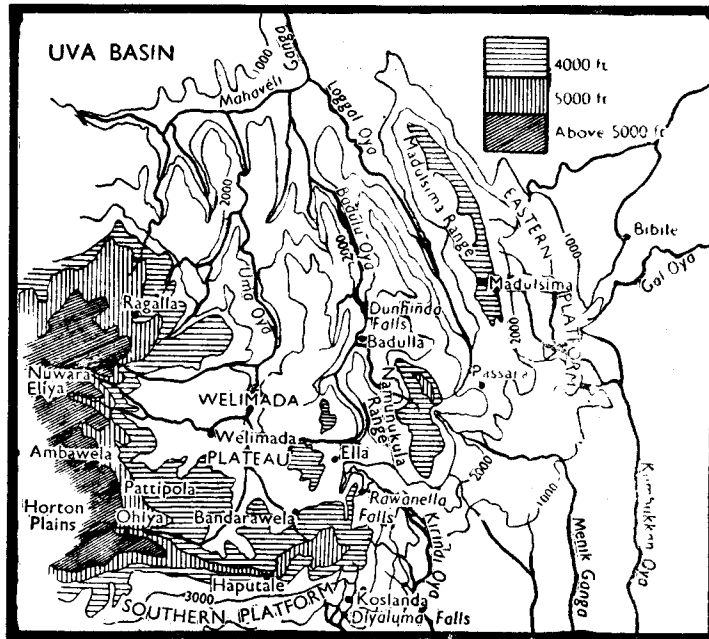
Another and more famous one is the Balane Pass. Through this took place all the historic Portuguese invasions of Kandy and over and over again, Portuguese forces under such leaders as De Souza and Azavedo were trapped here and destroyed. Today the Colombo-Kandy road via Kegalle utilises this gap and peaceful traffic comes and goes where once hostile forces passed to and fro. To the south is another important pass, namely, the Ginigathena Pass. When the Sitawaka Kingdom was in existence, Mayadunne, in the face of the Portuguese invasions, often retreated into the hills through this gap. But with the development of the tea estates of Uda Bulathgama, etc., the road from Colombo to Hatton and other hill towns was made to run through this gap. Today it is the closest route from Colombo to the highest section of the hill country.<sup>1</sup>

### Sub-Divisions

For a more detailed study of the relief of the hill country it is convenient to divide it into *three* large units. They are :

- (A) The Uva Basin.
- (B) The Western Sector.
- (C) The Northern Sector.

1. Consult (a) the *Haputale* sheet showing the great escarpment to the south, (b) the *Kandy District* sheet, the *Hanguranketa* sheet for parts of the Kandy Plateau and the Dumbara Valley, (c) the *Nuwara Eliya* and *Hatton* sheets for sections of the Hatton and Welimada Plateaus.



## A. THE UVA BASIN

The map given on the opposite page shows you the main features of the Uva Basin. The name 'basin' is very appropriate as you will notice that it is enclosed on three sides by highland areas. On the east is the arc of the Madulsima Ranges; on the south-east are the Namunukula Ranges; on the south the Dambatenne-Haputale Range and on the west the high ranges from Horton Plains to the Pidurutalagala Ranges. Within this great basin you will observe four noticeable physical units. For example the Welimada Plateau is itself a smaller basin enclosed by highlands of 4,000 feet in elevation. This plateau basin is drained by the Uma Oya and its headwaters. The next unit is the *Badulu Basin*. This is bounded by the 3,000 feet contour and it is drained by the Badulu Oya. In the centre of the basin is the town of Badulla. A third unit is the *Madulsima Ranges*. On its west side is the valley of the Loggal Oya with the town of Passara commanding the gap between the Madulsima Ranges and the Namunukula Ranges. Another significant unit is the *Eastern and South-Eastern Platforms*. The Eastern Platform is drained by the headwaters of the Maha Oya and Gal Oya. The south-east is drained by the headwaters of the Menik Ganga and the Kirindi Oya. The Kirindi Oya flows through the Ella Gap and on one of its tributaries is the well known Rawanaella Falls while the Diyuluma Falls, near Koslanda, are on the Kuda Oya, a branch of the Kirindi Oya. Notice that the Madulsima Ranges and the Dambatenne-Haputale Range slope steeply to the eastern and southern platform.

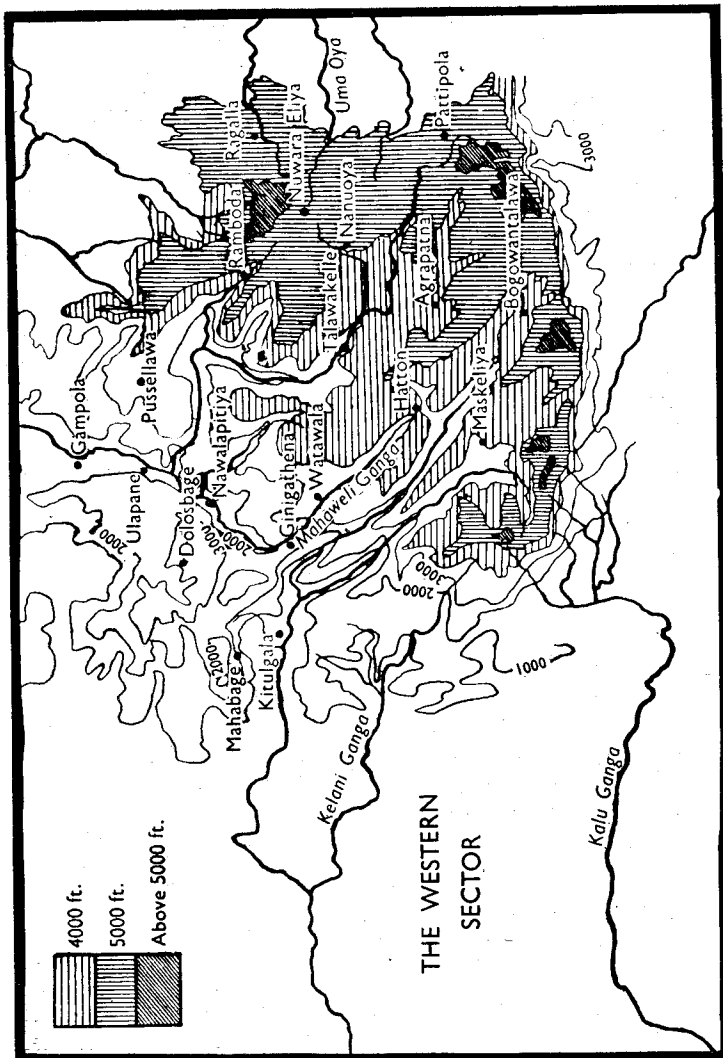
## B. THE WESTERN SECTOR

*The Adam's Peak - Dolosbage - Pedro Basin*

This is perhaps a convenient way of naming the upland basin enclosed by the *Dolosbage* uplands on the north-west, *Adam's Peak-Horton Plains Ranges* on the south and the *Horton Plains-Pedro Ranges* to the east. This basin is higher in elevation than the Uva Basin, and it opens northwards.

The smaller units within this area are:

1. The *Horton Plateau*—elevation of over 4,000 feet and drained by the headwaters of the Mahaveli.
2. The *Dolosbage - Mahabage Upland*—3,000 feet in elevation.
3. The *Adam's Peak - Horton Plains Ranges*.
4. The *Horton Plains*.



5. The *Pidurutalagala Range* and the basin of Nuwara Eliya. Note how the upper valleys of the Nanu Oya, Pana Oya and the Uma Oya concentrate on the Nuwara Eliya Basin. In it lies Gregory's Lake.

6. The *Gampola - Nawalapitiya Valley*. This area marks the centre of the paddy cultivation attempted by the Kandyans and it is significant that Gampola was the capital of a Sinhalese Kingdom. Later, like Badulla, it was the head of a principality. Ginigathena, commanding this valley as well as the Maskeliya Oya, a head stream of the Kelani Ganga, has become an important road junction from the north and west to the Horton Plateau.

### C. THE NORTHERN SECTOR

This contains the greater part of the *Kandyan Plateau* extending from Gampola to Matale via Kandy and eastwards of Kandy to Madugoda and Hanguranketa.

The physical units in the northern sector are :

1. The *Matale Ranges*. These stretch from Ratota to Hunnasgiriya and constitute a very significant watershed. To the north-east are the streams flowing into the Mahaveli or the Amban Ganga, e.g., the Kalu Ganga. To the south flow streams which join the Mahaveli between Teldeniya and Minipe.

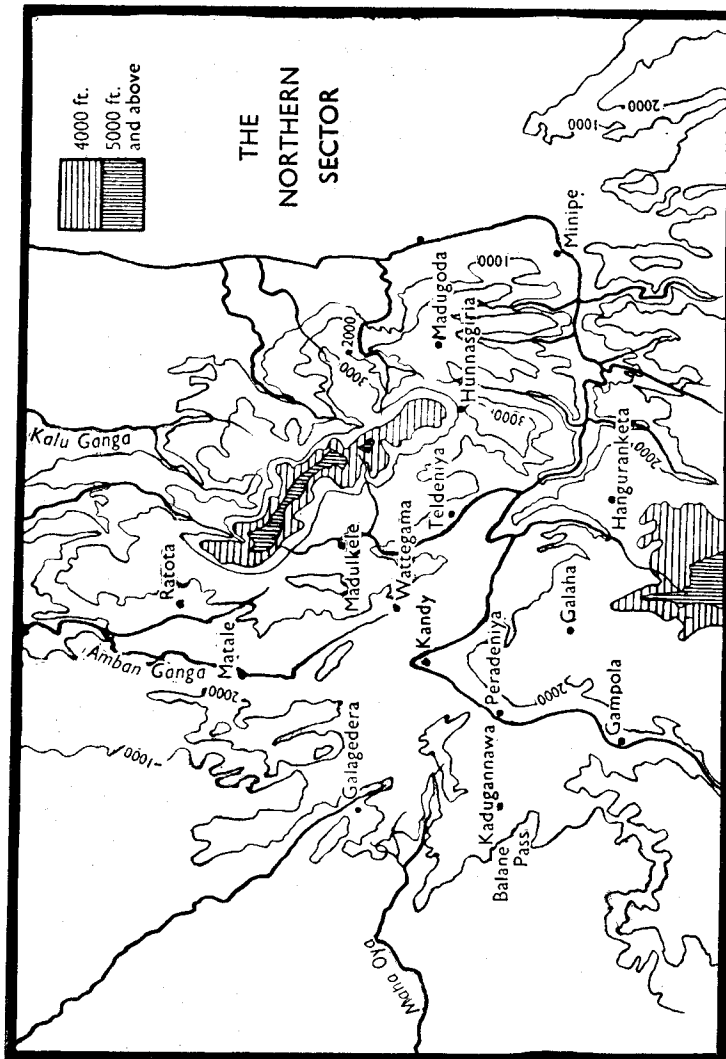
2. The *Dumbara Valley*. This is interesting in that it appears to be a transverse valley cut against the ranges of hills running north to south. At Minipe the river cuts across a rock ridge which is one of the grain lines of the land.

Side streams have developed on the north and south slopes of the transverse valley, making this a very rugged country. At Hunnasgiriya is a well known gap which opens a roadway from Kandy to Alutnuwara.

3. The *Matale Valley*. This lies between the 2,000 feet contours of the Matale Hills on the east and a range running north-south on the west. This valley is drained by the head-water of the Amban Ganga and is a natural way from the plain in the north to the Kanda Uda Rata. Nalanda and Matale are relatively ancient towns.

4. The *Kandy - Gampola Plateau*. Note how this area is bounded by the 2,000 feet contour. It is broad and flat and enabled paddy to be cultivated. All places of interest connected with the Kandyan Kingdom are found here. For





example Mahanuwara (Kandy), Peradeniya, Kundasale, Lankatileka and Gadaladeniya, Embekke, Degaldonuva, Hindagala, etc.

5. *The Western 'Borderland'*. This lies between the lowlands on the west and the Kandyan Plateau. Its hills run north to south and formed a mountain guard against invaders from the west. Two 'gateways' have been memorable in Kandyan History, Galagedera and Balane. Through these, roads make their way to Kandy.

*Note on the Origin and Structure of the Island.* Adams' *Geology of Ceylon—Canadian Journal of Research*, Vol. 1, Nos. 5 and 6.

1. The island has been formed by a series of uplifts of the earth's surface. Millions of years ago the island 'rose out of the sea to a certain height and remained stationary for a prolonged period of time'. This was subjected to erosion and various forms of denudation until what may be called a peneplain<sup>1</sup> was formed. This shall be called the third peneplain.

2. 'The island thus rose another 4,400 feet and remained at this level for long ages during which this part too was denuded and formed the second peneplain'.

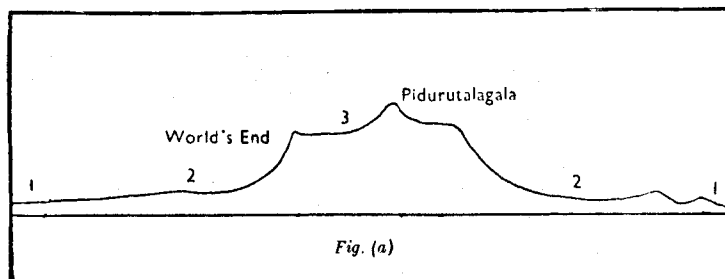
3. Next a third elevation took place amounting to 1,500 feet and the island remained at the level until the greater part of it was worn down to the level of the first peneplain, i.e., the present coastal plain.

4. Finally, it was again elevated until the present submarine plateau was at or above sea level. This too was denuded like the rest.

This positive or 'rising movement', however, was interrupted during its course by certain minor 'negative' movements of subsidence. Thus between the third and fourth movement, the island sank and the first peneplain was covered by the sea to a few hundred feet and on it was deposited the miocene limestone we see today forming the Jaffna Peninsula. A second subsidence took place when the water of the present

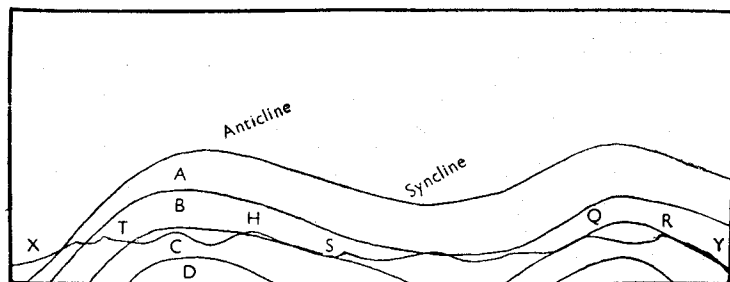
1. High mountain land worn down to lower levels.

ocean covered the submarine plateau (4) to a depth of some 216 feet. Fig. (a) illustrates the peneplains referred to above.



The first peneplain is today the coastal plain—only it is deeply covered with the debris accumulated on it. But the most resistant parts of the peneplain which had withstood erosion, are now often seen protruding or rising out of the debris. In places they rise high enough to be marked as ranges of hills or at least as rounded hillocks.

In the south-west section of the coastal plain of Ceylon these visible and elevated parts of the first peneplain are seen as hills ranged in parallel ranges running more or less parallel to the coast. All these hills and ranges are thus remnants of erosion of the first peneplain, and their peculiar arrangement is explained by the fact that the 'grain' of this peneplain runs in this direction. Thus the 'hard' parts of the grain or core resisted erosion better than the 'softer' parts and the hard parts are today mountain chains. The mountain chains are more accurately described as *strike ridges*. Suppose the earth to be folded up into anticline<sup>1</sup> and syncline<sup>2</sup> form thus :



1. *Anticline*: an upward fold of the earth's surface.
2. *Syncline*: a downward fold of the earth's surface.

After many millions of years of erosion let us assume line *xy* to represent the land surface. Points *t, h, s, q, r*, appear now as mountains. In just the same way the mountains of South-West Ceylon have been formed. In fact the hills of the Kalutara districts and Rakwana represent an anticline worn down, as the anticline seen in the above figure. It may also be borne in mind that the whole island is a huge syncline with the exception noted above, and the high hills of Central Ceylon are the remnants of a mighty syncline. Adams believes that about 10,000 feet of hard crystalline rock has been removed by denudation from the peripheral portion of the island.

On the south-east section of the coastal plain, which is also a part of the first peneplain, is seen a 'vast number of ridges, hills and buttes'. These are scattered very widely over the plain and are seldom more than a few hundred feet in height. Here and there are, however, great masses whose summits are coincident with the second peneplain. One of the most striking of these, known as 'Westminster Abbey' has been referred to earlier. Another great mass, about 3,600 feet in height is near Moneragala. These ridges and rounded hills all follow the 'strike' of 'grain' of the gneiss of which the peneplain is composed.

In the northern plain these remnants of erosion of the first peneplain are seen in the long ridges of gneiss rock found almost everywhere. A few examples are the long ridges of rock near Kurunegala—the Elephant Rock, the Tortoise Rock, Eel Rock, etc. Throughout the plain these black, gneiss ridges are seen. Thus from Vessagiri to the south of Anuradhapura a rock ridge runs to Isurumuniya and so along the bund of the Tissa Wewa and on to the 'Galge Vihare'. Besides these ridges are isolated fragments of erosion like the rocks of Yapahuwa, Sigiriya, Mihintale and Dambulla. All these ridges and isolated hill masses are arranged in a north-south direction in alignment with the strike of the land.

The second peneplain lies at the height of 1,600 feet.

The breaking down of the second peneplain on the west-ern side of the island is seen when one travels down from Kandy to Colombo by train. Kandy itself lies in a depression of the second peneplain. Looking to the south as the train passes between Peradeniya and Alagalla the deep dissection of the second plain is seen by great valleys running into its margin, the summits of the intervening remnants of the plain showing a general accordance of level. Many of these

remnants take on curious and bizarre shapes, some flat-topped, others presenting sharp pinnacles, the wedge-shaped forms. But by the time Rambukkana is reached these rocky ridges have disappeared and the rail road passes out on to the levels of the coastal plain.

The third peneplain—the highest, may be said to be 6,000 feet above sea level. The two depressions on it have already been described.

From this peneplain too are seen mighty remnants of erosion standing out as peaks and ridges. These are seen everywhere—for Adam's Peak and all the high peaks of Central Ceylon are such erosion remnants of the third peneplain.

If a person were to stand at the Haputale Gap many of the main features of the three peneplains can be clearly seen. He would be standing on the third peneplain and would see on the north and west all the mountain ridges leading to Pidurutalagala and Hakgala as well as the Welimada depression. To the south he would see the second peneplain all cut up into a variety of forms and clearly recognize the escarpment which separates it from the lowest—the first peneplain. And this too is seen as one vast lowland stretching far away to the south horizon. The above account of the origin of the island has been challenged by Dr. Wadia, a former Government mineralogist. As a result of careful study he offers another theory regarding this origin of the island. He is unable to accept Adams' view that the central part which was due to the first uplift is the oldest part of the island. Very old land masses never retain for long such a variegated topography as the central highlands do to this day. The action of the agents of denudation reduce these old land masses to peneplains (almost a plain). Now such plains, land, i.e., smooth or low relief are found around the central hills forming the northern, eastern, western and southern plains of Ceylon. This section according to Dr. Wadia shows all the signs of a land mass planed down by denudation. Hence this is the oldest part of the island. The second peneplain (1,600 feet approx.) was next formed by a vertical upthrust which lifted the surface level of the island well above the first peneplain. Today the second peneplain exists as a platform in some parts, as in South Ceylon, overlooking the low plain. The Haputale sheets show this second peneplain most clearly, the drop to the first peneplain being shown by a steep escarpment.



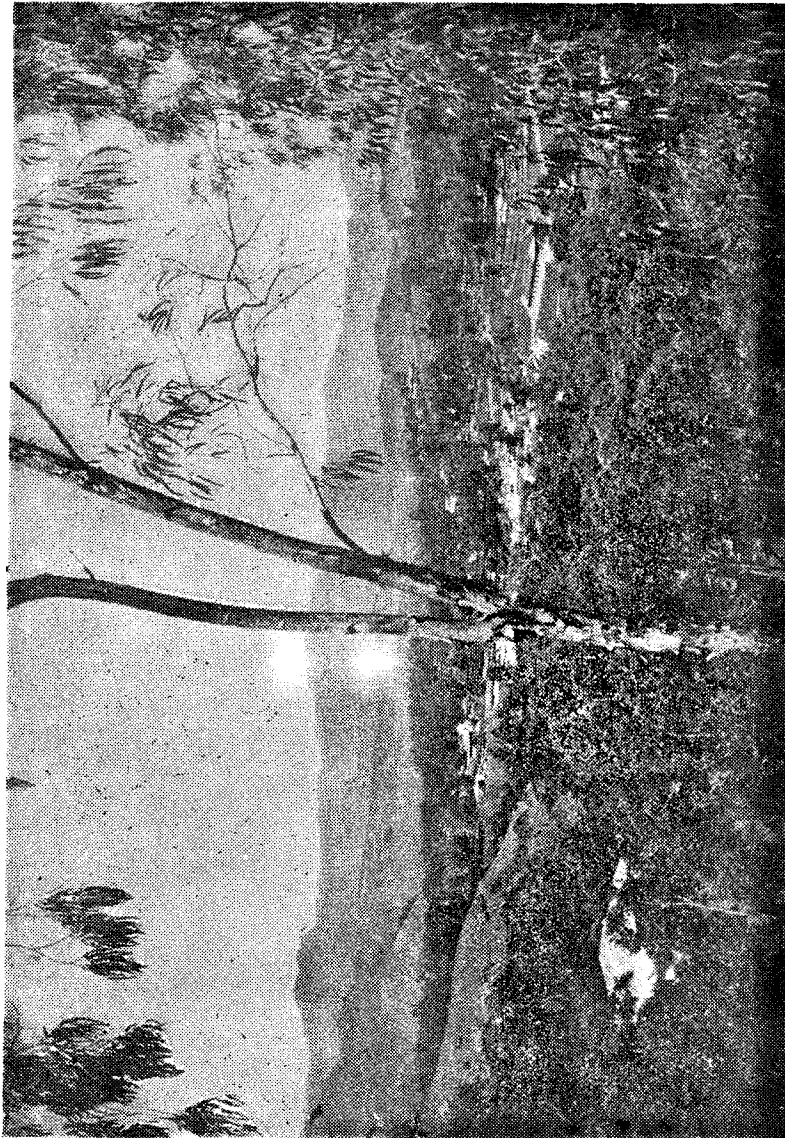
Geo. Koh

GENERAL VIEW OF THE SECOND PENEPLAIN

Photo



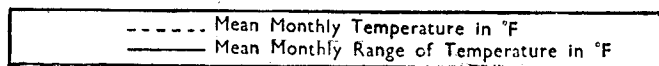
Later still, according to Dr. Wadia another upthrust lifted the land mass to form the third peneplain (6,000 feet approx.) and this today constitutes the central hill country. Its surface was denuded and the present topography of this part of the island was thus formed. The fact that rivers flowing from the central hill country have falls gives support to the view that the central hill country was due to a vertical upthrust. Its relatively young topography supports the view that it is the youngest part of the island.



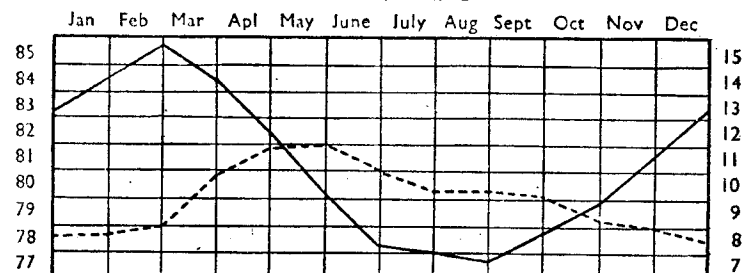
Photo

BANDARAWELA A VIEW OF THE THIRD PENEPLAIN

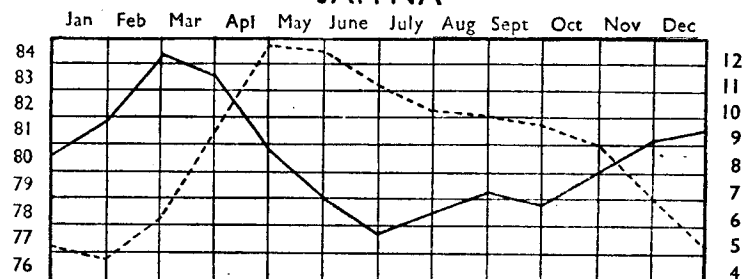
Geo. Koch



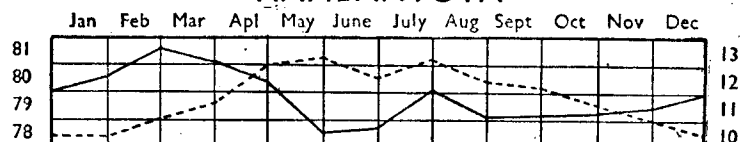
## COLOMBO



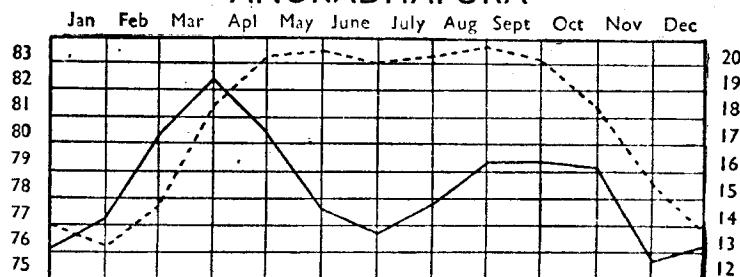
## JAFFNA



## HAMBANTOTA



## ANURADHAPURA



## CHAPTER III

### The Climate of Ceylon

#### Temperature

As the island is situated between  $0^{\circ}$  and  $10^{\circ}$  north latitude there is very little seasonal variation of temperature. The distribution of temperature is to a great extent controlled by the relief of the land.

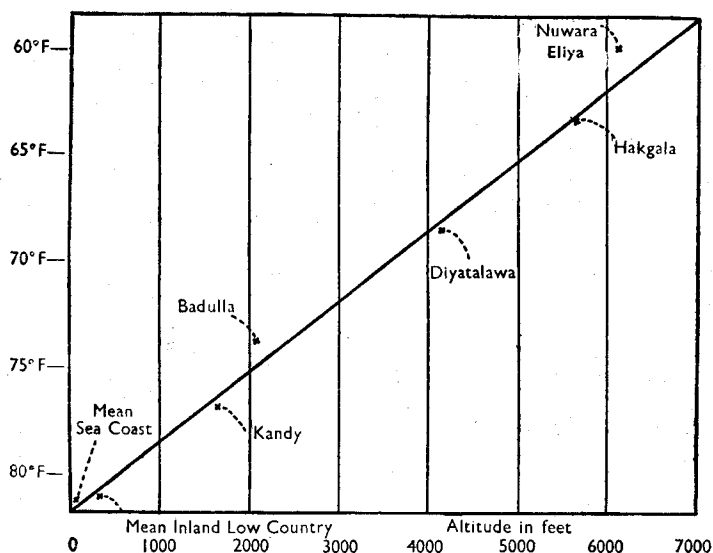
On the coastal plain of the south-west and south-east the average temperature is  $80-81^{\circ}\text{F.}$ , while over the northern plain it is  $81-83^{\circ}\text{F.}$  This slight increase of temperature may be due to the minimised influence of the sea and also to the proximity to air masses over South India.

Let us examine temperature curves for a few selected stations in the coastal plain and the northern plain—Colombo, Jaffna, Hambantota and Anuradhapura (vide opposite).

All the stations show *very little seasonal variation*. Colombo and Hambantota least of all—the variation being about  $3^{\circ}\text{F.}$  Jaffna however shows a variation of  $8^{\circ}\text{F.}$  whilst Anuradhapura shows the same. Nevertheless these variations are insignificant. All these stations show a fall in temperature with the arrival of the monsoon rain; in Colombo in June, in the other stations in November. There is also an increase of temperature from March to April. All over Ceylon, March and April are months of cloudless skies and therefore of intense insolation. This is indicated by the rise in temperature at all stations, but Jaffna and Anuradhapura show it best. The rise in the former may also be due to the warm air over the Deccan exerting an influence over Jaffna in spite of it being a sea-coast town. Anuradhapura is an inland town and hence does not get the full benefit of cool sea breezes.

Though all the stations selected do not show marked seasonal variation of temperature, nevertheless as the graphs indicate, they show considerable *daily ranges of temperature*. Thus at Colombo in February there is a range of  $15^{\circ}\text{F.}$ , whereas it is between  $8^{\circ}\text{F.}$  and  $9^{\circ}\text{F.}$  in June and July. Cloudiness or cloudlessness is the main reason for these changes, the former giving a small range whereas the latter gives rise to greater ranges of temperature. In Jaffna the smallest range is in May, June and July and it should be

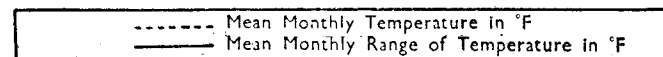
noted that in these months the humidity of the air is between 76-78 per cent. and this may account for the small range. But in February the range is greatest, amounting to  $15^{\circ}\text{F.}$ , and in this connection it should be remembered that the humidity of the air in this month is 66 per cent., being the lowest for the year. At Hambantota we notice the same feature—that the range is greatest in the months of lowest humidity, i.e. in March and February ( $73-72$  per cent.); while the range is least in May and June, the months of the highest percentage of humidity ( $78-76$  per cent.). At Anuradhapura



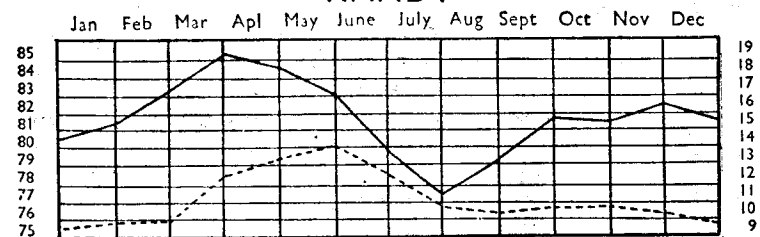
GRAPH TO ILLUSTRATE THE DECREASE OF MEAN ANNUAL TEMPERATURE IN CEYLON WITH INCREASE OF ALTITUDE

too, the daily range of temperature is 20 degrees in March and in this month the humidity is the lowest for the year (60 per cent.). In August and September the daily range runs to  $15^{\circ}\text{F.}$  with the humidity low at 61-62 per cent. In marked contrast are the months of May and June when the daily range is least ( $13^{\circ}\text{F.}$ ) and the humidity is 68 per cent. And so in November-December the daily range is  $13^{\circ}\text{F.}$  and the humidity is the highest for the year (77 per cent.).

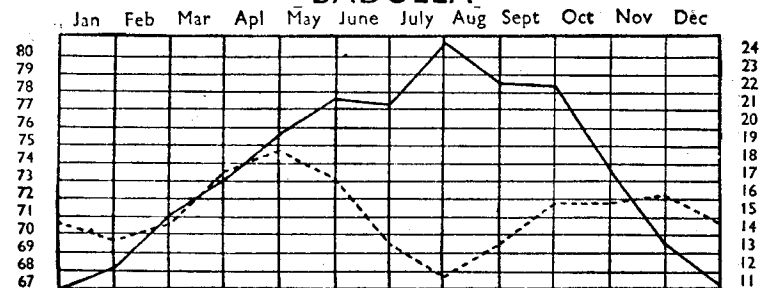
The distribution of temperature in the hill country is more or less controlled by the relief of the land. In fact



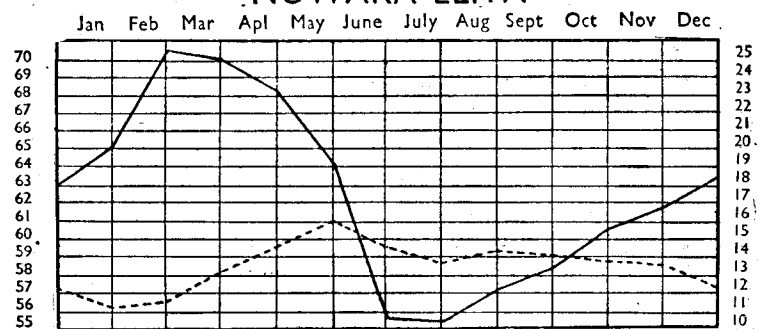
## KANDY



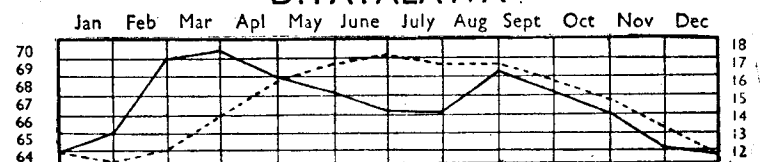
## BADULLA



## NUWARA ELIYA



## DIYATALAWA





isothermal lines may be considered as coincident with the contour lines, e.g.,

1,000' = 77°F.  
3,000' = 70°F.  
6,000' = 60°F., etc.

Let us now examine the temperature curves for four selected hill stations of varying elevation (page 49). These show at a glance how the temperature varies every month at the different stations, the warmest being Kandy and the coolest being Nuwara Eliya.

Taking individual stations, it will be seen that there is very little monthly variation in temperature, the most being 5°F. But as with the low country stations, the daily range of temperature is considerable. Taking Kandy first, we notice the range greatest in March (20°F.) and lowest in July (11°F.). Cloudlessness is the major cause for the great range in daily temperature, and it is worth while bearing in mind, that the range of daily temperature is greater when the rainfall is less. Note the low range during the south-west monsoon months of May, June and July.

Badulla shows the greatest range of temperature in July, August and September. These months are relatively dry months and the skies are not cloudy by day or night, thus causing great heat by day and rapid radiation by night. At Nuwara Eliya the daily range of temperature is greatest in February which is also the driest month of the year. March and April too show ranges of temperature from 20° to 25° and these months are months of scanty rain.

Thus it will be observed that the daily range of temperature of most stations in Ceylon whether of the hill country or the low country depends on cloudlessness or cloudiness of the skies, for cloudless skies lead to intense insolation by day and radiation by night and thus hot days are followed by cold nights. If skies are cloudy, as in the wet months of the year, insolation and radiation are both restricted, hence the range of temperature is not great.

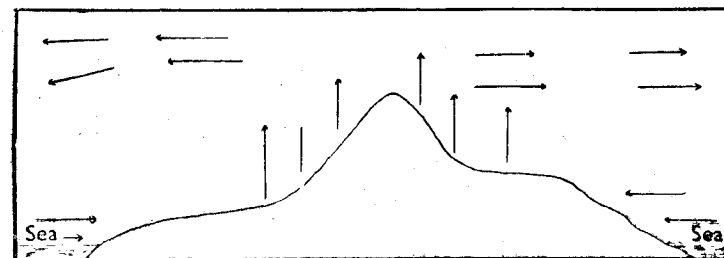
## CHAPTER IV

### The Rainfall of Ceylon

As Ceylon lies between 0° and 10° north latitude it is not far wrong for one to say that the *normal* type of rain should be caused by afternoon heat thunderstorms. The land is heated by the sun from 6.00 a.m. and reaches a maximum a little past midday. As the land is warmed the air over it is consequently heated and begins to rise. This process is slow at first, but by 10.00 a.m. is well established. As the heated air rises the cooler air from the sea comes blowing into the land. The rising air is humid and cooling by ascent will cause condensation and consequent rain. The humid sea air coming in acts as a 'supply depot' of moisture and helps to increase the moisture content of the rising air. This naturally increases the quantity of rain likely to fall.

The ascent of heated air over Central Ceylon reaches its maximum in the early afternoon so that rain falls in the central districts a little past one or two o'clock. The thunderclouds which form in the centre of the island are wafted seawards by an upper drift of air which moves from the land to the sea. The thunderclouds so wafted bring rain to the coastal districts in the late afternoon, e.g. after 3.00 p.m. and by sundown, the clouds have drifted over the sea. The night is thus clear and when the sun shines the next day, it begins the process of heating the land and causes masses of air to ascend to be replaced by cooler air masses from the sea. Once again the thunderstorm rain falls in the central districts in the early afternoon and over the coastal regions between 3.00 and 7.00 p.m.

Here is a diagram which illustrates the process :



These conditions are established over the whole island in the March-April and September-October periods. The air

pressure over Ceylon is more or less uniform so that there are no air masses traversing the island from any direction. By day the air pressure is lower over the land than over the sea and the chief air movement then is from (a) the sea to the land and (b) from the land vertically upwards over the central regions. By night the more rapid cooling of the air over the land creates a higher pressure area over the land than over the sea and the consequent air movement by night is from the land to the sea. The main controlling factor in the movement of air under these conditions is the *diurnal variation of pressure*.

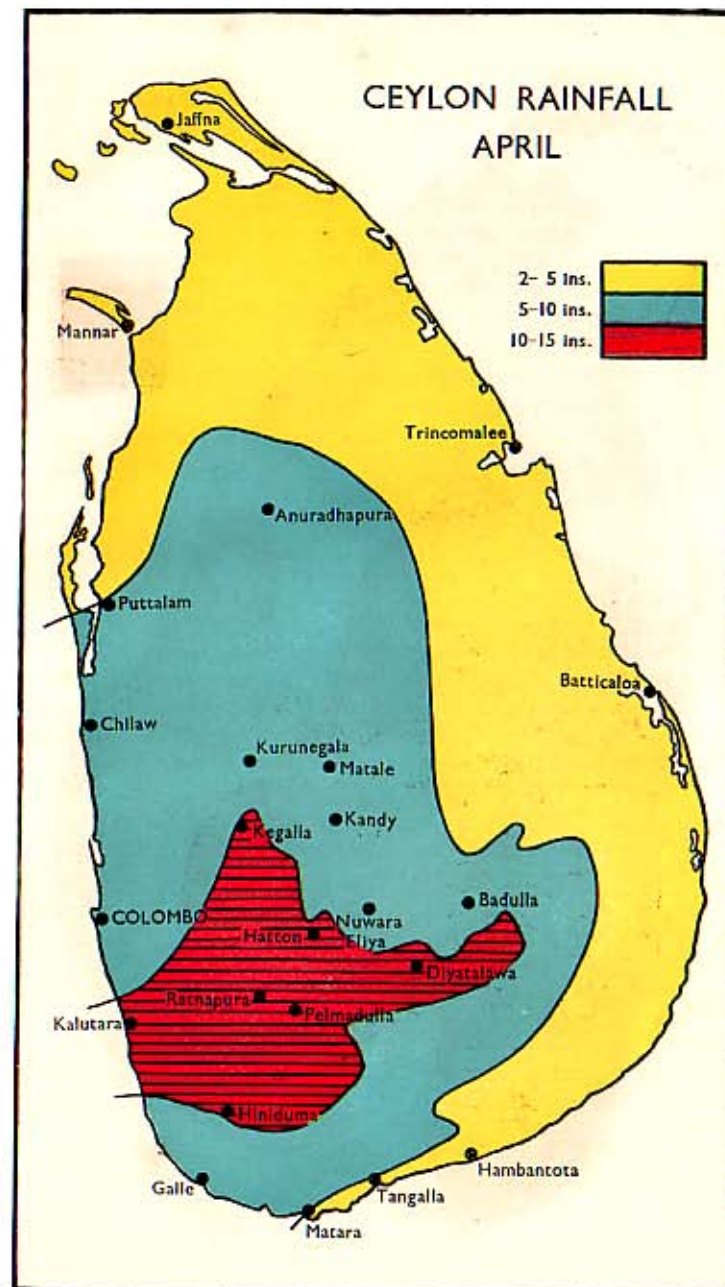
Let us now examine a map showing the distribution of rain in **April** (page 53).

The first point to notice is the fact that rain is *well distributed all over the island* and that *over three-fourths of the area has over 5" of rain*. The next noticeable feature is the *relation between the relief of the land and the area of the heaviest rain*. The south-west hill slopes have more rain than any other part of the island and this is no doubt due to the fact that the sea air coming in from the south-west increases the moisture content and a certain amount of rain is caused by its meeting with opposition from the hills. The heavily moisture-laden air would be forced to ascend by the high land and the consequent cooling will no doubt cause rain. It is interesting to note that the isoyhet of 10" follows fairly closely the Adam's Peak-Haputale Range suggesting that the rain here is caused by the moist air ascending along the high ranges.

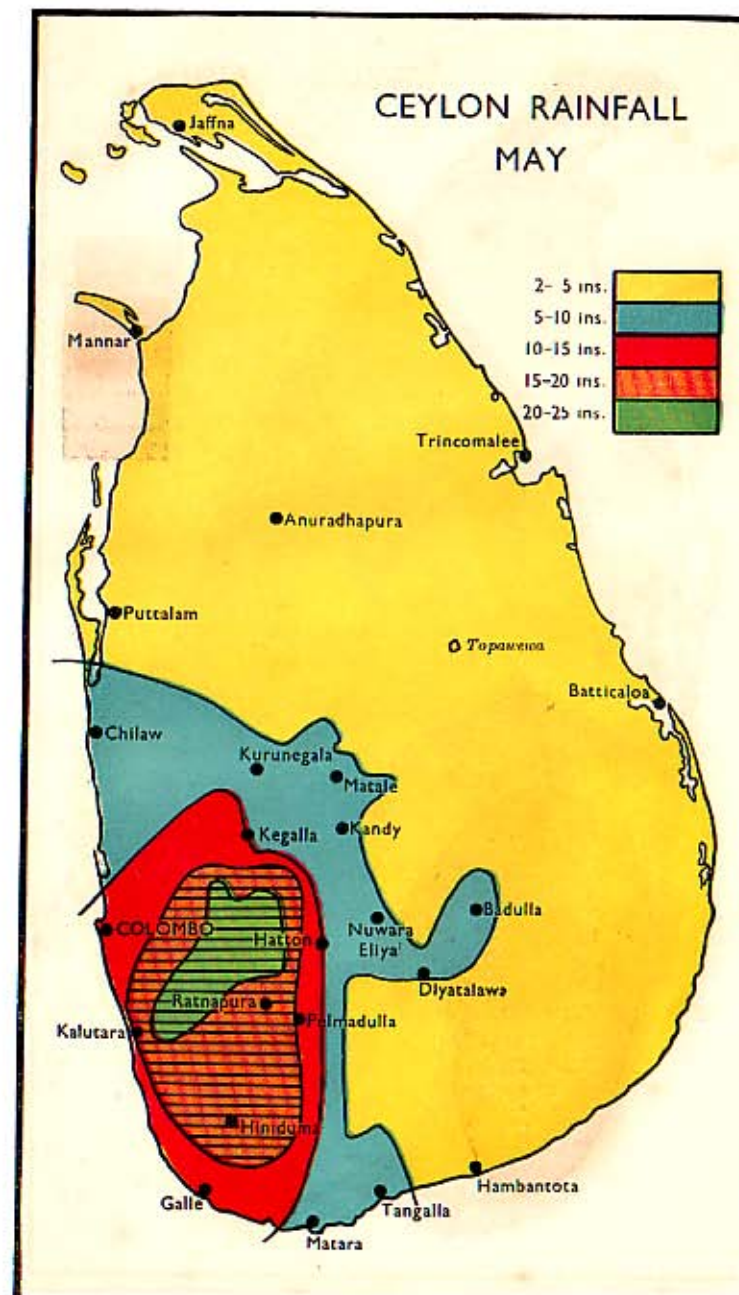
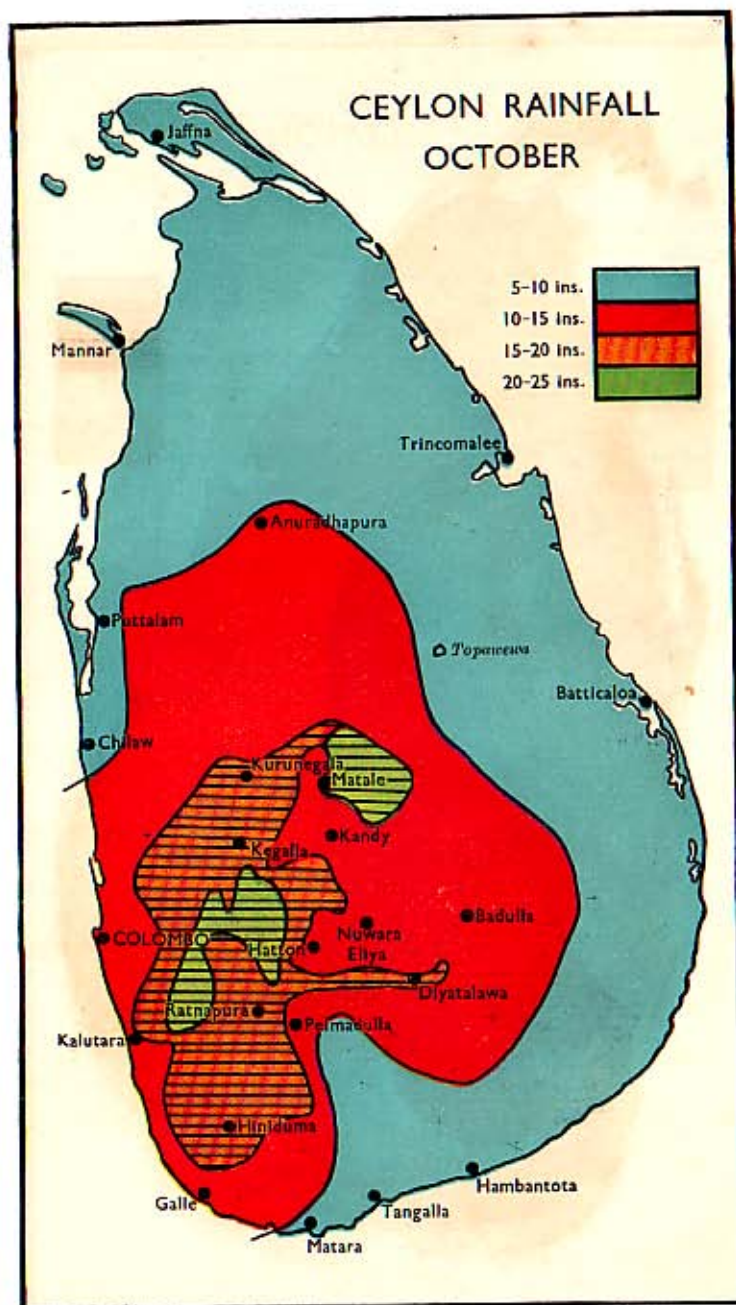
Next let us examine the map showing the distribution of rain in **October** (page 54).

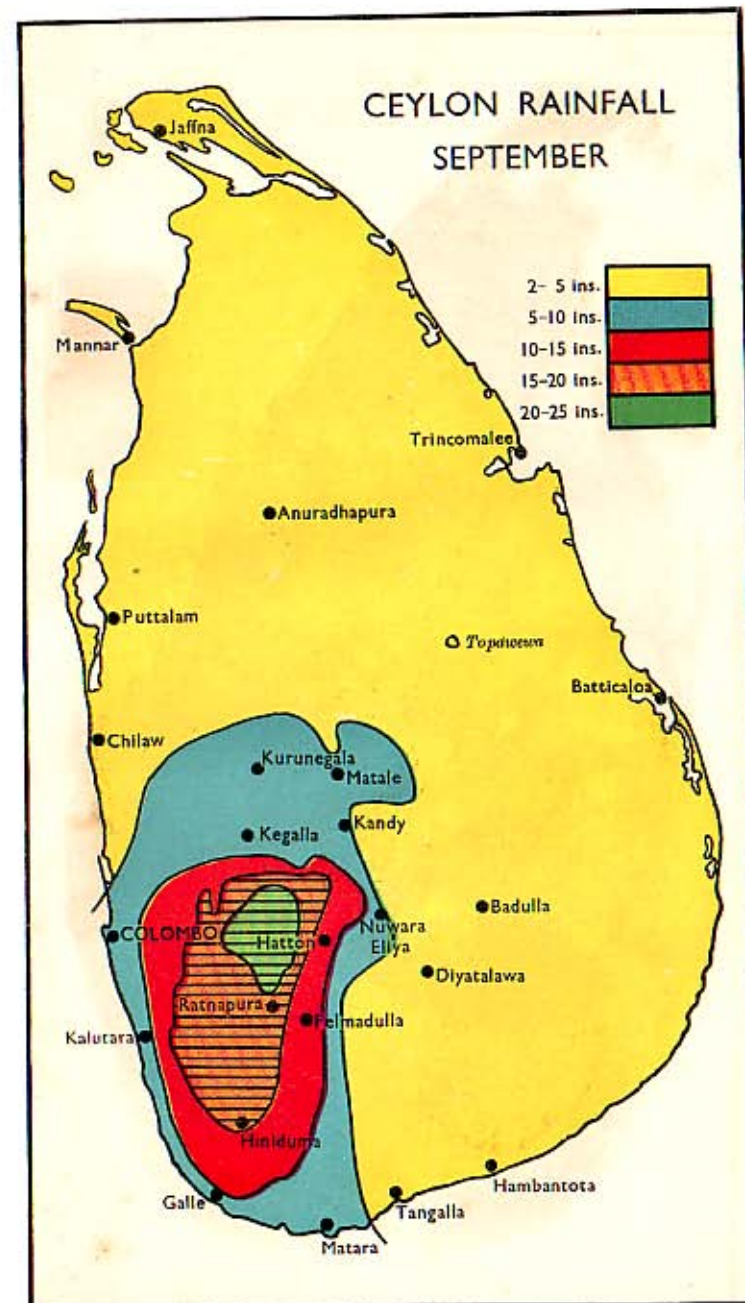
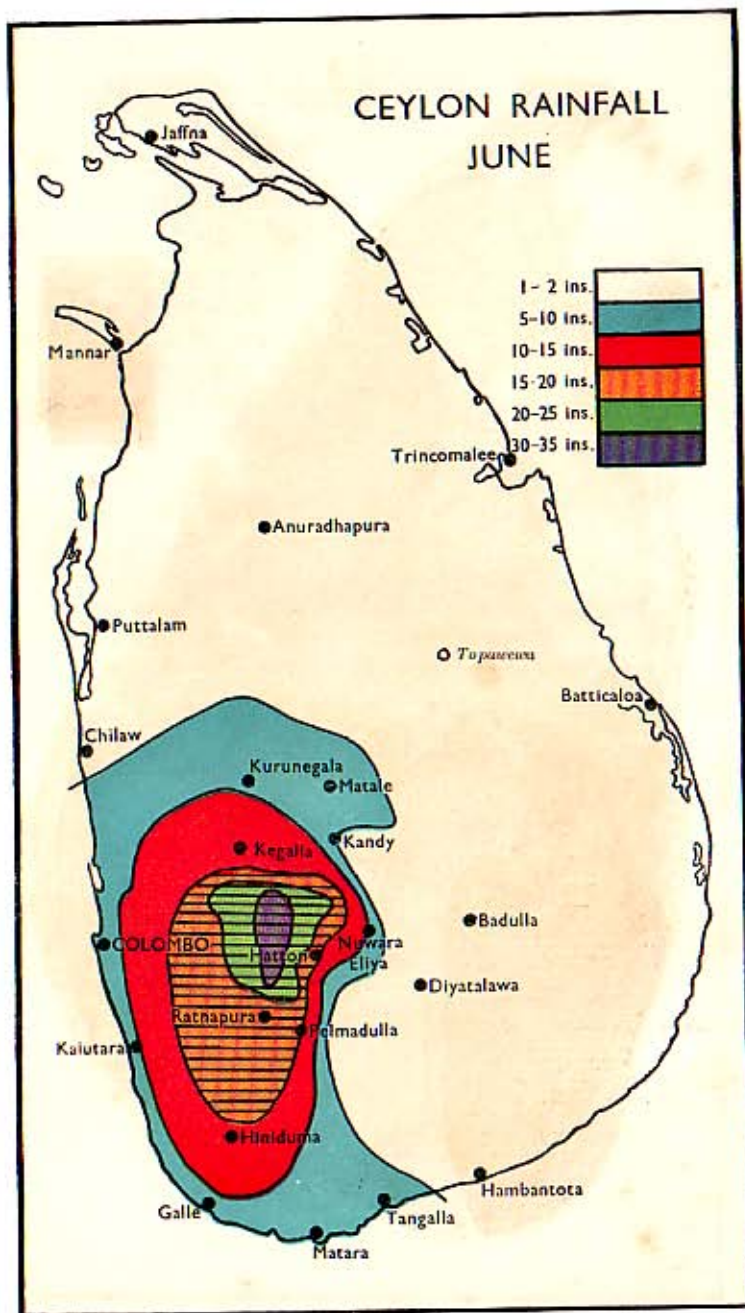
Here again the rain is *well distributed* but the quantity is more than in April. Over three-fourths of the island the rainfall is 10-15" as against 5-10" in April. The northern and eastern coastal regions have 5-10" of rain whereas in April it was 2-5". You will also observe that once more the higher lands get heavier rain and the 20" rainfall line follows the contours of the Adam's Peak-Haputale Ranges and the Matale Hills. The heavier rain in October is due to cyclonic rain which is fairly common at this time of the year. But the normal or the periodic type of rain in October is connected with thunderstorms which occur in the *afternoons*.

From *May to August* air movements in Ceylon are controlled by a low pressure region outside the island. The diurnal variation of pressure is dominated by a four month period of low pressure in North-West India and a belt of

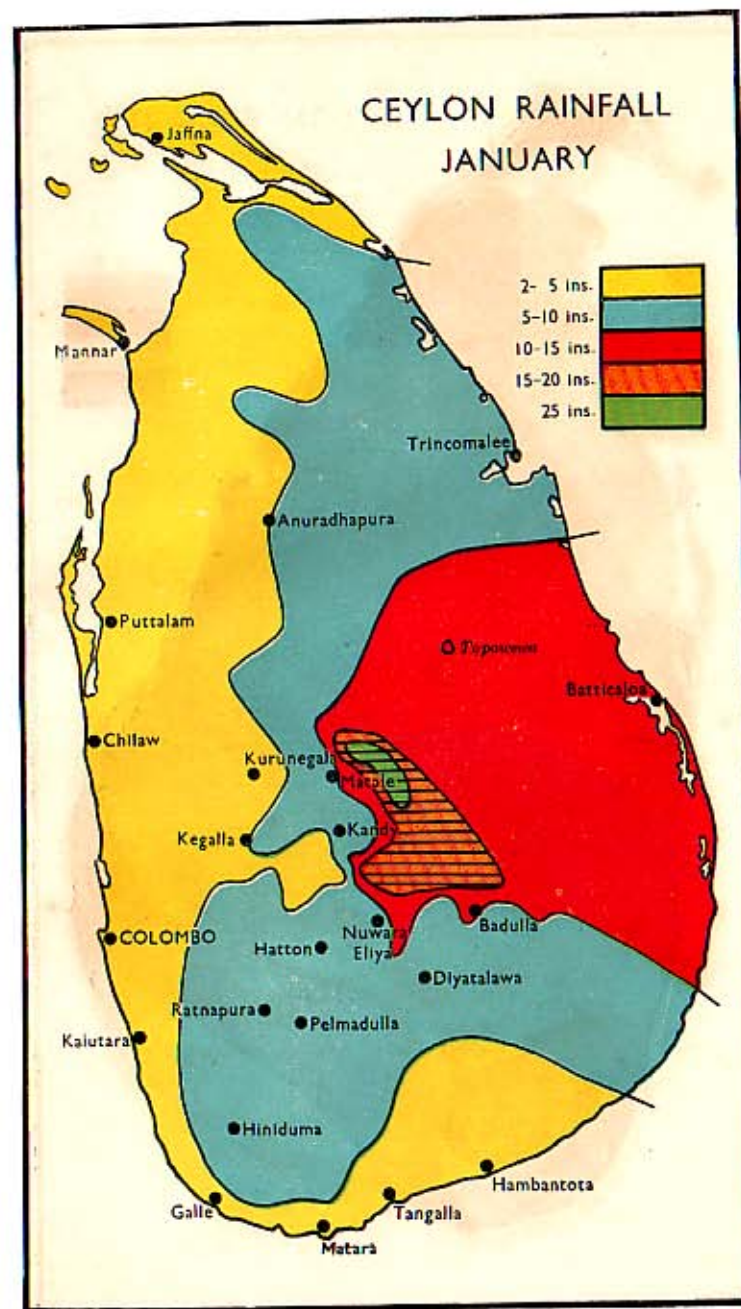
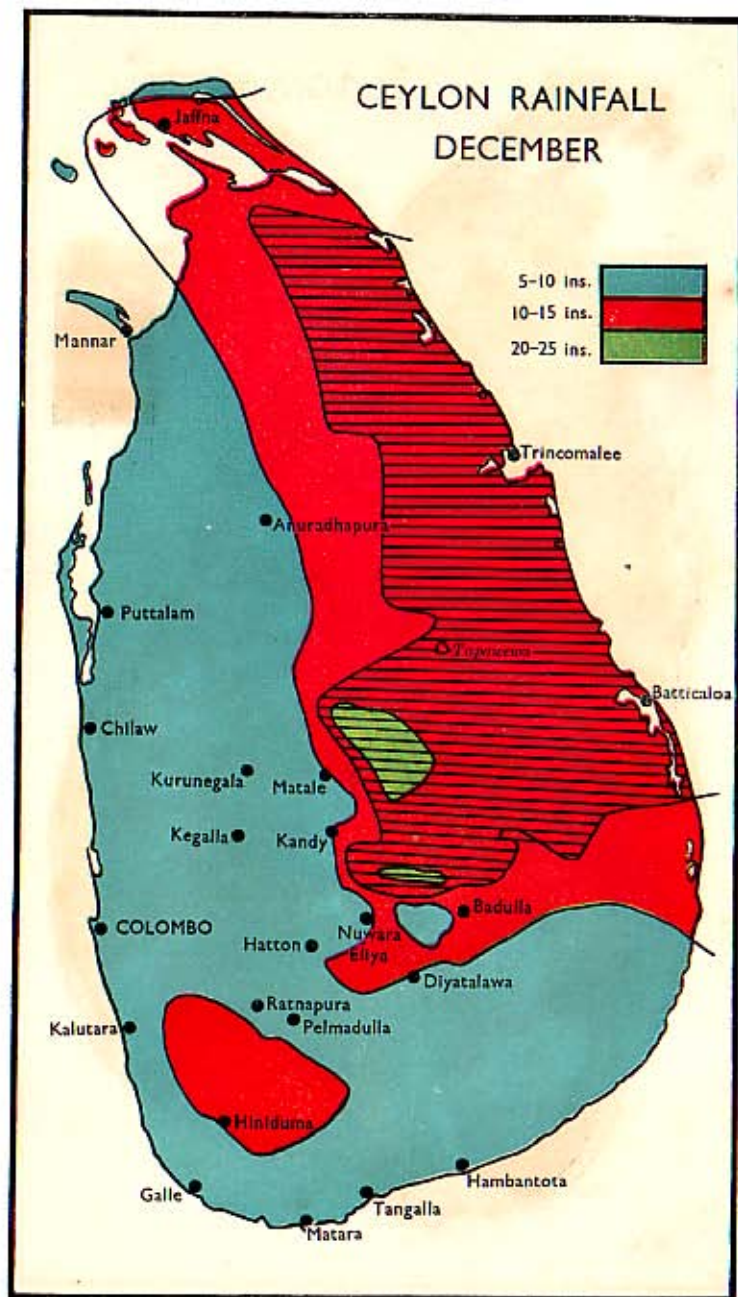




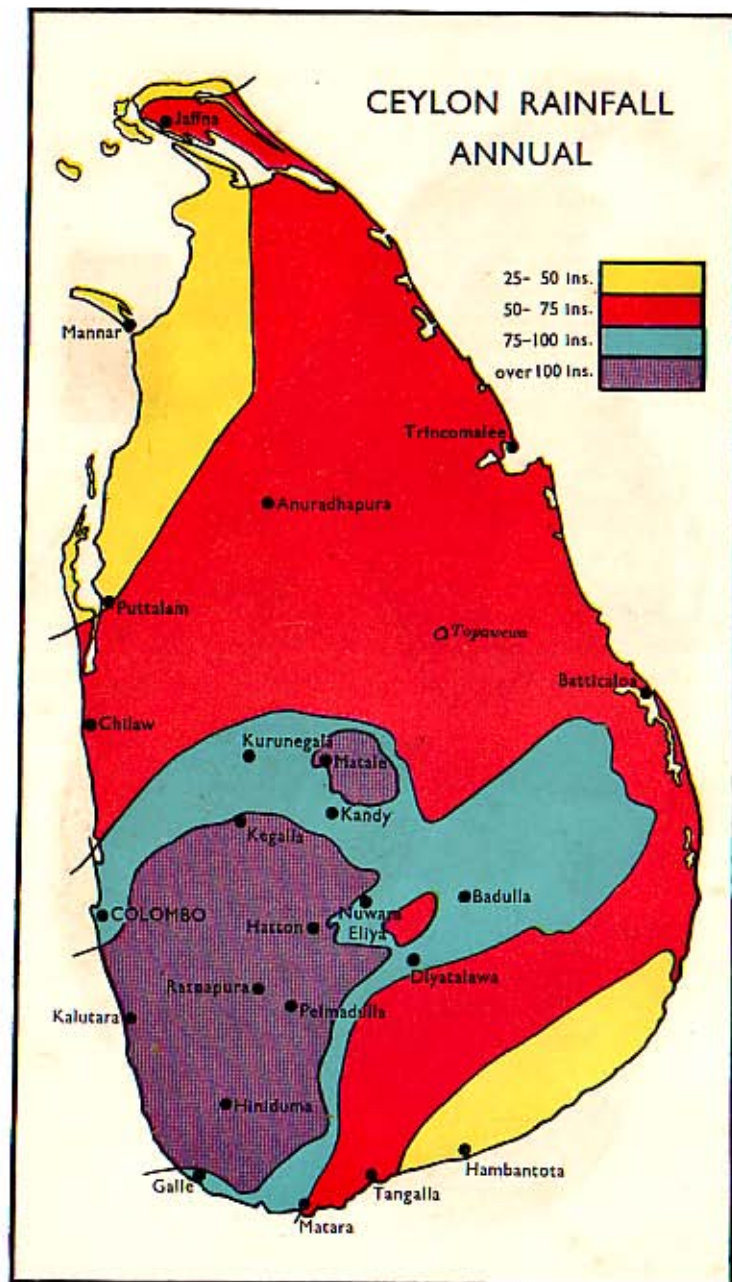












high pressure to the south and south-west of Ceylon. Consequently air masses move from the south-west towards the north-east of our island and as this takes place during a season, we call this air movement—the *south-west monsoon*.

The south-west monsoon is a vast mass of very humid air moving slowly in May when the Indian low pressure area is forming. But it gathers strength and 'develops' into a faster movement in June and July when the low pressure area has developed. Later in August the monsoon slackens as the low pressure area begins to 'fill up' with the southward movement of the sun towards the end of the year.

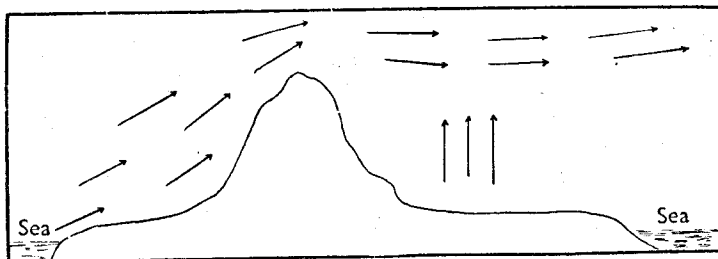
Let us now take the rainfall map of **May** (page 55). You will notice at once that the *rain* is more or less *confined* to the *south-west quarter* of the island whereas the remaining three-fourths is relatively dry. The rain in the south-west is heaviest in the lower hills of the south-west and the coastal areas receive as much as 15-20" of rain. Notice also how rapidly the rainfall diminishes as you travel inland. This is shown by the isoyhets coming close to each other, e.g. from Ratnapura to Hatton and to Diyalawala. The rainfall drops from 20-10" and then to 5" at Diyalawala. This is of course due to the fact that the rain from the south-west monsoon is for the most part *relief rain*, the windward sides getting more rain than the leeward sides.

Over the northern and eastern parts of the island the rainfall is low and the 2-5" of rain are brought by local thunderstorms. These are active whenever the monsoon wind is *weak*, as for example in the beginning and end of the monsoon. This again illustrates the fact that thunderstorm rain is the *normal* type of rain in a tropical island and whenever any abnormal influence is removed or is weak, the normal feature asserts itself.

The rain on the leeward side of Ceylon is also caused by the ascent of monsoon air over masses or 'domes' of heated air rising from the surface of the land. In May the northern and eastern plains are cloudless and the heating up of the ground surface is great. By one o'clock the ascent of heated air is very considerable and these masses can effectively push upward weak streams of air moving horizontally above the ground. If the air thus forced upward is cooled, condensation can take place and rain will



fall. This process is illustrated by the following diagram :—



In May we have the rain that comes with the advancing monsoon. In June the monsoon has strengthened and blows with considerable strength. The map of rainfall for **June** (page 56) shows you that once more the rain is confined to the south-west quarter of the island as in May, but the quantity is much more. The leeward side has much less rain than in May and this is explained by the fact that when the south-west monsoon is strong, the chances of local thunderstorms on the leeward side are less.

When the south-west weakens in **August-September** the rainfall diminishes and the distribution approaches that in May. Thus in the **September** map (page 57) the areas having 5-10", 15-20" and 2-5" almost coincide with those in May.

When November sets in, the direction of air movement over Ceylon changes. Over Northern India, which at this time has cool weather, high pressure develops while to the south and south-west of Ceylon low pressure exists. The result is that winds blow from India outwards and these reach Ceylon as north-east winds. As these last a period from November to January we call them the *north-east monsoon*. The north-east monsoon is not a great 'rain bringer'. It starts as a relatively dry wind and moving into lower and warmer latitudes it tends to become warm. It will then 'pick up' moisture rather than yield what it has. This it does on its way across the Bay of Bengal and when it reaches our shores it is not a dry wind. It has however not the same moisture content that the south-west monsoon has.

Let us now examine the map showing the rain in Ceylon in **December** (page 58). You will notice that the northern and eastern parts of the island have over 10" of rain with over 20" in the Matale Hills and the Rangalla Ranges. The leeward side has 5-10" with 10-15" in the Rakwana Hills. The rainfall in these hills is perhaps due to the north-east monsoon air

masses curving round the central hills and meeting with opposition from the Rakwana Hills. We must not forget that thunderstorms will also bring rain on the leeward side on the central hills.

In **January** the monsoon has weakened. Your map (page 59) will show you that the quantity of rain has diminished although the north and east of the island receives most rain. The north-east half of the hill country has naturally the heaviest rain.

We have so far described the regular or *periodic* agents of rain. They are (1) *local thunderstorms* which provide rain in the afternoon. This rain is heaviest in the central hills and it diminishes along the coastal belt especially to the north and east.

(2) The *monsoons*—(a) The south-west is dominant in the May-September period and brings heavy rain to the south-west quarter of the island. The Bulutota Hills and the western and southern slopes of the hill country have the heaviest rain. (b) The north-east monsoon begins about November and ceases by about the end of February. At this time the north and east of the island receive the most rain and the north-eastern slopes of the hill country receive the heaviest rain.

Besides these two periodic agents of rain, Ceylon experiences *tropical cyclones*. The period between the monsoons is the season most liable to these storms. It has been established by means of records that cyclones are commonest in the *Bay of Bengal* in the months of *October and November*. Of a total of fifty-six cyclones recorded from 1877 to 1903 over the Bay of Bengal thirty occurred during the October-November period, seventeen of them being in November. Cyclones can however appear at other times of the year.

The most important feature about a cyclone is that it has within it so to say, the means of causing rain. The centre of a cyclone is always a region of uprising warm air and if this comes over even the flattest region, rain will fall.

Within a cyclone one can distinguish two sectors, one a cold and the other a warm sector. In cyclones of regions north of the equator the cold sector lies in the northern part of the cyclone and the southern part has warm air and so is called the warm sector. Where the warm air meets the cold air within the cyclone, rain is likely to fall because the warm air coming from the south will rise over the heavier colder air coming from the north. This ascent of warm air

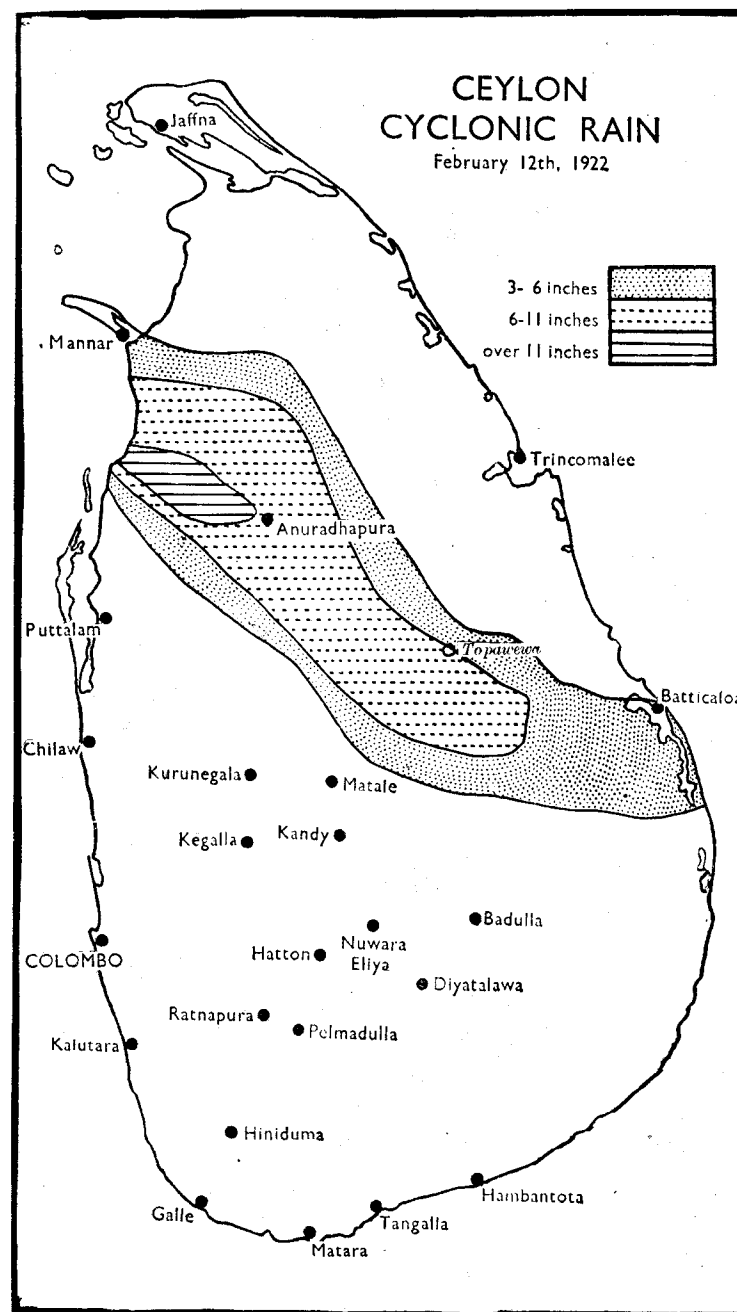
will cause condensation and rain is likely to fall even on the flattest land. On the morning of the 21st of November, 1920 a cyclone was reported to be east-south-east of Batticaloa. At 1.00 p.m. it had moved north and was east of Trincomalee. Here are some figures to show you the amount of rain that fell between the 20th and 24th of November, 1920

	20th-21st	21st-22nd	22nd-23rd	23rd-24th
Jaffna	.. 3.00"	6.13"	3.25"	1.26"
Elephant Pass	.. 5.09"	14.59"	1.77"	.55"
Mullaitivu	.. 18.33"	.54"	.13"	3.26"

Cyclones can come at all times of the year. They come sometimes with the monsoon and heavy rain results. For example in 1930 a cyclone appeared on the east of Ceylon on May 6th and it moved away on the 8th. The monsoon air masses were drawn across the island towards the cyclone and very heavy rain fell in South-West Ceylon causing heavy Kelani floods. Similarly a cyclone caused widespread havoc in Central and Western Ceylon in August, 1947.

The outstanding feature of the weather in August 1947 was the unprecedentedly heavy rains that occurred about the middle of the month in the south-western quarter of the island, particularly in the hill country. Kandy, with an average August rainfall of 5.73 inches, totalled 28.41 inches, its previous highest August rainfall during 77 years of observation being only 17.07 inches in 1931. Among the other numerous stations that broke their previous August records may be mentioned, Peradeniya Gardens 31.99 inches (previous highest, 19.18 inches in 1931; 64 years), Waragaland Estate, Madulkele 50.41 inches (previous highest, 14.30 inches in 1931; 44 years), South Wanarajah Estate, Dickoya 49.72 inches (previous highest, 31.01 inches in 1931; 62 years), Luccombe Estate, Maskeliya 58.76 inches (previous highest, 49.57 inches in 1931; 45 years), and Hatton 53.50 inches (previous highest, 41.28 inches in 1931; 51 years).

Cyclones are important 'rain-bringers' to the lowlands of Northern and Eastern Ceylon. Sometimes they cause floods and as much as 22" of rain has fallen in 24 hours, e.g., at Nedunkeni in 1887. In fact much of the rain that falls in the northern and eastern lowlands of our island can be traced to the influence of cyclones. But for their aid, these lowlands would be very dry because little or no relief rain can fall here. Take for example the north-western and south-eastern coastal regions. These are the driest areas in Ceylon



in spite of the fact that both monsoons blow over them. They can give no rain as the land is flat and so does not present any opposition to the monsoon winds. They blow over as dry winds. Fortunately for the lowlands of the north and east, they come under the influence of cyclones which often travel along the east coast and occasionally cross the island over the northern plain. On the previous page is a map which shows you how on February 12th, 1922 a cyclone gave heavy rain to North Ceylon.

The year may be divided into the following :—

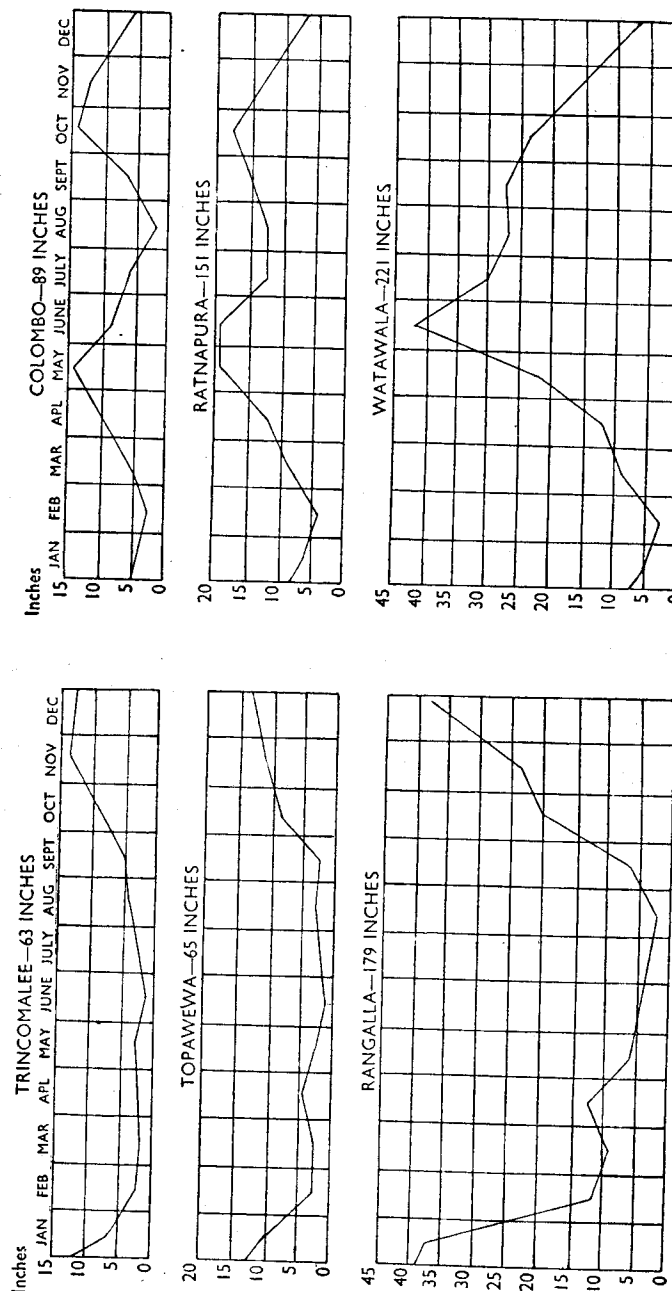
#### A. Rainfall Periods

**1.—May to September.** This is the season of south-west monsoon rain. The south-western quarter of the island receives most rain. The north and east are generally dry as the south-west monsoon blows over as a dry wind. Paddy is sown in South-West Ceylon early in May and the harvest is gathered in August. The plant gets increasing rain as it develops but the harvests are often ruined by rain.

**2.—October to November.** This is the season of afternoon thunderstorm rain. It is well distributed throughout the island, the heaviest rain being in the central and western hills. It diminishes as the coastal belts are reached. Cyclonic rain is a regular feature over the northern and eastern plains. This rain is most important for the cultivation of paddy and chena crops all over Northern and Eastern Ceylon. The sowing takes place in September and the October-November rain provides the increasing supplies of rain required by the growing plants. Sometimes the cyclones do not appear and then the paddy and chena crops perish. It is this *unreliability* of the supplies of rain that makes agriculture so precarious a task in North and East Ceylon.

**3.—December to February.** This is the season of the north-east monsoon rain. The rain on the lowlands is often associated with weak cyclones that come with the monsoon. The monsoon rain nourishes the paddy and chena crops and these come to maturity by the end of February when the monsoon ends. It should be noted that over the lowlands of the north and east much of the rain that comes during the north-east monsoon, is caused by weak cyclones often called 'depressions' and that as these are an uncertain factor, the rain of this period of the year is *unreliable*. It often happens that the 'monsoon fails' as the saying goes: 'What has failed is not the monsoon which is only a wind'.

#### MEAN ANNUAL RAINFALL



It may blow but *no rain* will fall unless cyclonic activity is present to cause rain on the *lowlands*. The monsoon however does not 'fail' to give rain to the hills on the north-east of Central Ceylon. This reliable rain accounts for the tea estates on the hills of Matale, Rangalla and Badulla districts.

**4.—March to April.** This is the season when the sun is, as in September, overhead in Ceylon. The insolation is great and conditions are favourable for the development of thunderstorms. Rain falls in the afternoons and is well distributed over the island. The heaviest falls are over the hills of Central and South-West Ceylon. The lowlands of the north and east have the least rain. These rains are very helpful in preparing the paddy fields for sowing in all parts of the island.

### B. Rainfall Types and Regions

We shall now examine a few rainfall types of the island. The following are the stations selected :—

Trincomalee	99 feet above sea level.
Topawewa	200 feet above sea level.
Rangalla	3,600 feet above sea level.
Colombo	24 feet above sea level.
Ratnapura	122 feet above sea level.
Watawala	3,259 feet above sea level.

On the previous page are the rainfall curves for the stations selected. We shall take the first group to begin with.

All three show the influence of the north-east monsoon as a rain-bringer while the Rangalla curve shows the effects of relief in giving a very heavy rainfall. But there is one noteworthy point in these rainfall curves, and that is, that the maximum rainfall for the coast station is in November, while the inland stations get it in December—a month later. This chiefly indicates the development of the monsoon. Yet another point to observe is the heavier afternoon rains brought by the thunderstorms, at the inland stations. Further, notice how steep is the rise and fall of the rainfall curve for Rangalla, the hill station; e.g. there is a rise of 15 inches of rain between November and December and a fall of 25 inches between January and February. The former indicates the heavy rain that falls on hill stations once the monsoon is fully developed owing to the high hills effectively checking the monsoon stream of air. In the same way the first to feel the heavy drop in rainfall is the inland hill station. Notice also a marked 'dry season' at these stations from February to September.

A second group of three stations has been selected—a coastal, an inland and a hill country station.

The average figures show that the rainfall on the south-west side is heavier than that at the stations on the north-east of the island, cf. Colombo 89 inches with Trincomalee 63·5 inches, Ratnapura 151 inches with Topawewa 65 inches and Rangalla 179 inches with Watawala 221 inches. Notice also the absence of a well-marked dry season which is found in the stations of the north and east sides of the island.

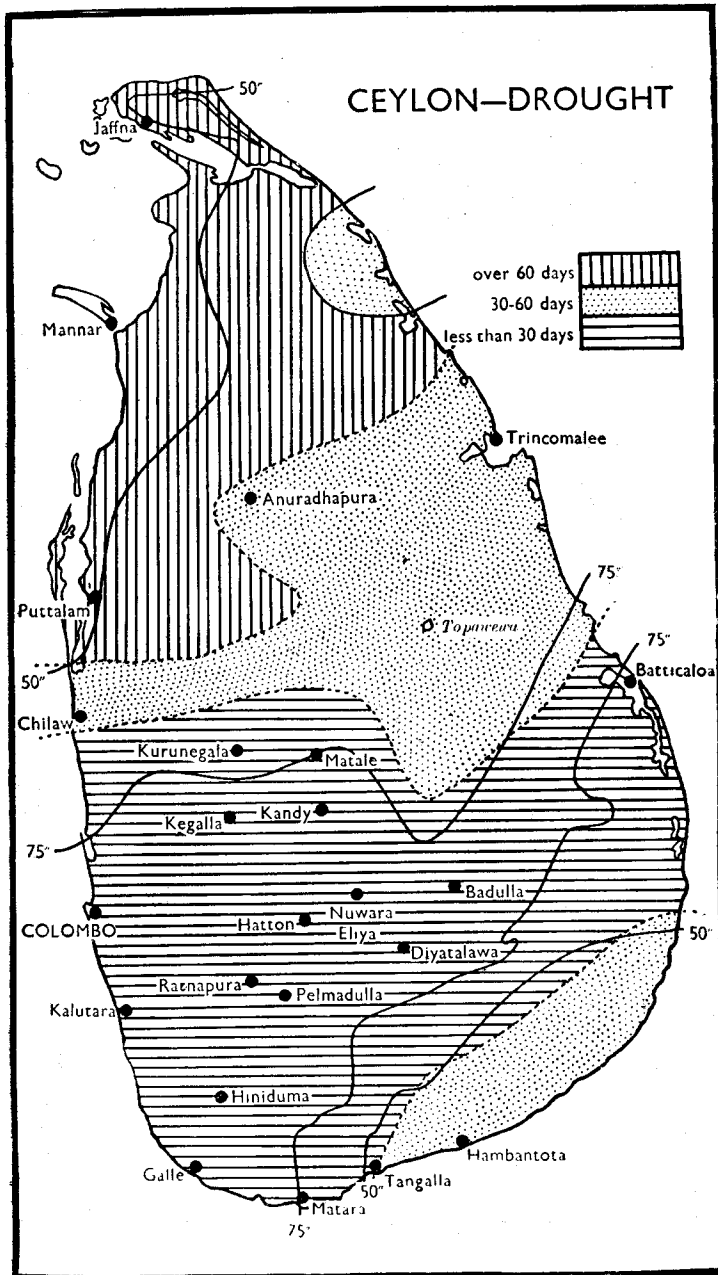
Colombo shows an increase of rain from March, April to May when the south-west monsoon arrives. But in June and July when the monsoon develops Colombo shows a falling off in the amount of rain received. But observe the curves for Ratnapura and Watawala. At these stations the maximum rain during the south-west monsoon comes in June—a month later. This indicates the development of the monsoon, and one observes that the inland stations receive their maximum rainfall a month later than the coast stations.

Colombo and Ratnapura both shows two 'peaks' of heavy rainfall—one in May-June and the other in October. This is a feature very characteristic of lands within 10 degrees of the equator. The two 'peaks' of rain occur at the time the sun is overhead. The latter may also be due to the effect of thunderstorms in the south-west part of the island, for neither Trincomalee nor Topawewa has quite as much rain in October as Colombo and Ratnapura. Perhaps this may be due to the closer proximity of the hills to the south-west coast than to the north-east, and to the fact that thunderstorms do not have to travel very far to reach the south-west coastal plain.

Watawala records a very great and sudden rise of rain during April-June—a rise of 30 inches. Notice too, how sudden this increase is, especially from May to June—a rise of 20 inches in thirty days. This again illustrates the heavy rains caused by the high hills presenting a very effective barrier to the fully developed monsoon. And as soon as the monsoon weakens we notice a drop in the rainfall of 10 inches in a month. From June to December the rainfall steadily diminishes to its lowest figure in February. This is the driest month in the south-west part of the island.

The *points of contrast* between the two groups of stations are now summarised :





1. The stations on the north and east plain show a well marked dry season from February to September, the rainfall is less than 10 inches. This has had an important bearing on human activities in this part of the island. Paddy cultivation begins with the September-October rain and the harvest is gathered in February. Then follows the dry season, and it was to enable cultivation during this season that the ancient Sinhalese built great tanks, etc. This secured a paddy harvest in August, thus enabling two harvests to be gained per year.

On the south-west side however, no such dry period is found, February and August being the driest months. Two harvests are gathered in these two months, but the constant rains frequently damage the crops. This rarely happens in regions where a marked dry period occurs.

Further, the existence of a wet and dry period on the north and east sides of the island enables crops to be grown which require a long dry period to mature. Cotton, and fruits like the orange are just two examples.

If lack of rain is the scourge of the farmer of the north and east, abundance of it is the scourge of the peasants of the south-west side. But of course, plants like rubber have been extensively cultivated on this side of the island though the rainfall is by no means favourable for grains, fruit, etc.

2. The rainy season is reversed in the two groups—this being the result of the two monsoons that blow over Ceylon.

3. The rainfall on the south-west is heavier than the rainfall on the north and east sides. This is due to the higher moisture content of the south-west monsoon and also to the fact that the south-west is hilly and more rugged than the north and east. Relief has thus a great control of the distribution of rain.

4. The rainfall of the two hill-country stations is more than that of the stations of the plains, and in each case the maximum is reached a month later than on the coastal plain. Other climatic details will be discussed later, but this section cannot be considered complete without an examination of the 'Drought Map' of the island opposite. This illustrates the great differences in rainfall existing in the north and east and the centre and south of the island. It shows very vividly the areas needing irrigation. The north-east monsoon rains are not quite so reliable as the rain brought by the south-west monsoon, and this emphasizes all the more

the importance of water control. This prompted the ancient Sinhalese to direct the water in the rivers flowing from the Matale Hills into canals, and thus feed the tanks in the low country. The Yoda Ela from Kalaweva is one example. To help the reader to appreciate the significance of drought in the north and east of the island the following figures are given :—

	1931	1932
	Days of drought	Days of drought
Anuradhapura ..	227	117
Batticaloa ..	175	192
Jaffna ..	223	190
Mannar ..	253	263
Tabbowa ..	169	105
Topawewa ..	226	169
Trincomalee ..	224	203

On page 70 is a map showing you the regions where *drought* is common. You will observe that 'Plantation Agriculture' is confined to the area where *drought* is rare and where the rainfall is thus *reliable*. Over Northern Ceylon there are over sixty days of drought and it is worthwhile noting that some of the largest of the ancient irrigation works are to be found here. For example, the Kalaweva, Nuvara Weva and Padaviya together with the Giants' Tank were built by ancient kings to offset the evils of drought.

The south-east which formed the ancient Ruhunu Rata has thirty to sixty days of drought and here too very extensive irrigation works connected with the Walave-Kirinde and Menik Ganga supplied water to the cultivated land.

To the north of a line joining Kurunegala and Alutnuwara is another zone where there is less than sixty days of drought. In this region too ancient irrigation works connected with the Polonnaruwa kings served to counteract the ill effects of drought. This map brings home to us that over three-fourths of the area of Ceylon agriculture can be successful *only* if irrigation on a large scale is available. To provide this was the main work of ancient kings and it must also be the foremost task of the statesmen of modern Ceylon.

On page 60 there is a map to show you the annual rainfall of Ceylon. We may divide Ceylon into a number of rainfall regions (Hyetal regions).

- i. Arid zone (25-50" of rain).
- ii. Dry zone (50-75" of rain).
- iii. Wet zone (over 75" of rain).

### C. Climatic Regions

The details examined hitherto indicate that there are many climatic regions in Ceylon. This variety is of great value to man because it makes the cultivation of a variety of crops possible.

The plain of Ceylon can be divided into two climatic divisions. On the west side there is the wet zone where the rainfall is over 75 inches. This type can be called the **wet zone lowlands**. Rain is well distributed throughout the year and there is really *no* dry season. The relatively dry months are February and August. An examination of the rainfall charts for Colombo and Ratnapura illustrate this. Another point worthy of note is that there are two 'peaks' of rainfall in May and October. This is just a month after the sun has reached its highest point in the sky for Ceylon, the time, therefore, of highest insolation. The 'peaks' of rains corresponding to the period of the 'overhead' sun are a feature of what is generally known as the equatorial type of climate. In this respect as well as in the absence of a dry season, the south-west lowland type is similar to the equatorial type of climate. There are other features that justify this statement. The humidity of the air is high throughout the year. Air temperatures are high and show very little seasonal variation. All these make the *south-west lowland, a hot, humid, wet region*. It is a region where plants grow thick and fast throughout the year. All cultivated land thus creates a problem, namely, of keeping land free of weeds. The bright sunlight, heavy rain and high temperature encourage the growth of plants and tend to develop *leaf, bark and sap*. This perhaps is the reason why cinnamon, rubber and cinchona have flourished in this region. Here, as in most hot, wet lands where the air temperature does not go below 68° F. *palms* thrive. The south-west plain is the home of the areca, the coconut and kitul palm, the first being a source of great profit to the former Portuguese and Dutch rulers of this region. The future agricultural development of this region as far as climatic features indicate, seems to lie in the direction of cultivating palms and plants whose economic value lies in leaf, bark and sap.

Toward the Deduru Oya and Walawe Ganga Basins the hot, wet type of climate changes somewhat into a transitional type between this and the dry zone type. The rainfall is below 75 inches and appears to suit the cultivation

of paddy more than those plants which are typical of the wet zone lowland.

The other climatic division of the plain of Ceylon is the **dry zone lowland**. It can be further sub-divided into an **arid zone lowland**. This type is found to the north-west and south-east coastal strips of the dry zone lowlands. It is interesting to note that the earliest known immigrants of Ceylon first settled down in these two areas and successfully cultivated paddy which was their food grain. The annual rainfall is between 25 and 50 inches. The wet season is from October to January. At Tissamaharama the rainfall for the period is, October, 6 inches; November, 8 inches; December, 6 inches; January, 3-8 inches. The dry season is from May to September when the rainfall for each month in this period is less than 2 inches. On the north-west section too, at a place like Murunkan, the wet season is from October to January, and the dry season from May to September. In this climatic division aridity is the chief characteristic. The loss of moisture due to evaporation is great and is increased by the sandy nature of the soil. Drought is common every year, with thirty to sixty days of absolute drought. The rainfall too is not reliable as perhaps much of its rain is due to the action of atmospheric depressions. If the land were hilly more rain (relief rain) would be likely to fall.

Nevertheless the zone is not unsuitable for paddy cultivation if sufficient water can be stored up for its use. The sequence of a wet season for plant growth and a dry season for ripening is admirably adapted to paddy cultivation. We have evidence that the earliest farmers in these areas learnt to store water in tanks and tapped rivers for supplies of water. The presence of ancient tanks in the north-west, e.g., the Giants' Tank and smaller tanks in the south-east section proves the fact of land cultivation in this region long ago. Ancient settlements and pre-Christian inscriptions also bear evidence of land utilization long ago.

This arid zone lowland was thus the training ground for the early Sinhalese in the arts of water storage for paddy cultivation. Later when they migrated into more favoured areas they were able to use their knowledge of irrigation on a much larger scale. This perhaps accounts for the success of the Sinhalese in developing the dry zone because in the arid zone they had learnt to irrigate the land for their food crops.

Another crop likely to be a success in this zone is cotton. The experiments in the Hambantota districts are proof of this.

The next climatic region is the **dry zone lowland**. The rainfall region is similar to that of the arid zone but the total rainfall is greater being 50-75 inches for the year. The succession of the wet season by a dry season is most favourable for such plants as paddy, sugar-cane, orange, and in places, cotton. It is an admirable climate for oil seeds such as castor, sesame and ground-nuts. The evidence of history goes to show that this climate was not only good for grains, pulses and fruits but it was good for man as well. Malaria has nothing to do with 'bad air' as the derivation of the term implies. The dry air, and the bright sunshine (there is no doubt of more hours of sunshine in the dry zone than in the wet zone) are factors connected with physical well-being and it is worthwhile noting that all the civilized people of the ancient world were inhabitants of dry lands; e.g. the Chinese, Indians, Babylonians, Egyptians, Hebrews, Persians, Arabs and the Greeks. On the other hand, hot, wet regions have been conspicuous by the absence of early civilized people in them.

The climate of the dry zone has certain features which are not very favourable to man. For one thing the rainfall is not reliable and as the land is for the greater part a plain, much of the heavy rain is due to atmospheric depressions. Such rain is not what one can expect to happen regularly. Another is the drought that often does harm to crops. Yet another factor is the presence of a dry, parching wind during the long, dry season from May to August. Loss of moisture by evaporation and desiccation is great and agricultural practices must combat this evil. Irrigation is of course essential for successful cultivation but large tanks lose much of their water by evaporation. Perhaps devices may be found to minimize this evil.

The **hill country** can be divided into two major climatic divisions, namely, a **wet zone** and a **dry zone**.

The **hill country wet zone** is approximately west of a line joining Matale, Kandy, Nuwara Eliya and Haputale, (vide map). In this division the rainfall is heavy and is found well distributed through the year. There is no dry season. But, unlike the wet zone lowland, temperature differences are marked owing to differences in elevation. For example, the Kandyan Plateau is warmer than the Hatton Plateau which is, in turn, warmer than the high ranges. On the Kandyan Plateau where the temperature

is above 68° F. the areca and kitul palm grows. Paddy is cultivated and the pepper vine is grown in gardens in the Matale district. Rubber and cocoa, all natural to a hot, wet region, flourish in this area.

The Hatton Plateau being cooler shows slight differences in natural vegetation. As night temperature below 68° F. occurs, palms do not thrive well, save in low valleys, e.g. in Kotmale kitul palms are found in village gardens, but English vegetables are successfully grown and English flowers bloom in gardens here. Paddy cultivation is less and less successful: high elevation brings temperatures too low for successful paddy cultivation. Tea cultivation holds pride of place. It is by far the major crop in the Hatton Plateau.

On the high ranges the temperature is lower still, e.g. Nuwara Eliya, 60° F. Low night temperature occurs in December, January and February, and frost occurs, especially in February. Tropical plants disappear and plants of temperate climates make their appearance. High winds in June and July are unpleasant to man and hostile to cultivated plants.

The wet zone hill country, especially at the latitude of the high ranges, has been considered by some as a useful place for the establishment of health centres, or sanatoria. This was how Nuwara Eliya became a town.

To the east of the wet zone lies the dry zone of the hill country. The rainfall regime is similar to that of the dry zone lowland but elevation brings about differences in temperature. Paddy cultivation has been carried on in this division from the times of the Kandyan Kings. Irrigation is essential and mountain streams have been utilized to irrigate the terraced fields. Chena cultivation has been practised here and perhaps accounts for some of the patanas. The air on the hills is drier in this section and health centres like Diyatalawa and Bandarawela are popular with patients suffering from lung complaints. Differences in temperature are found for instance between the high ranges, e.g. Haputale, the Welimada Plateau and the Dumbara - Hewaheta Upland. Strong winds are experienced here and these too contribute to the making of upland grasslands such as the patanas.

Ceylon, therefore, has more than one climate, and this accounts for the variety of flora found in the island, and may prove helpful in the cultivation of a variety of useful plants.

### Climatic Regions

- |                           |                        |
|---------------------------|------------------------|
| A. Plains— (below 1,000') | i. Wet zone lowland    |
| „                         | ii. Dry zone lowland   |
| „                         | iii. Arid zone lowland |
| B. Hills— (above 1,000')  | i. Wet zone hills      |
| „                         | ii. Dry zone hills     |

The wet zone hills can be sub-divided into smaller units based on differences of temperature due to varying elevation. The wet zone is then divided into:

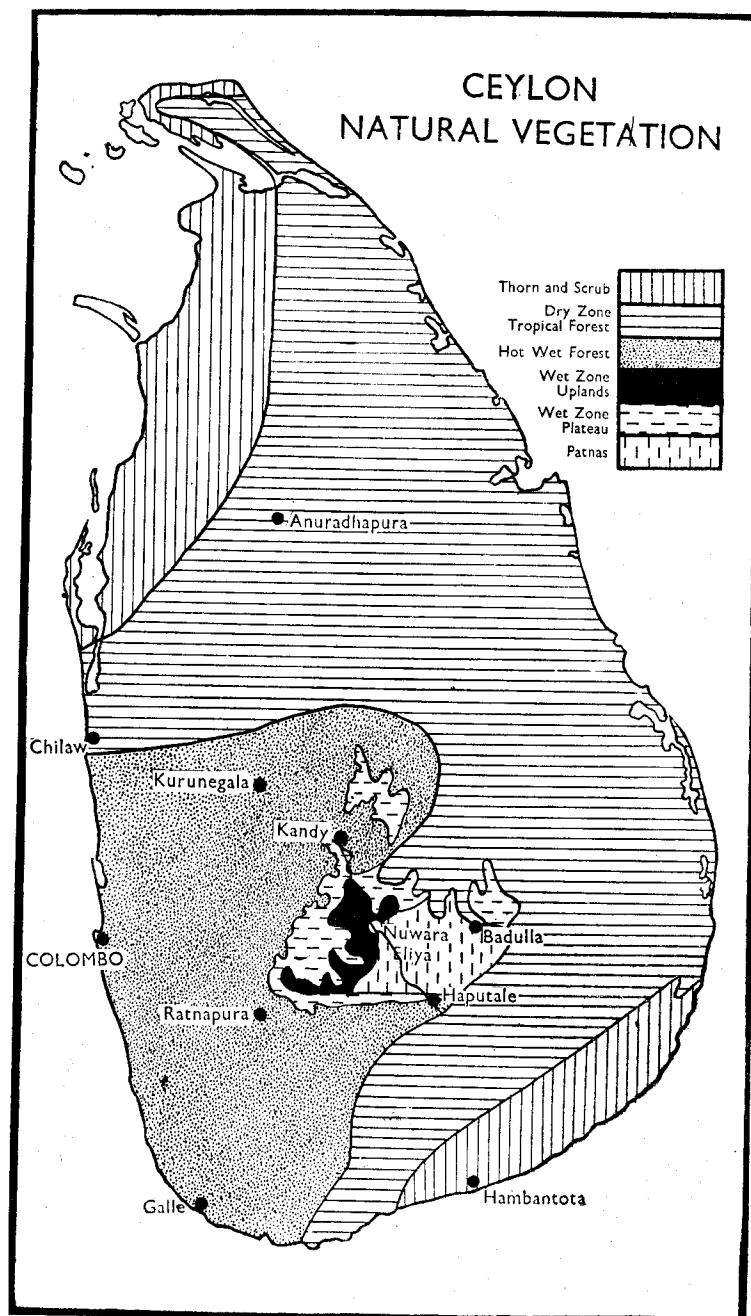
- (a) The High Ranges, where the average temperature is 60° F. These are over 5,000 feet.
- (b) The Hatton Plateau, (3,000-5,000 feet). The temperature here is between 70-75° F.
- (c) The Rakwana Hills and Kandyan Plateau—west (1,000-3,000 feet). The average temperature is over 75° F. and it is worth noting that in this sub-division palms are common, e.g., areca and kitul.

The dry zone hills can be similarly sub-divided:

- (a) The Kandyan Plateau—east (1,000-3,000 feet). Koslanda and the Mavalatenna Plateaus.
- (b) The Welimada Plateau—(3,000-5,000 feet).
- (c) The High Ranges (over 5,000 feet).



## CEYLON NATURAL VEGETATION



## CHAPTER V

### Natural Vegetation

Forests cover 73 per cent. of the island, and the distribution and nature of these forests are of importance to the geographer in so far as forests have had any relation to human activities. For example, the student of geography wishes to find out how far the forests have influenced the efforts of man to clear the land and settle down; how far they have checked man's movements and migration, or provided a refuge from his enemies. Further, what does he gain from the forest in the shape of timber and other forest products, and how far does the nature of forests and other forms of natural vegetation indicate to human beings the types of plants they may grow.

It is to study these questions that the geographer is interested in natural vegetation.

The map opposite shows the important types of vegetation in Ceylon. This is not to be taken as indicating a very definite and clear cut demarcation of types, for in nature we do not find boundaries so well defined as lines are on a map. These lines are to be thought of more as 'zones' than border lines, for one type of forest does not *immediately* change into another. Instead, between two distinct types is a border zone where it is possible to discover the gradual changes that lead from one type of forest to another.

In the second place, this map shows very approximately the various types of natural vegetation. Within each division are found great differences of plants, etc., nevertheless, each division has a stamp of its own. Sometimes forest types follow closely the rainfall division, but all the same, it must be borne in mind that 'the character of vegetation depends in all countries on situation—comprising soil, aspect, elevation—and climate, of which humidity of the atmosphere and rainfall are the principal factors'.

Finally, the reader should remember that in the divisions in the south-west and centre of the island, the original forest has been cleared, and tea, rubber, etc., grown extensively. Nevertheless, these divisions are very instructive, as natural vegetation indicates what human beings may grow in these zones.

We shall now examine these regions in detail.

### Thorn Forest

The *thorn forest* is found in the arid belt on the north-west and south-east margins of the island. The rainfall here is between 25-50 inches, and in a tropical land where evaporation is great, the moisture available for plant growth is very greatly diminished. In this region the average temperature is 80°F. and for six months of the year very little rain falls, and as the skies are cloudless, the evaporation is very great. Besides, the soil is more or less sandy, and the rain that falls is easily dried up by the sun's heat, hence the plants found in these districts are thorny and low-lying shrubs. Further inland, a patchy, stunted forest of *palu* and *weera* trees is found. Intermixed with this forest is found a stunted undergrowth of *eraminia (s) nelli*, etc. *cactus* plants abound. All plants bear on them the stamp of the aridity of the land in their stunted form; thick, fleshy stems, or the spike-shaped scanty leaves on the trees.

### Dry Zone Tropical Forest

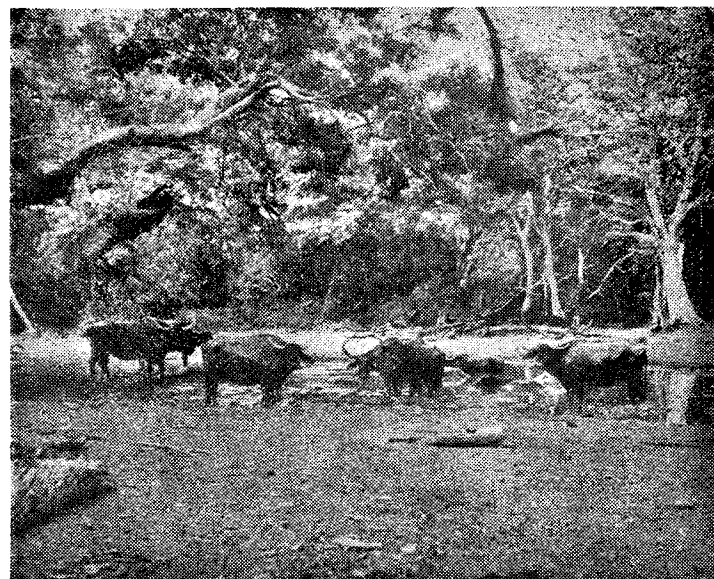
The largest forest division in Ceylon is the *dry zone tropical forest*. In this region there is a marked wet period and during this period plant activity is great. But for six months of the year, from February to August very little rain falls, and, worst of all, a dry wind sweeps across the face of the country. This only emphasizes the drought; and the trees have to struggle hard for existence during these months. Hence, most trees have tiny leaves, some drop their leaves in this season. Others have thick barks, etc., and, owing to the scarcity of water, trees do not grow to a great height, and slow growing hard woods are common. 'In nearly all the forest we find the ground covered with a great variety of species crowded together, all struggling and hustling one another for light and air. The average height of the trees is about 30 to 40 feet; all the species grow to the same height, the *satinwood*, *palu* and *halmilla* making much show above the rest'

When the trees have reached their maximum height they form very broad, flat crowns, which interlace, and besides serving to throw an impenetrable shade on the soil, keep out the winds that blow so steadily for the greater part of the year. Above the flat umbrella-shaped tops of the other trees, *satinwood* and *halmilla* can be distinguished at a great distance by their isolated crowns.

Instead of herbaceous undergrowth, a dense undergrowth of shrubs, or of seedlings of the larger trees, springs up, forming

a miniature forest, six to ten feet high, and rendering progress, except along a cleared path, almost impossible. The soil lacks humus. Except during the north-east monsoon, the soil is generally dry.

The most valuable trees are the *satin*, *ebony*, *palu*, *halmilla*, *milla* and *wévarana*. There are many other types, but these provide the most useful timber. Though there is a great variety of species, very few trees provide valuable timber. The general condition of the forest is that trees of one, or more, of the saleable kinds are mixed up with a very



Photo

DRY ZONE TROPICAL FOREST

Geo. Koch

large variety of valueless wood. The former never exist as a pure forest by themselves, and collectively, even in the most favourable situation, never form more than 1/20th of the whole. It is only in the fine forests of Bintenne and in the Eastern Province, that *satinwood*, *ebony* and *halmilla* compose this share of the standing growth. In 9/10ths of the forests of the dry zone, the saleable woods do not form more than 2 per cent. of the whole. These forests are not very valuable from the point of view of timber supplies.

Yet, to the student of human geography, the forest land is fascinating, as it was once the cradle of the Sinhalese race

It was in the dry zone that this race grew to manhood and the dry zone to this day bears the traces of its glory. Experts have discussed whether the dry zone forests are primeval or not, but everything points to the fact that these forests are not primary because many centuries of occupation must have led to extensive forest clearing, and where the forests are today, was once the region of densest population. No doubt much of the forest of the dry zone grew after the decay of the ancient Sinhalese power, for history tells us of the break up of the Sinhalese rule in the North, the destruction of the system of irrigation, and the depopulation of the land. It was then that the forest gradually spread over the land, and it remains there to this day.

To the first Aryan settlers in Ceylon the forest must have been a great barrier, and source of dread. Very likely this was why their first settlements were on the coast, or on the banks of rivers. The need of fresh water must have also had a share in deciding these settlements.

But the existence of a dry period when the forests were parched up by a dry south-west wind helped the Sinhalese people in their efforts to clear the land. If the trees are felled in the dry season and set on fire, the wind sweeps the flames before it, and before long, thousands of acres are cleared of jungle. The chena cultivator is most likely following the practice of his ancestors in opening the land, and nature helps him, for fire does the work of a hundred hands in destroying the forest. It is interesting to note that the ancient Sinhalese spread throughout the dry zone of Ceylon before they were compelled by force of circumstances, to move towards the wet highlands and lowlands where forest growth is unchecked throughout the year and clearing is most difficult. In fact the forest of the wet zone was cleared very recently. Hot, wet forests are too mighty for small tribes to destroy. Witness the state of the native settlers of the Congo and the Amazon where there is a never-ending fight against the growth of the jungle. There is no season of rest from this toil. But such is not the case in the dry zone forest, and man makes a fairly easy conquest of the forest, and establishes himself on the land with his cultivated fields, gardens and villages.

We might at this stage examine the present day value to man of the forest of the dry zone. For this purpose it is most convenient to adopt the divisions made by the Forest Department. The *Northern Division* is practically the Northern Province. The 'Jaffna timber and firewood depot situated forty-five miles from the nearest forest land and sixty miles from Mankulam (the main collecting centre of

timber supplies which are despatched by rail) is absorbing 25,000 c.ft. of timber per annum and over 11,000 tons of firewood. These supplies are expected to increase to 30,000 c.ft. of timber and 15,000 tons of firewood to serve the needs of the Peninsula as well as the town of Jaffna. The timber which is mostly in demand is *palu*, which is very hard, very heavy, and very slow-growing. These supplies originated from the necessity of clearing the land under the Iranamadu Tank for cultivation purposes and from this source the supply of firewood was maintained for over twenty years. There is now sufficient material to meet the demands of both. It is necessary, in view of the rapidly diminishing accessible fuel reserves, to undertake planting schemes to ensure future supplies. The Jaffna depot will, ere long, return a cash revenue of two lakhs of rupees'.

The *North-Central Division* which is the home of the *satinwood* has many large reserves, the most accessible of which have been decimated by past supply work. It has been largely drawn on for supplies of Government Departments, and no attempt has been made until recently, to capture trade. Exploitation originally commenced in a similar manner to the Northern Province, by the utilization of timber under irrigation schemes, and extended to the other forests for the railway sleeper supply which absorbed vast quantities of timber in a comparatively short space of time. Other portions of the North-Central Province have now become accessible as a result of the railway to Trincomalee and Batticaloa and one large forest in the east of the province is now being subjected to regular extraction of timber, etc. This is expected to yield an annual supply of some 20,000 c.ft. of hard wood for supplies to Government Departments, while trade is being encouraged by periodic sales at depots adjacent to the railway which carries supplies of timber to Jaffna, Colombo and other towns in the South. Forest improvement is urgently needed.

The work of the Forest Department in the *Eastern Division North* (Trincomalee District) aims at the selection of one large forest block, 80 square miles in extent, for main exploitation purposes. The yield from these forests is low as they were, in all probability, heavily exploited in early days. *Satinwood*, *palu*, *milla* and *halmilla* are found here and there has been a considerable sale of medium-sized *satinwood* which is exported to South India.

The *Eastern Division South* (Batticaloa District) supplies the bulk of the *satinwood* which is sold in Colombo for export purposes, and logs of 'flowered' *satin* realize high prices.



The condition of the forests of the dry zone can however be improved. As we stated earlier, these forests do not contain pure stands of merchantable timber, but a few useful timber trees are found mixed up with a host of useless trees. Government has steadily undertaken the task of reafforestation, of growing satinwood, teak, etc. very much in the manner of a plantation. Till this work is well in hand, the exploitation of the dry zone forest will not be a commercial success. Besides, reafforestation is an urgent necessity in view of the great demand for fuel which will some day cause a fuel scarcity unless reafforestation is steadily maintained.

A hundred years of exploitation has used up the valuable timber of Ceylon and the process is going on at a more rapid rate than ever, bringing exhaustion every year. The depletion of the Ceylon forests leaves no hope for a large trade until reafforestation and regeneration measures become productive half a century hence.

### The Wet Zone Forests

These forests are to be found in the central and southwestern parts of the island. But the relief of the land brings about differences, and we are justified in sub-dividing the forests of the wet zone into low-country forests and up-country forests. Above the 5,000-foot contour the average temperature is about 60°F and this has helped plants of temperate lands to grow here.

The low-country wet zone forests are typical *equatorial, or hot, wet forests*. The temperature is about 80°F all the year round and the humidity is also about 79 per cent. Moreover the rainfall is heavy. It is over 100 inches and in parts as much as 200 inches of rain falls. There is no marked period of dryness when plant growth is checked.

The trees in these forests are tall, the foliage broad, unlike the foliage of trees of the dry zone forests. There is a dense undergrowth and large creepers are very common. Unlike the forests of the dry zone, these forests contain a vast array of soft woods and moderately hard woods. Here are the names of the principal timber trees—*godapora, na, doon, hal, lunumidella, kong, amba, nadun, dawata, del* and *kos*. Other plants of interest are *talipot* palms, *kitul* palms, *cinnamon, aralu, bulu*, etc.

The forests in the Western Province, especially on the banks of the Kelani Ganga, have been largely exploited for firewood. The Government revenue amounts to 84,000

rupees annually. Reafforestation is being carried out and jak plantation proceeds at the rate of 150-200 acres per annum. In the Galle and Matara districts the forests are in rather mountainous and inaccessible country. *Hora* is one of the important timber trees in the latter region. The forests of



Photo

WET ZONE FOREST

Geo. Koch

Sabaragamuwa are the least developed of the forests of the wet zone low hills. Roads are very few, and the narrow gauge railway is ill-adapted to timber transport. Some time ago timber for tea chests was cut and floated down the river to the factories but this is not done now. *Jak* and *nadun* plantations as well as *calamander* are being tried in this division.

### The Wet Zone Upper Hills

These forests contain a few trees in demand for building purposes. They are *kina, mihiriya* and *walsapu*. The rest are fuel species and have been exploited for the use of the railway.

The vegetation here resembles that of temperate zones, and this is what distinguishes it from the low-country forests. European plants have been introduced at Nuwara Eliya.



Large trees are also found, whilst the *rhododendron* is a striking feature of the vegetation of these regions.

In this division the task of reafforestation has been undertaken. *Australian gums and acacias*, have been grown for fuel purposes and conifers like the *cupressus lausoniana* have also been grown. Firewood depots are found at Nuwara Eliya, Haputale, Diyatalawa, Bandarawela and Badulla. The forests of the wet zone have been steadily cleared and planted. On the lower wet zone the characteristic cultivation is rubber, a native of the hot, wet forests. Today we find the largest acreage of rubber in the Kalutara, Kegalle and Ratnapura districts.

The lower hills, the orchid country of Ceylon, were first cleared for coffee. But today tea has taken its place and on the higher hills also.

One other type of natural vegetation remains to be described. The patanas of the hill country. These are found on the high plains, like the wind-swept Horton Plains, but they are mostly confined to a triangle within Nuwara Eliya, Bandarawela and Badulla. These patanas are 'grassy slopes and hill lands covered with coarse grasses, "*mana*" and "*illuk*"'. Trees dot the surface of these areas, the chief of these being the *rhododendron*. In the hollows and ravines, protected from the high winds, are found clumps of stunted trees.

Some state that these grasslands are not due to climatic causes, like inadequate rainfall, etc. They are inclined to explain the patanas by reference to soil, such as the hard pan of rock found a few inches below the surface preventing trees from getting a firm foothold. This, coupled with the strong wind, may explain these treeless plains. Nevertheless one is inclined to think that some of these patanas are due to chenas which have destroyed the former forest. Rainfall may have a powerful hand in causing these grassy plains. It should be noted that all the forests of the upper hills are on the western and the south-western slopes which are drenched with rain, whereas the 'patana' country seems to lie in a high rain shadow, shielded from the south-west rains by a high mountain rim running in a semi-circle from Pidurutalagala via Horton Plains to Namunukula. Thus the patana country does not receive as heavy a rainfall as the rest of the hill country. The annual rainfall map (see page 60) shows us this area as a circular region of 50 inches to 75 inches of rain, the amount the dry zone receives. Hence

the rainfall may be at least a contributing factor of these grassy plains.

In conclusion it is worthwhile examining the relation cultivated plants bear to the zones of natural vegetation.

The **wet zone** with its high annual temperature and rainfall encourages the quick vegetative growth of plants. Hence plants whose *trunk, bark, sap or leaf* are of commercial or food value will thrive in this zone and should be cultivated. Thus we have *cinnamon, cinchona, rubber* and *tea*, the valuable cultivated plants most suited to this zone. Further, creepers are common among the natural plants of the hot, wet zone and we know that the Dutch and the Portuguese gathered harvests of *pepper* from pepper vines cultivated by the peasants. Finally *palms* are natives of hot, wet lands and from time immemorial, the areca and coconut palms have been grown in South-West Ceylon. Thus a study of the natural vegetation helps us to understand why certain plants are grown, or should be grown, in this region.

The **dry zone** is characterised by a marked wet and dry season. The former is the growing season for plants while the latter is a season of checked growth when moisture has to be economised by the plants. In such a climate other things being equal, grains thrive well. Thus, on wet land, *paddy* can be successfully grown, while on the dry land, dry grains such as *kurakkan, meneri, amu, maize* are successfully cultivated. The *cotton plant* and the *sugar-cane*, now cultivated as annuals, can be planted in the wet season and the harvest gathered in the dry season. Fruit trees such as the *orange*, the *lemon* and the *grape-fruit*, grow well in this region. In a word plants which need a wet growing season and more important, a dry ripening or harvesting season, are best suited to the climate of the dry zone.

The **wet zone uplands** where the temperature falls with altitude can grow plants which normally grow in a cool habitat. Thus at Nuwara Eliya one finds plants and trees of temperate climates. On the other hand tropical plants cannot grow here because of the danger of frost. Cold air, or low air temperatures are hostile to plants of warm habitats. This is one reason why plants like rubber, the areca and coconut palm, paddy, maize, and orange cannot be grown at high altitudes. We can now understand why the ancient Sinhalese, who were paddy farmers found little to attract them in the hill country of Ceylon. When they could not live on the plains they moved to the dry eastern half of the hills and the lower plateaus where they could grow paddy.

In this way, in later times, the Kandyan people lived on the Kandyan Plateau and the eastern hills of the Welimada and Uva districts.

'Man conquers nature by obeying her'—This truth is partly illustrated by the way natural vegetation has indicated what plants can be grown in the different parts of the island, and partly by the way man has selected his crops to suit the different climatic zones of Ceylon. Thus the early paddy farmers lived and prospered in the dry zones (plain or hill), while in later times when crops were grown for export, plantation agriculture flourished in the wet zone, where coconut, rubber and tea find conditions favourable to them.

Our country's climate gives us the possibilities of a balanced agricultural system. The coconut, rubber, tea and perhaps cinchona of the wet zone will provide the products for exports, while the dry zone will enable us to grow food crops, like paddy, and dry grains such as kurakkan, maize, etc.; also fruits such as the grape-fruit and orange. The sugar-cane can be successfully cultivated and may perhaps in the distant future supply all the needs of the island. Other useful crops such as ground-nuts grow well; cotton has been and can be successfully cultivated in the dry zone. In this way Ceylon can be, what geographical factors point her out to be, primarily an agricultural country. Hitherto we have utilized only the possibilities of the wet zone, and this is why the country, though essentially agricultural, has had to import its food. This can, however, be put to right by making use of the dry zone where Ceylon's food crops can be successfully cultivated.

## CHAPTER VI

### Natural Regions

To the geographer, a division of any country into natural units is of great value. The other divisions like the political, etc. are useful, but these do not illustrate the relations between man and his physical environment so well as natural divisions do. Hence the need for a division of any region, great or small, into natural units. This is not a very difficult task if we select one of the major elements of the environment as a working basis. For example, Ceylon may be divided into units of relief and these would form natural regions. But this will not help us very much in our attempt at understanding how the people of this island in the past and in the present utilized and modified the opportunities nature has given them, in their search for their livelihood. The reason for this is, that of the various elements of the environment of this island, the relief of the land is not directly the most powerful.

We must turn to the climate of the island, especially to the distribution of rainfall, to provide us a working basis for a system of natural regions. In most tropical regions the deciding climatic factor is not so much the quantity of rain as the *length* of the dry season. Having sketched this out, details can be next examined in the light of other factors of the environment.

On the basis of rainfall, we can divide the island into two large divisions:

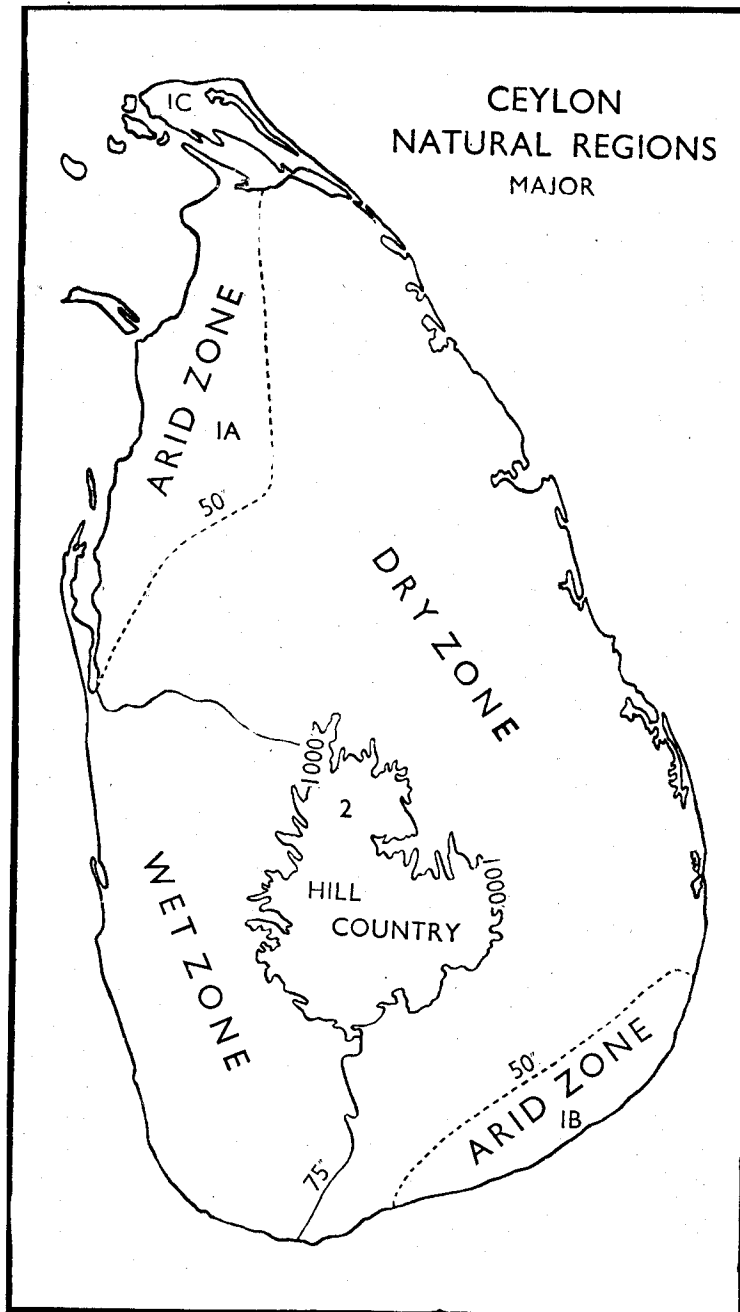
- (a) The **wet zone**.
- (b) The **dry zone**.

The **wet zone** is not all one monotonous unit. The relief has had very striking effect on the lives of the people in the present as well as in the past. We shall describe this later. But for the present we are justified in sub-dividing the wet zone into:

- (a) *The wet zone lowlands.*
- (b) *The wet zone highlands.*

This gives us two natural regions within the larger unit—the wet zone.

Next, taking up the other large climatic unit, the **dry zone**, we can mark out once more, smaller regions within



it which have special characteristics of their own:

- (a) *The arid belt of land (25-50")*
- (b) *The dry zone (proper) (50-75")*
- (c) *The Jaffna Peninsula.*

#### The Wet Zone Lowlands

We may take the approximate limits of this region to be the Deduru Oya on the north, the Walawe Ganga on the south, the sea on the west and the 1,000-foot contour on the east. These are to be considered as approximate, for nature does not show us such absolutely defined boundaries as straight lines would suggest. In fact we do find always, transition zones between any two well-defined natural regions. So there are such transition zones for the region we have now under survey, in the Deduru Oya and the Walawe Ganga areas, as well as about the 1,000-foot contour.

What are the characteristic features of this natural region?

The relief of the land is one feature. Here are low hills all arranged in 'echelon' and all these are the 'strike' ridges of the first peneplain. These hills are remnants of erosion and not fold mountains as some believed years ago. The soil that covers these erosion fragments of the first peneplain is uniformly red and everywhere we see the gneiss rock in varying stages of decomposition. Between these chains of low hills are valleys and intermont basins. This can be seen for example by one travelling from Avisawella to Ratnapura. These valleys and basins contain layers of debris from the hills and are the paddy lands of the region.

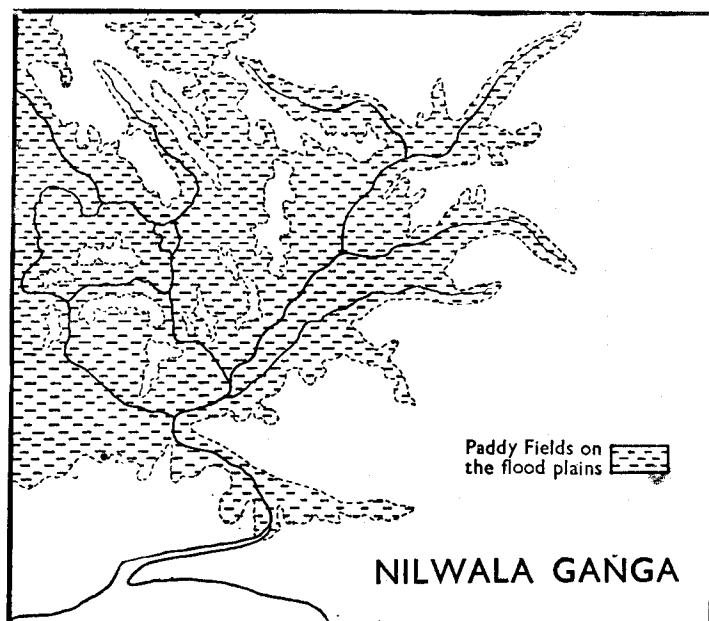
Along the sea coast is a strip of land, sandy, and fairly narrow on the south and west, but broadening on to the north of this region. A triangle formed by joining up Chilaw, Kurunegala and Colombo covers this flat plain. Here the soil is sandy for the most part, but stretches of alluvium are found studding the plain and these again are paddy lands.

The rivers that drain the 'south-west country' or this wet zone low country, are the Deduru Oya, the Maha Oya, the Kelani Ganga, the Kalu Ganga, the Bentota Ganga the Gin Ganga and the Nilwala Ganga. Most of these rivers have built up flood plains as they flowed over the flattest parts of the plain. The map on the next page shows the flood plain of the Nilwala Ganga, while it may be observed that the flood plain of the Kelani, is equally, if not more marked,



than this. So is the flood plain of the Gin Ganga. These lands are all converted into paddy lands although the Kelani flood plain is not. Its frequent floods have discouraged the cultivation of paddy.

All these rivers can be described as consequent streams—that is, rivers following the natural slope of the land. As we have noticed before, these rivers have very often to cut their way through the hill ranges forming gaps. Most of these rivers have tributaries that can be best described as subsequent streams. These join the main stream at



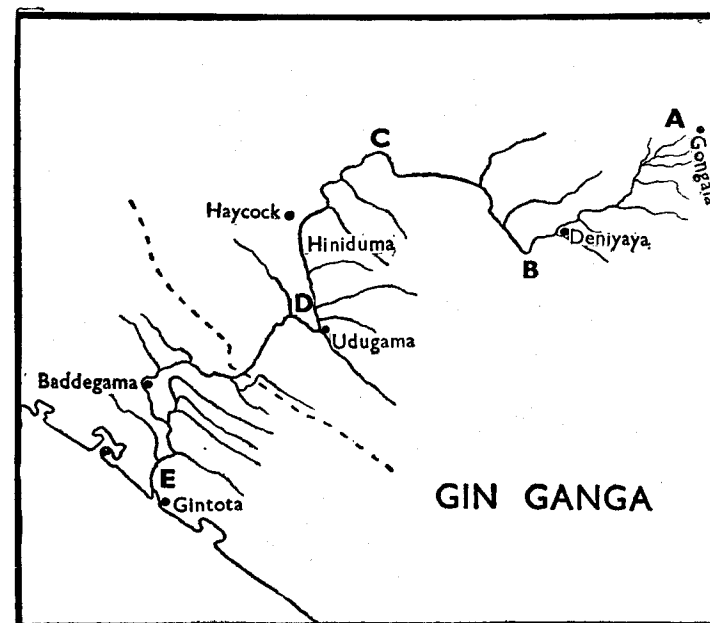
almost right-angles. The map opposite is a tracing of the Gin Ganga. The subsequent stream seems to flow along the 'strike' or grain of the land. Thus the ground plan of the river system seems to have been laid by the structure of the land itself.

Climatically this region differs from the other divisions of Ceylon. Everywhere in this low country the rainfall is heavy and not confined to any period of the year.

The temperature is high all the year through and the natural vegetation is different from that of other parts of the island. Hence physically, the low country wet zone

has a personality, and individuality of its own and it is this that justifies our classing it as a natural region.

If we trace the story of man's utilization of the resources of this region, we shall find a very different story to that of any other part of the island. Before 1000 A.D. this part of the island does not seem to have been peopled in large numbers. The heavy rains must have covered the land with marshes and thick forests and moreover, the climate here is not quite as good as that of the dry zone for paddy cultivation. This may have checked the penetration of the Sinhalese into this part, whereas the dry zone had been by



this time well utilized, as the numerous ruins and irrigation works testify. But when we come to the later middle ages of Ceylon's history we begin to hear more of the low country wet zone. This is specially so during the time of Parakrama Bahu. As Governor of the 'Southern Country' he drained the swamps and marshes of Pancayojana (Pasdun Korale—Kalutara District) and converted them into paddy fields. The region lying between the Bentota river and the Walawe Ganga was known as 'Dolosdahas Rata' and we read of settlements here. We can safely conclude that by A.D. 1200 the coastal regions of the low country wet zone were

occupied. Coconut palms and gardens are referred to in the *Suluvamsa* as being found here.

But it was really with the decline of Sinhalese power that the low-country wet zone became important. From 1215 A.D. onwards Sinhalese capitals shift southwards to Kurunegala, Gampola and Dambadeniya, safe retreats from Tamil invasions, and by 1500 A.D. Kotte had become a royal city. The dry zone was left to the forests, and the scene of Ceylon history shifted to the wet zone low-country. We read of kings of Kotte, Raigama and Sitawaka but not of kings of Anuradhapura and Polonnaruwa. And from the days of the Portuguese (1500 A.D.) to this day this region has been in the forefront of the island's history. The Portuguese ruled this region for over one and a half centuries and it is in this part of the island that they have left traces of their occupation. Roman Catholicism was established in the land. Many Portuguese words entered the Sinhalese language and, of the Sinhalese people, those of this region were the most 'Europeanized'.

To this day, Portuguese names are borne by low-country Sinhalese. After the fall of the Portuguese, the Dutch ruled this region, and they too left behind them in their turn traces of their occupation. Systematic cultivation of the coconut palm and cinnamon was attempted and in the principal towns like Colombo, Galle and Matara, forts and monuments, as well as names of places, still commemorate the days of Dutch rule. They left behind as their descendants, the Burghers of Ceylon and as their heritage the Roman-Dutch Law. Many Dutch words entered the Sinhalese language and the process of 'Europeanization' of the town peoples went on apace.

In British times, this region was greatly transformed. Roads were built linking Colombo with the coconut and rubber lands of this region. Colombo continued to be the centre of political administration as well as the financial and commercial centre of the island. Hence the large city and busy port of today. Neighbouring towns became more or less its suburbs and a zone of dense population grew from Colombo to Kalutara. Town life gradually extended into the rural parts of this region. Today it is the most populated region in the island and contains the largest mileage of roads, and telephone and telegraph communications in the island. It has also the largest number of towns too, and the people in this part of the island are those who come into closest touch with foreign ideas, peoples and influences.

In all these ways, we see that the south-west section of Ceylon has an individuality of its own.

### The Hill Country

This is the second of our natural regions. Here the relief of the land has marked it out clearly from the rest of the island. We need not go into the details of the relief of the hill country at this stage, but the reasons for demarcating it as a natural region are obvious. Climatically too, it is a region in itself. Now all this must not be taken in a very rigid way. There are parts of this hill country that closely resemble the south-west lowlands and even the dry zone and the story of man's occupation of this part of the island is quite different from that of the part we have already marked out.

The hill country was known from the very earliest times as the *Malaya Country*. But we do not hear of any important towns or people in this region till we come to the days of the Portuguese. There may be many reasons which explain why the Sinhalese avoided the hill country. The heavy rains and forests and the cold of the high hills may be some. We know that land above the 3,000-foot contour was occupied and utilized in very recent times. Another reason may be that the hill country did not favour the cultivation of the food crop of the Sinhalese. Only when the fear of invasion drove the people to seek refuge, did the hill country become a kingdom. Even then, the *Kandyan* towns of Kandy, Gampola, Badulla, Hanguranketa are all below the 3,000-foot contour, the first two having been selected as defence sites against invasion. The typically *Kandyan* Pattus which are fairly densely populated to this day are all below 3,000 feet. These are Tumpane, Yati Nuwara, Uda Nuwara, Harispattu, etc.

But with the fall, in British times, of the *Kandyan* Kingdom, a flood of foreign influences entered the hill country. New crops like *coffee* and *tea* spread over the land and the jungles gave way before man's advance. Unpopulated regions became populated and strange races of men came into the land. Roads, and later, railways, broke down the isolation of the hill country and the *Kandyan* Sinhalese became gradually accustomed to the new changes. Thus the hill country has features which distinguish it as a natural region, not only by reason of its physical features but by its story of human occupation.

### The Dry Zone

This is the third of the major natural regions of the island. It has a distinctive climate and this alone separates it from the regions we have so far dealt with. But the characteristic features are not purely physical. The story of human occupation too is peculiarly its own. This was the cradle of the ancient Sinhalese. Here, they developed a system of irrigation not found anywhere else in the land, and with this aid developed paddy cultivation on a large scale. We know that a dense population once existed here and there were towns and ports of no little importance. Then for hundreds of years the land was abandoned to the jungles and in this state it is still today. This is the least Europeanized part of the island save in the ports where traces of Portuguese and Dutch influences remain.

All else is a land of villages and villagers. These have not come very much into contact with the outside world and know little or nothing of the conditions of life and the vast changes that have taken place in other parts of the island. Great trunk roads make their way across this region but these roads do not carry much traffic, so these villages and villagers continue their old-world life, isolated from the rest of the island thus removed from the foreign influences both good and bad, that other parts of the island have received.

Here then is another human region. Though modern foreign influences have not left a deep mark in this region, yet the influences of the past historical movements are seen today. The Arab sailors and the Muslim traders who came here in the days of the Sinhalese kings have left descendants behind them in the Muslim population of Puttalam, Mannar and Batticaloa as well as in the Muslim villages of the Wanni. The Tamil people have been long settled in various parts of the dry zone. This is an indication of the historical influences of South Indian people on Ceylon either by peaceful penetration or by conquest in war.

### The Jaffna Peninsula

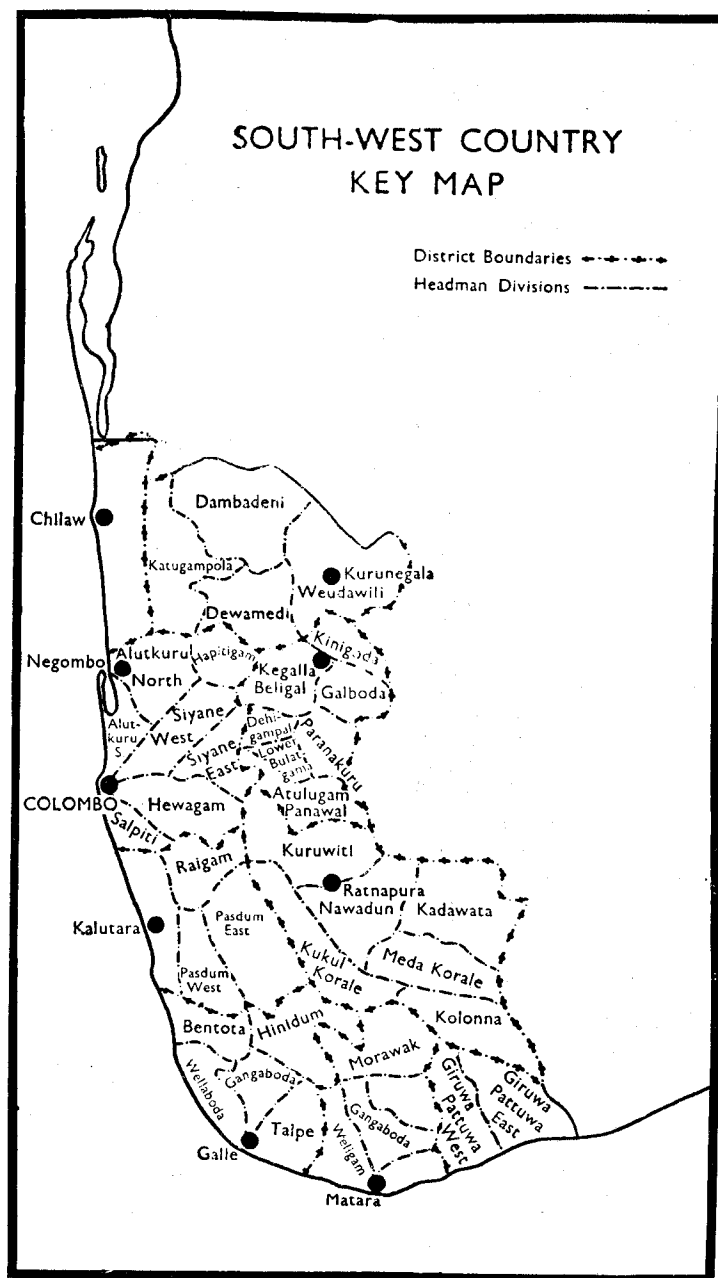
This is the last of the larger natural regions. Climatically it is a part of the dry zone but it has nevertheless certain features which give it a certain and clearly distinguishable personality. Unlike any other part of the island, the Jaffna Peninsula is a block of miocene limestone and though the rainfall is inadequate for cultivation, there are vast supplies of underground water. These have always been utilized for

man's use and without it, human settlement in the Peninsula would have been impossible. The landscape is dotted with *suriya* groves which indicate the presence of wells and much toil is needed to bring the water in the wells to the fields.

The limestone has decomposed into soil of excellent texture, but it is poor in humus and plant food. Very great care is necessary in preparing the fields for cultivation and all this work has created a thrifty, hard-working peasantry; for with man's toil and care only, will the land give any return. Nature here is not lavish in her gifts.

The Jaffna Peninsula is, in other respects too, a definite region. Although the Sinhalese once lived here, as place names, as well as monastic ruins and inscriptions such as the Vallipuram Gold Plate of 127 A.D. testify, today it is the land of the Tamil people. Here one finds the home of a Tamil culture and civilization which draws its inspiration from South India. To a Sinhalese now entering the Peninsula for the first time, it is like entering a new land. It seems as though a piece of South India has been planted in the north of the Island.





## CHAPTER VII

### The South-West Country

#### Relief

The south-west country may be said to be defined by the Deduru Oya on the north, the 1,000-foot contour on the east, the Walawe Ganga on the south, by the sea on the west. All save the last boundary, must be regarded as zones rather than lines of demarcation.

Nature does not delimit regions as rigidly as man marks out his fields and gardens. Thus the Deduru Oya is selected only as a means of locating very generally the northern boundary of the region, while in reality, there is on either side of the Deduru Oya a transition region, part of which belongs to the south-west country while the rest belongs to quite another zone. Thus one natural region gradually merges into another, almost imperceptibly. We do not ever find in nature a line of division such as a wall or fence or political boundary on either side of which are two distinct regions or countries. These remarks are true of the Walawe Ganga and the land boundary of the south-west country.

The relief of the south-west country has already been referred to and needs little emphasis here. Along the coast is a strip of land ranging from a mile or two in the south to fifteen to twenty miles in the north, below 100 feet in height. From this zone the land rises gradually eastwards into the hill country of Central Ceylon and the highlands of Deniyaya, Morawaka and Bulutota. The most striking feature of the relief of the south-west country is the peculiar arrangement of its hills. These are as it were arranged in parallel bands running north to south and south-west.

The rivers naturally follow the slope of the land. The Deduru Oya, Maha Oya, Kelani Ganga, Kalu Ganga and Bentota Ganga flow west, while the Gin Ganga and the Nilwala Ganga flow south to join the sea. All these rivers have to flow 'against' the ranges we have spoken about, and many of them cut their way through. In this way 'gaps' have been formed and these have been utilized for constructing roads, etc. Thus the Kalu Ganga cuts its way through the hills at Nambapana and through this 'gap', the Ratnapura-Panadura road runs. Similarly it is interesting to note

how useful the rivers have been in pointing out, as it were, the way for roads across the mountain ridges of the region. The Matara-Deniyaya road follows the Nilvala Ganga, the Colombo-Avisawella road follows the Kelani Ganga, the Horana-Ratnapura road winds its way across the hills along the Kalu Ganga Valley and the Ambalantota-Pelmadulla road may be considered as making use of the valley of the Walawe Ganga.

In some places gaps are formed, but no rivers are seen to flow through them. At such dry gaps, towns have grown up. Kurunegala for instance commands such a gap and was a royal city centuries ago. Today it is very interesting to note how roads and railways seem to converge on this point. It is the hub of a wheel whose spokes are roadways—to Puttalam, Kandy, Dambulla, Polgahawela and Chilaw, as well as the railway of Jaffna.

Polgahawela, the railway junction town is at such a gap and at this spot the railway bifurcates, one branch running north to Kurunegala and the other to the Kandyan Hills.

The direction of the hill ranges of the south-west has left its mark on the development of rivers and river systems. Examine the map of the Gin Ganga (page 93). The main stream follows the slope of the land, but from section B to C it follows the line of the hills. At C it cuts across the hills to fall into the sea at E. The tributaries between C and E follow the grain of the land.

The Kalu Ganga and the Kelani Ganga have river systems very much similar. They illustrate further the structural lines of the south-west country. These are seen on a smaller scale if one travels across the land from Colombo to Avisawella, the traveller will notice the road rising and falling continuously all the way through. The crests are the low-lying hills, the structural lines of the land, while the troughs are the flat valleys running parallel to the hills. From Avisawella to Ratnapura the road runs along the hills in a valley, now studded with paddy fields.

### Soils

The distribution of soils is quite simple. Along the coast from Matara to Colombo is a belt of sandy soil a mile or two in width. North of Colombo, the area of sandy soil widens out into a triangle with Colombo as the apex and Kurunegala and Chilaw as the ends of the base. This sandy soil belt is the home of the coconut palm and in Dutch times there

was one continuous grove from Colombo to Galle. It was, however, in British times that coconut plantation spread into the triangular area to the north of this region.

In the river valleys, and in the intermont basins are flat lands, all built up by the soil washed down from the hills. The Kelani has built up an extensive flood plain between Hanwella and the sea. The floods have prevented tillage of these lands but the flood plains of the Gin Ganga and the Nilvala Ganga carry extensive paddy fields.

Valleys and intermont basins stud the land. The valleys are more often than not, narrow and long and tend to follow the line of hills, and hence the paddy fields too take on the shape of the valleys. These fields are fairly ancient for most of them have been under cultivation in the later middle ages of Ceylon's history. The soils are mixed soils and black in colour.

The hills of the south-west country, and also the uplands (over 100 feet) are all covered with red soil. This is the soil produced by the decay of the parent gneiss rock, and various stages of soil formation can be seen throughout the western part of the island. The rock decays under the action of rain and humid air and soon forms a thin layer of red or reddish soil. In course of time masses of rock decay into red soil and the soil and sub-soil bear the lines of foliation of the parent rock. At Avisawella one can see an example of this, and other examples can be seen in any road cutting on the Colombo-Ratnapura or Ratnapura-Panadura roads.

The red soils have been for centuries forested. But with the introduction of rubber, the forests have been cleared for the rubber estates of the Kalutara, Kegalle and Ratnapura districts.

Thus the distribution of soils is seen to be closely related to the distribution of hills and valleys of the south-west country, and coconut, paddy and rubber thrive on the sandy lands, the alluvium, and the red soils of the region, respectively.

Climatically, the south-west country belongs to the wet zone, but the Deduru Oya and Walawe Ganga areas are transition regions between the wet and the dry zones of the island.

The south-west region has very little or no range of temperature for the year. The temperature is 80°F all the year round but the months of December-January and February show a diurnal range of 13°-20°F.

Rain falls throughout the year, and the relative humidity is high. The rainfall curves for Colombo and Ratnapura (vide chapter on climate) indicate February and August as the driest months of the year. Paddy is harvested about this time. The wettest months are May, June and October. On the whole the climate of the south-west country is equatorial, being hot and wet for the greater part of the year.

The south-west country owes much of its present importance to its position. In ancient times the centre of political and commercial importance was to the north of the island, with its royal capitals at Anuradhapura and Polonnaruwa, and its port in Mantota. In those days the south-west country was not thickly populated, but was, very likely, forested, and much of its flat lands marshy. We nevertheless hear of settlements along the coast as at Kelaniya.

There can be no doubt that forests covered the greater part of this section of the island. The heat and heavy rains favoured the growth of thick forests of the equatorial type. Clearing must have been difficult and there was nothing to attract settlers from the dry zone, where the tanks built by wise kings enabled plentiful harvests of paddy to be gathered.

But after the Tamil invasions of the 9th and 10th centuries and the establishment of the Polonnaruwa kingdom (1070-1215) we hear more and more of the south-west country. Various provinces were marked out for rule by the king's officers and during Parakrama Bahu's rule as governor of the 'southern country' (the land roughly between the Deduru Oya and the Bentota river) much was done to improve the land. Gem mining became important. There were 'thick jungles' and 'widespread' swamps; and in Pancayojana (Pasdun Korale) the prince had the marshes drained and laid out paddy fields and garnered together much store of grain.

As time went on the Sinhalese power declined in the 13th and 14th centuries, and forests began to cover the northern plain. When the Portuguese arrived in Ceylon there was a Sinhalese Kingdom at Kotte and many petty kings ruling the land. On the south-west were the Kotte Kingdom and the Sitawaka Kingdom. The story of these kingdoms belongs to the pages of history, nevertheless the records of Portuguese writers throw light on the condition of the land, and the occupations of the people.

Agriculture has been the chief occupation of the people in this part of the island, because the sun, rain and soil of this region encourage a healthy and rapid growth of plant life, and men have made use of these opportunities provided by nature to grow crops useful to them.

Paddy has been grown here from time immemorial as it was the food crop of the inhabitants. Arecanut trees gave them a 'cash crop' and the villager paid his dues to his overlord in arecanuts. The same was true of the pepper grown in garden plots. The coconut palm was grown here from very early times and the *Suluwamsa* speaks of the havoc wrought by feudal chieftains in cutting down coconut groves. Jak trees supplied food as well as timber, and Portuguese records refer to this valuable timber. Above all, cinnamon grew wild especially in the Four and the Seven Korales, and round Galle, and six leagues north of it.

Roads were few, but mention must be made of the famous 'way' from Colombo to the hills and so on to the Kandyan Kingdom. This 'way' went from Colombo, the chief port of the Portuguese, to Malwana where the Captain-General resided, then past Hanwella where there was a fort, it ran to Menikkaduware and Ruanwella. These two were fortified—the former being the headquarters of the Portuguese army.

Along the coast were well-known towns such as Negombo, Kalutara, Galle and Matara while in the Sabaragamuwa Province there was the town of Sofragam where the Disawa of Sabaragamuwa lived.

When the Dutch became masters of this part of the country, they found it depopulated, and the land allowed to run into jungle. But the Dutch, who were anxious to make the island support its cost of administration paid great attention to agriculture. As the country lacked villagers to till the fields, the Dutch were compelled to bring slaves from South India, and they were set to cultivate the land. This is a striking illustration of the havoc caused by the wars of the Portuguese as well as by their harsh rule.

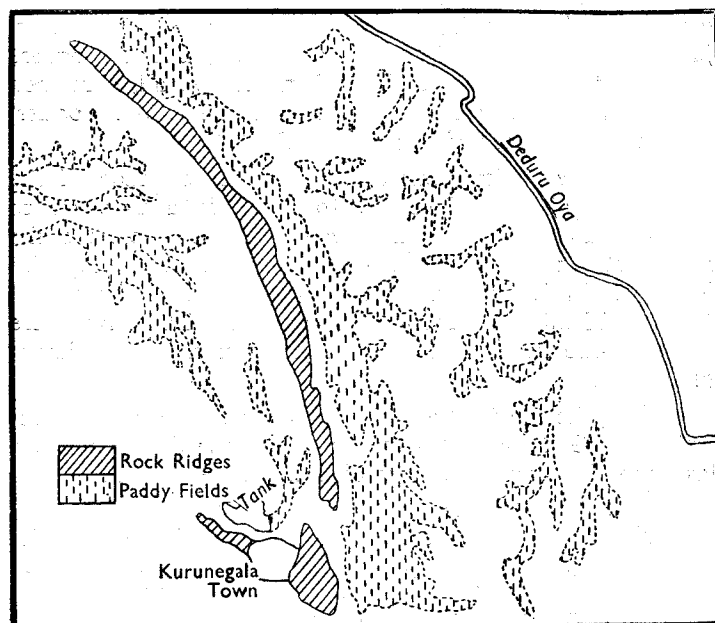
Paddy, arecanut, coconut, pepper, coffee and cinnamon were grown by the Dutch rulers. In fact, early British records tell us that there was from Colombo to Galle an unbroken belt of coconut land. Agriculture once more became the major occupation of the people of the South-west Country, and is so to this very day. Cinnamon and pepper have



sunk to the rank of minor crops but paddy and coconut together with a new product, rubber, are the most valuable of cultivated plants of this region.

### Paddy

This crop is confined to the wet lowlands along river valleys and alluvial basins. Along the banks of the Nilwala Ganga, the Bentota river and Gin Ganga are unbroken stretches of paddy land. The river supplies the water during the dry season by means of 'elas', that lead the water from the river into the fields. The sketch map on page 92



shows the paddy fields of the Nilwala Ganga flood plain. Elsewhere paddy fields are scattered about the land, as in the Colombo District (north) and the Kurunegala District. The sketch map above shows the general distribution of these paddy lands. They are dry valleys or intermont basins where the debris brought down from the hills during centuries of erosion has accumulated, and provided flat land which can be easily converted into paddy fields.

The total acreage of land under paddy in the south-west is about 308,150 acres. The North-Western Province has an acreage of 121,348: the Western Province has 86,153

acres and the Southern Province, 100,649 acres. In the Ganga-boda Pattus of the Galle and Matara Districts, however, paddy occupies half the area under cultivation and as the name implies, these pattus have a higher percentage of alluvial lands than other pattus of the South-west Country.

In the South-west Country the cultivator depends on rain-water for his crop. He has two seasons, the Yala and the Maha. The latter is the more important, and sowing is usually begun about August when the rains have supplied the fields with water, and it goes on till mid-October. The



Photo

PLOUGHING

Geo. Koch

harvest is reaped between February and March when the rain has decreased and the sunshine is bright.

The Yala Crop is rather a precarious one. It is sown in April, when the afternoon rains have moistened the ground and the harvest is gathered in July and August. But the harvests are often ruined by the heavy monsoon rains, though there is a chance that July may bring a few weeks of bright weather.

The methods of tillage are centuries old. The fields are ploughed with wooden ploughs drawn by buffaloes or oxen. In some districts the fields are dug and the soil turned over by mattocks. The soils are later trampled by men or

oxen and worked into a soft puddle and then the field is smoothed out by means of smoothing boards or by the feet of men. The surplus water is let out and the seed sown on the soft, wet soil. In the Southern and Western Provinces artificial fertilizers such as bone dust, bone meal and fish guano are employed.

'Before sowing, the cultivator selects his seed very carefully. He then tests a sample for its power of germination. Taking a handful, he begins by soaking it in water for 24-26 hours. He then wraps it in plantain leaves, and



Photo

HARVESTING

Geo. Koch

places it under weights for two or three days. At the end of that time, if germination is successful the seed will have begun to sprout, and he then proceeds on a larger scale, to treat the whole of his seed paddy similarly. The sprouted seeds are then separated from one another and sown broadcast on the fields'. Transplanting paddy seedlings is not practised by the farmer though a start has been made in the North-Western Province and in the Kegalle District. The present system is to sow broadcast and then to thin out the plants.

The crop receives very little attention, apart from water, weeding and guarding against birds until the approach of the ripening period. When the plants begin to

mature, they first take on a yellow colour, and at this stage, the cultivator drains the water from the field and allows the paddy to ripen.

The harvesting is done by women who reap the paddy with sickles while the men gather the paddy stalks in bundles and heap them in huge stacks or mounds. In a few days when the stalks have faded and the grains can be separated from the stalk, threshing is begun. In some districts, cattle thresh the grain, in others men trample the stalks and separate the grain from them.

The grain is then winnowed in the wind and the fine grains separated from the empty husks. The paddy is now ready for the barn.

Sometimes the owner of the field cultivates the land himself, with the assistance of his neighbours. Often, the owner lets the land out for cultivation, his rent being a half share of the produce.

The yield of paddy per acre in Ceylon is poor, the average being 634 lb. per acre. In Java the average is 1,300 lb. Much can be done to increase the yield. Better methods of cultivation can be adopted. Transplanting may be encouraged as it is distinctly better than the common habit of sowing seed broadcast, for it helps the plant to tiller and yield a large crop. Better seeds may be sown, and manures used to fertilize the exhausted fields. Land holdings are for the most part very small and do not lend themselves to improved methods of cultivation. Further, paddy cultivation is not lucrative, especially in the face of imported rice which is cheaper than the rice from the paddy locally grown. Many of the peasants have been attracted by higher wages, etc. to the towns and the rubber estates, and in many districts the peasants have sold their lands to the rubber cultivator, or they have taken to planting little plots of rubber themselves.

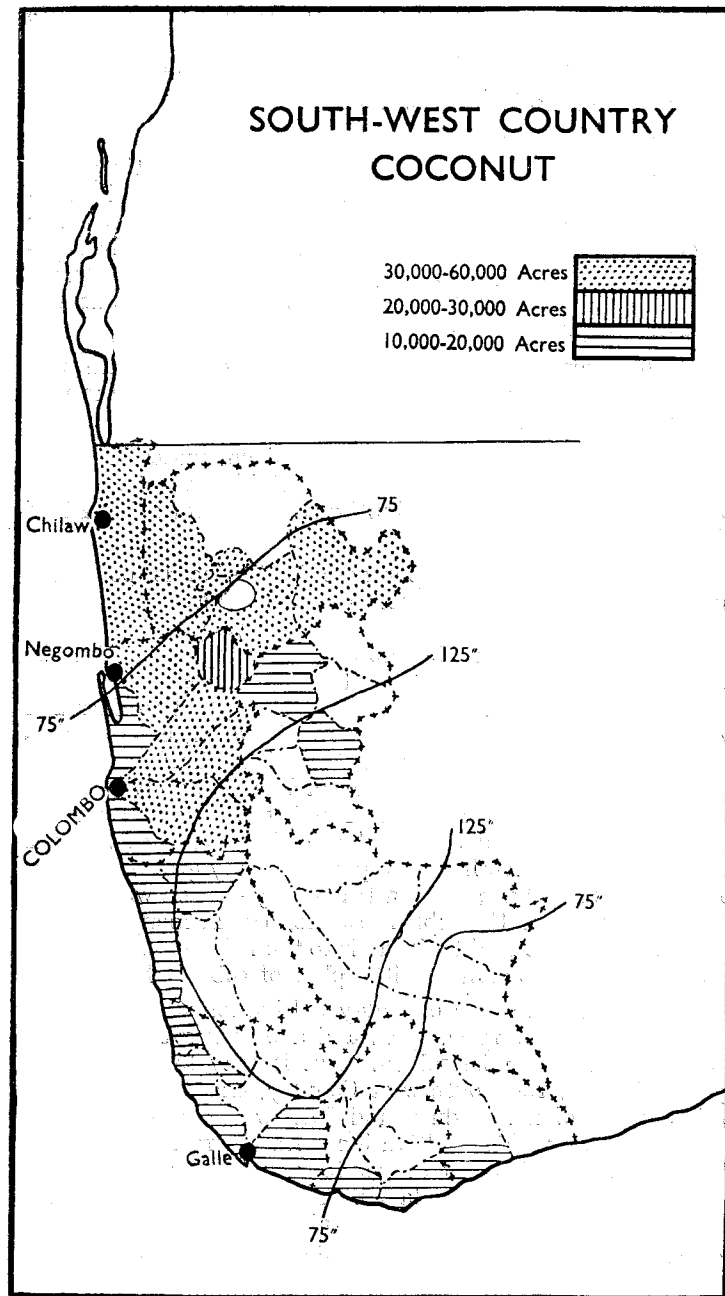
The whole problem of paddy cultivation and its extension in Ceylon is very complex and a wide survey has to be made before it can be solved. But it may be stated that geographically, the South-west Country, except in the transition zones of the Deduru and Walawe areas—is not the best zone for paddy cultivation. An increase of paddy cultivation should, other things be equal, be attempted in the dry zone on irrigated lands. For here is a climate ideal for wet or dry grains—a season of rain, is followed by a season of dryness and bright sunshine. And as in ancient days, the seed can be sown during the north-east monsoon and the ripe grain harvested in the warm days of February and March.

## Coconut

The coconut palm has been grown in Ceylon from very early times and the *Suluwamsa* speaks of coconut trees being cultivated in those days and, how in the days of feudal anarchy these valuable trees were cut down. In Portuguese times the palm was cultivated by the villagers and the 'Tombus' record the number of nuts the tenants had to pay as dues to the lord. But the Portuguese never attempted to cultivate the palm in a systematic manner. The Dutch on the other hand were anxious to extend the cultivation of coconut, as the sale of arrack, vinegar and coir brought in a considerable revenue. 'It is not because the liquor is less in demand than formerly, but on account of its scarcity either owing to the trees becoming exhausted in which case the remedy would be found in planting new trees or because the people have been discouraged by the bad times in Ceylon and have been neglecting the trees. I caused all the lands along the sea-coast between Galkissa and Kalutara to be surveyed so that they may be leased. Not a tenth of these lands had been cultivated and there seems to be no justification for allowing such a large tract of land, so suitable for planting of coconut trees, to lie waste. They would be divided into small lots and given away by deeds of grant on conditions that they are planted in two years. If this is done there is hope of increasing the production of toddy and coconut oil . . .'. So wrote the Dutch Governor Van Imhoff. The result of these efforts was that in early British times there was an almost unbroken tract of coconut palms along the south-west coast.

The map opposite shows the distribution of coconut cultivation in this region. From Matara and Tangalla in the south it extends along the coast in a fairly narrow strip to Kalutara. North of this town the coconut belt widens into a triangular area roughly with Colombo, Chilaw and Kurunegala at the angular points. This is the most important coconut district of Ceylon.

Yet in this region one can discern differences not in the palm but in the uses to which it is put. Along the narrow belt south of Colombo the trees are tapped, the arrack, toddy and vinegar are the important products. Not that coconut oil and copra are not made, but these are the special products of another zone. Coir, too, is made in this southern coastal belt of palm. The husk is soaked in fermenting pits and then beaten till the pulp is separated from the fibre. The fibre is next dried and combed out and ropes are made by hand or machines. The making of fibre and coir ropes is carried







Photo

COCONUT ON THE SOUTH-WEST COAST

Geo. Koch

on chiefly at Kosgoda, Hikkaduwa and Dodanduwa, where it is more or less a cottage industry. Toddy, arrack and vinegar were made in towns like Moratuwa, Panadura, Maggona and Beruwela, though today these have lost their former markets. Arrack is made by Government as well as in private distilleries. In 1926, 846,085 gallons of arrack and 4,264,576 gallons of toddy were consumed, while in 1935 the consumption of arrack was 356,348 gallons and toddy 4,817,463 gallons. The temperance movement has dealt a heavy blow to the local liquor trade.

In the northern section of the coconut belt the estates are larger and better cultivated. Oil and copra are the most important products.

Copra is the dried kernel of the nut and is used for the manufacture of coconut oil which again is utilised for the manufacture of margarine, soap and other products. Poonac, a largely used cattle food, is the by-product of the manufacture of coconut oil from copra. The bulk of it is used locally either as cattle food or manure but in 1934, 623,470 cwt. valued at Rs. 1,687,872 were exported. In 1939, only 536,321 cwt. were exported but the value rose to Rs. 2,013,302.

The number of nuts required to manufacture a candy (560 lb.) of copra varies from nine hundred to one thousand.

'Copra is sun-dried as far as possible, as sun-drying gives a better copra with a higher oil content, but the uncertainty of the weather makes it necessary to resort to artificial drying in certain areas'. Thus the wetter (100-125 inches) south-west coastal region does not specialise in copra whereas the less wet north belt (50-75 inches per year) is the 'copra' district.

The usual practice on many estates is to have copra dried by contract. The contractor is paid Re. 1.50 per one thousand dried nuts in husk supplied to him. He has to husk the nuts, split them and take the kernel out of the shell when partially dry. The copra is sorted into qualities Nos. 1, 2 and 3 in the estate sheds. The best quality is thick, clear, clean and unbroken.

The important coconut centres are Chilaw, Negombo, Marawila, Veyangoda and Mirigama. These towns are all within a triangle formed by joining up Colombo, Kurunegala

and Chilaw. The total exports of copra were as follows :

	Quantity (cwt.)	Value (Rs.)	Avg. Value per cwt. (Rs.)
1944 ..	2,019,955	26,625,914	14.17
1945 ..	2,273,599	38,802,828	17.07
1946 ..	776,200	16,407,064	21.14
1947 ..	594,694	21,386,805	35.96
1948 ..	1,089,216	42,190,888	38.74
1949 ..	431,492	21,567,197	49.98
1950 ..	422,336	25,435,672	60.23
1953 ..	427,804	22,855,558	—

The principal purchasing countries were India, Pakistan and Great Britain.

Besides copra other industries are carried on in this region. Coir yarn is made, and mills are found at various places for the extracting of the fibre from the husk. The fibre is classified into yarn, mattress fibre and bristle fibre.

The exports were as follows :

*Coir Yarn :*

	Quantity (cwt.)	Value (Rs.)	Avg. Value per cwt. (Rs.)
1944 ..	13,185	295,542	22.42
1945 ..	4,765	158,542	33.27
1946 ..	29,211	1,217,426	41.68
1947 ..	35,703	1,515,203	42.44
1948 ..	50,870	1,992,402	39.17
1949 ..	56,777	2,129,765	37.51
1950 ..	87,069	4,477,003	51.42
1953 ..	46,343	2,100,157	—

The United Kingdom, South Africa and Germany were the principal buyers.

*Bristle Fibre :*

	Quantity (cwt.)	Value (Rs.)	Avg. Value per cwt. (Rs.)
1944 ..	33,364	610,170	16.78
1945 ..	45,692	748,551	16.38
1946 ..	124,567	3,459,131	27.77
1947 ..	102,550	1,392,759	13.58
1948 ..	117,323	2,752,796	23.46
1949 ..	188,392	4,591,077	24.37
1950 ..	178,533	4,949,434	27.72
1953 ..	1,279,612	23,600,600	—

The United Kingdom, Japan and Australia were the chief buyers.

*Mattress Fibre :*

	Quantity (cwt.)	Value (Rs.)	Avg. Value per cwt. (Rs.)
1944 ..	181,602	1,304,558	7.18
1945 ..	214,159	1,889,912	8.08
1946 ..	418,179	5,823,605	13.93
1947 ..	449,233	4,331,439	9.64
1948 ..	536,600	5,632,623	10.50
1949 ..	644,834	8,470,055	13.14
1950 ..	873,948	15,898,254	18.19

The United Kingdom was the best buyer.

Coconut oil is another of the more important products of the palm. The oil is used in the making of soap, margarine and edible oils. In recent years formidable rivals have entered the field in competition with coconut oil and this has resulted in a setback to the coconut oil trade. Its rivals are whale oil and to a larger extent, soya bean oil. Coconut oil is prepared in a somewhat crude form in 'chekkus'. But oil mills have been set up and these give a greater and finer yield of oil. Such mills are to be found in Colombo, Negombo and Chilaw.

The oil is stored in casks or metal drums and is exported to the United Kingdom, India, Canada, Sweden, Egypt and Holland.

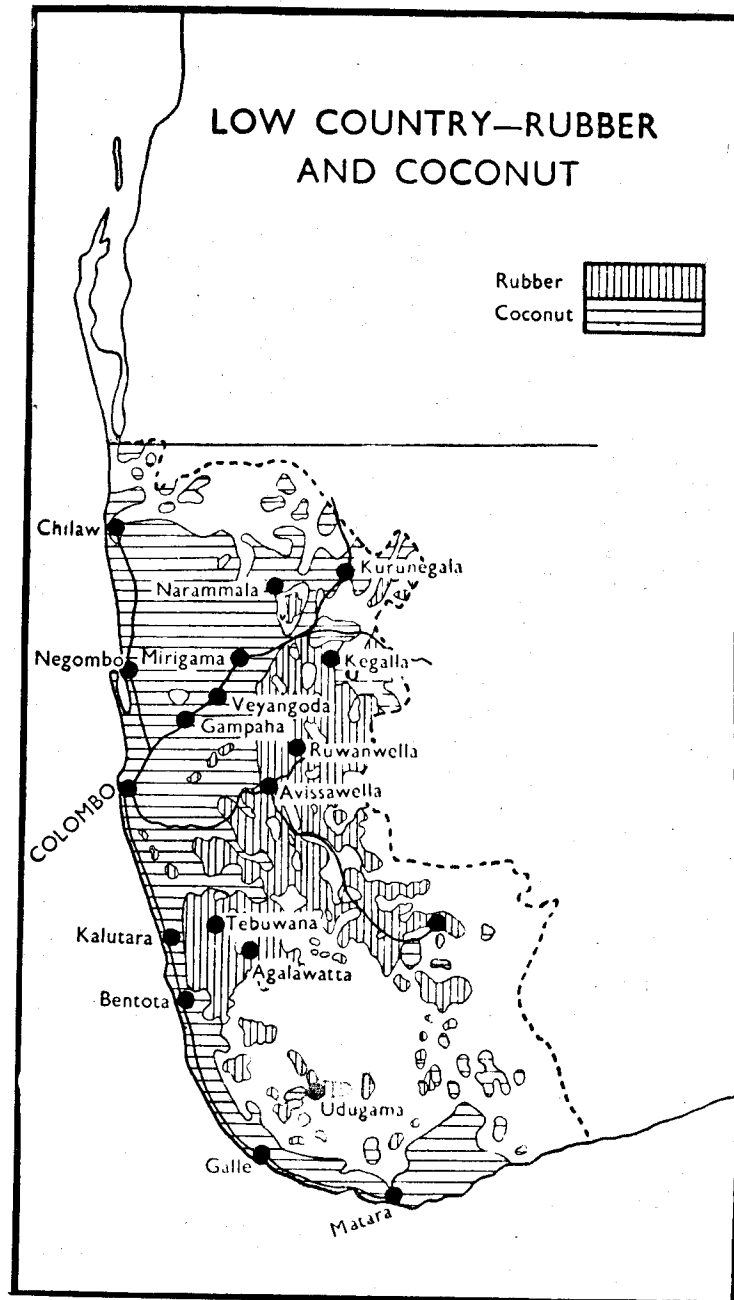
The exports were as follows :

*Coconut Oil :*

	Quantity (cwt.)	Value (Rs.)	Avg. Value per cwt. (Rs.)
1944 ..	826,791	19,509,112	23.59
1945 ..	773,525	21,358,550	27.61
1946 ..	861,482	29,758,438	34.54
1947 ..	846,304	48,488,076	57.29
1948 ..	1,514,606	84,060,587	55.50
1949 ..	1,783,684	121,326,750	68.02
1950 ..	1,514,337	127,374,147	84.11
1953 ..	1,871,368	142,000,000	—

Fresh nuts, too, are exported, especially to Egypt and British India.

Desiccated coconut is produced on a large scale. The kernel is taken out, washed and put into a disintegrator and shredded. The product is placed in siroccos for drying. Then after cooling, it is sifted into 'fine', 'medium' and 'coarse' and packed in 130-lb. boxes lined with tea-lead and packing paper.



The exports were as follows :

*Desiccated Coconut :*

	Quantity (cwt.)	Value (Rs.)	Avg. Value per cwt. (Rs.)
1944 ..	58,259	1,516,072	26.02
1945 ..	107,451	3,249,932	30.25
1946 ..	198,446	10,226,345	51.53
1947 ..	231,007	23,103,027	100.01
1948 ..	236,495	25,245,243	106.75
1949 ..	312,041	25,499,662	81.72
1950 ..	898,180	95,237,956	106.34
1953 ..	1,145,551	78,838,180	

The United Kingdom, Pakistan, United States of America, Germany and Holland were the principal buyers.

There remains yet another product of the coconut palm to be mentioned. The cake left after the oil has been extracted from the kernel is called 'poonac'. This is used as a cattle food and quantities are exported to Belgium and Spain.

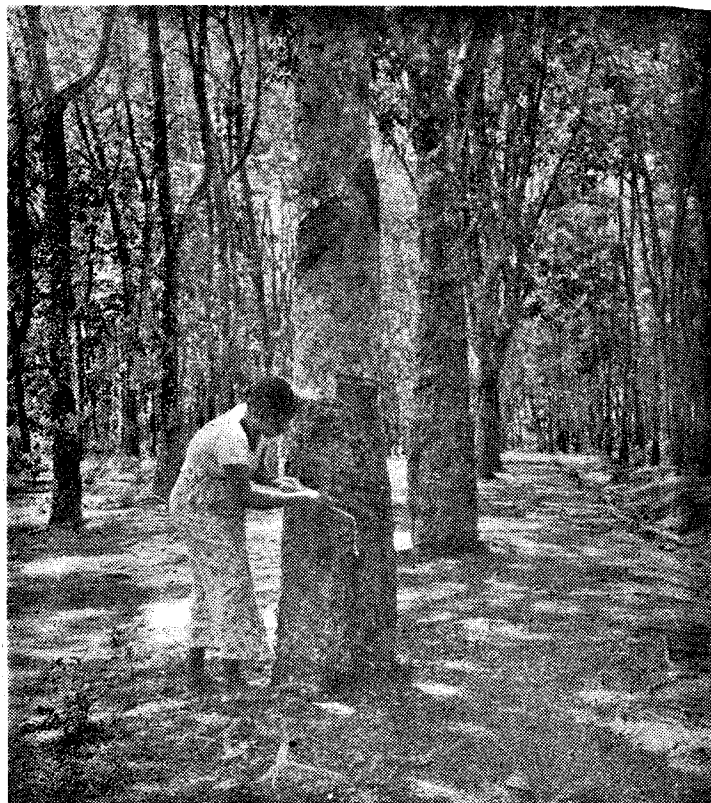
The coconut industry had been greatly helped by the development of roads and railways. Coconut produce from Galle and Matara is sent by road and rail to Colombo for export. The estates are linked with the main transport services, both road and rail, and the railway centres, e.g. Galle and Matara, serve as collecting centres for the produce of the neighbourhood.

North of Colombo, large coconut estates are found. The railway from Colombo to Puttalam on the one hand and to Kurunegala on the other, enclose this district and the railway stations serve as important transport centres, e.g., Chilaw, Madampe, Negombo, Veyangoda, Mirigama, etc. Roadways running east-west act as feeders to these two railway lines, though now, road transport by lorries has entered into very serious competition with the railway. The lorry has almost replaced the bullock cart and most estates have their own lorries. These bring the produce for shipment to Colombo and on the return trip bring back to the estates supplies of food.

### Rubber

Rubber is quite a new product of the South-west Country. In 1876 rubber seeds were planted in the Henaratgoda Gardens but it was not till many years later that rubber was systematically cultivated. The great expansion of the motor car and electrical trades in Europe and North





Photo

TAPPING RUBBER

Geo. Koch

America created a great demand for rubber. Planting thus began in earnest in 1904-1905 followed by a great rush in 1905-1907. The following figures show the increasing extent of land brought under cultivation:—

1905	..	40,000 acres
1908	..	180,000 "
1912	..	217,000 "
1916	..	250,000 "
1920	..	397,000 "
1924	..	433,000 "
1928	..	534,000 "

In 1938 there were 604,111 acres under rubber. In 1950 the acreage had risen to 660,646, an increase of 56,535 acres in twelve years.

The map on page 114 shows the principal rubber-growing areas of the South-west Country. These are the Kelani Valley, Ratnapura Districts (Kuruwita and Nawadun Korales), the Kegalle Districts (Lower Bulatgama) and the Kalutara District (Pasdun Korale West) where 'para rubber' finds almost ideal conditions for growth.

The map shows that these rubber districts are all within the 125 inches rainfall line and are more or less confined to the higher lands of the South-west Country. The rubber plant is a native of equatorial lands and hence it thrives well on the hot, moist parts of the island. The plant requires a well distributed rainfall of not less than 80 inches per annum and it flourishes well below 2,000 feet in elevation. Thus the South-west Country is the home of the rubber plant in Ceylon.

Rubber is generally propagated from seed, usually selected from heavy yielding trees which at the time seed is taken, are not in tapping. Seed is sown in nurseries and when the plants are eighteen months to two years old, they are removed, have their tops cut off and are planted in the new clearings as 'stumps'. Planting is carried out at varying distances, but 24 feet by 12 feet is a favourite of growers.

'Tapping generally commences when the trees are six to seven years of age and upon trees whose girth at 3 feet above the ground, has reached approximately 24 inches. Daily tapping was formerly most common, but alternate day tapping is now generally popular, while every third day is adopted upon some estates.

'The tree is rested for one month from February 15th to March 15th. The first flow of latex occurs during the

north-east monsoon, almost 60 per cent. of the year's yield being obtained in the second half of the year.

'Rubber is manufactured in two ways (a) smoked sheet or (b) crepe. To obtain smoked sheet the latex is first standardized by the addition of water and then panned for coagulation. The rate of coagulation varies with the amount of acetic or formic acid used. The coagulated rubber is then kneaded by hand and rolled in a smooth roller to extract the water from it. The rubber is then put through a machine which marks a diamond pattern on it in order to prevent the sheets sticking together. It is then cured by being put to dry in smoke in a specially constructed smoke room. After a further drying for a period of seven to ten days the smoked sheet is ready for export.

'Crepe is obtained in a different way. After coagulation the rubber is rolled into strips and then macerated by being put through creping machines which make the rubber into lace-like filaments. These are dried in a hot air drier and the filaments are rolled together into blanket crepe'.

Very little of the rubber thus manufactured is used locally. The export of rubber in 1926 amounted to 131 million lb. valued at 170 million rupees. This was the highest reached during the year 1905-1928. The most important buyers are the United States and the United Kingdom. Exports in 1948 totalled 206 million lb. valued at 142 million rupees and were 25 million lb. or 6.2 million rupees higher than those of 1947. In 1950 it was 265 million lb. valued at 40.5 million rupees.

The best and the most accessible lands have been opened out and unless another 'boom' occurs the more remote lands of the South-west Country will not be occupied. Time alone can tell, for should new uses for rubber be discovered, the industry will once again recover. The total output of Ceylon is only 1/10th the world total and the Dutch East Indies and British Malaya hold a very commanding position in the rubber trade. Nevertheless, rubber is one of the most important agricultural products of the South-west Country. Apart from soil and climatic factors favouring its growth, rubber cultivation in the south-west has been greatly assisted by roads and easy means of access of the port of Colombo. First class roads help fleets of lorries to bring the rubber of the Kegalle District to Colombo. The Kelani Valley Railway

as well as the great roadway to Ratnapura are utilised for the transport of rubber of the Pasdun Korale while the Udugama-Galle road links up the Udugama plantations with the railway town of Galle. Thus easy and quick transport has greatly encouraged the opening up of land for rubber.

Many areas yet remain in the south-west district quite suited for rubber cultivation. The well watered hill slopes of Hinidun Korale, the land around Elpitiya and up the Bentota river now forested, the hills of Pasdun Korale East, and the highland of the Kukul and Kolonne Korales in the Sabaragamuwa are all well suited for rubber.

The exports were as follows:—

	Quantity (Lb.)	Value (Rs.)	Avg. Value per lb. (Rs.)
1944 ..	224,181,640	222,791,439	0.99
1945 ..	214,752,622	218,403,853	1.02
1946 ..	227,979,782	226,665,188	0.99
1947 ..	181,128,204	135,501,814	0.75
1948 ..	205,803,025	141,618,650	0.69
1949 ..	195,152,244	122,861,590	0.63
1950 ..	262,188,468	401,119,743	1.53
1953 ..	217,326,080	337,582,445	—

### Cinnamon

Ceylon has been very famous in the past for her cinnamon, which has always been regarded as the best in the world. The Portuguese when they conquered the Maritime Provinces found the tree growing wild. They never cared to grow it in gardens but sent out peelers into the jungles to secure the precious cinnamon bark.

Queyroz tells us that the 'cinnamon was grown mainly in the provinces of Matara, Saffragama (Sabaragamuwa), the Four Korales and Seven Korales (the Kegalle districts and the Kurunegala districts especially)'. He tells us further that the 'Matara District (the southern and western provinces of today) includes the lands of the Mahabadda six leagues distant from Galle north-ward along the coast whence came in recent years the greatest quantity of cinnamon—not because its wanting in other disavas but because the inhabitants of this district called Chaleaz (Salgama) were obliged to make 1,800 bahars of cinnamon'. Cinnamon in these days was a monopoly of the crown and the 'Chaleaz' were people

## 120 A REGIONAL GEOGRAPHY OF CEYLON

whose special duty was to peel the cinnamon for the Government.

It was in the days of Dutch rule in Ceylon that cinnamon came to be extensively cultivated. The Dutch realized that it was not wise to rely on supplies of cinnamon grown in the jungle, for these lands belonged to the Kandyan King, and whenever he was displeased with the Dutch, he could always destroy the cinnamon trees or harass the peelers. The Dutch decided to grow the plant in gardens within their territories and thus ensure a steady and safe supply of cinnamon for export.

The lands, korales and provinces which are most fruitful and yield the best cinnamon stretch along the sea coast from the river of Chilaw (Deduru Oya) in the north to the Walawe in the south, to a distance of 56 miles (Dutch) and in breadth from the sea coast landward from 5 to 15 miles, except those korales which are the property of His Majesty the King of Kandy, from which we have permission from the King to peel cinnamon. The localities in which cinnamon is to be had are the following :— The Pitigal Korale where grows a large quantity of good cinnamon; the Katugampola Korale which yields the largest quantity of cinnamon though inferior in quality of that of any other Korale, is rather difficult to obtain on account of the distance which makes it difficult for the Chalias to transport the cinnamon from there to Negombo which is the nearest place. The Beligal Korale and likewise the Dehigampal Korale grow cinnamon. The above-named korales are all within the territory of the Kandyan King. The Alutkuru Korale in which Negombo is situated yields a fair quantity of good cinnamon and also the Salpiti, Hewagam, Pasdun and Raigam Korales. The part of the Weliwita Korale, north of the river, yields a fair quantity of cinnamon' (Governor Van Rhee). Maatsuyker adds that cinnamon of the 'best and finest quality is found in the Negombo District or in the Seven Korales'.

The Dutch Government paid very great attention to the cinnamon trade, the principal source of revenue. A cinnamon department was organised to superintend the cultivation and collection of cinnamon. 'The selling or giving away of a single stick, the export or peeling of cinnamon without the authority of Government, the wilful injury of plants, were offences punishable with death'

The British maintained the cinnamon monopoly when they succeeded the Dutch as rulers of the Maritime Province. Governor North attempted to concentrate the cinnamon gardens in a few places and two gardens were selected for this purpose at Maradana and Kadirane (near Negombo). In 1833 the cinnamon monopoly was abolished, but as early as 1803 the signs of the ultimate fate of Ceylon cinnamon trade appeared. Other countries especially Java, opened up gardens of cinnamon and the prices of Ceylon cinnamon fell rapidly.

There are at present 26,000 acres of cinnamon. In 1926 the total export of cinnamon products amounted to rupees four million. But it is today a minor product and the acreage is declining, as other crops yield a better return. The existing gardens are the survivals of old gardens which once supplied the world with cinnamon.

The harvest lasts from June to September and branches are fit for peeling in the fourth year of the life of the plant. The bark peeled and scraped and stacked in bundles form the cinnamon 'quills'. Other products are cinnamon chips and oil. The principal countries to which Ceylon cinnamon is sent are Mexico, the United Kingdom, the United States of America, Australia and Chile. The exports for 1953 were 57,242 cwt. valued at 7,439,497 rupees

### Arecanut

The areca palm grows well in the South-west Country. It has been grown in the villages as a garden crop from very early times. In the days of the Portuguese the arecanut was an important article of trade with South India. But we have no definite information about the extent of the trade in arecanut until we come to Dutch times. The Dutch considered arecanut as one of the most important articles of their trade in Ceylon (van Goens 1675-1679).

'This has been proved by the sale this year of over 40,000 amunus (1 amunu = 24,000 dry or 30,000 fresh nuts) which were supplied to various places :—

Bengal	..	..	..	5,200 amunus
Coromandel	..	..	..	20,000 "
Negapatnam	..	..	..	12,000 "
Madura	..	..	..	4,000 "
Malabar	..	..	..	500 "
Persia	..	..	..	300 "



The arecanut bought for 200,000 guilders will bring a profit of 550,000 guilders, which is more than sufficient to pay off the whole garrison of Ceylon'. In 1740 the value of arecanut exports was £12,500.

At the present time arecanut is not as important an article of trade as it was in Dutch times. Rubber and coconut offer higher returns and this has led to the neglect of the areca palm. Besides, the market for the nut is limited and unlike rubber, etc. not capable of expansion.

The palm grows well in the South-west Country especially in the Sabaragamuwa Province. It is still a village garden crop and the total acreage today is about 69,000 acres. The nuts are exported to India and the Maldiv Islands.

During 1938 the exports of arecanuts were 83.9 thousand cwt. valued at Rs. 1,031,000. India and the Maldiv Islands were the principal buyers. In 1948 exports of arecanut totalled 100,000 cwt. valued at 4.4 million rupees. The bulk of the exports went to India. In 1950 the figure was 101,552 cwt. in 1953, 5,680,684 cwt. valued at 3 million rupees.

### Citronella

'Citronella oil grass is a large coarse grass growing 3 feet to 4 feet high, cultivated in Ceylon for its oil, which is obtained from the leaves by distillation. The grass is grown in any ordinary soil and thrives best in a hot, moist climate. Its cultivation is confined to the south-west coast where about 33,000 acres are under the product. The grass is propagated by divisions and may be planted about 3 feet by 4 feet apart in rows. The cultivation is very simple. The clumps are ready for cutting in about eight months from time of planting. Two cuttings a year may be obtained, and about 40 lb. of oil per acre is the estimated yield. The oil is of a strong aromatic odour. It is exported for use in scenting soaps, perfumery, etc. and is also an excellent preventative against the bites of mosquitoes and leeches'.

The Matara District is today the principal region of the citronella grass. The principal buyers of oil are the United States of America, the United Kingdom and India.

The exports were as follows:

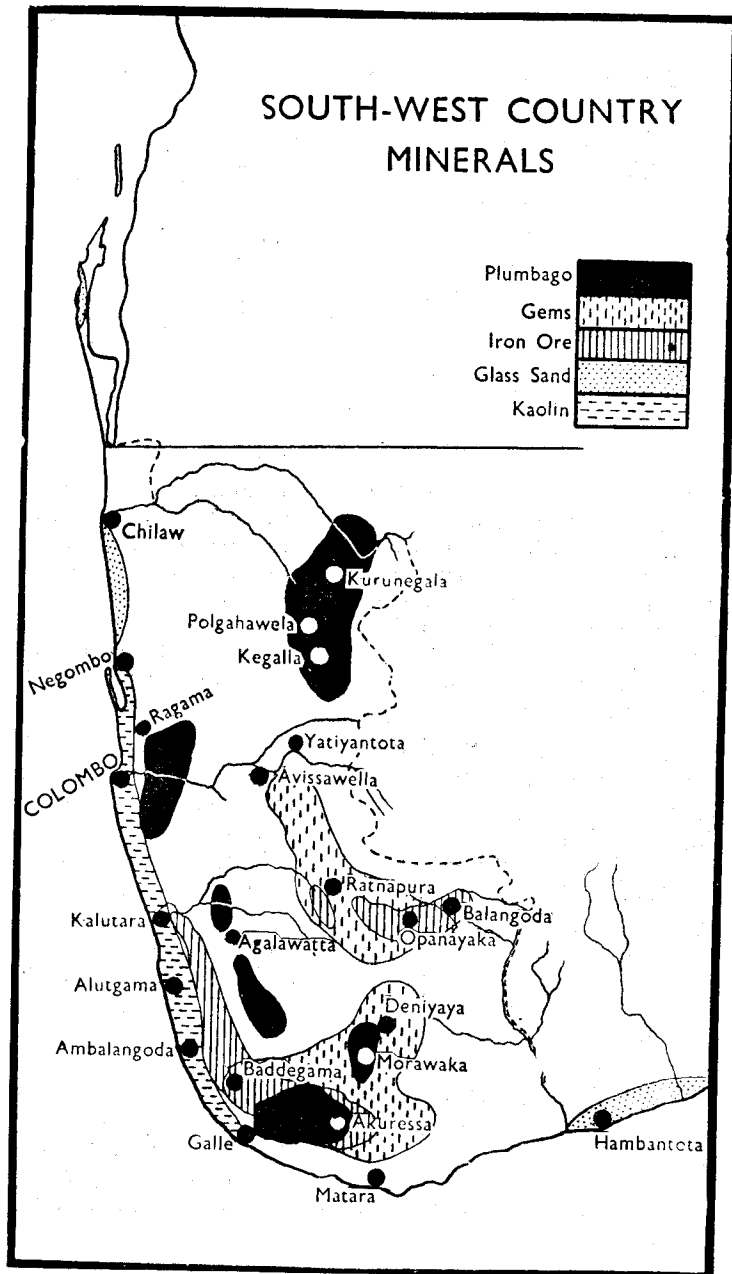
	Quantity (Lb.)	Value (Rs.)	Avg. Value per lb. (Rs.)
1944 ..	1,314,287	2,888,778	2.20
1945 ..	1,413,132	3,319,397	2.90
1946 ..	1,725,713	8,907,915	5.16
1947 ..	1,277,511	3,988,914	3.12
1948 ..	1,567,643	3,338,117	2.13
1949 ..	1,663,148	4,568,436	2.75
1950 ..	1,620,557	8,376,794	5.17
1953 ..	3,251,670	2,777,000	—

### Agricultural Possibilities

The above are plants grown in the south-west and they indicate what other useful plants can be successfully grown here. The south-west is the climate of palms, and plants such as those whose value to man lies in their bark, leaf and sap. For this reason *cinchona* is likely to grow well. The loss of Java in the second world war deprived Ceylon of her supplies of quinine. Attempts have been made to grow the cinchona plant in the Sabaragamuwa and the results are most encouraging.

In recent years the development of *sericulture* or breeding of silk-worms, has been discussed by the State and a very encouraging report has been published by an expert. For one thing the successful breeding of silk-worms depends on the cultivation of the *mulberry* plant. Its leaves form the food of the silk-worms and the harvests of cocoons that can be gathered depends on the year long supply of mulberry leaves. In the moist south-west of Ceylon plant activity is great throughout the year and there is not the least doubt about sufficient quantities of mulberry leaves. Sericulture can be established as a village industry where the peasant can be trained to grow his mulberry tree and feed the silk-worms. The cocoons produced will be an excellent means of earning a money income. Buddhist peasants may not take kindly to the steaming of the cocoons to kill the chrysalis in it. But this difficulty can be overcome if some co-operative or State Agency will buy the cocoons and prepare the raw silk for sale.

Another venture likely to be a success in the neighbourhood of towns is the breeding of *pigs, poultry and milk cattle*



Milk cattle need besides poonac and other special foods, excellent *fodder grass*. Such grasses can be very successfully grown in the moist south-west of Ceylon. The low-lying areas and water meadows (Sinhalese—Ovitas) can easily be converted into grass fields. Such work has been done in the neighbourhood of Colombo and Galle. In the former the low-lying areas subject to floods have been converted into grass fields. In the latter, lagoons studded with mangroves have been filled up by the sweepings of the city and been converted into grasslands.

#### Mineral Exploitation

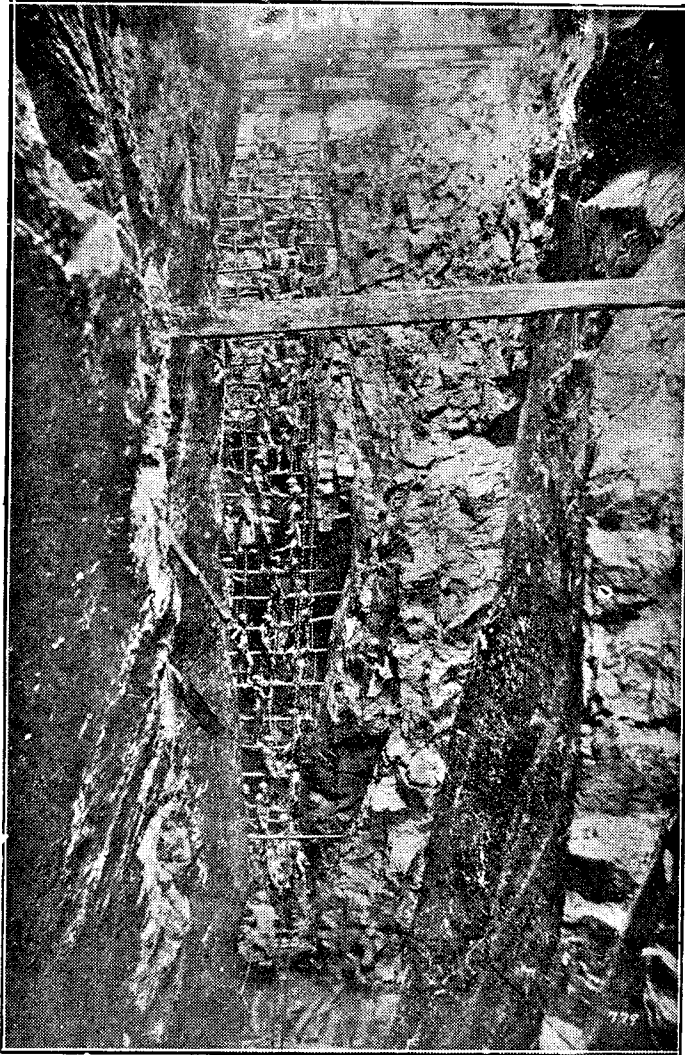
Such are the principal agricultural products of the South-west Country, and for years to come, agriculture will continue to be the principal occupation of the people in this region.

We shall now examine other occupations of men rendered possible by the opportunities nature gives to man.

Ceylon is rather poor in minerals but in the past she has had a reputation for gems and precious stones. Traders from the East like the Chinese or those of the West like the Arabs, came to this Island for gems. In the language of the day, Ceylon was the 'Island of Gems'—Ratna-Dwipa.

The South-west Country certainly supplied part of the total supply of gems that entered into ancient trade. The Ratnapura District has been famous for its gems and in the days of Parakrama Bahu I it was called Ratnakara. As Governor of the Southern Country he acquired a monopoly of the gems of this district and we learn that these were exported to other lands. This trade in later days was mostly in the hands of the Arabs and even today the mines are worked by the Sinhalese but the gem-cutting trade is exclusively in the hands of the descendants of the Arabs—the Moors.

Precious stones in large variety are found in the alluvial gravels of the Ratnapura Districts. These gravels are overlaid with mud, etc. and most of the gem pits are in valleys where for ages the gravel has collected. A pit is dug and the gravel brought to the surface and washed. This process leaves the precious stones at the bottom of the basket. These are then sorted out and cut by the lapidary into the



A PLUMBAGO MINE

gems' of the trade. The most important precious stones found here are rubies and sapphires.

In the days of the Portuguese, these gem lands or Agras' were crown property and the trade in gems was a royal monopoly. Queyroz, the Portuguese historian, tells us that in the year 1630 the produce of the mines of Sabaragamuwa were :

700 topazes  
1,000 sapphires  
18 cats' eyes  
58 rubies and  
8,000 precious stones of all sorts.

At the present time it is not possible to estimate the quantity or value of the output of the mines.

### Plumbago

The other mineral product of importance in this region is plumbago. It is widely distributed throughout the South-west Country but is not everywhere found in marketable quantities. Important mining centres are Megahatenne, Dodangaslanda, Ragedara, etc.

The plumbago industry has declined very seriously in recent years. From 1900 to 1917 the output exported was 500,000 cwt. valued at Rs. 21 million. In 1918 a decline set in, reaching 180,000 cwt. in 1920 and many mines were closed down. 1921 showed a record decline to 86,996 cwt. The chief cause of this was the discovery of surface deposits of plumbago in Madagascar. The plumbago though inferior to the Ceylon variety is more easily mined and is sold at lower prices. The growth of armaments production since 1937 once again gave impetus to the plumbago trade. In 1944 the exports were 245,283 cwt. and in 1950 they were 256,879 cwt. The best customers before the second world war were Japan, the United States of America; the United Kingdom and Germany. The chief buyers today are the United Kingdom and the United States of America.

Plumbago is chiefly used in the manufacture of crucibles, furnace facings, electrodes and stove polish as well as for making lubricants, black paint, lead pencils and in electroplating. During the great war, 1914-18, large quantities were required for the manufacture of munitions, and the exports rose to the value of 21 million rupees. In 1953 144,364 cwt. were exported, valued at 3,888,000 rupees.



### Iron Ore

About five to six million tons of iron-ore are found on the surface soil and sub-soil distributed over a dozen fields lying in the south-west sector of the island. The occurrences are of such a nature that only open-cast quarrying and no mining operations are called for. The ore which is of lateritic origin has reached a stage of concentration averaging 50 per cent. of metallic iron and is of a texture which makes it easily reducible without high-grade coal or coke fuel. The six million tons of ore available would be a bagatelle if the blast furnace methods of iron and steel manufacture are to be adopted, as in the mammoth iron plants of the present day. The discovery of the new technique of direct steel manufacture, now practised in Scandinavia and in the United States of America in small scale electric ovens gives the Ceylon ores a chance for highly remunerative utilisation. Ceylon's annual import of iron and steel goods, metal and fabricated goods of a type such as can be manufactured locally, during the normal pre-war years, was of the order of about 15,000 tons (at its maximum), valued roughly at between two to three million rupees. The quantity of raw material available, therefore, is sufficient for iron and steel requirements of Ceylon for much over a 100 years.

The ore is a soft rather spongy aggregate of iron-oxides of a composition and structure suitable for the electric methods of smelting, using only charcoal, peat, or saw-dust as a reducing medium. The electro-smelting with charcoal produces "sponge iron" for the direct making of cast iron, steel and wrought-iron without going through the Bessemer process or the open-hearth process. Ordinarily, in a furnace of capacity daily of 50 to 60 tons of pig-iron (according to Pring and Bradley Stoughton, who have discussed electro-metallurgy of iron and steel, as practised in the United States of America and Sweden) the current consumption amounts to about 2,200 k.w.h. per ton of pig-iron, the electrode and charcoal consumption being approximately 12 lb. and 7 cwt. respectively. If electric energy is available at a little more than half a cent, or even at three-fourths cent per unit (k.w.h.) there is every chance of the electric-furnace produced iron being able to compete with imported iron. Without giving details of the various items of expenditure in an address to a general audience, a safe approximation of the cost of manufacture of steel in Ceylon would be considerably below the cost of imported steel in the post-war years. The initial capital outlay would be small, well within a million rupees, for erecting three or four units at the site

of the principal ore-deposits and near sources of hydro-electric power.

The above technique of iron manufacture is new and is not practised in England or India, where supplies of coal and coke fuel are comparatively cheap and readily available. Though cost of production of iron by this method is low, once the technique and manipulation are acquired, the initial stages will need careful preparation and expert consultation. For the success of the project it is essential to obtain skilled technical advice and experienced foremen from the iron works of Norway and Sweden, both for putting up plant and equipment and for training the necessary skilled labour.

### Kaolin

The resources of Ceylon in kaolin, pure white china clay, porcelain clay, other industrial clays, fire clay and terra-cotta clays, are very extensive and for internal consumption purposes, practically inexhaustible. An export trade on a considerable scale can be encouraged and maintained and a highly profitable industry of kaolin refining can be set up. Kaolin fields of sufficient extent and richness exist within a few miles radius of Colombo and in the strip of swampy country stretching along the south-west coast of Ceylon from Negombo to Galle. In its chemical composition, burning quality, texture and plasticity, refined china clay of Ceylon is not inferior to Cornwall clays or other imported clays. An important market for refined kaolin will be found in India, where the consumption of this commodity is mounting fast for the manufacture of all classes of ceramic wares, as well as for the paper and textile trades as filler, paints, cement and a number of other minor uses.

### Fishing

Fishing has been a very early occupation among people along the south-west coast. Portuguese and Dutch records in particular, make definite reference to fishing and fishing villages. In Dutch times a tax was levied on boats and nets ('oru panam' and 'del panam') while the D. E. I. Company derived income from 'rent of the fishery at Galle, Matara, Dondara and Weligama'.

Fishing in these early days was primarily to feed and maintain the fishing communities along the coast. The surplus was no doubt sold in the neighbouring villages or exchanged for grain. At the present time the south-west

coastal fisheries have the whole of the south-west as a market and fishing is now more for purposes of trade than subsistence. The fisherman today sells his catch to middlemen who transport the fish to the markets in and near Colombo.

The coastal waters from Puttalam to Hambantota provide opportunities for the development of useful fisheries. A continental shelf of about 8-10 miles in width provides an excellent breeding place for fish. Its shallow waters, influenced by the sun, encourage the growth of submarine

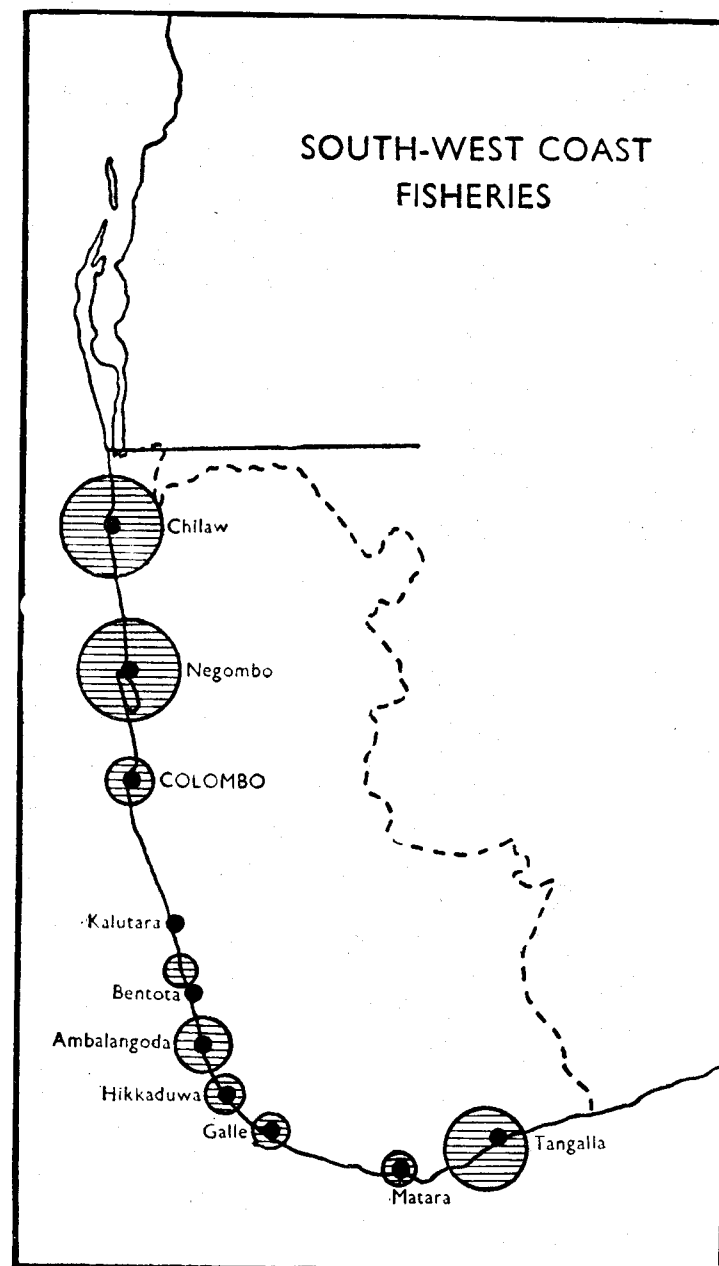


Photo

FISHERMEN HAULING IN THEIR NETS

Geo. Koch

vegetation and this in turn helps to maintain millions of small creatures which form the food of the fish. A survey made of the edible fish on this continental shelf confirms the belief that this contains valuable fishing areas. The dense population along the coast and in the coastal towns like Chilaw, Negombo, Colombo, Kalutara, Galle and Matara constitutes the market for the fish. In spite of these two favourable factors, namely a supply of edible fish and a market for it, fishing is declining in importance. Over 12 million rupees worth of fish and fish products are in normal times imported.



The reasons for the failure of the local fisheries to supply the Ceylon market are many. Firstly, the methods of catching are not suited to fishing on a large scale. The outrigger canoe, the line, and inshore net, were handy means of catching fish in early times when the market was very small. A report published in 1951 makes excellent suggestions for the development of the island's fisheries. It suggests among other things, that methods of catching fish have to be modernised. It points out that along the south-west coast the continental shelf of about 12-15 miles in the areas where edible fish is found in large numbers. But the fishermen do not extend their fishing to cover any appreciable extent of the available fishing banks because they are so dependent on oar and wind. Motor driven fishing vessels would enable fishing operations to be carried out over a larger field and so increase the catches.

The important fishing centres are Gandara, Kottegoda, Weligama, Ambalangoda, Balapitiya, Moratuwa, Mutwal, Negombo and Chilaw. Negombo has been famous for its lagoon fisheries but even these may perish in days to come. There is no law for the protection of fisheries and the fishermen on the coastal lagoons literally sweep the waters clean of edible fish. This, in course of time destroys the prospects of fish breeding and maintaining a regular supply. No attempt has been made to develop river fisheries by breeding edible fish in them. A time may come when these opportunities of developing coastal and deep sea fishing, lagoon and fresh water fisheries will be utilized for the benefit of the people. A Fisheries Department has been organized to study the problems of securing supplies of edible fish.

## CHAPTER VIII

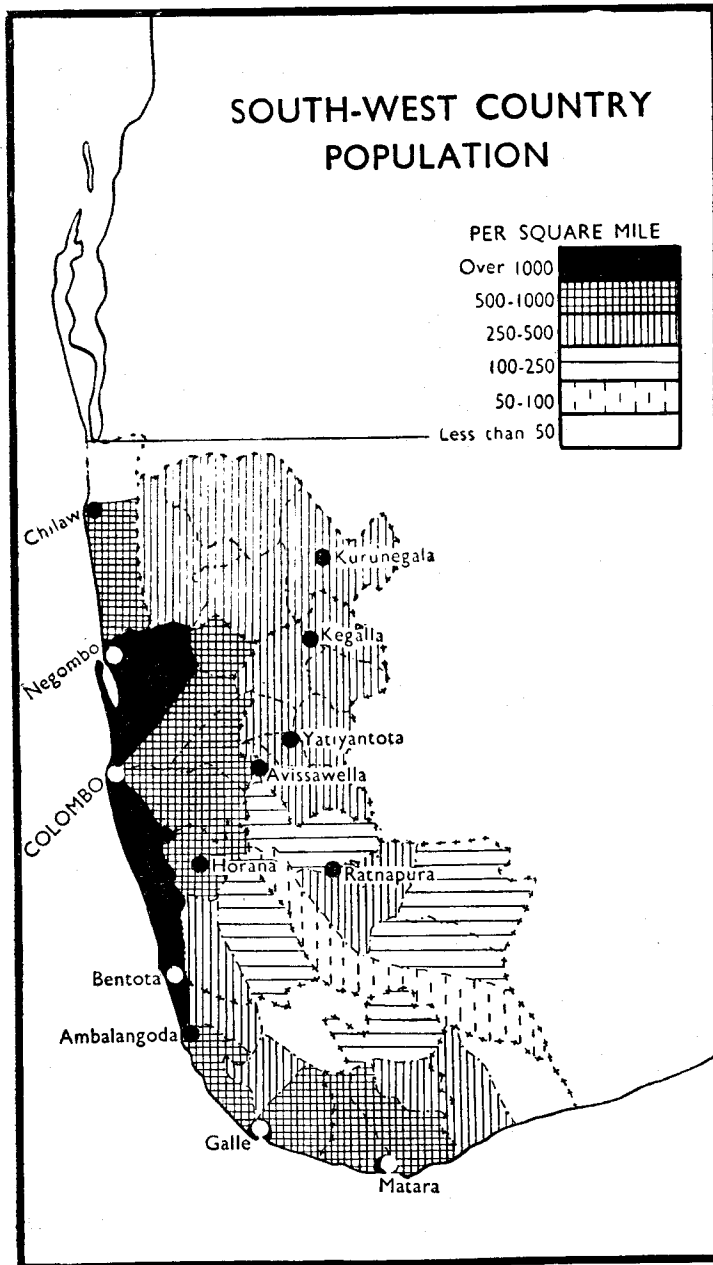
### Distribution of Population and Types of Settlement

The distribution of population in the South-west Country illustrates its importance as a region of human activity. From the days of the decline of the ancient Sinhalese monarchy in the 13th and 14th centuries the south-west has been a populous land. It was then the region of the highest importance, politically and economically, and continued to be so throughout the Portuguese and Dutch eras down to the present day. It has today about half the total population of the island though its extent is only about one-fifth the area of the island. It contains the capital of the island which is also her most important port. Round this has gathered the trade and commerce of the island.

The South-west Country is on the whole healthy, being spared for the greater part from the ravages of malaria. Roads are plentiful and much of the land is cultivated, save in the less accessible regions such as the Kolonna and Kukul Korales, etc.

Colombo is the great focus of the distribution of the population of this region. Being the centre of administration as well as the commercial capital of the island, it draws to it people from all parts of the island by the opportunities it can offer of higher wages and greater employment. The city population amounts to 355,374. From Chilaw and Negombo, from Nugegoda, from Alutgama, Panadura and Moratuwa thousands travel to the city for their daily work. We thus find a belt of dense population stretching north and south of Colombo (vide map page 134). As Colombo is becoming more and more a business centre, people tend to live away from the city in the suburbs where house rents are low and means of road and rail transport and travel are easily found. One sees this process in the conversion of 'bungalows' into stores and 'godowns' at Slave Island as well as in the great increase in house building all the way south from Kollupitiya to Dehiwela and beyond to Ratmalana, Lunawa and Moratuwa. The double track railway provides easy means of travel to the city, while in the suburban areas the 'bus' is a very cheap means of travel. North of Colombo too, is a similar residential area, and large





numbers travel daily to Colombo by train and 'bus, from Negombo, Kandana and Ragama as well as from Kelaniya, Gampaha and other stations on the road to Polgahawela. On the east of the city we do not see the same distribution of population. This is no doubt due to the dangers of the Kelani floods. But south of the river, beyond the flood menace, we see once again a suburban grouping of population in places served by the narrow gauge Kelani Valley Railway.

Thus the city has grown outward, north, south and south-west. When the process will stop none can say for if the city grows larger and more congested, people will move further out and quicker means of transport may assist this process. It may come to pass that towns like Panadura and Kalutara in course of time will become suburban areas of the city of Colombo.

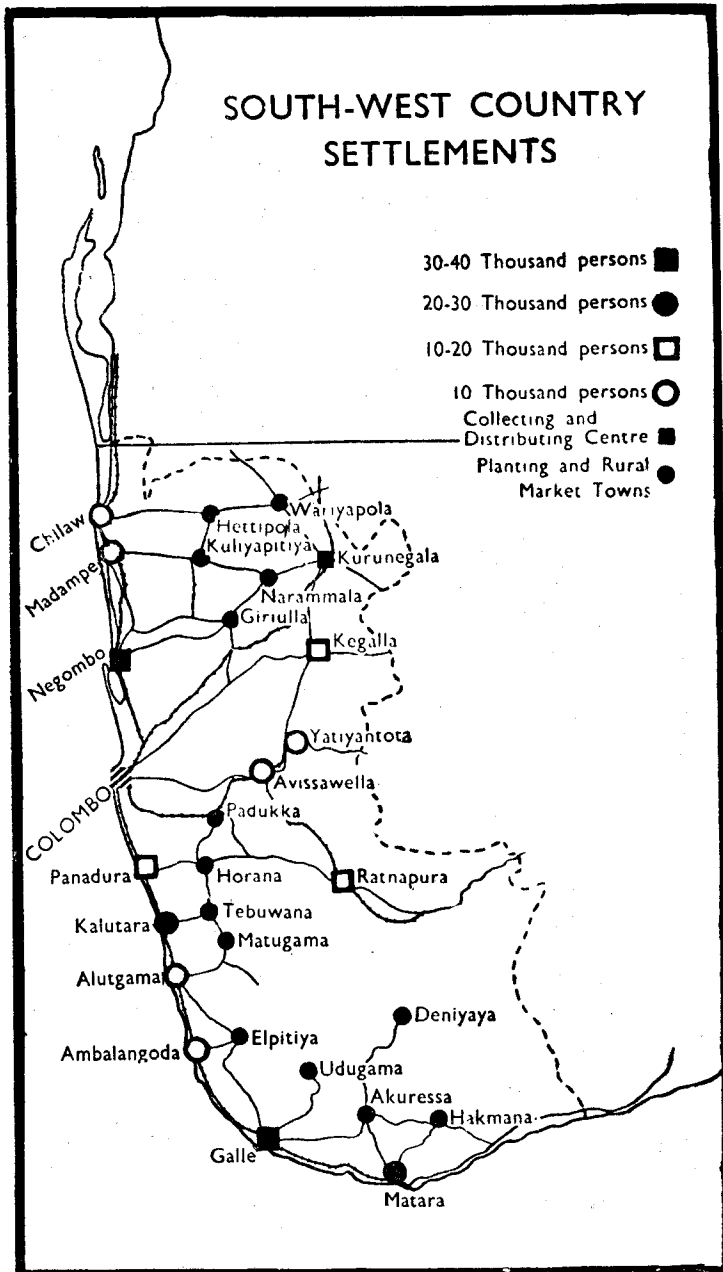
Galle and Matara also show over 1,000 persons to the square mile within the town limits. Both are very old towns and have been populous from even ancient times. Galle was once the chief port of the island. But with the building of the artificial harbour of Colombo, Galle decayed and large numbers left for Colombo in search of work. Both towns are today important railway towns for the districts they serve and are thus important market towns.

East of the region discussed (vide map), is a zone of population ranging from 1,000 to 500 per square mile. This does not mean that the population is evenly spread throughout this region as in an urban zone as the map would suggest. This zone is one of cultivated land—coconut, rubber and paddy—and the population is largely rural. In the 'rubber lands' of the Kegalle and Ratnapura Districts as well as in the Pasdun Korale of the Kalutara District the rural population is about 97·8 per cent. This percentage is not far wrong for the other part of rural South-west Ceylon.

Lastly, we find an 'inner belt' of population ranging from 100 to 50 per square mile and below. These are in divisions where roads are few and forests are many. Such are the Kukul and Kolonne Korales of the Sabaragamuwa and the Hinidun Korale of the Galle District. Malaria keeps the death rate high and isolated villages are found in the valleys where paddy is the principal crop.

The population of the South-west Country thus falls into three divisions.

The *first* and most populated zone lies north and south of Colombo—a zone reflecting the importance of Colombo. Though the population of the Western Province is



markedly rural being 74 per cent. of the total, 25 per cent. is urban, the highest for any districts in the island. So too around Galle and Matara. Here in the Southern Province the urban population is only 11 per cent. of the total, and is the third highest for the island. This illustrates the influence of old towns which still maintain an urban population.

The *second division* consists of the rubber and coconut lands of the South-west Country. The density varies from 250 to 1,000 per square mile. But the population is decidedly rural. In the Western Province 74 per cent. of the rural population is spread throughout the eastern parts of the province of Siyane, Hewagam, Raigam and Pasdun Korales. In the Southern Province 88 per cent. of the rural population is spread throughout the Wellaboda, Talpe, Weligam and Gangabada Korales where coconut and paddy are extensively grown. In the Sabaragamuwa 97·8 per cent. of the total population is rural. This second belt of population is thus decidedly rural. Few towns are found in this zone and these are large market centres.

The *third division* is the zone of scantiest population. This is found on the 'inner side' of the rural zone and includes the least accessible, forested mountain sections of the Sabaragamuwa and Southern Provinces. The Kukul and Kolonne Korales have only 7 per cent. and 6 per cent. respectively of the land cultivated, while the Hinidun Pattu has only 2·9 per cent.

In course of time these divisions too will come under cultivation but it is not possible to say when this will happen.

### Types of Settlement

We shall now proceed to examine the places where men are found to assemble for various reasons, for residence, for business, etc. The geographer wishes to discover what natural factors helped the origin and establishment of a human settlement and whether natural factors have played a part in the development of such settlements. It is in this light that we shall pursue our study.

The first type of settlement to which we shall devote our attention is the **village**. Villages are no doubt very ancient types of settlement of South-west Ceylon. These centred round a stretch of paddy land and the houses were always built on rising ground away from the fields. The hills were for the greater part clothed with forest which supplied the villages with firewood, timber and creepers to

serve as ropes, etc. On the garden land, vegetables were grown and the *thombos* of the Portuguese refer to coconut trees, areca and pepper being cultivated in the village lands.

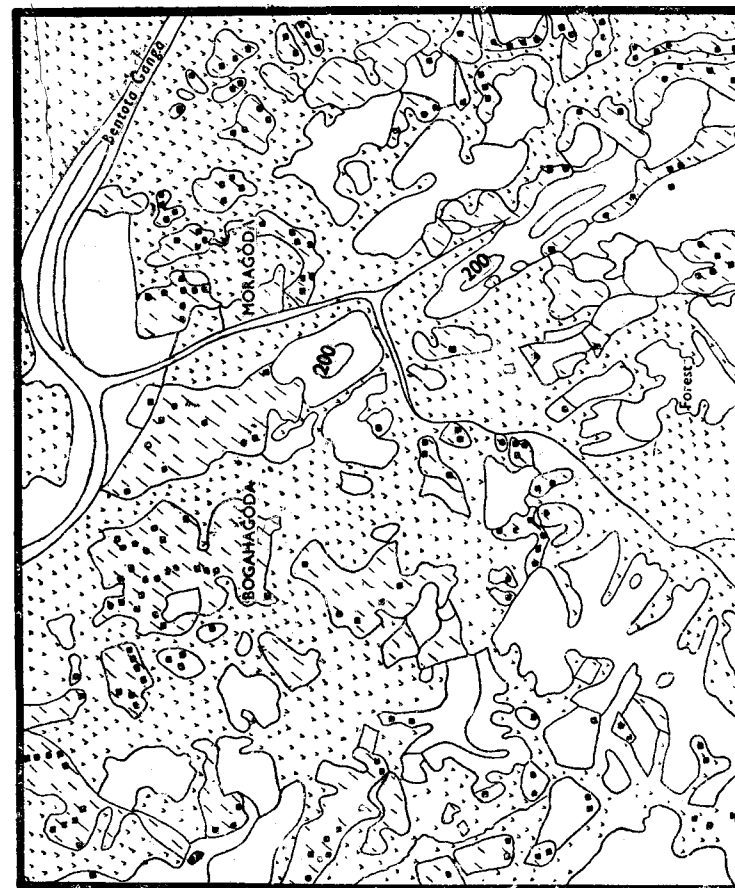
Villages of the ancient type are still to be found in the remote parts of the South-west Country such as the Sabaragamuwa. But with the advent of coconut and rubber plantations, roads and means of quick travel, the isolation of the village was broken down and its distinctive features have disappeared.

Another ancient type of settlement is the **fishing settlement**. In its rudimentary form it consists of a collection of thatched houses clustering together on the coast with a garden of coconut palms encircling it. The open coast is the landing place of the boats and these are often seen drawn up on the shore with the sails and the fishing tackle drying in the sun. These settlements have also undergone drastic changes with the coming of roads and railways, the growth of towns and trade and the widening of the markets for fish. Villages in this stage of transformation are to be found in the South-west Country. Examples are Gandara, Kottegoda at one end of the scale with Moratuwa, Weligama, Balapitiya and Ambalangoda at the other. Some of these have now become important market centres, thanks to road and rail development, and have attained the status of towns.

The third type is the **ford town**. At places where there are crossings across a river, settlements tend to develop which in course of time may become large towns. Examples of these in the South-west Country are Matara, Gintota, Bentota, Kalutara and Panadura.

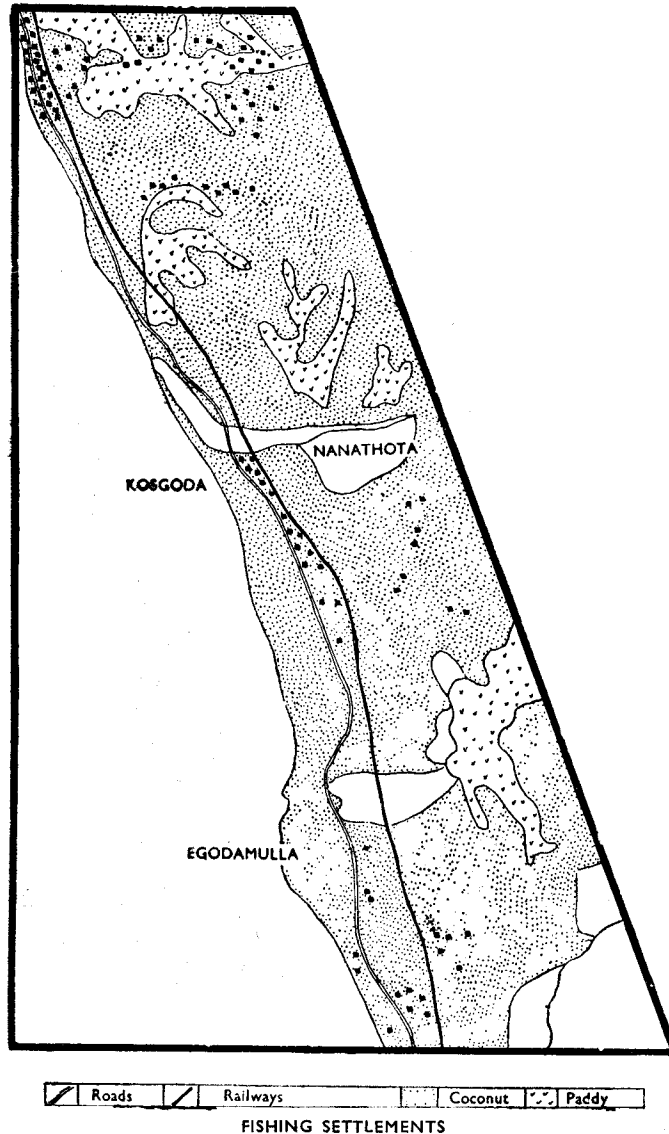
**Matara.** The name Matara means 'great ford'. There is thus no doubt as to the reason for the town's origin. In the days of the Portuguese, Matara became the residence of the Dissawe. It was described as a 'large town' with a 'bazaar' where Moor traders dwelt. When the Dutch became the rulers of the Maritime Provinces of Ceylon, they made Matara the chief town of the district. They built a fortress and Matara was regarded as the centre of the cinnamon trade in the district.

But the importance of Matara today lies in the fact that it is a centre for distribution of goods. It is the terminus of the coastline railway and it is thus linked up with the seaport of Colombo. First class metalled roads join up the outlying towns of Tangalle, Beliatta, Hakmana and Deniyaya.



RURAL SETTLEMENTS, SOUTH-WEST CEYLON





Matara is thus a collecting centre of the agricultural products of the district—tea, rubber, coconuts and vegetables—and at the same time is the distributing centre of imported goods to supply the demands of large and prosperous villages in the neighbourhood.

Gintota (called in the *Suluwansa* 'Gimhatittha') is another example of a settlement due to a ford. But this is not a collecting or distributing centre of goods.

Bentota or (Bhimatittha) is the third example of this class of settlement. This town besides being mentioned in the *Suluwansa*, is often referred to by Portuguese writers. Today it is a railway town, though the railway station is on the north side of the Bentota river at Alutgama. The land behind this ancient town has not been developed, for up the river are villages and vast tracts of paddy lands. Alutgama, however, is linked by a first class road to the rubber lands of Matugama and the plumbago mines of Megahatenne.

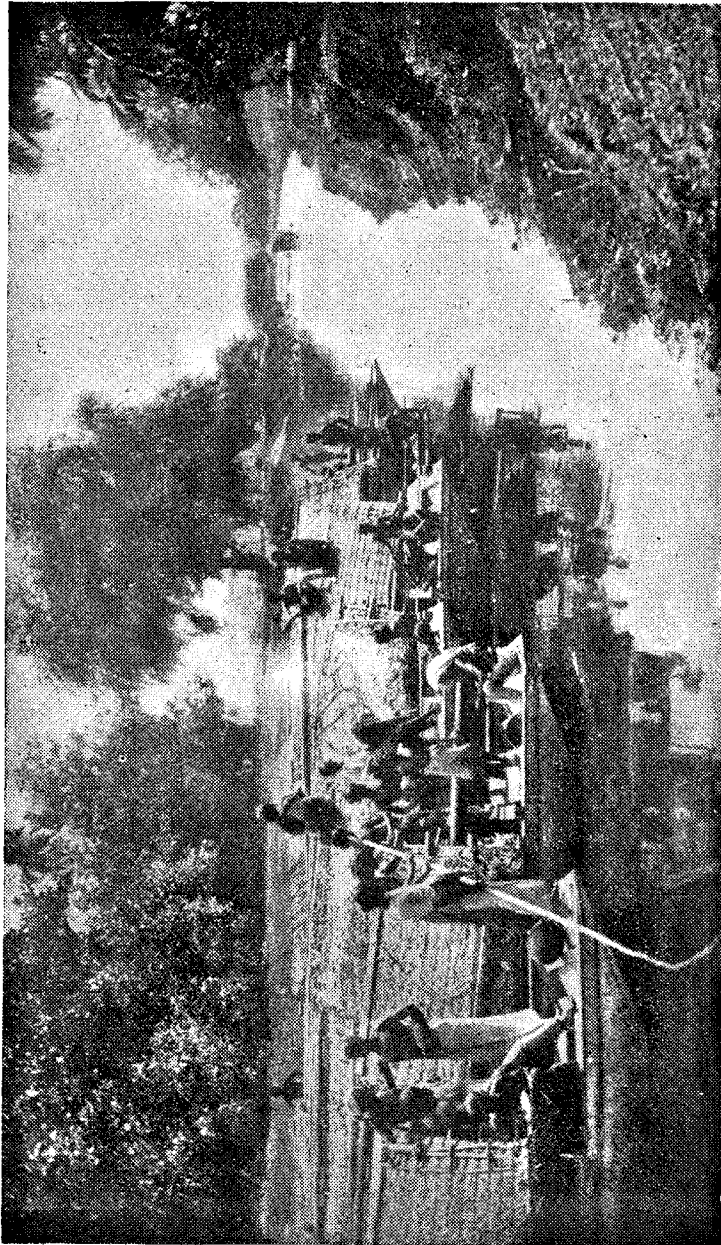
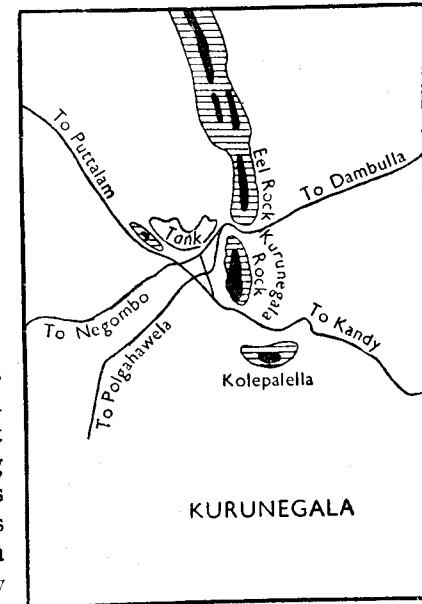
Kalutara is the next example of a ford town. In the days of the Portuguese and the Dutch a little fort overlooking the river guarded possible attacks on Colombo from the south, while the ferry at Anguruwatota kept watch over enemies coming down the Kalu Ganga. In fact the Dutch when they began their operations for the capture of Colombo seized Kalutara first. Today the town is a very important market centre. Bridges over the Kalu Ganga link the town by road and rail with Colombo. But the prosperity of the town really began with the opening up of the Pasdun Korale under rubber. In 1902 the district had only 436 acres and in 1921, 82,000 acres. Besides these it has 40,000 acres each of paddy and coconut land. It is thus an important agricultural district and the town of Kalutara which is the railway town as well as the collecting and distributing centre for goods of this district, has become the most important town. Its population today is 13,000 and the town is administered by an Urban District Council.

Panadura can be classed as a ford town. But thanks to the railway and the quick growth of Colombo, Panadura has become a suburb of Colombo. Today it has a little over 10,000 people. A first class road connects it with Horana and Ingiriya, and Panadura has become a market town. The long bazaar, the crowded 'bus stand, the railway station, all testify of the town's importance as a market town and residential area.

We shall next examine another type of settlement. We shall call these **defence sites or fortress towns**. Two examples are Kurunegala and Ratnapura.

Kurunegala is first mentioned as a royal city about A.D. 1300. This was a time of national decline and the rocks of Kurunegala, Ibbagala, Etugala, etc., served as rock citadels for the city. The 'wewa' supplies water and the city could hold out against enemies. These citadel rocks were undoubtedly the main reason why Kurunegala was selected as the site for a capital and the old name (Hathigiripura) means 'city of the elephant rock'. Such defence sites have often been selected as sites for capitals, e.g., Dambadeniya, Yapahuwa and Sigiriya.

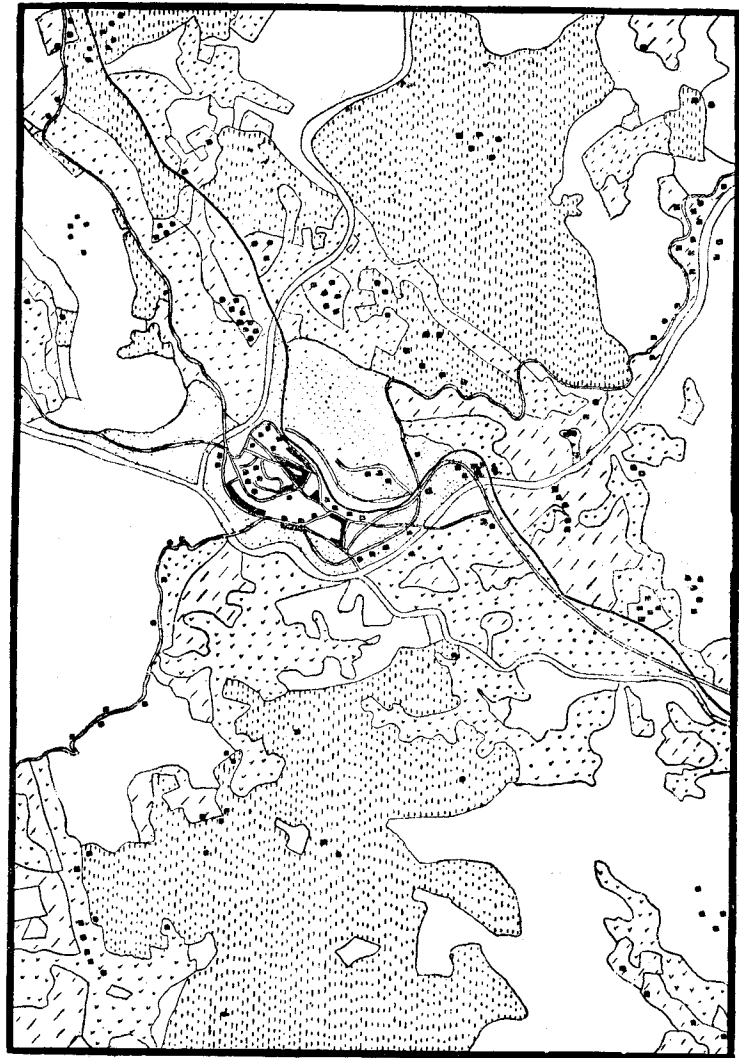
But the geographical importance of Kurunegala today lies in its being an important market town for the outlying districts. In the days of the Kandyan kings Kurunegala was on the road from Kandy to the port of Puttalam and even today, a road runs from Kandy to Puttalam via Kurunegala, though Puttalam is no more a seaport of the Kandy District. Other roads from Chilaw, Colombo and Dambulla make Kurunegala the focus of through traffic. Kurunegala is also a centre of agricultural produce and the road and rail connection with Colombo make it a collecting centre of goods needed in the outlying districts. Witness for example the crowded bazaar and market where manufactured articles from abroad are seen side by side with the local agricultural products. As Kurunegala is half way between the wet and



and Statistics

PADDA BOATS

Courtesy, Dept. of Census



Roads
 Railways
 Rubber
 Coconut
 Paddy
 Village, Gardens & other Cultivation

RATNAPURA AND VILLAGE SETTLEMENTS IN PLANTING DISTRICT—RUBBER

dry zone one sees in the market square fruits and vegetables and grains of both zones, e.g., kurakkan, gingerly, ash pumpkins, etc. Moreover as it is the administrative centre of the North-Western Province it has the Kachcheri, Land Registry, Law Courts, etc. and all these tend to secure and perpetuate its former importance.

Ratnapura (City of Gems) has had an interesting history. The district of Ratnapura is called in the *Sulwansa* 'Ratnakara' and from time immemorial this region was famous for its gems.

Parakrama Bahu as Governor of the 'Southern Country' exploited these minerals. The Portuguese in very much later times secured a monopoly of the gem trade which had been for centuries in the hands of Arab merchants. In fact the Chinese traders of the middle ages called Ceylon gems 'Mohametan stones'.

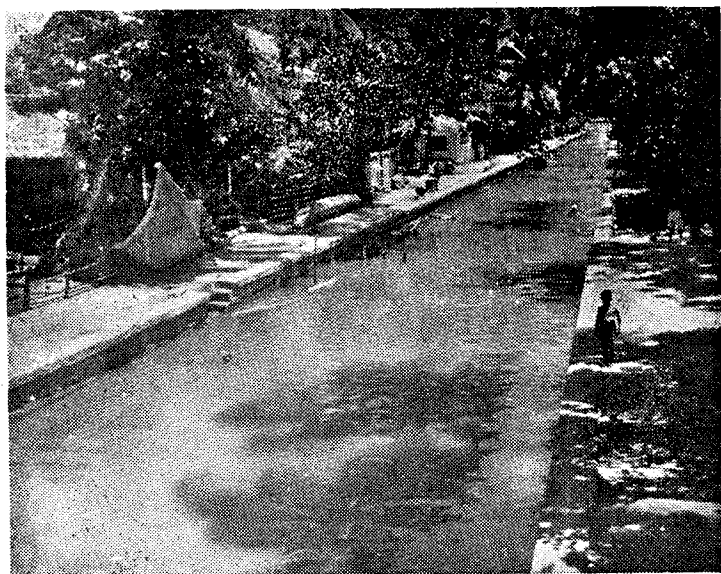
But the town of Ratnapura may be safely said to originate from Portuguese times. The Kalu Ganga winds its way past the modern town which is situated on a piece of rising ground. On this are found today the Kachcheri and other Government offices and the major street of the town, while at its foot are the 'bus stand and the vegetable market. The hill was once a Portuguese Fort which guarded possible inroads of Kandians into the Portuguese province of Saffragam (Sabaragamuwa). This hill is the nucleus of the modern town whose importance today is due to other reasons. The Colombo-Haputale road passes through Ratnapura and a main road from Panadura meets here. Thus Ratnapura is at a meeting place of roads and through traffic. Besides it is a railway town as well. All round it are rubber estates and the town supplies the needs of the villagers as well as the wants of the estate population. The Planters' Club indicates the fact of the town being a social centre for European planters. Muslim gemcutters, South Indian merchants and goldsmiths, Low-country Sinhalese shopkeepers all tell the tale—namely, that Ratnapura is a centre of various interests. It is besides the judicial and administrative centre of the district and this helps to maintain the importance of the town settlement. Its civic affairs are managed by an Urban District Council.

The next type of settlement can be best described as **settlements in planting districts**. These are undoubtedly market centres but the main reason for human beings settling down and congregating in these places is the growth



and development of plantations—tea, rubber or coconut. The majority of settlers have interests in these products either as workers on estates or small business men supplying the wants of the estate population, etc. Examples of such settlements are Yatiyantota, Avisawella, Deniyaya, Horana, Padukka, Elpitiya, Kegalle, Veyangoda, Mirigama, Minuwangoda and Giriulla.

The last type of settlements we have to discuss is the **port type**. These are towns the origin of which is due to a port, though of course with the change of time the value of



Photo

NEGOMBO CANAL

Geo. Koch

the port may have varied and the port may even have fallen into insignificance. Examples are Chilaw, Negombo, Galle and Colombo. Chilaw or (Halawata) or Salwat as described by Muslim traders of the 11th and 12th centuries was once a well-known port for cinnamon. The lagoon in those days provided anchorage for the sailing vessels of the time and in the neighbourhood, cinnamon was found in plenty. Ibn Batuta, the Muslim pilgrim, tells us that when he landed at Salwat (1344) he saw bales of cinnamon piled about the port. Thus the lagoon and the cinnamon that grew wild in the district as well as in the Seven Korales,

may be considered the chief reason for Chilaw becoming a port. Later in Portuguese and Dutch times, Chilaw was protected by a fort and a small garrison, for thus the cinnamon lands could be protected.

But the main reason for the present importance of Chilaw lies in the development of the coconut lands of the neighbourhood. In 1911 the price of land had increased by 80 per cent. thus showing the great demand there was for it. In 1911 the railway to Chilaw was sanctioned and this established the position of Chilaw as a town and encouraged its further development.

Like Chilaw, Negombo may be considered as having its origin in a port. The lagoon provided shelter for vessels like the Arab dhows and these came in search of the cinnamon that grew in the district. Right through Portuguese and Dutch times when Negombo was a port, cinnamon was the commodity that made it important. The Dutch writer, Valentyn, writing in 1663 says: 'The country of Nigumbo is extraordinarily rich in fish, on account of the mighty and great back-water that it has. It is also the capital of the Seven Korales where the very best cinnamon in the whole world grows and in very great quantity . . . Nigumbers (people of Negombo) travel to the opposite coast of Madura and Coromandel and are bold seamen as they are mostly fishers'

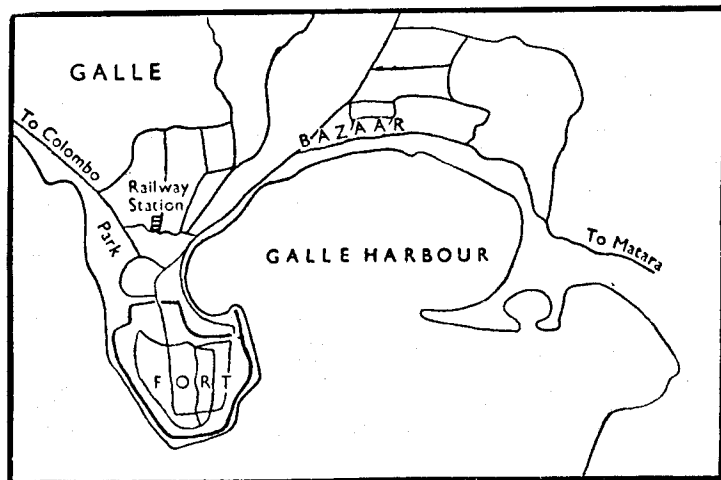
Cinnamon is no more the cause of the importance or prosperity of Negombo. Coconut has taken its place and the railway (1909) has converted an ancient port into a railway town drawing to it traffic in the shape of coconut produce. The town itself may in course of time become a suburb of a greater Colombo. 'It is only 23 miles from Colombo, the road being in excellent order and one of considerable beauty, and is an ideal spot both for the visitor who wishes to see something of the island and its people in a short space of time, and for the Colombo business man who desires a "week-end" away from the noise and dust of Colombo. Since the advent of motoring, visitors to the town have increased largely'. Its population is about 25,000 and the town is administered by an Urban District Council.

Galle is the next port to be dealt with. Arab geographers tell us that in the Island of Serendib (Ceylon) there existed a great emporium called Kaleh. Hither Chinese merchants brought silks and other goods and exchanged these for goods brought by Arab traders. Thus Kaleh became a meeting place of Arab and Chinese merchants. Some

scholars identify Galle with the ancient port of Kaleh saying that it is the only really large natural harbour in the south of the Island and that Kaleh bears in *sound* a resemblance to Galle.

Further the existence of a Muslim population in and about the town of Galle lends colour to this identification, quite as much as 'China Gardens' or 'China Koratuwa' suggests a Chinese quarter.

However this may be, the harbour of Galle was the cause of the importance of the town. In the days of the Portuguese and the Dutch, Galle was fortified and the Dutch fort of Galle can be seen to this day. Baldaeus in 1671 wrote:



'Galle has a commodious bay, fit for anchorage . . . The city is well built of stone, with goodly houses, a stately church and pleasant gardens'.

During early British times Galle was the premier port of Ceylon. Pridham writing in 1849 of Galle says 'The trade of Galle chiefly consists of exports: the export of salt fish to the continent of India was formerly very large . . . coir rope, coconut oil and arrack are sent from this province. Ships obtain better supplies here than anywhere else in the Island and fish, vegetables and fruit, are cheap and abundant'.

Up to 1885 when the breakwater was completed and Colombo harbour constructed, some twenty shipping lines used to call at the port of Galle. A large business was done

in curio work, coconut oil (even in 1910 it amounted to 2½ million rupees) coir yarn, fibre, rope (over 1 million rupees worth was exported in 1910), citronella oil, copra and plum bago. Of the imports, coal and grain were the most important.

The population of Galle is about 41,000. Today it has become a very important rail and market centre. As the outlying districts were developed, a demand for manufactured goods was created and these were naturally stored in the bazaar of the town. A number of roads terminate at Galle, those from Udugama and Baddegama being the most important. These serve the outlying villages and estates and help to make Galle a market for their produce.

Nevertheless Galle did not recover the loss of her trade caused by the construction of the harbour of Colombo. Her business men, etc. all moved to Colombo and labourers and skilled workers came thither in search of work.

The town still preserves an old time appearance. The Dutch Fort and canal, the names of streets within the Fort, etc. are relics of Dutch occupation. The harbour is more picturesque than busy, and the jetties are almost idle. A mile out of the town, one enters the country and there is little about the town and its neighbourhood that suggests a busy port humming with the work of men.

### Colombo

The town of Colombo is almost entirely the product of the harbour and port of Colombo. We shall first trace in the broadest outline the history of the port of Colombo and later examine the town and its environment.

In the early days of Sinhalese rule of the Island, Colombo did not exist as a port. The face of the country was as it were turned towards India, and Mantota was to Ceylon what Colombo is today, the gateway to the Island.

In the middle ages of the island's story (10th-13th centuries) the position of Ceylon midway on the line of traffic that stretched East and West across the Indian Ocean, made the island a centre of considerable trade with India, Persia, Arabia as well as the Far East.

The earliest mention of Colombo by a foreign writer is by the Chinese traveller, Wang-ta-Yuan, about the middle of the 14th century. His description of early Colombo is far from being a compliment either to her people or the

place. On the other hand a contemporary Arab traveller, Ibn Batuta, who visited Ceylon in 1346, states that 'Kalempa' was one of the finest and largest cities of the Island of Serendib. It is the residence of the Wazir, Lord of the Sea, Jalestie, who has with him about 500 Habhis (Abyssinians).

In pre-Portuguese times Colombo ranked after Galle, Trincomalee and Weligama. But after the arrival of the Portuguese in the Island it became the chief seaport of the Kingdom of Kotte. From its favourable position in the chief cinnamon districts of the island, it afforded trading facilities to the Moors who had set up their 'Bangasalas' or warehouses probably on what is called *Bankshall Street* today. Here they traded in silks from Cambay, and elephants, gems and cinnamon from Ceylon.

From this it will be seen that Colombo as a seaport owed its origin to the foreign trading elements, chiefly the Moors, for the Sinhalese were never a commercial race.

One physical factor in the rise of the port of Colombo in the period referred to may be noticed. The western coastline of this island which is more or less straight, forms a little bay about which the early town and port of Colombo grew. On the southside of the bay is a little promontory from which the modern south-west breakwater begins and the bay formed by this headland and the curving beach found the harbour of early days. Vessels were small and could find sufficient depth of water to anchor within this bay.

#### *Colombo in Portuguese Times.*

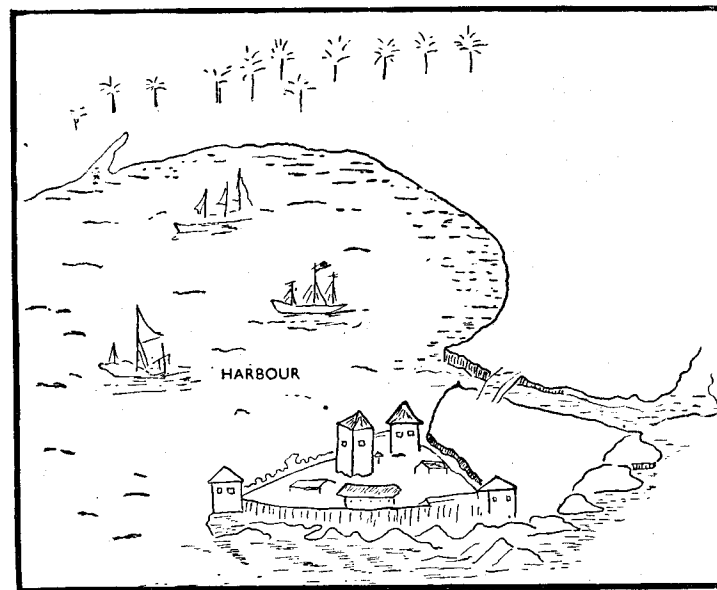
The port of Colombo as it existed at the beginning of the 16th century is described by a Portuguese writer 'It has almost the shape of a hook, for it has a spacious entrance, the middle of which is cut by a river and the point that forms the "barb" of the "hook" is so sharp and is so separated from the main body of the land, that a stone can be thrown across its breadth'. The barb of the hook may be identified with the root of the present breakwater and the 'river' was very likely a branch of the Kelani Ganga.

We need not enter into the history of Portuguese relations with the kings of Kotte, etc. But in 1565, Kotte was dismantled and Colombo became the capital, nominally of the Kotte Kingdom, but actually, of the Portuguese power in Ceylon. Colombo suited them, being traders and seafarers and the city was fortified and became the centre of Portuguese trade. In 1656, Colombo fell before the attacks of

the Dutch who in turn made the city their capital. The town developed rapidly as a port. The Fort became the residence of the Dutch officials and the Pettah or the old city was occupied by the Burghers. The Moors and Chetties occupied what is now known as the 'Moor' and 'Chetty' Streets respectively.

In 1796 Colombo was surrendered to the British by the Dutch and it was in British times that Colombo developed into one of the world's important ports.

Up to 1885 Galle with its natural harbour was the chief port of Ceylon. Colombo then gave poor protection to ships.



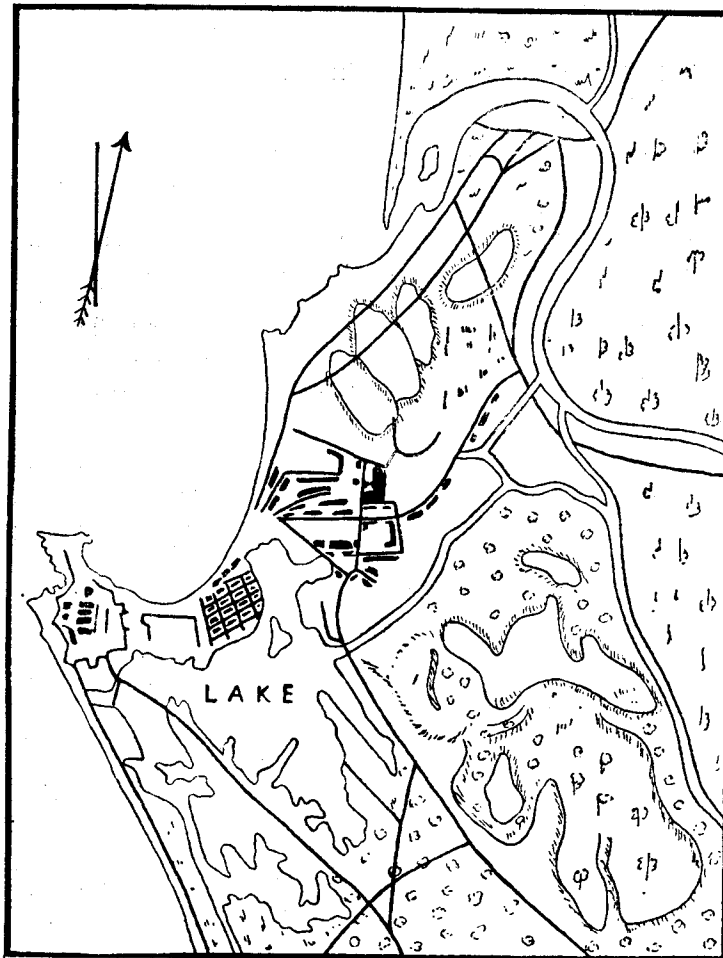
THE FIRST PORTUGUESE PORT OF COLOMBO

Cordiner (1807) says, 'a projecting rock affords shelter to a small semi-circular bay on the north side of the port. There the landing place is rendered pleasant and convenient by a wooden quay extending about one hundred feet into the sea answering well for the loading and unloading of boats. The depth of water is not sufficient to allow sloops or large dhonies to lie alongside the quay. Large ships seldom come within this road. A bar of sand on some parts of which the water is not 10 feet deep entered from the projecting rock across the bay (vide map page 152). Strictly speaking



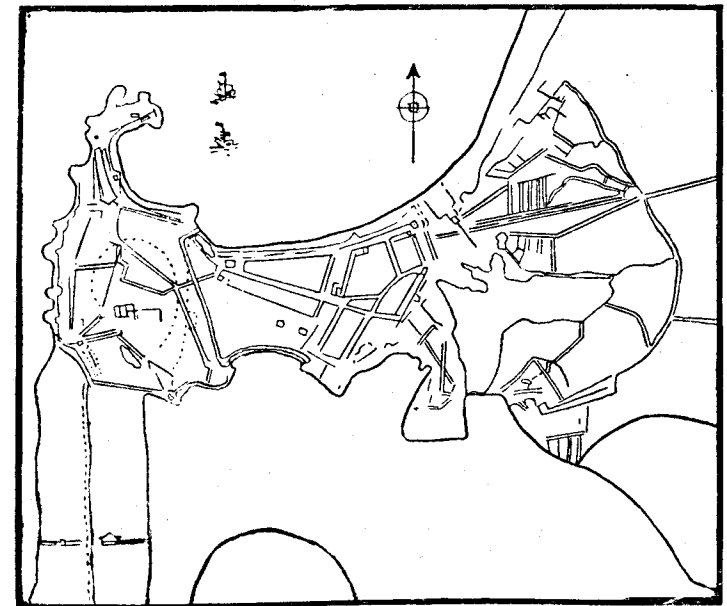
there is no harbour at Colombo for the little bay which affords occasional shelter to small craft does not deserve that name'.

How this 'little bay' became the port of Colombo is easily told. By 1833 a network of roads spread over the land with Colombo as the centre. Then came the coffee era and with it the development of railways. The growth of an extensive export trade demanded a suitable port. Galle was far away from the scene of agricultural enterprise and besides, the harbour was small and its entry hazardous. Plans



COLOMBO IN 1807

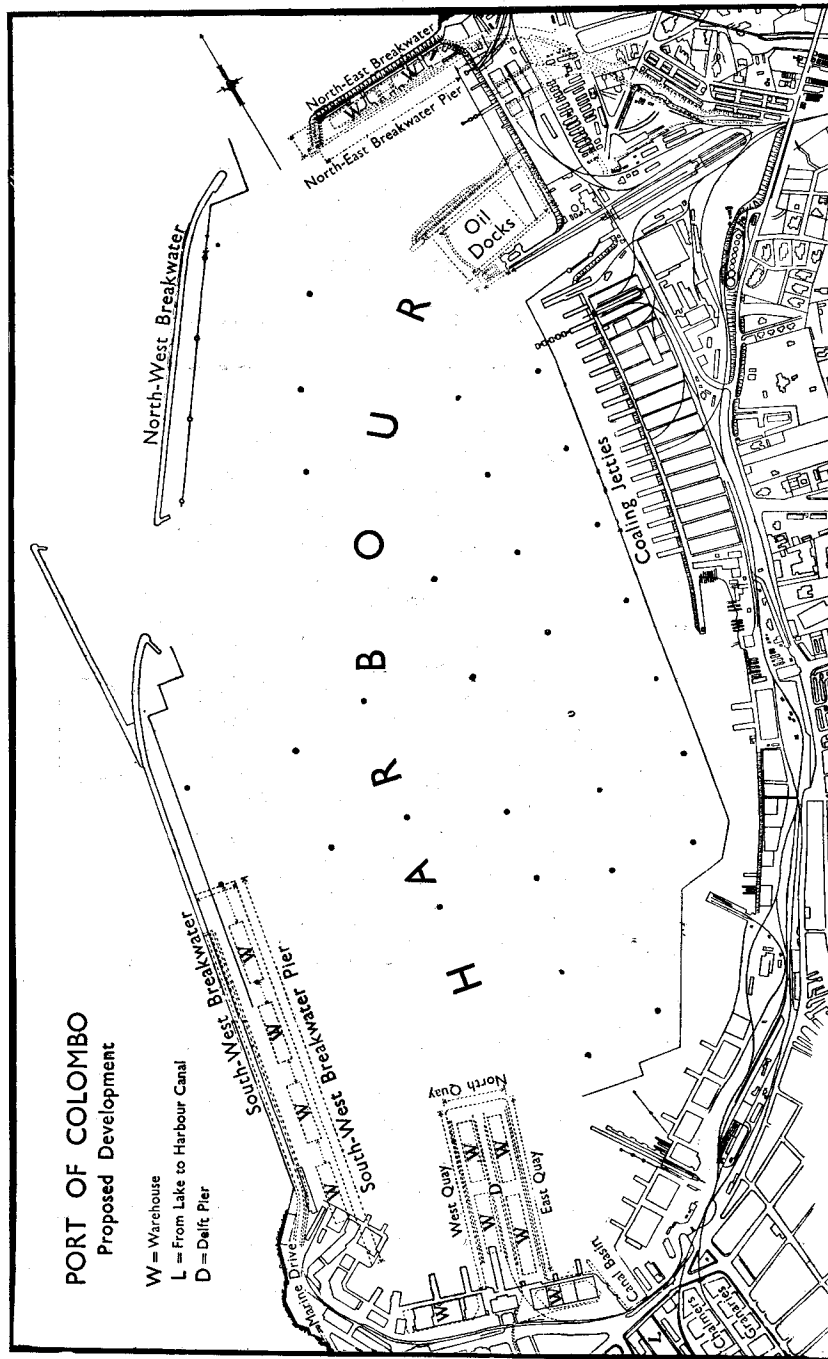
(Note the Fort and the Pettah, and the Garden to the South and South-East)



THE DUTCH CITY OF COLOMBO

were discussed for the creation of a port at Colombo and by 1885 the breakwater was completed, and Colombo entered on the scene as *the* port of Ceylon, when in 1882 the P. & O. Company's steamships abandoned Galle and commenced using Colombo as their port of call for Ceylon.

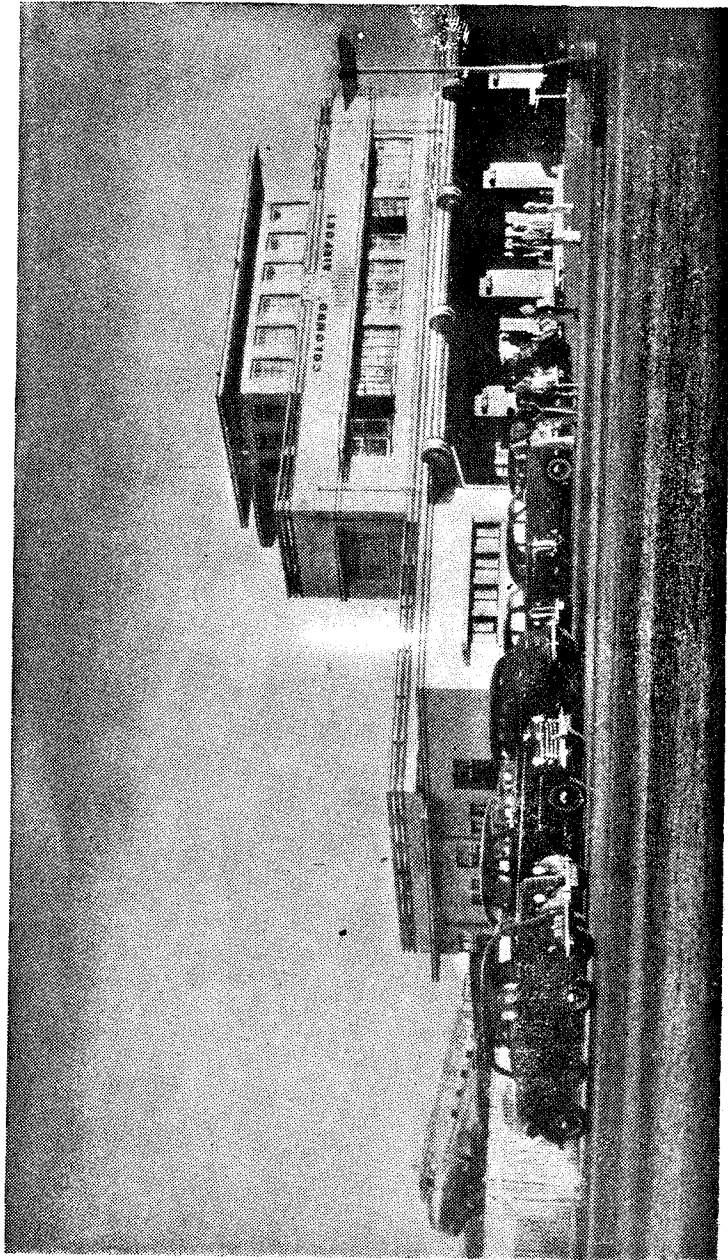
From 1883-1889 the shipping increased 60 per cent. in value and a steady increase has been maintained ever since. The harbour dues have increased from Rs. 400,000 in 1885 to three million rupees in 1925. In 1950 the total revenue from harbour dues, etc., was 402 million rupees.



The Colombo harbour as it now appears is an artificial haven of 643 acres enclosed within by three massive breakwaters, vide plan opposite. The harbour is large enough to accommodate 36 to 40 ships at one time. There are in the harbour ten coaling jetties each 200 feet long and an excellent passenger jetty. Loading and discharging of goods are done from lighters. Warehouse accommodation amounts to 929,961 square feet. The import and transhipment warehouses extend from the root of the south-west breakwater eastwards to the Kochchikade coal grounds. The export warehouses lie between the canal entrance and the Block Jetty. Further east are jetties for the landing of perishable cargoes.

A large graving dock, an inner graving dock, and a patent slip have been added since the construction of the breakwater. With the advent of oil burning vessels (2,900 in 1952) a large installation has been constructed just outside Colombo. This oil depot is 91 acres in extent and there are pipelines from the harbour for fuel oil and kerosene imported in bulk. Two jetties, one for bunkering vessels and one for discharging oil tankers have been provided. In 1946, the bulk coconut oil storage and shipping scheme was completed. The installation consists of eight storage tanks capable of holding 4,400 tons. An 8-inch pipeline transfers the oil from the tanks to the guide pier whence the oil is pumped into vessels.

The close of the first half of the twentieth century marked another milestone in the 2,000 year old history of the Port of Colombo when plans for its modernisation were passed with the signing of an eighty million rupee contract on the 28th June, 1950. In course of time all transport of goods and passengers by means of boats to ships in the harbour will cease. When this scheme is completed, Colombo will have alongside berths for 17 ships. These berths are to be constructed in four areas of the harbour: two at the north-east breakwater, seven where the passenger jetty is now located for landing of general cargo and foodstuffs; four along the south-west breakwater to enable even 30,000 ton liners to disembark and embark passengers and two berths at the guide pier for vessels to bunker requirements of fuel oil and taking supplies of coconut oil, etc. Finally there will be an oil dock which will enable two tankers to discharge their cargo in safety. Road and rail facilities will be vastly improved to serve the new warehouses on the alongside berths. It is also proposed to develop the wide expanse of water known as the Beira Lake which is under the control of the Port



and Statistics

COLOMBO AIRPORT

Courtesy Dept. of Census

Commission and most of the Island's exports will be transported in lighters direct to ships awaiting in the harbour from stores situated on the McCallum Road banks, etc.

When the present scheme of development is completed, Colombo will undoubtedly be one of the most efficient ports in the East. With its enviable geographical position, 'on the cross-roads of the east', the port of Colombo can at long last look forward hopefully to the future and the important part it can play in the material progress of the nation.

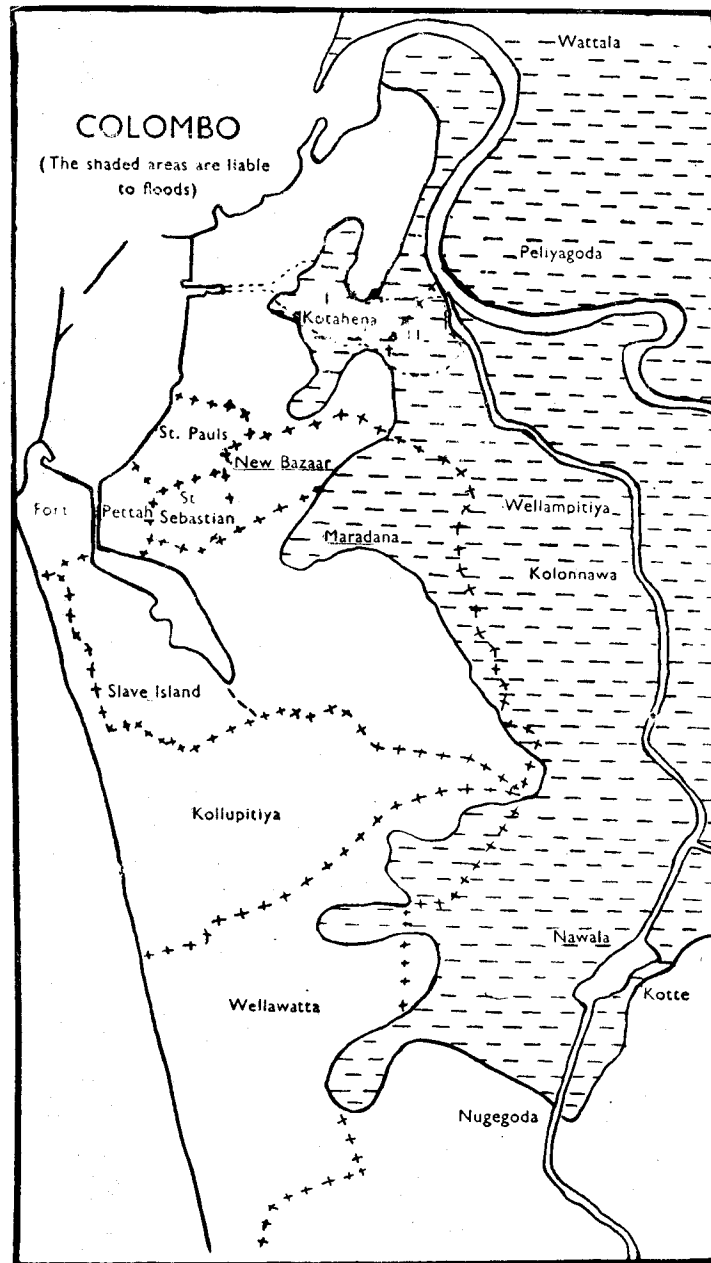
With the growth of such a port, the town of Colombo too began to grow. In 1871 the population of the town was 95,843, in 1901 it was 154,691, in 1933 it was 284,160, and today it is 355,374. But the old city of the Portuguese and Dutch days disappeared for ever. The old fort has become a very important business centre. The important banks, the offices of the leading European businessmen and firms, the post and telegraph offices and the shops of high class jewellers and clothiers, etc. are all within the Fort. Only the artillery stores, the barracks and the quarters of the European soldiers now remain to remind the visitor that the place was once a military fort. The ground area is now fully occupied by buildings and the flatness of the land round the harbour facilitated building. But the congestion in the city and the growing scarcity of land for buildings are seen best in the new buildings—the sky scrapers—such as the Times Building, the National Mutual Building, Imperial Bank, etc. This always happens where land is limited for building, and people build upwards.

The Beira Lake is connected with the harbour and along the lakeside, stores and godowns have been built, and launches and lighters are frequently used. In 1930 the numbers amounted to close on 8,000.

North of the Fort is the old city—the Pettah. There we find a very crowded area where 'most trade in rice, curry-stuffs, cloth, etc., is carried on'. Main Street with its various cross streets is crowded with shops of clothiers, shoemakers, tailors, hardware merchants, etc. Within the Pettah are the granaries and the principal food and curry-stuff dealers. Ninety per cent. (90%) of these are foreign merchants—Borahs, Chetties, Scind merchants, etc.

Further north still, near Kochchikadde are the tenements of thousands of labourers in the city and in the engineering firms, etc. These live in the close neighbourhood of their places of business.

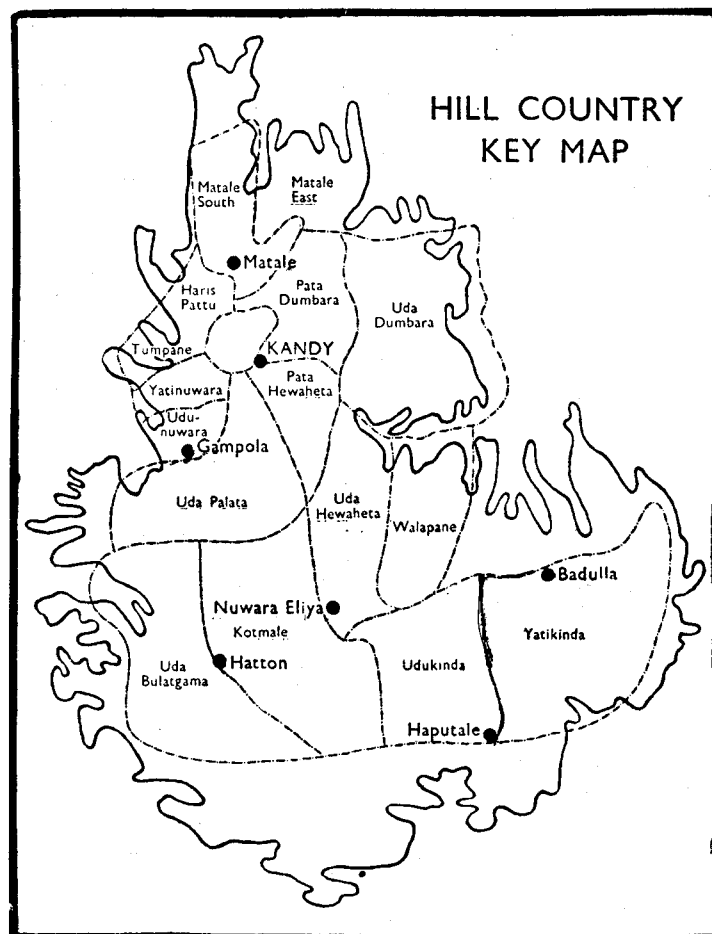




South of the Fort we have an extension to the commercial city. First class roads and a double track railway have enabled thousands of people to live outside the city and yet travel daily to the Fort for work. Year after year a stream of population has made its way from Colpetty to Bambalapitiya and on to Dehiwela and Mount Lavinia and the heavy bus and rail traffic testify to the thousands of city workers who live outside the town. In the same way the Kelani railway and roads are used by city workers from Nugegoda, etc.

Opposite is a map of the city of Colombo. One can see at a glance what a great advantage it has been for the growth of the city that almost 13 square miles of the flat land has been given by nature to build upon. Also one can see that the growth of the town has not extended eastwards as it has southwards. The shaded area on the map shows the area subject to floods and this is the chief reason for the peculiar growth of the city so far. In 1921 Professor Patrick Geddes suggested ways of relieving the congestion in the city by showing how the flood area could be controlled. He pointed out that the river loop could be straightened, thus giving considerable land on the southside of the river mouth, including Crow Island for building (vide map). Next he suggested the creation of a wet dock due east of the present graving dock. This was to cover about 165 acres. The land to the east of the city liable to floods was to be cut up into a number of lakes and the land round about these rendered available for city dwellers. North of Victoria Bridge on the other side of the river the same plan was to be followed.

Whatever the merits of his suggestions be, one fact is clear that floods and the fear of floods have caused the city to extend southward so that the city is narrow and long. But the value of Geddes' suggestion lies in that vast areas to the east of the present town and north across the Kelani River can be utilized for dwelling houses each with its little garden. In this way a garden city could be created—a blessing to the poor who otherwise must live in back-to-back tenements in crowded areas such as Kochchikadde or Maradana.



## CHAPTER IX

### The Hill Country

#### *The Wet Western Section.*

We shall now proceed to examine the activities of men in the 'Hill Country' and see in what way these are related to the geographical conditions found there. We have already studied the physical divisions and climatic features of this region, and it now remains for us to find out first, how people settled down here, secondly, what the present occupations of people are and how these occupations have affected the distribution of population and human settlements. (2)

In very early times when Anuradhapura was the capital of Ceylon, the Hill Country was known as the Malaya Country. Up to the 9th century A.D. we hear very little of this district. The ancient Sinhalese who had developed a splendid system of irrigation and paddy cultivation, spread throughout the flat lands of the dry zone. The Hill Country was no doubt visited by them but very few permanent settlements were established. Perhaps the geographical conditions did not suit them or their food crops. The hills were very wet, and there was rainfall almost all the year round. Thick forest grew in most parts, and unlike the dry zone forests, these have no long resting period and thus forest clearing by fire was difficult. Hill slopes are naturally not suited for ploughing, nor for sowing, for the rain would wash down both field and crop. Very hard work would be necessary to terrace the hill slope for paddy fields. Then the higher one went up the Hill Country the colder it became—and this was not perhaps welcome to the Sinhalese.

But in the 10th, 11th and 12th centuries we get more information regarding this region. Pilgrims visited Adam's Peak, and Vijaya Bahu I has left an inscription at Ambagamuwa. Parakrama Bahu I fortified Nalanda and fought many campaigns in the Matala District. Parakrama Bahu II (13th century A.D.) built a road via Gampola, Ulapane and Ambagamuwa to Adam's Peak. In the 14th century we find Buyanaike Bahu IV making his capital at Gampola. The 13th and 14th centuries were centuries of decline and the Sinhalese kings abandoned North Ceylon and built their capitals more to the south-west at Yapahuwa, Kurunegala,

Dambadeniya, Kotte, etc. Thus we can reasonably infer that during this period when the Tamil Kings reigned at Jaffna and the forest covered Anuradhapura and Polonnaruwa, the Sinhalese migrated to the hills through the Nalanda Pass to Matale, Kandy and Gampola or to Kandy via Alutnuwara and to Uva up the branches of the Mahaveli Ganga.

When the Portuguese established their power in Ceylon in the 16th and 17th centuries, Kandy was the capital of a Kandyan kingdom, with Matale and Uva as principalities. But it is noteworthy that the Sinhalese during this period never made any lasting settlements above the 2,500 foot contour line. The Matale District, the Uva Province and the Kandy-Gampola sections were thickly populated. Even to this day the divisions round Kandy such as Tumpane, Yatinuwera, Harispattu, etc. show over 250 persons to the square mile. The basis of settlement was paddy cultivation on the terraced fields. The higher hills (over 2,500) were forested and the Sinhalese had no use for these lands, for paddy crops are hard to raise here.

Then a change came. In 1815 the Kandyan Kingdom fell and in 1833 Governor Barnes started coffee cultivation at Peradeniya. Soon plantations were opened out at Gampola, and slowly, but steadily, this new crop was established in the Matale and Kandy districts. The Sinhalese began to cultivate coffee to such an extent that about half the output came from their gardens. But the more interesting fact is that the whole Hatton Plateau (round Dimbulla, Dickoya and Maskeliya, the 'wilderness of the Peak' as the early planters called the jungle land here) was cleared, and coffee gardens opened up. In 1867 the railway was opened to Kandy and by 1885 it had reached Nanu Oya. This was the first stage of the development of the higher hills. A tree crop had been found in coffee and this could be easily grown on hill slopes. No terracing of the land was necessary and the land which was once jungle now became the chief source of the country's revenue. But a leaf disease swept away the plantations. In 1836 there were 4,000 acres; in 1845, 37,586; in 1848, 60,000; in 1878, 275,000 but in 1903 only 5,000 acres.

Soon a new tree crop was found to take the place of the coffee plant and the 'Hill Country' entered on a new phase of its history—the era of Tea. In 1873 the extent of the tea land was 250 acres, in 1883 it was 35,000 acres, in 1893 it was 255,000 acres, in 1905 it was 380,000 acres, in 1935 it was 420,000 acres and in 1938 it was 557,000 acres. This new

plant was well adapted to hill slopes and soon the plantations spread throughout the Hatton Plateau—and on to the hills of Uva. The railway line too, kept pace, facilitating the transport of the product.

Vast changes took place in the Hill Country as a result of this development, the most striking being the increase of population.

In 1824 Uda Bulatgama had only eight villages and three persons to the square mile. Kotmale had 39 villages and seven persons to the square mile while Udukinda had three persons to the square mile. These areas today have 250 to 500 persons per square mile. To put it in another way, in 1857 the total population of the Central and Uva Provinces was 260,000; in 1921 it was 951,000. In 1857 the density per square mile was 47; in 1921 it was 171.

Besides this vast change, the racial distribution of population also changed. The new crop brought the Indian labourers into the Hill Country.

<i>Kandy District</i>	{ 49 per cent. are Kandyans 35 per cent. Indian Tamils
<i>Nuwara Eliya District</i>	{ 28 per cent. Kandyans 60 per cent. Indian Tamils
<i>Badulla District</i>	{ 53 per cent. Kandyans 35 per cent. Indian Tamils

It is interesting to note how in the old Kandyan provinces with their villages and paddy fields, the Kandyan Sinhalese predominate, while in the 'new' lands the 'foreigners' out-number them.

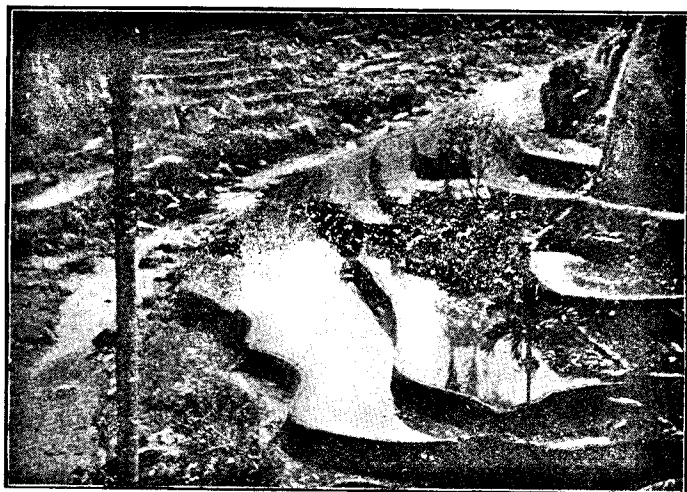
The 'Tea era' thus marks the latest phase in the history of man's utilization of the Hill Country. What it may be in the future no one can say, but tea has become the principal export of the Island. We shall not enter now into the question of the foreign hold of the country's land, and the future land policy in regard to sale of crown land. In the course of events tea cultivation has come and will remain, unless some disaster overtakes it. And no true lover of Ceylon will ever hope this would happen.

We shall now turn our attention to the principal human activities in this region. We shall first study its Agriculture.



### Paddy Cultivation

Paddy cultivation in the Hill Country of Ceylon provides an excellent example of how men adapt themselves to their environment, and utilize the benefits that nature bestows. As flat land is scanty, the hills have been terraced into little strips of flat land and on these paddy is grown. The total acreage is about 84,000 acres. Most of it is confined to the land below 3,000 feet. In some districts such as Udubulatgama, Kotmale, Udukinda and Yatakinda the percentage of cultivated land under paddy is from one to seven per cent. Taking the regions round Kandy such as Yatinuwera, Udu-



TERRACED PADDY FIELD

nuwera and Harispattu we find 58 to 70 per cent. of the land cultivated but 15 to 17 per cent. under paddy. All this shows that the Hill Country is not especially suited to grain cultivation. Apart from the difficulty of making terraces and fighting soil erosion there is the climatic factor which is not too favourable for grain crops. Grains (wet and dry) ripen well where there is a season of dryness and sunshine. This condition is found in the Dry Zone of Ceylon and we are not surprised to find it had once been a flourishing grain land. The Hill Country on the other hand is *generally* too wet for paddy to ripen well. True there are months when the rainfall is low—but there is not the same amount of sunshine as we find in the Dry Zone.

Besides, other occupations and crops may have led to the neglect of paddy cultivation in the Hill Country. Geographically the land is not suited for paddy cultivation and other crops of greater value are bound to limit the progress of paddy cultivation.

### Tea Cultivation

Tea is undoubtedly the most valuable crop in the Hill Country. The map on page 166 shows the distribution of tea. Kotmale and Uda Bulatgama show the largest acreage (note that a good portion of this area is over 3,000 feet). In Uda Bulatgama 50 of the 55 per cent. of land under cultivation is under tea and in Kotmale 58 per cent. of the 63 per cent. of cultivated land. Udapalata comes next with 46 per cent. of the 67 per cent. of cultivated land, growing tea. Udukinda in the Uva Province has 23 per cent. of the 33 per cent. land cultivated, under this crop. So much for the present distribution of tea.

The cultivation of tea as we have remarked earlier began in 1873. The same year saw the extension of the railway line to Gampola and how close the connection has been between this form of transport and tea cultivation can be seen from the following table:—

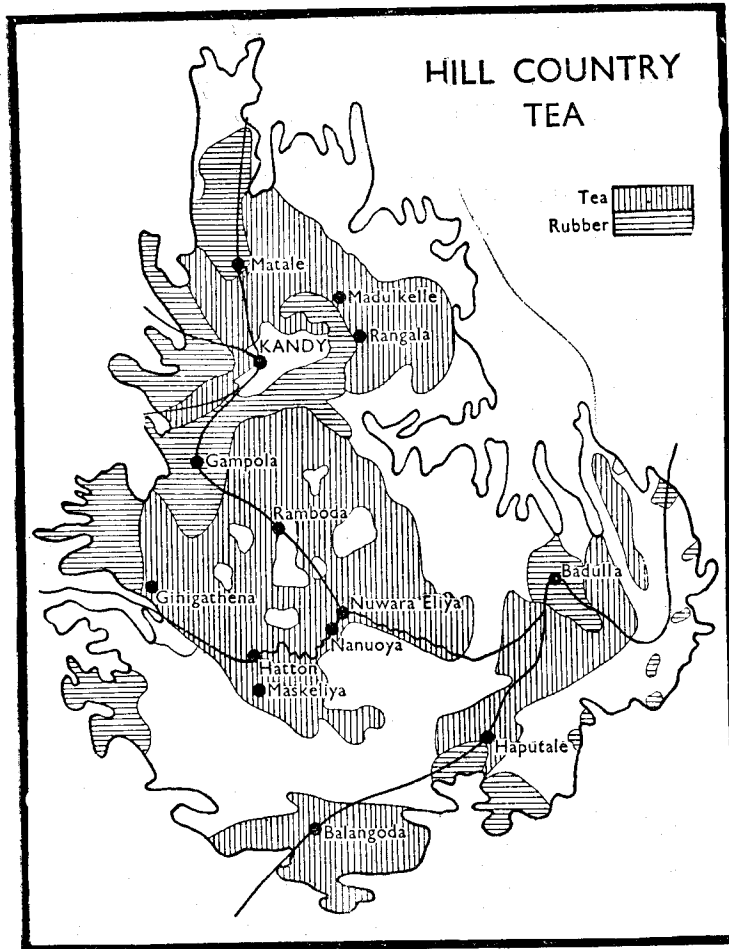
Acre	Year	Railway to
1,083	1873	Gampola
1,750	1874	Nawalapitiya
70,000	1884	Hatton
273,000	1893	Haputale
305,000	1894	Bandarawela
380,000	1893/4	Nuwara Eliya and Ragalla
400,000	1924	Badulla

These railway stations have become centres of transport of tea, the most important being Hatton.

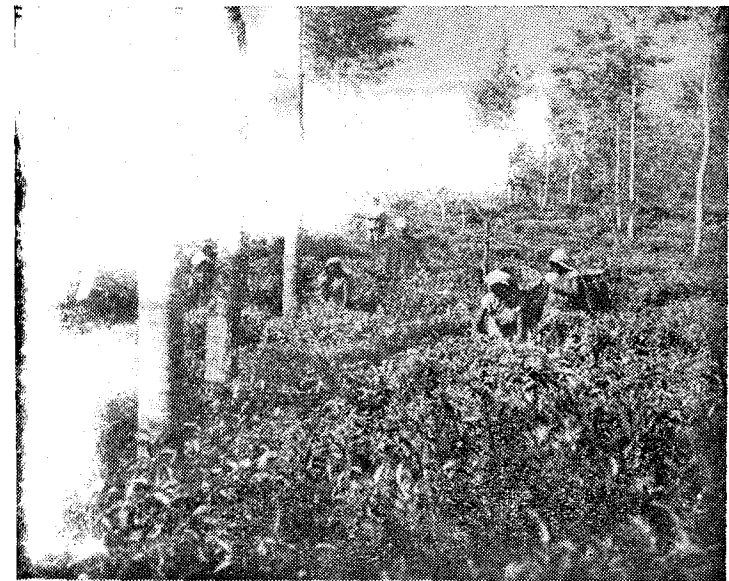
What are the geographical conditions that have helped this vast development of tea cultivation?

Let us not forget that tea took the place of coffee and as a shrub it was well suited to agriculture in a hilly land. So it is with tea in Japan, China and Assam.

But the plant requires an evenly distributed rainfall of 60 to 250 inches per year and this makes the Hill Country a suitable home for the plant. Moreover the plant requires a good drainage of the soil and this is why it thrives on hill slopes.



The object of tea cultivation is to secure the maximum quantity of the best quality of leaf. For this purpose the bushes are pruned periodically so as to ensure regular, frequent and plentiful 'flushes' or young tender shoots on the tops of bushes. The buds at the tip of the new shoots and two to three leaves below them are plucked by hand. This makes a supply of cheap labour very necessary for the successful cultivation of tea. No machine has been yet devised to pluck the tender leaves and the prospects of such a machine being devised are remote because the twigs of the tea bush do not flush at the same time nor are the buds and



Photo

TEA ESTATE

Geo. Koch

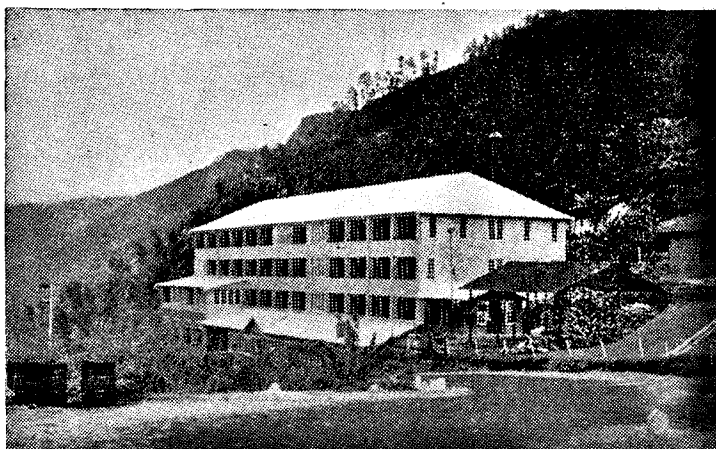
tender leaves all at one level. If this were so, then a machine can be devised such as the one that reaps grain on flat lands. Moreover, as tea estates are very large and all on hilly ground, a machine can hardly be used to pluck the tea leaves. The same problem faces the cultivators of cotton for the cotton bolls do not open at the same time, nor do they grow at a uniform level like the ears of corn or grain. Cheap labour is therefore essential to the cultivation of cotton and tea.

In Ceylon, immigrant labourers from South India have long supplied the necessary labour. Women and children

do most of the plucking while the men are engaged in pruning the trees or clearing the land of weeds, etc.

'The crop seasons for tea vary in different parts of the Island. They depend largely upon the weather, the bushes flushing freely when rain follows a dry spell. For this reason April and May are generally the heaviest months for the pluckers. October and November often show heavy flushing, but this is somewhat uncertain'.

'On being removed to the factory, the "leaf" is spread and left to wither in special withering lofts for 18 to 24 hours. It is then passed through rolling machines for several specified periods. After this time the "roll" is dropped out



Photo

TEA FACTORY

Geo. Koch

and appears as lumps of twisted green leaves hanging together in masses. These masses are then broken up by the "roll breakers" and the coarse leaf separated by a sifter, rolling and sifting being carried on alternately for about two hours. The leaf is then spread on glass or wooden tables or mats with free access of cool air to ferment, or oxidise. In about two hours it assumes a copper colour and develops a peculiar aroma. At a certain point the fermentation is arrested by placing the leaf in the firing or drying machines. These provide a hot air draught to convert the damp fermented leaf into the dry and brittle black tea. This black tea is sifted into grades of which samples are sent to Colombo for tasting by the Brokers' and Agents' experts and the assessing of the value. The grades are bulked separately,

packed in lead-lined tea chests of about 100 lb. each, soldered, labelled with the name of the estate and despatched to Colombo for shipment'.

Green tea is prepared by steaming the green leaf instead of withering as above described, and by omitting the fermenting process. Green tea is drunk in Russia and America with lemon juice and sugar'.

The best customer of Ceylon tea has been the United Kingdom. On the average she takes more than 67 per cent. of the total export. Next to her comes the United States of America (7 per cent.), Australia (4.9 per cent.), the Union of South Africa (4.9 per cent.), New Zealand (4.2 per cent.) and Canada (4 per cent.).

The total exports of tea are as follows:

	Quantity (lb.)	Value (Rs.)	Avg. Value per lb. (Rs.)
1944 ..	276,215,394	311,270,685	1.12
1945 ..	232,003,365	278,476,033	1.20
1946 ..	291,775,051	380,545,387	1.30
1947 ..	287,259,020	566,522,598	1.97
1948 ..	296,000,174	590,271,396	2.00
1949 ..	297,573,381	649,845,462	2.11
1950 ..	298,098,585	751,650,630	2.52
1953 ..	335,554,577	825,000,000	—

The total export figure for 1950 of 298,098,585 lb. constitutes a fresh record. Shipments to the United Kingdom at 96 millions showed a decline of 24 million lb. on the previous year. On the other hand United States of America at 42½ million lb. shows a marked increase of 16 million lb. over the 1949 figure. Other changes of note are increases of 5 million lb. to Australia, 7 million lb. to Canada, 2 million lb. to South Africa, 1 million to Libya, 1 million to Tunis and decreases of over 1 million each to Arabia, Iraq and Argentine and a decrease of 2½ millions to Egypt.

### Cocoa

Cocoa is grown principally in the Kandy and Matale districts, particularly in the Dumbara Valley and there are about 34,000 acres in the island. Of this roughly 29,600 acres are in the Hill Country. The Kandy District has 18,357 acres and of this 53 per cent. is in Pata Dumbara. Matale District has 11,274 acres and 88 per cent. of it is in Matale South. The plant does not thrive below 500 feet or above 2,000 feet and this is the principal geographical reason



for the popularity of the Matale and Kandy districts. In contrast of this the Nuwara Eliya District had in 1921, six acres. Climatic conditions also exercise control over the distribution of cocoa cultivation and an average rainfall of 60" to 80" is required. The annual rainfall map will again illustrate the suitability of the above-mentioned localities for cocoa cultivation.

'The tree begins to bear fruit about the fifth year. Two crops are gathered, one in May, June and July and the other November-January. The latter is the heavier crop.

The picking of the fruit is done by labourers. The fruit is picked off the branch with the aid of a pruning knife and picking gangs go round as often as necessary.

The fruits are next gathered and opened and the beans removed to the fermenting sheds. At the fermenting shed the beans are heaped into boxes or vats for fermentation. This process is accompanied by a rise of temperature and by the decomposition of the pulp surrounding the beans. During the fermentation the pulp becomes more liquid and gradually flows away, the bottom of the fermenting boxes are perforated . . . The period of fermentation in Ceylon is about 36 hours. After 12 hours the beans are given a light washing and turned over into another box. At the end of 36 hours the beans are washed again and removed to the curing house.

The best method of curing is the gradual drying of the beans in the sun. This takes five to seven days according to the temperature. But as most of the picking is done during the wet months of the year, curing has to be done in curing houses. These are two or three-floored buildings and the beans are spread on coir mats. The building is heated by hot air conducted by pipes placed under the floor and during the curing process the temperature is kept between 110-120°F.

After the beans are cured they are sorted into different grades and packed in bags for export'.

The total exports of cocoa are as follows:

		Quantity (cwt.)	Value (Rs.)	Avg. Value per cwt. (Rs.)
1944	..	45,938	1,809,682	39.39
1945	..	40,390	2,283,238	56.53
1946	..	27,237	2,941,811	106.37
1947	..	36,582	3,478,936	91.00
1948	..	46,381	7,030,876	149.43
1949	..	47,114	5,088,012	110.66
1950	..	43,012	7,100,519	169.24
1953	..	55,010	9,000,000	—

Prior to 1926 the best customers of Ceylon cocoa were the Philippine Islands (40 per cent.), United Kingdom (18 per cent.) and Australia (10 per cent.).

In 1933 the Philippines took the largest quantity (50 per cent.) with Mexico second on the list of customers. Australia came third and Canada fourth. Now the Philippines continue to be the best customer with the United Kingdom second and Canada third.

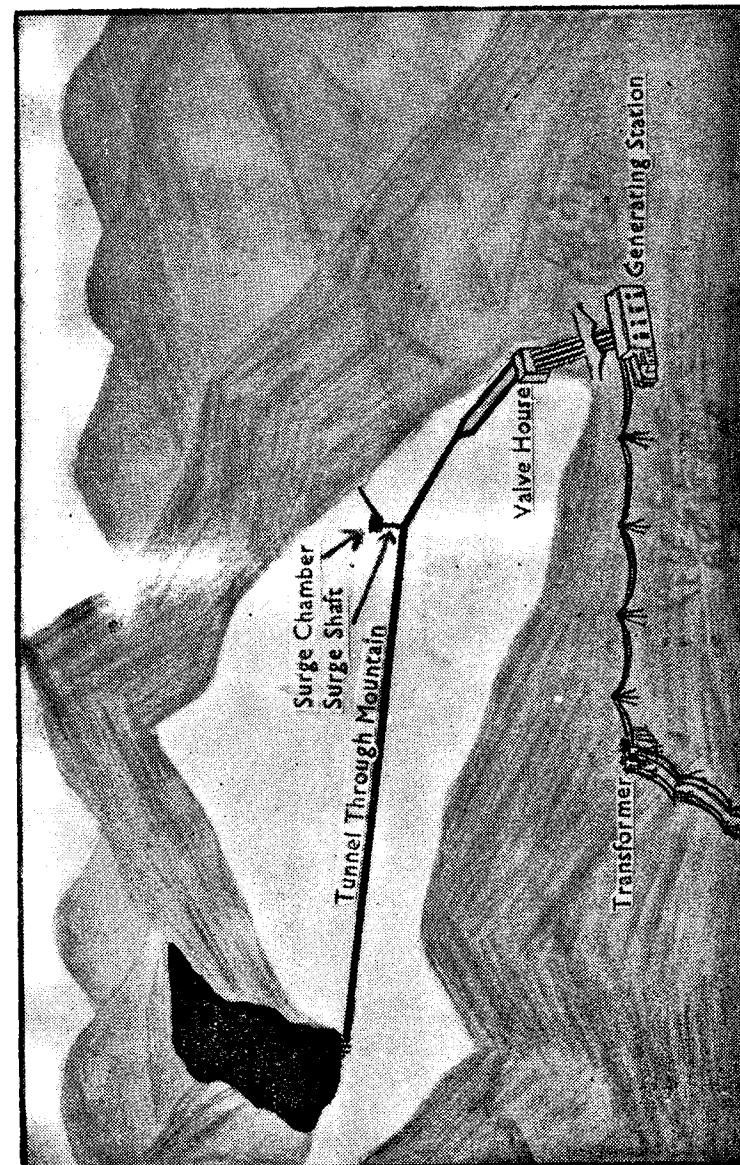
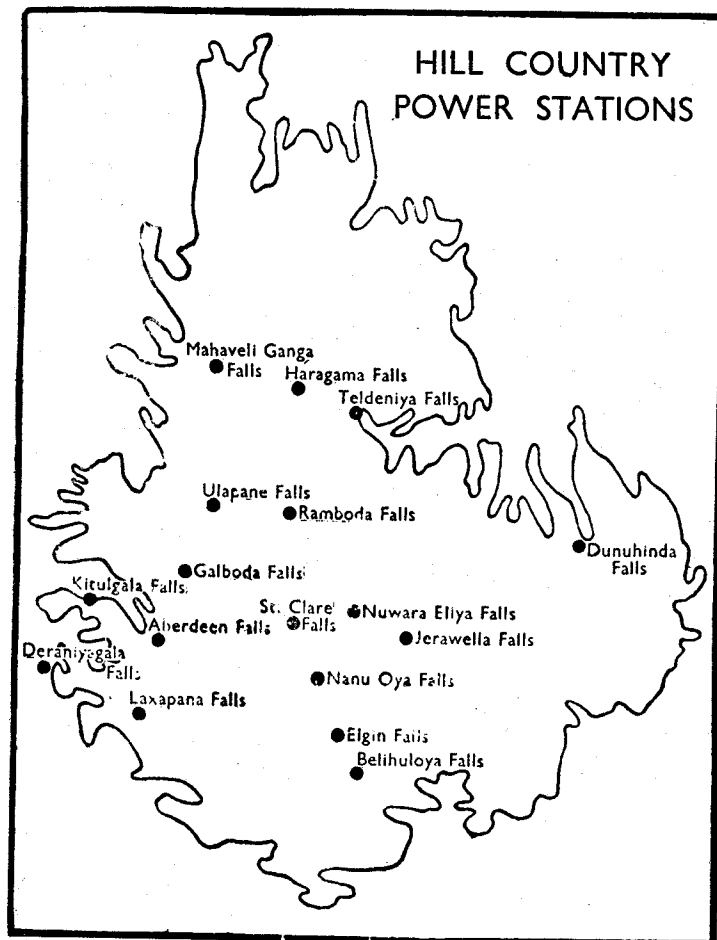
We have now concluded our study of the agriculture of the Hill Country. Very little can be said about the mineral exploitation in the region while forest exploitation has been referred to in an earlier chapter.

One other great natural resource remains which, when utilized, may be for the great gain and good of the Island. This is the development of hydro-electricity by harnessing the waterfalls and rivers of this Hill Country. This work has now been undertaken and is now in progress. We cannot go into technical details regarding the development of hydro-electricity but a few geographical facts have to be borne in mind by all who wish to study the development of water power in this region. One is the very heavy rainfall (over 100 inches per year) thus ensuring adequate supplies of water and as the rain is well distributed throughout the year the fear of streams running dry is remote. All the available hydro-electric stations are well within the 1,000 foot contour and the natural slope of the land is a favourable factor in causing waterfalls. Plans have been devised to utilize these rivers and falls.

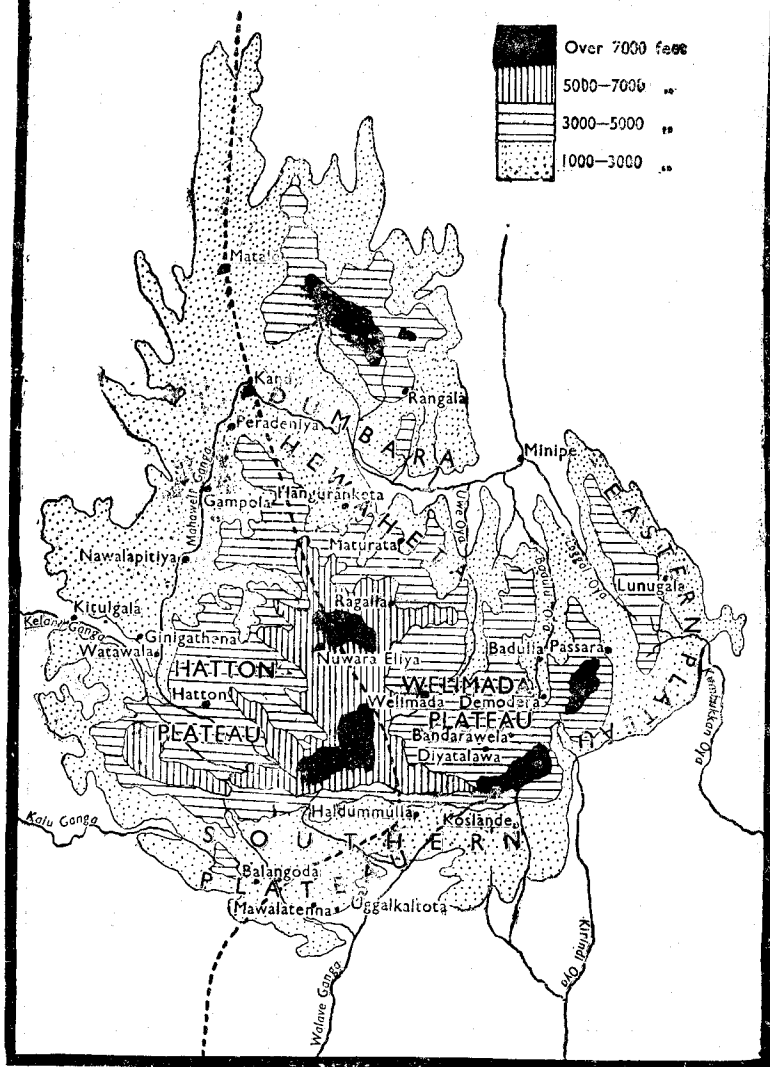
The map on page 172 shows the places where electric power is to be generated. 'The Aberdeen-Laxapana' Scheme, it is hoped, will supply 75,000 electric horse-power and the total for the Island is reckoned at 500,000 horse-power.

According to the scheme in hand, power developed by the Aberdeen-Laxapana Scheme will be transmitted to Kandy and Colombo.

The development of hydro-electric power can be of the highest value to the Island. Ceylon is today dependent on imported fuels (coal and oil) or local fuels (wood, etc.) for mechanical power. Many of these can be replaced by electricity. Street lighting, the running of trams and railways and the working of machines in tea and rubber factories can all be done by electricity and moreover all these will save money, for hitherto the Island has had to pay for imported fuels. Perhaps cheap power may attract



## HILL COUNTRY RELIEF



foreign industries here, e.g., textiles like cotton, and thus afford work for many or it may be possible for local industries to be started in Ceylon. Electro-chemical industries, e.g., the manufacture of nitroline fertilisers, etc. may be established in the land.

Of course these things require careful planning and many factors such as markets for goods, etc. have to be examined. But as far as the geographer is concerned he sees in the water power of the Hill Country a store-house of wealth which can be utilized for the country's gain. Nature has created these resources, and man must learn to make use of them.

## The Hill Country

*Dry Zone.*

The dry zone of the Hill Country of Ceylon lies above the 1,000 foot contour west of a line joining Matala, Kandy, Nuwara Eliya, Pattipola, Ohiya and Haputale. The lower levels that go to make the Mawalatenna and Koslanda Plateaus also belong to this region. The true line of demarcation of the Hill Country divides into a wet and a dry zone is the 75" isovhet.

The relief of the dry zone of the Hill Country is made up of plateaus encircled by high ranges. The southern region consists of the Mawalatenna and Koslanda Plateaus ranging from 1,000 to 3,000 feet. The northern border is a high wall of mountains extending from the Adam's Peak Range to Namanakula. This wall is broken by 'gaps' at Idalgashinna, Haputale, Dambatenna, Ellá and Passara. The Mawalatenna Plateau has the small hamlets of Mawalatenna, Rajawaka, Uggalkaltota situated on it. The whole plateau is still covered by forests and the only roads are the Balangoda-Haputale road on the north and the Balangoda-Uggalkaltota road to the south. The main streams of the Walave Ganga drain this plateau.

The Koslanda Plateau is smaller and is crossed by the Haldummula-Koslanda-Wellawaya road.

On the eastern side of the high ranges from Dambatenna to Namanakula and the Madulsima Ranges lies another plateau or platform ranging from 1,000 to 3,000 feet. This is a forested region and the only road across it is the road from Passara past Lunugala to Bibile. There is also a branch of this road from Tennugewatte eastwards to Badalkumbura. The head streams of the Kirindi Oya, the Menik Ganga, the Kumbukkan Oya and Gal Oya drain this plateau.



The *high ranges* may for our purpose be considered to pivot on the high Horton Plains. East of these are the Pattipola-Dambatenna-Namanakula and Madulsima Hills. These form an arc to encircle on the south and east of the Uva Basin. North of the Horton Plains the high ranges extend towards the Pedurutalagala Range. From this an eastward extension stretches to Ragala and Uda Pussellawa, almost encircling on the north the Uva Basin with Welimada as its centre. This central area is best called the Welimada Plateau. In it are Welimada and the hamlets of Gurutalawa



Photo

HORTON PLAINS

Geo. Koch

and Boralande, while looking down on it from the south and east are Haputale, Diyatalawa, Bandarawela, Ella and Namanakula. The Welimada Plateau collects streams from the west and south and these make up the tributaries of the Uma Oya.

Another smaller basin in this area may be called the Badulla Basin. It is drained by the Badulu Oya. The towns of Demodara, Hali-ela and Badulla lie in this basin. The Badulu Oya leaving this basin tosses down to the lower level at the Dunhinda Falls. This basin is crossed by the roads from Passara, Bandarawela and Taldena to Badulla.

The other high range is a detached block commonly known as the Matale Hills. This is over 3,000 feet in height. Between it and the Uva Basin lies the Kandyan Plateau (3,000-1,000 feet). It is really the middle course of the Mahaveli and the central feature is the Dumbara Valley across which the main river flows. From the north of the Matale Hills it is joined by many streams flowing south. These drain the Uda Dumbara and Patha Dumbara divisions. From the south, that is from the Uda Hewaheta and Patha Hewaheta, similar streams flow north to join the Mahaveli Ganga.

We have thus the following physical units making up the dry zone of the Hill Country.

1. *The Southern and Eastern Plateaus* or platforms (Mavalatenna-Koslanda and Lunugala).
2. *The High Ranges.* Horton plains east to Namanakula and Madulsima. North to Pedurutalagala and Ragala. The Matale Hills.
3. *The Interior Plateaus.* Welimada—The Badulu Basin—the Dumbara and Hewaheta Plateaus.

The *climate* of the dry zone of the Hill Country is in many respects similar to that of the dry zone of the plains. The annual rainfall is between 50" to 75" and there is, as on the plains, a well marked wet and dry season. The season of rains begins in September and ends in January. It is then followed by two months of dry weather with cloudless skies. April is a month of thunderstorms and when this is ended there comes the long dry season from May to August. This is a very difficult time of the year for plants as the ground dries up and the dry, south-west monsoon also desiccates the land.

As the relief is high, air temperature is lower here than on the plains. The hill stations such as Haputale and Diyatalawa have an average temperature near 60° F. The climate is balmy. It is never cold here and the dry air makes the climate very healthy. The long hours of sunlight also add to the climatic benefits of this region and there is no doubt that the dry zone plateaus are the healthiest regions in all Ceylon. They are however regions of difficulty for human settlement. Cultivation is possible only during the wet season. As the land is hilly it does not suit paddy cultivation unless of course the land is terraced. The higher elevations are too cold for paddy and were once forested. Today their place is taken by the 'patanas'. Tea and

rubber do not *thrive* here as they do in the south-west, and so plantation agriculture did not develop here save on the high ranges where the heavy rain encouraged tea cultivation.

The patanas are today of very little value to man. In some areas the 'mana' grass is set on fire in August so that when the September rains come, fresh shoots spring up and provide fodder for cattle. In other areas 'chenas' are opened and Indian corn, kurakkan, pulses and beans are grown. These areas are exposed to soil erosion because they are stripped of the grass cover which keeps the soil on the hill slopes. In the years to come it may be possible to grow fodder grass on the 'patanas' and in this way establish cattle farms on these uplands. In fact the State has organised such farms at Ambawela and Bopathatalawa. It is also interesting to note that the 'mana' grass has done its duty by the soil because the grass has helped to break up the clay soil layer into 'crumbs' and in this way help to 'aerate' the soil. The soil over the whole area is derived from the decay of archaen rocks such as gneiss and granite and the result is a laterite soil, red in colour. Over large areas there is a surface layer of clay and the grass growing on it has broken it up into small particles. This helps to improve the soil for cultivation.

Another interesting fact is, that in these dry areas the surface rock and soil are greatly heated by day especially in the long dry season when there is hardly a cloud in the sky. When the sun sets the earth cools rapidly so that the rocks and soil layers which were heated by day cool rapidly at night. This expansion by day and rapid contraction by night breaks up rocks and soil layers into large blocks which are in turn broken into smaller and still smaller pieces. When the rains set in these broken fragments are easily washed away causing sudden earth slips. In fact even a whole hill side may come down in this manner.

In recent years attempts have been made to 'reafforest' the 'patanas'. This is no doubt a step in the right direction. A forest cover will prevent soil erosion, supply humus and above all keep the soil and subsoil **moist**. It will help to check springs drying up and so maintain water in the streams. There is evidence to show that when there was such a forest cover the 'elas' did not dry up in the dry season and the water was used to irrigate the paddy fields on the lower slopes of the hills.

The eastern dry region was the home of the Kandyans. They found this region suited for paddy cultivation as well as for chena crops. They could also keep herds of cattle on the mountain pastures which were abundant when the forest covered the hills. The hill slopes were terraced with marvellous skill and perhaps nowhere in the world can one find more skilful terracing of hills for paddy than in the Dumbara and Hewaheta regions.

Cultivation was carried on during the dry season by means of irrigation. The streams fed by the rain on the western margin were fully used and there is evidence to show that the streams coming down the Horton Plains were tapped. 'Most interesting is the irrigation channel which begins at the foot of Horton Plains, meanders at a very easy gradient along the side of the hills as far as Patti-pola: here it enters a deep cutting and finally a tunnel full 40 feet underground. When it emerges from the tunnel it rushes down the gorge that cuts the Narabutugala, loses itself in a torrent and resumes its individuality some 1,500 feet below: from here it meanders again along the hill sides to irrigate the paddy fields of the Uva'. (Hocart).

The dry zone of the hills is a sadly neglected region. It has few roads and these touch only the fringes of the region. One trunk road winds east of Kandy along the Dumbara hill slopes to Madugoda and on to Minipe on the plain. Another runs south-east from Kandy through Hewaheta, linking up Hanguranketa, Padiyapelella, Mulhalkelle, Ragalla and Uda Pussellawa.

Welimada is the 'hub' of a number of roads from Nawara Eliya, Badulla, Bandarawela and in recent years from Ohiya through Boralande and Gurutalawa. The **settlements** of this area belong mainly to two types. One is the traditional village. This is found located in an upland valley. The valley floor and sides are used for paddy cultivation and village gardens. Above these are the open 'patanas' which help to feed the village cattle as well as to supply thatch for the village homes. In olden days there were in the higher elevations forests which supplied timber. But as these are no more, the 'elas' have dried up and paddy cultivation has also declined. The neglect of irrigation has hastened this decay and at the present time the life of the villager is most unfortunate.

The other types are of course connected with modern roads and have become the market centres for the region. Road development has encouraged market gardening so

that in the Welimada area peasants grow fruits, vegetables and garlic. In the Moslem villages poultry farming has become profitable.

The dry zone of the hills is a region awaiting development. It has many assets, chief of them being its delightful climate and enchanting scenery. But until ways have been devised to make the 'patanas' more useful to man and irrigation works and roads encourage land utilization, it would not be possible for large numbers to live here.

## CHAPTER X

### The Hill Country

#### A. The Distribution of Population

The map on page 182 shows the distribution of population in 1824. The most striking feature of the map is that the most densely peopled districts are below 3,000 feet. The key map will tell you that Yatinuwera, Udunuwera and Harispattu show 100 to 250 persons to the square mile. These are ancient divisions where the Kandyans have lived for centuries—the basis of their prosperity being paddy cultivation on terraced hills. East of these divisions towards the north-east face of the Hill Country the population declines—25 to 50 to the square mile. This section is drier than the former and is more malarial, and even today it shows a fairly scanty population.

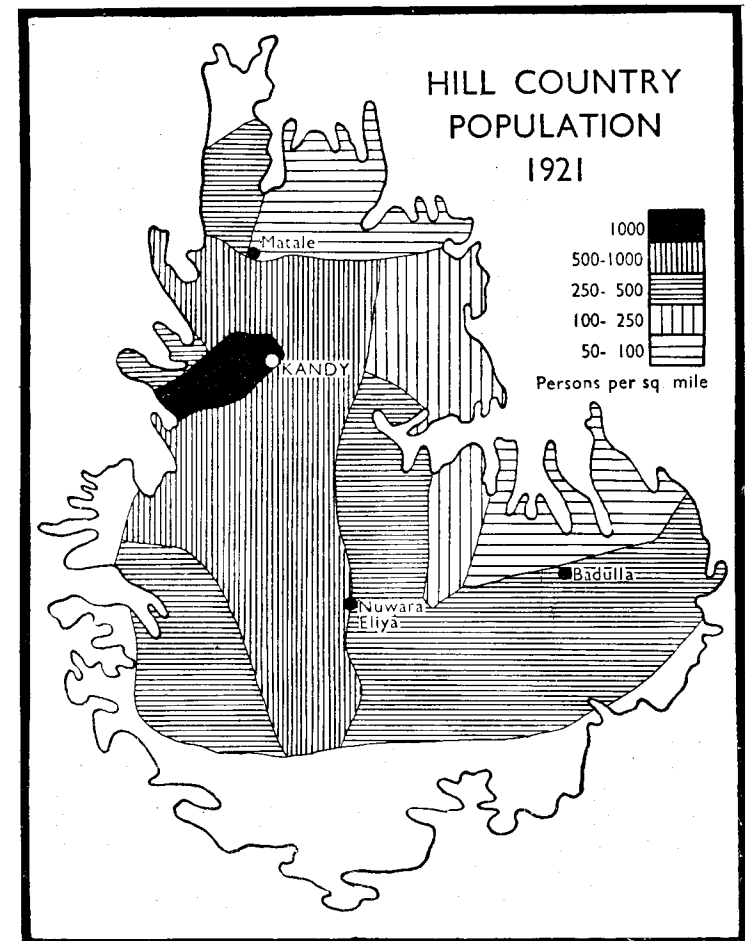
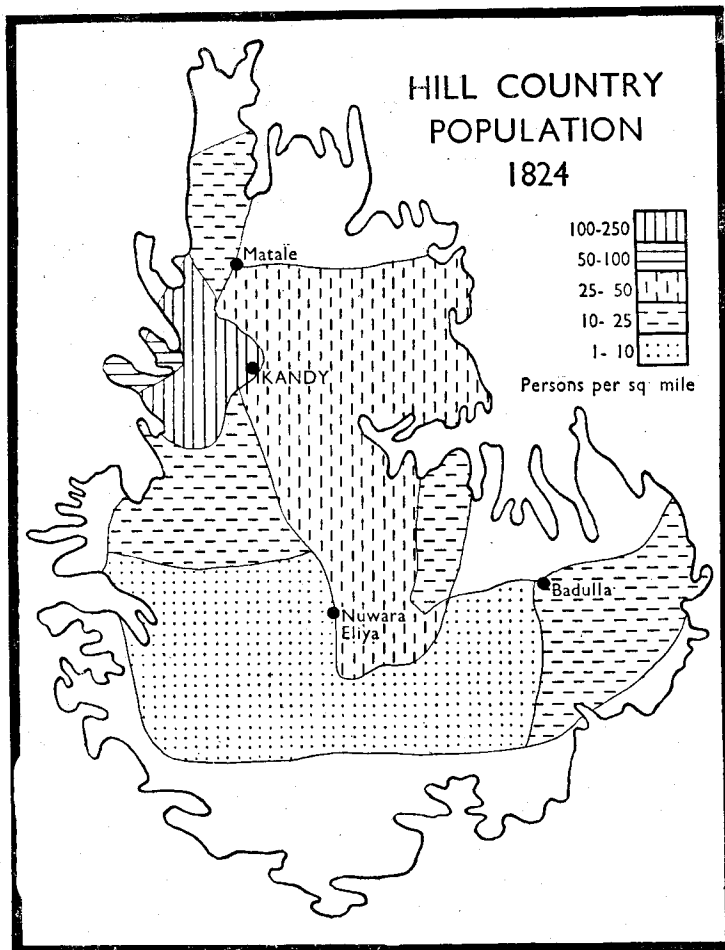
Udupalata with the once royal city of Gampola and Matale South show 20 to 25 persons to the square mile. All these divisions are as it were the fringes of population round the core of a densely populated district, the heart of which was the king's capital city of Kandy.

Udubulatgama, Kotmale and Udukinda show one to ten persons per square mile. In 1824 these divisions were outside the fringes of population and remained a wild uninhabited land till coffee and tea came to claim the hills.

This map is therefore very useful in that it shows how the distribution of population was related to the life and occupation of 1824. The land was full of villages cut off from the outside world. No roads traversed the land and the only occupation was the cultivation of rice, arecanut, etc. and every village was self-dependent, save for salt and a few manufactured articles.

But as the years went by life changed for the dwellers of the Hill Country. By 1833 roads came breaking up the isolation and bringing in other peoples—the Low-country Sinhalese, etc. The land then developed under coffee and later tea and along with this came the construction of the railway line. Large numbers of Tamil coolies, and many 'outsiders', such as the Europeans, Indians and the Low-country Sinhalese came to take possession, as it were, of the land. The Kandyans too found in these changes many opportunities of securing wealth and comfort. In fact 50 per cent. of the coffee output was grown by the villagers though





they could not take kindly to tea cultivation. We are here not concerned as students of geography with the rights and wrongs of the changes that came over the Hill Country after 1833. The simple fact is that the face of the land and the lives of the people were completely changed.

Study the map which shows the distribution of population in 1921.

The changes are obvious. The land which in 1824 appeared unpeopled now seems to swarm with people. Yatinuwera has over 1,000 persons to the square mile while in 1824 it had 100 to 250 persons.

The divisions to the north, east and south come next, 500 to 1,000 persons. These are Harispattu, Pata Dumbara, Pata Hewaheta, Udunuwera, Udalapata and Kotmale. Compare this map with the map showing the tea district and the reason for this increase in population is explained by the development of land under tea. In 1824 these divisions had 10 to 15 persons per square mile. Udukinda, Matale South and Udubulatgama came next with 250 to 500 persons per square mile. These were the outer fringes of the zone of denser population.

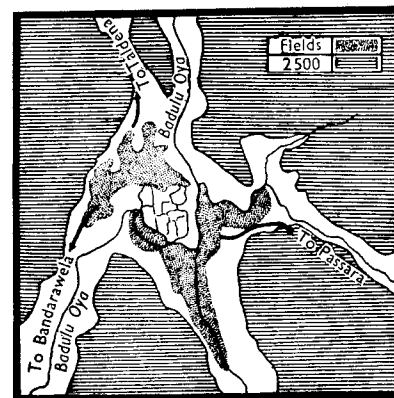
To the south and east of the Hill Country the population is the least for this region. Here it is below 250 persons per square mile and in many divisions even less. These divisions are for the most part uncultivated. Yatikinda has many tea lands but the patanas are bare lands and the peasants who have very few fields resort to chena cultivation. The rainfall is lower than that in the other sections of the Hill Country and so this eastern fringe is partly in the dry zone. Chenas are common and paddy fields are few. Malaria takes its toll of human lives and the roadless forest-covered land awaits development. These remarks are true of Uda Dumbara and Walapane.

### B. Types of Settlement

Before we enter into the study of the types of settlements in the Hill Country it would be helpful to examine the existing means of communication—road and rail.

In the days of the Kandyan Kings roads did not exist in this region (if they did, the fall of the Kandyan Kingdom would have come earlier), and so the country was left in part under forests through which enemies found their way with difficulty, and guerilla warfare helped the defenders.

But as soon as the Hill Country fell into British hands, roads were opened out primarily for military purposes. Then a road was made to Kandy and by 1833 there were main roads radiating from Kandy—one to Colombo, another to Matale, a third to Puttalam *via* Kurunegala, a fourth through the Dumbara Valley and up the Badulla Oya to Badulla and a fifth past Gampola, Pussellawa to Nuwara Eliya. Another road entered the Hill Country from the south-west through the Haputale Gap. These were the earliest roads. The later ones are not many—meaning the trunk roads—but one deserves special mention. This is the Colombo-Hatton Road entering the Hill Country through the Ginigathena Pass.



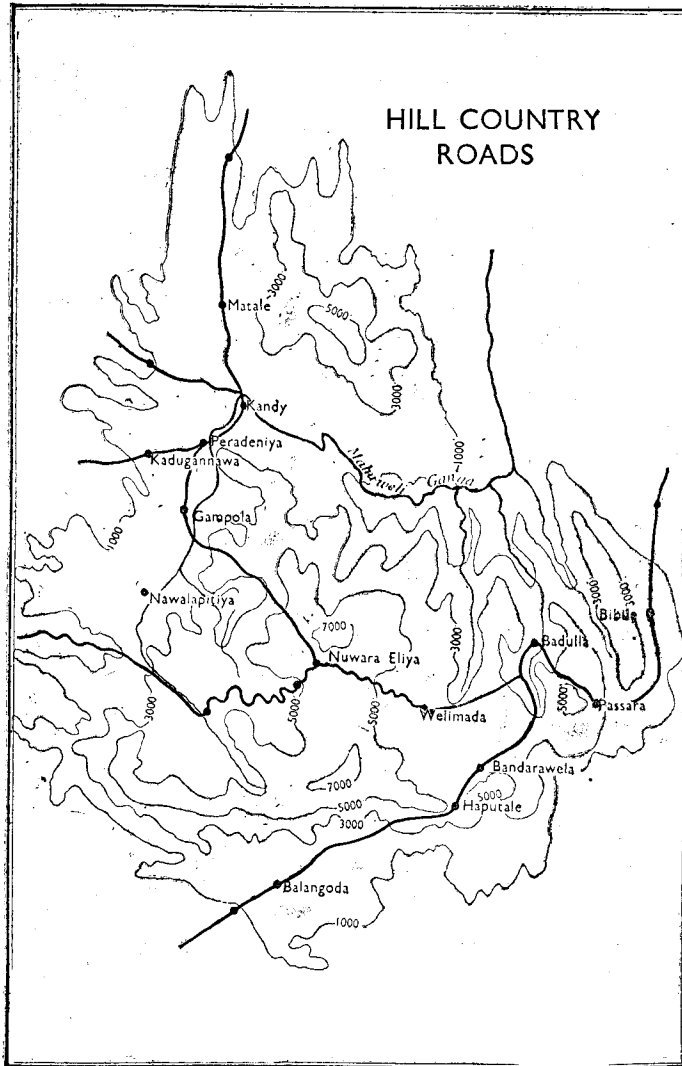
BADULLA

The railway entered the Hill Country in 1867 when the line from Colombo to Kandy was opened. And then slowly and steadily the line was extended—north to Matale and south to Gampola, Hatton, Nanu Oya, Nuwara Eliya, Bandarawela and Badulla.

The newer and easier means of travel and contact with the outer world worked great changes in the Hill Country. We are here concerned with types of settlements and we shall see how ancient towns of the Kandyan Kingdom received new life and vigour and grew apace, while new settlements in districts once given to the jungles arose with the coming of the railway

The first type of towns to be examined are ancient settlements which have not decayed with the birth of the new era referred to. They are Badulla, Gampola and Kandy, to select a few outstanding examples.

Badulla in the days of the Kandyan Kings, was the capital town of the Principality of Uva. It is situated in the middle of hill-encircled valley with the Badulu Oya flowing through. The valley itself was very fertile and



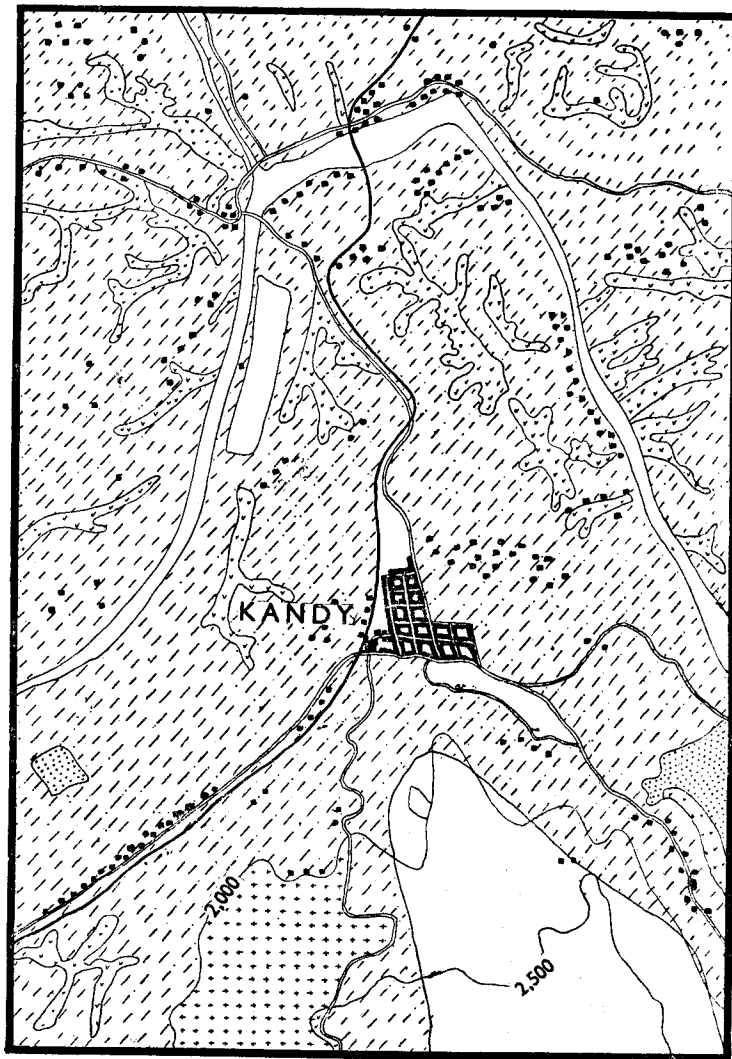
this may have been the reason for the origin of the town. When the Kandyan Kingdom fell Badulla became a garrison town. Davy writing in 1821 says: 'It is an inconsiderable place. The buildings are few and confined, chiefly, to officers' quarters, a barrack for European troops, a native cantonment and a small bazaar. As a station little can be said in favour of Badulla and were it not for its *rich valley* it would be probably deserted'. But in 1846 with the beginning of coffee cultivation the town began to prosper for Tenant says: 'No scene in nature can be more peaceful and lovely, but the valley has been so often desolated by war that nothing remains of the ancient city except the vestiges of a ruined dagoba. The British have converted an ancient residence of the Province of Uva into a fort; and the modern town in the activity of its bazaar and the comfort and order of its dwellings, generally surrounded by gardens of coffee, attests the *growing prosperity* of the district'.

It was with the advent of coffee and tea cultivation that the town rose into anything like importance. The railway line to Badulla made the town the terminus of the Hill Country railway and thus the town became the railhead for the planting districts of Passara, etc. First class roads connect it with Passara, Taldane and Welimada. The population of the town today is about 8,126 its importance being due to the modern means of communication and the planting district round it. It retains its former pride of place in that Badulla is today the capital town of the Uva Province.

Gampola too is an ancient town. It was once a royal capital and was known as 'Gangasiripura'—the royal city on the river. The 14th century saw the decline of the Sinhalese Kingdom and in 1347 Bhuvanaike Bahu IV made his capital here, undoubtedly for strategic reasons for the city was well guarded by the loop of the Mahaweli Ganga on the one hand and the hills on the other. For fifty years and more it remained a royal city and then was forgotten.

But when the Kandyan Kingdom fell and the coffee estates were opened out in 1833 round Gampola, the town rose into importance once more. Soon road and railway linked it with Colombo, and when tea took the place of coffee its importance was maintained. Today Gampola supplies the needs of a large area chiefly to the east along the road to Ramboda and Nuwara Eliya. The road to Nuwara Eliya runs south-east from Gampola through the district of Pussellawa, first through rubber and then through tea





KANDY AND KANDYAN VILLAGES

lands. On the west side, the road to Dolosbage serves the lower Dolosbage estates, and a minor road to Kadugannawa also carries considerable traffic to Gampola. Thus road and rail and the opening up of estates have brought prosperity to Gampola once more. The population today is over 5,000. Low-country Sinhalese form 26 per cent. indicating the influx of Low-country Sinhalese into this once Kandyan city. Twenty-one per cent., are Kandyans. The Moors form 26 per cent., the result of small business and historic trade connection of the Kandyans with the Moors. The Indian Tamils form 6 per cent.

**Kandy.**—In 1592 Don Juan Konnappu Bandara set himself up as Vimala Dharma I and reigned at Kandy. He built a great wall round the city with eighteen towers to strengthen it. Nevertheless during the long wars with the Portuguese the city was taken and sacked many times, until it had lost its former splendour when the British took possession of it.

Kandy was selected as a royal city because of the strategic value of its site. Like Gampola the city was within a loop of the Mahaweli which guarded it from the north and west, while the central hills checked any attack from the rear. Time and again the Portuguese were beaten at the fording of the Mahaweli—as at Gannoruwa, while no attack was ever made through the hills. In peaceful times, Kandy had easy access to her ports. Puttalam on the west, Trincomalee or rather Kottiyar and Batticaloa on the east. From Kandy traders and tavalams would go past the Weuda Kadawata and the Galagedera Pass to Kurunegala and on to Puttalam taking arecanuts, cinnamon and spices. From Puttalam, salt and cloth would be brought to Kandy. On the east the Dumbara Valley provided a pathway either along the Mahaweli to Kottiyar or across the land to Batticaloa whence came rice, salt and ghee. In fact so dependent was Kandy on her ports that the Dutch found the easiest way of retaliating on the Kandyan was by closing these ports.

In 1815 the Kandyan Kingdom ceased to exist and the modern era began. Road and rail soon connected Kandy with Colombo, and the development of tea and coffee estates helped to increase the commercial value of the town. From Kandy a network of roads spreads out more to the east where there is no railway. One runs to Teldeniya serving the estates (rubber and cocoa) of Dumbara, and tea estates of Rangalla, a branch road running to Hanguranketa and

Maturata, while another reaches Kandy past Peradeniya from Deltota and Galaha. In this way the plantation districts are linked with Kandy by road.

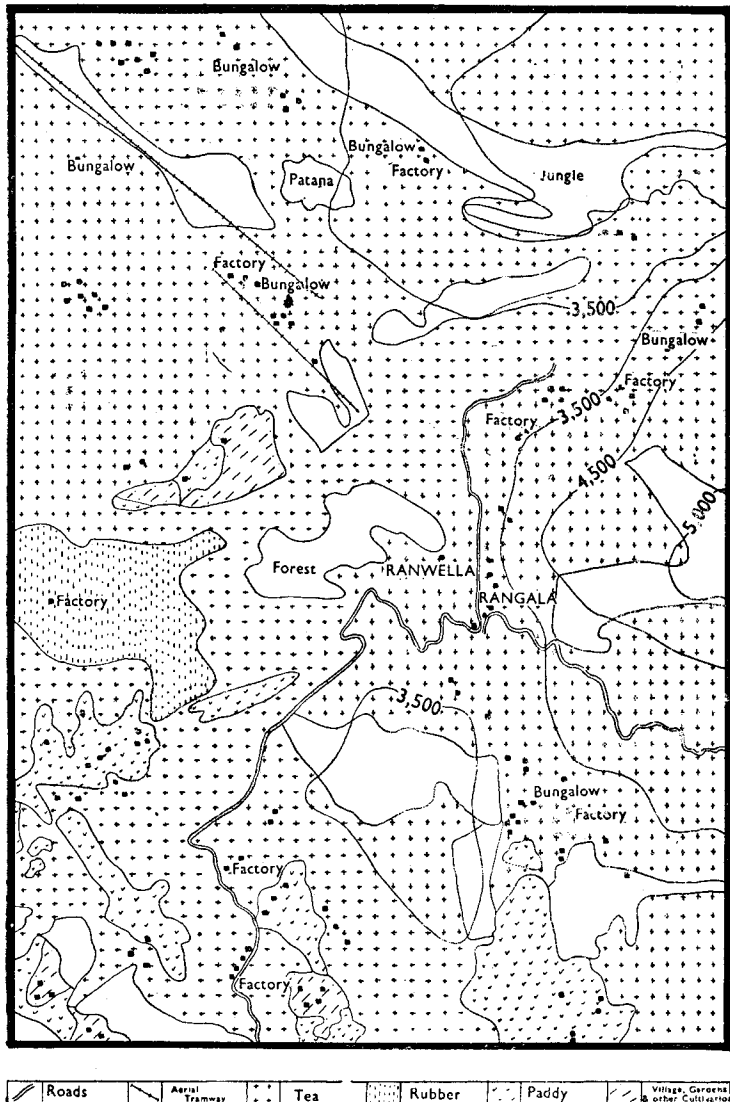
Kandy is now no more a town of strategic value. It has become a large market centre whose prosperity now rises and falls with that of the plantations in the district. Its population in 1821 amounted to 2,930. By 1848 it had risen to 7,500 and in 1871 with the development of the coffee estates it reached 20,000. From this date it has maintained a steady increase of population reaching in 1921 a total of 32,562. The town is administered by a Municipality.

Matale too belongs to the same class of towns as the ones we have dealt with so far. Not that it was a royal city—but it certainly is an ancient settlement. The *Sulu-vamsa* mentions it in connection with Parakrama Bahu's wars with Gaja Bahu of Polonnaruwa. It was like Badulla, the headquarters of the Prince of Matale and in early British times a garrison town, for past Matale a road ran through the Nalanda Pass to Dambulla and then to Trincomalee.

But the prosperity of Matale today is due to the development of estates—tea, rubber and cocoa—in the district. Being the rail head it links up all the neighbouring estates. It is thus the main centre of distribution in the district. The main road is the one to Dambulla while a branch road runs to Rattota and Gammaduwa through rubber and tea estates. The population of the town is about 7,800.

The second type of town includes all settlements of a more recent date. Thus towns like Nawalapitiya, Hatton, Diyatalawa, Nuwara Eliya, Nanu Oya and Haputale fall into this class. These are more or less the creation of the planting industry of Central Ceylon, and the road and railway system occasioned by it. But some of these towns have special value as 'health centres' and we shall touch on these later.

We shall begin with Nuwara Eliya. This town has now become almost a world renowned sanatorium. Nevertheless as a place of residence it is a discovery of British times. Davy writing in 1821 gives us the following account of Nuwara Eliya. 'We entered a forest in which we began to see traces of elephants and proceeded over wooded hills gradually descending till we came to a great extent of open country, the aspect of which was no less novel than agreeable'.



SETTLEMENTS IN A TEA PLANTING DISTRICT

Our guides called it Nuwara Eliya Patana. In point of elevation and extent, this tract, there is reason to believe, surpasses every other of the kind in the Island: surrounded by the tops of the mountains its character is that of a table-land elevated and depressed into numerous hillocks and hollows'.

'Beautiful as this region is and cleared, and possessing in all probability a fine climate (certainly a cool climate) it is quite deserted by man. It is the dominion, entirely, of wild animals: and in a special manner of the elephants, of whom we saw innumerable traces . . . All I could collect from the natives with regard to this region amounted to this: that the patana was never inhabited and that except by the passing traveller it is visited by two descriptions of men—by the blacksmiths of Kotmale who come in the dry season to make iron, and by the gem-renter and his people in quest of precious stones'.

But the city did not come into existence for either of the above reasons. In 1828 the Governor established a convalescent station for troops in the Ceylon Service. Thus the blessing of a cool climate to Europeans working in the tropics was the real cause of the origin of the town. 'From the establishment of a mail coach between Colombo and Kandy' writes Casie Chetty in 1834 'we may expect it to become the resort of invalids, even from the coast. The European soldiers resident at Nuwara Eliya appear ruddy and healthy and possess the same strength and spirits as in their native land'.

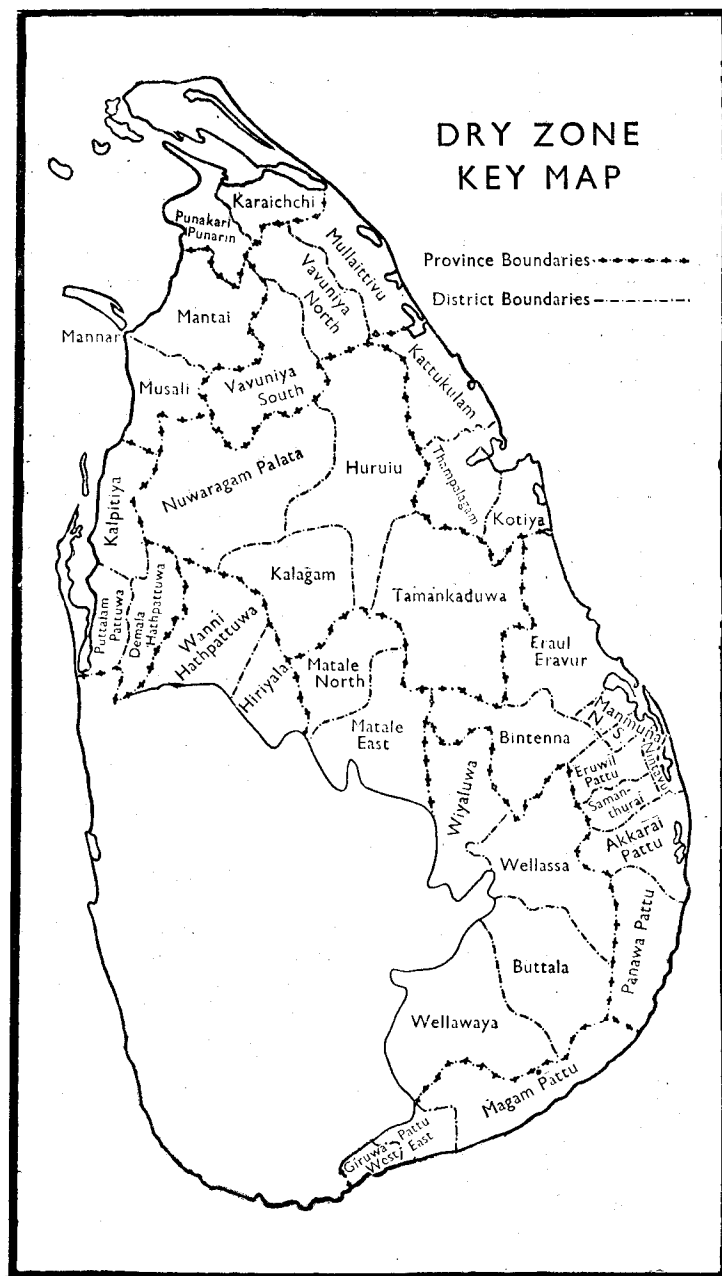
In 1884 the railway line was extended to Nanu Oya and in 1903 railway traffic was opened to Nuwara Eliya. At the same time tea estates were opened up throughout the district and these are the mainstay of the prosperity of the district. The sanatorium of 1828 has grown into a beautiful city with its parks and gardens, hotels and golf links and every 'season', in April, crowds leave the hot plains of the south-west to enjoy the cool air of the hills and Nuwara Eliya among other hill towns is crowded. Its population in 1901 was 5,000 and in 1921 it was 7,000. Every season it is estimated that 2,000 people visit the town. The town itself is situated like Kandy and Badulla in a valley surrounded by hills. Four important roads connect it with the outlying districts. One running north-west *via* the Ramboda Pass goes to Gampola, a second runs south-west to Nanu Oya, a third south-west to Welimada and a fourth

north-east through Kandapola to Uda Pussellawa serves the important tea districts there.

Other Hill Country towns like Diyatalawa and Bandarawela owe their value to the invigorating climate of the hills. Diyatalawa serves as a 'camp' for the military, as well as a recruiting station. Haputale situated at the well-known Haputale Gap, and Welimada almost the centre of the Welimada Plateau are towns that have arisen with the tea industry. So are towns like Nawalapitiya, Talawakelle and Hatton. In all one sees the stamp of the major industry of the district, in the bazaar and boutiques storing food and clothes for the estate population, the 'engineering works' and 'transport' agencies serving the needs of tea estates. Hatton is by far the most important of the towns that arose with the tea estates, for it serves the very extensive tea districts of Dickoya, Maskeliya and Bogawantalawa. Hatton is thus a collecting centre for the tea to be sent by rail to Colombo and the railway reaps a good harvest in the shape of freight.

These are the most important settlements of the Hill Country. They arose with the opening of the land—(all save the ancient cities referred to) under coffee and later tea. This brought in an influx of people, Indian Tamil labourers and Low-country Sinhalese and Moors. Thus Nawalapitiya has 28 per cent. of its people Low-country Sinhalese, 19 per cent. Indian Tamils and 19.9 per cent. Ceylon Moors, while Hatton has 36 per cent. Low-country Sinhalese, 25 per cent. Indian Tamils and 10 per cent. Ceylon Moors. Thus these settlements were populated by 'strangers' not by the native Kandyans whose real home was more on the lower levels. Tea never became a garden crop as coffee was once, and the new districts were opened out by foreign capital and labour. From the point of view of human geography the Hill Country settlements above 2,000 feet are the youngest in the Island.





## CHAPTER XI

### The Dry Zone

Of all the natural regions of the Island, the Dry Zone is richest in human associations. This is the land of the ancient Sinhalese and scattered throughout this region, are the remains of their former splendour. Jungle covers it almost wholesale, and the land awaits developments as once it did, when Vijaya and his men landed on these shores.

The Dry Zone is almost three-fourths of the Island. Its sea boundary is obvious but on the land side one is compelled to accept transition zones. Nevertheless the Deduru

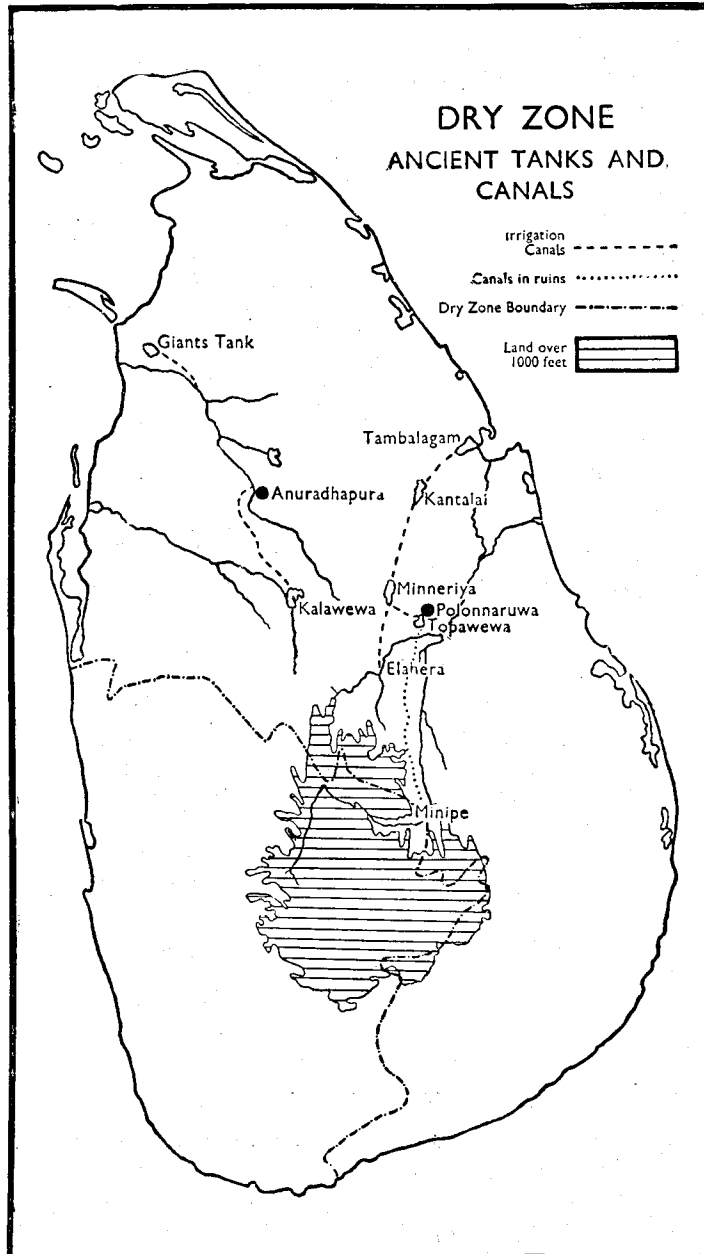


Photo

EAST COAST JUNGLE

Geo. Koch

Oya may be taken as one boundary for it is about this river that the Wet Zone changes into the Dry Zone. The Walawe Ganga may be considered as another boundary while the north-east foot-hills of the Central Hill Country form the third and last land boundary. There too we should bear in



mind the transition zones referred to. Thus a traveller passing through Matale South to Matale North or East will notice how the Wet Zone gradually merges into the dry zone. This remark also applies to the foot-hills of Uva.

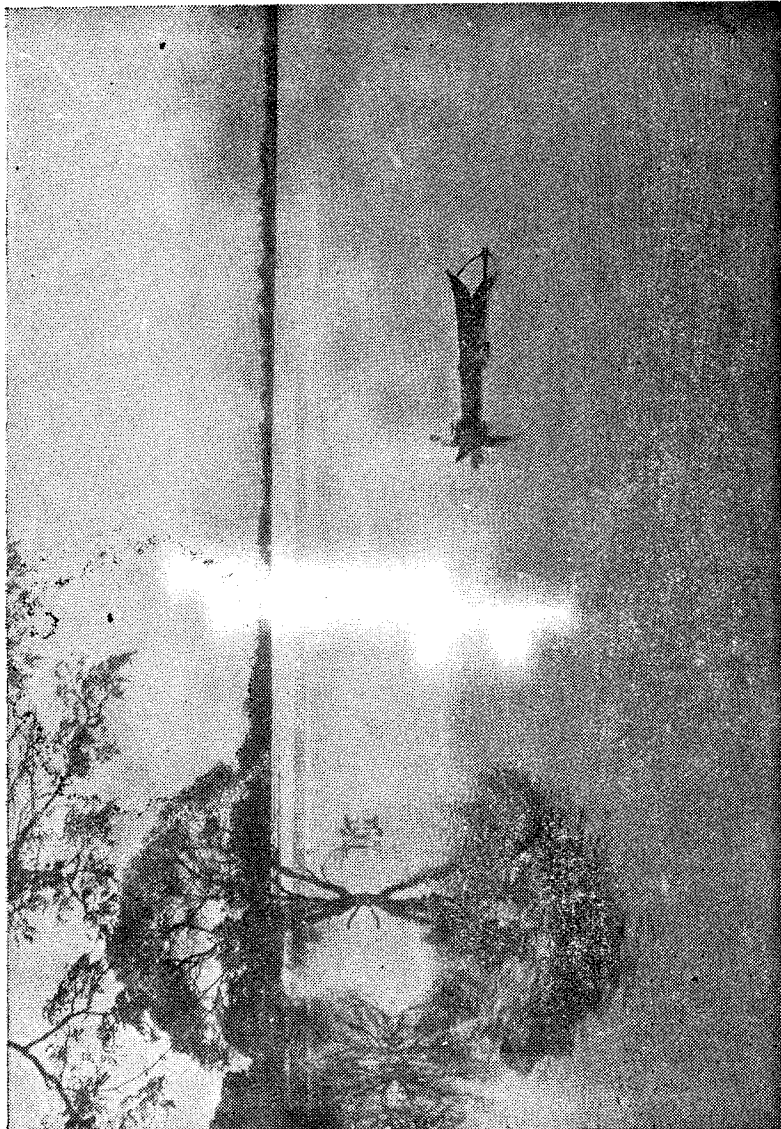
The Dry Zone forms one climatic unit, and it is the climate that has had a profound influence on the lives of people in this area. The rainfall is markedly seasonal and we have seen that forest or plant growth is confined to the wet half of the year while from March to September it is checked. Hence forests could be destroyed by fire, quite effectively, and land easily cleared for the first stages of settlement or cultivation.

Let us now examine the rainfall graphs for *Topawewa* (p. 67). We find that the Dry Zone has a major wet period from September to January followed by a short dry period in April and a major dry period from May-August when the dry south-west monsoon sweeps across the face of the land. Herein we see the opportunities given by nature for cultivation. The land can be sown or trees planted during the wet month of September and by February with the dry air and bright sunshine crops would come to maturity. This rainfall distribution suits grain cultivation admirably, for it requires a wet growing period and a dry period for ripening and harvesting. We know that paddy was grown in the Dry Zone from very early times and it is grown there to this day. Thus the distribution of rain has helped the cultivation of an important food crop. In April, afternoon rains fall and these are utilised for the sowing of dry grains like kurakkan, etc. But the rain is uncertain and drought holds the land till September arrives. If people depend on the rainfall only for their crops, only one crop is possible for the year. But the ancient Sinhalese learned to utilize the resources of their environment. They built great storage tanks and these were filled by the rains of the major wet period. And when April came and the long months of drought, the tank water was led into the fields and the grain turned golden and fruits ripened under the bright sunshine of the rainless months and August becomes a month of harvesting. So with the coming of irrigation the 'work year' was divided into two periods and two harvests were gathered. Of this we have evidence on some of the rock inscriptions of King Nissanka Malla. The importance of the irrigation works to human beings in the Dry Zone cannot be easily over estimated. The north-east monsoon is not a great rain bringer and the rainfall is not always reliable. This is why the ancient Sinhalese learnt to direct the waters



of the rivers flowing from the central country with its copious rains into man-made channels which in turn filled the large storage tanks. The map on page 196 shows the largest of these works whereby the waters of the Mahaweli and its branches were diverted into the Minneri-Kantalai and Tanblegam Tanks by the Elahera Canal, while the Minipe Ela filled a once 'giant' tank of 9,100 acres 'the Sea of Parakrama'.

Moreover drought often holds the land in its grip. Thus in 1933 at Anuradhapura there were 143 days of drought,



Geo. Koch

A TANK

Photo



Photo

AN ABANDONED TANK

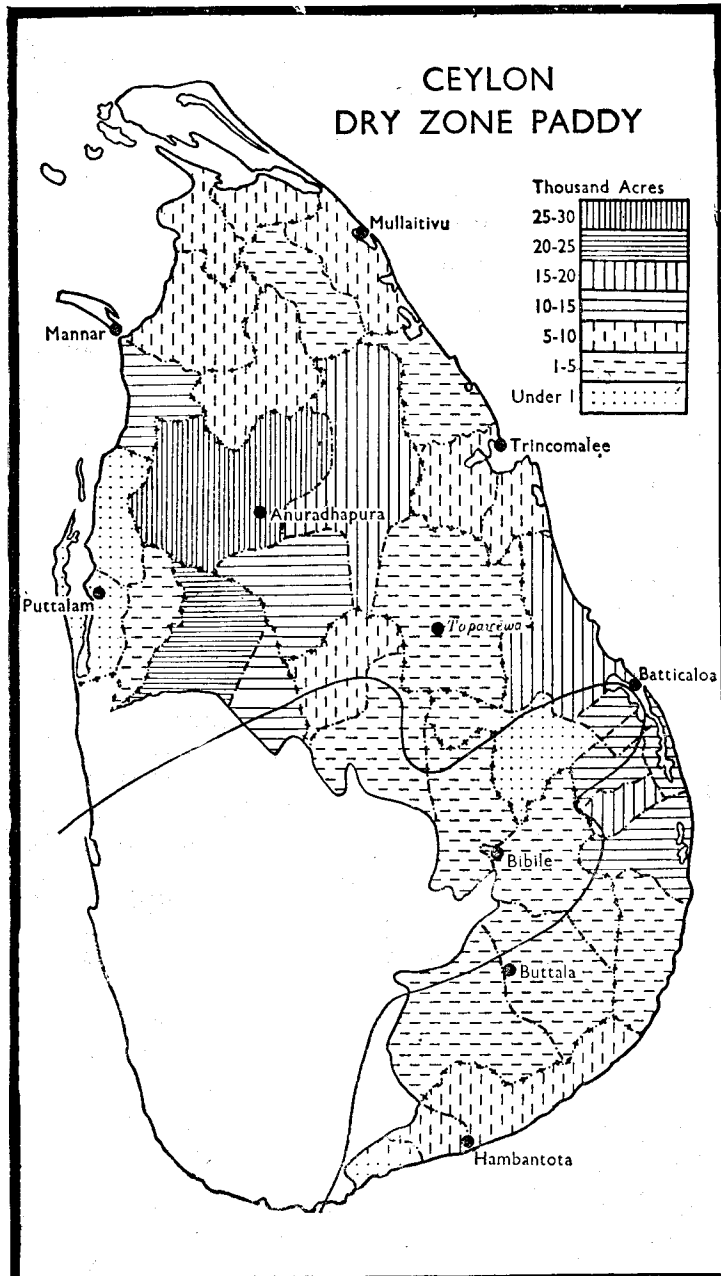
Geo. Koch

at Batticaloa 164 days, at Mannar 236 days and at Topawewa and Vavuniya 104 and 175 days of drought respectively.

On the average practically the whole dry zone has over 60 days of drought every year. All these point to the great influence climate exercises over this region as well as to the urgent need of irrigation works if men are to inhabit this land once more.

Let us now examine the occupation of men in this land today.





### Paddy Cultivation

The most important districts of the dry zone today are Batticaloa with 41,000 acres; Anuradhapura with 57,000 acres; Hambantota (especially Giruwe Pattu) 24,000 acres; and the Kurunegala district with 106,000 acres (vide map on the opposite page).

Most of this paddy is consumed locally and some of it finds its way to the Colombo and Jaffna markets. The straw of the Anuradhapura districts finds a ready sale at Jaffna.



Photo

PADDY FIELD, MINNERIYA

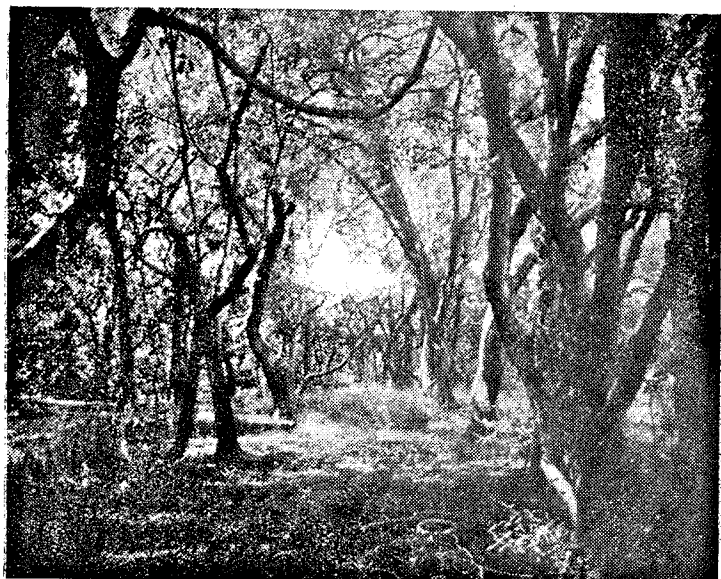
Geo. Koch

Methods of cultivation vary in different districts but the common practice through the Dry Zone is to sow before the rains of the north-east monsoon and to reap in February. This is the practice on the rain-fed lands but where the land can be irrigated sowing can take place in March or April and the harvest will be ripe in August before the rains of the north-east monsoon fall. In certain districts like the Wanni, cultivation varies with the soil. Where the soil is dry pulverised soil, sowing may be as follows:—The fields are ploughed in July and sown in August or early September. The heat of the soil keeps the grain dry and as soon as the

rains fall the seed germinates well. The harvest is gathered in February. Thus one can see clearly how great the influence of the distribution of rain is, in conditioning the time of sowing and reaping. The grain ripens in the long spell of rainless, dry weather and brilliant sunshine from June to August. But the harvest must be gathered 'before' the rains.

### Chena Cultivation

On the high and dry lands people have from time immemorial, practised **chena cultivation**. We shall first see



Photo

SCRUB JUNGLE, N.C.P.

Geo. Koch

what this is and then discuss whether it is a system 'beneficial or harmful to the peasant' of the Dry Zone.

In April, May or June peasants clear a patch of jungle of their own or one obtained on a permit from the Government. The dry wind (the south-west monsoon) and the blazing hot sun soon dries up the leaves and the peasant then sets the jungle on fire. The wind spreads the flame and soon the patch of land is burnt up, the leaves have settled on the ground as ashes, while the tree trunks and stumps remain black charred logs. The peasant then drags the

logs away and piles these in the form of a high fence round his chena plot, the tree stumps are left unrooted. The soil is not dug or manured. Sometimes the surface is barely scratched or scoured by a pointed stick. Sometimes the soil is slightly dug and turned over, but in no case is the soil well dug and turned over and broken up.

The peasant then turns to cultivating the plot of land he has cleared. He may sow kurakkan. If it is the soft variety, he sows it between September and November with the first north-east monsoon rains. This harvest is gathered in three months' time. If the kurakkan is the 'hard' variety he sows it in October or November and reaps it in February or March. Once more the peasant must take his time from the rain. Perhaps the peasant may sow a money crop—*tald* or gingelly. He awaits the afternoon rains of April to moisten the ground and then sows the seed. The harvest is ready in June and July, and the heat and dryness of the air contribute greatly to the thorough ripening of this oil-yielding seed. It is sold to the local Muslim or Tamil dealers or some of it is kept for food.

Besides these many other dry grains are grown on the chenas, e.g., *amu meneri*,<sup>1</sup> *kollu* and *gram*. On some chenas, crops of Indian corn are cultivated, while very often one sees on the same chena a miscellaneous crop of chillies, pumpkins and gourds all growing together. And they grow well and quickly too, unless the chena has been worked for many years until it has lost its fertility.

In this manner the peasant raises his chena crops. But as soon as the land shows signs of impoverishment he moves to another patch of low jungle and starts work again. Meanwhile low jungle begins to spring up on his first chena. The second plot is in turn abandoned and the peasant clears another for cultivation. It is undoubtedly a very bad system, for the peasant never learns to master the soil, to manure it and make it better year by year. Instead he seems to take the laziest and easiest path, namely, to 'rotate' his soil—not his crops. In lands of skilful farmers, one always finds the methods of manuring highly developed. Besides, various crops are grown one after another so that the soil is not permanently impoverished. One thing is then true, that chena cultivation will never make the peasant a skilful cultivator. It will never tie him to his garden and

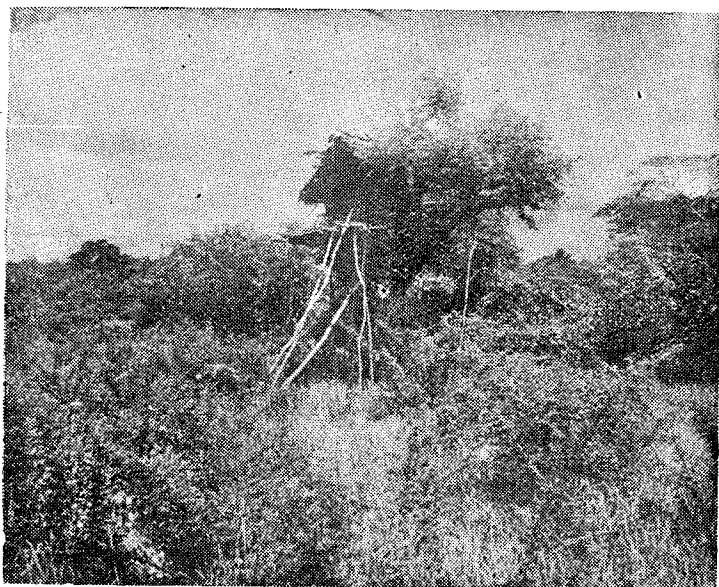
1. This is a very valuable food and the crops can be grown in two months on very little rain. It is thus an excellent 'Yala' crop.



his home nor will he ever learn to love his field and till it with loving care. He will continue to be a man who changes his house with his chena.

Critics of chena cultivation point to the great harm done to forests by chena fires. Others say that the chenas have led to the neglect of paddy though the peasant will repeat the answer given to a former Governor of Ceylon 'Give us tanks full of water and we will give up chena'.

There is not the least doubt that the chena system as a system of agriculture is very bad. But taking the dry



Photo

A CHENA

Geo. Koch

zone as it is, with the forest and malaria and the almost complete breakdown of irrigation works in a dry land, one can understand why the peasant tries even by chena cultivation to gather supplies of food. The north-east monsoon rains are uncertain and crops may fail. If the tanks are full then it is possible to gather a second crop for the year. Paddy will not grow on high land: only dry grains will, and the peasant, ignorant, poor and fever-stricken, burns the forests and with kindly nature's help in the form of rain, gathers a supply of food saved by great efforts from the ravages of the wild animals.

It may be that in course of time a system of agriculture can be developed that will gradually train the chena peasant to give up an unskilful method of cultivation. Coconuts may be grown on the high lands and plantations opened up as they were near Puttalam and Chilaw in days when prices for coconuts were good. Cotton can be tried on the chena lands, and a system of crop rotation worked out. Fruits, vegetables, oil seed may be tried. Goat and cattle farming may help the peasant to live on his land and better roads may bring him in touch with the markets of the Island. The burdens of poverty and debt may be wiped out by training the peasant in thrift by co-operative societies, etc. Many, many years will go by before this evil of chena cultivation can be remedied, but the geographer can see that the chena system—bad as it is—is after all an instance of man's use of his environment.

### Coconut

On the coastal belt of the Dry Zone coconuts flourish. Their present distribution is chiefly round Batticaloa, Puttalam, Mullaitivu and the Island of Mannar (vide map on p. 206).

Mannar had about 4,000 acres, Batticaloa 12,000 acres, Mullaitivu 27,000 acres, Puttalam over 50,000 acres and Hambantota 10,000 acres. In the other divisions of the dry zone coconuts are grown but not so extensively as in the maritime belts. In fact every village in the dry zone has a grove of coconut trees that makes it conspicuous amidst the vast forest cover of jungle trees.

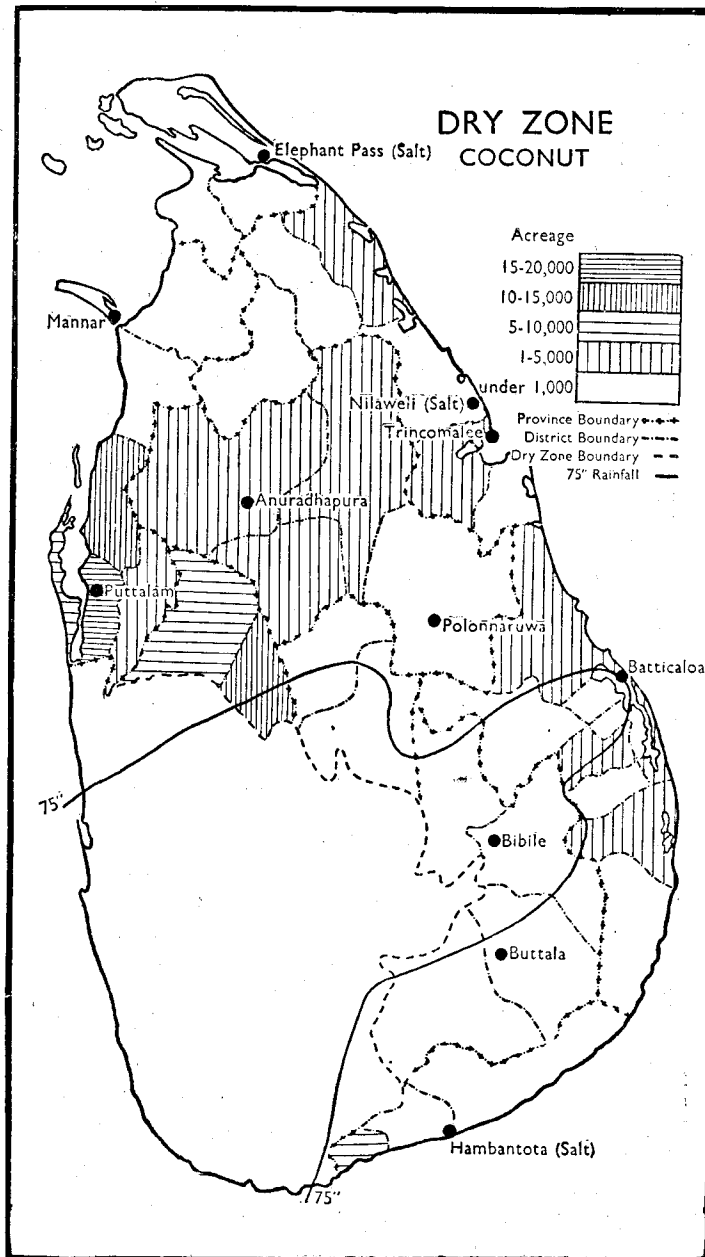
### Agricultural Possibilities

We may ask ourselves whether the jungle will continue to cover the land or will some day give place to cultivated crops. And what crops? We cannot answer all these questions but we can point out the *possibilities* which may or may not be realised in the future. A study of the geographical conditions of the dry zone points out the possibilities of crop production and of animal husbandry, of forest and mineral exploitation, and the resources of the sea.

### Cotton

The prospect of cotton cultivation has been held up before the peasants of the Dry Zone and successful experiments were carried out. Cotton is a plant that requires a moist growing period of two and a half to three months, and



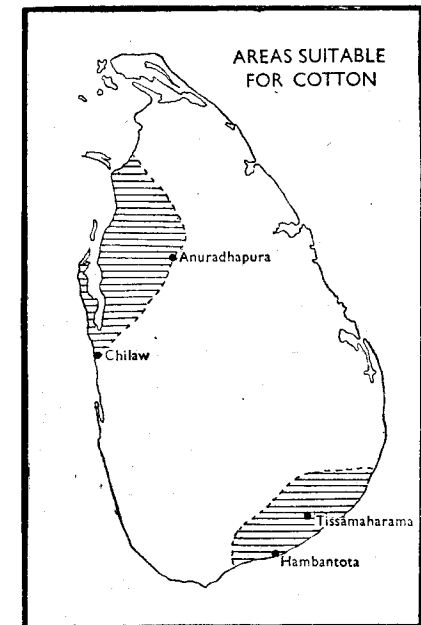


a warm dry period of three to six weeks for the ripening of the cotton pods. These conditions are admirably supplied by the climate of the Dry Zone. The best zones for cotton appear to be:

(a) North of a line joining Negombo and Trincomalee. At a place near Mannar 16 square miles of excellent cotton soil has been found, while old chena lands and the lowland between the familiar rock ridges of the northern plain supply good soil.

(b) South-east of a line from Matara to Batticaloa. In the Dry Zone two harvests of cotton can be gathered. (1) From rain-fed land in February and March and (2) from irrigated land in July and August. Note how these harvests correspond to the paddy harvests on rain-fed and irrigated fields. On the cotton land a crop rotation can be established by the cultivation of leguminous plants like ground-nuts, while maize can be grown as 'wind breaks' in between the rows of cotton plants.

All this may appear very simple, but we are thinking of 'possibilities' and cotton is a plant that can thrive in the Dry Zone. But whether it can be profitably grown is a question for the economist and business man for the great part. The State may assist the venture, organization may assist in marketing a good product, and traffic may secure advantages to the grower. Cheap electric power may encourage cotton spinning in the moist and crowded south-west of the Island. Nature has certainly given man opportunities and it is left to him to make use of them. It is so with the future of cotton in the dry zone. The experiment carried out in the Hambantota district may be of interest.



'The earliest attempts to grow cotton in the Hambantota district were made in 1912. The great war caused an interruption and in 1921, the Department of Agriculture undertook to carry out experiments in cotton cultivation. The success of the early trials and the attempts of the peasants to grow cotton on small plots caused the organization of a peasant scheme which rapidly expanded in a few years' time. The subsequent depression in cotton prices, etc. has done much to discourage the efforts of the cultivator. Cotton is nevertheless one of the few crops in the Hambantota district which provide the villagers with an income in the form of money, and unless prices drop heavily (which unfortunately happened) it is not likely to be abandoned'.

The cotton grown under the peasant scheme referred to, was bought from the peasants by the Agricultural Department and sold to the cotton spinning and weaving mills in Colombo. The seeds were supplied by the department and chena permits for planting cotton were granted along with the two acres kurakkan chenas. The scheme worked well for some time but the world trade depression gave it the death blow. Nevertheless cotton growing on the chena lands is a possibility and deserves the attention of those interested in working out a form of crop rotation on the high land of the dry zone.

Cotton is grown entirely rain-fed in this country. Sowing is usually done in October, with the first rains of the north-east monsoon. The monthly rainfall distributions at three stations in the south of the Island, averaged over a period of twenty years are presented here.

MONTHLY RAINFALL DISTRIBUTIONS AVERAGED OVER  
A PERIOD OF TWENTY YEARS

Stations	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total Sept.-Mar.
Hambantota	3.08	4.83	7.76	5.63	3.75	1.03	3.83	29.91
Tissamaharama	2.17	5.21	9.40	7.06	4.31	1.24	4.26	33.65
Ambalantota	2.63	6.03	7.81	6.90	3.56	0.90	3.76	31.59

Cultivators grow cotton in a system of shifting cultivation: the jungle is burnt after felling, the land cropped for one or more years, then abandoned and used again after some years when the jungle is well grown. On Departmental Stations rotations are adopted. The rotation at Wirawila is cotton, ground-nut, cotton, followed by a two and a half years ley of *Melinis minutiflora* and *stylosanthes* species. Other rotations are being investigated in two

long-term experiments at Wirawila. Tractors are used for tillage operations, sowing and inter-cultivation. Harvesting is done by hand. Cultivators use a hand implement, a hoe called the mamoty, for soil tillage and inter-cultivation. Sowing is done by hand. The spacing adopted by cultivators is 3 feet by 3 feet with two or three plants per hill. At Wirawila, in 1944/45 there were only 8 acres. In 1946/47 the total was 16. In 1947/48 the acreage rose to 372 and in 1948/49 it was 2,300. In 1948/49 the quantity of seed cotton produced was 11,000 cwt.

Cotton breeding work is conducted at an isolated station, Hambantota, in the south of the Island. About twenty varieties are under test. Attention is confined to upland cottons (*Gossypium hirsutum*). Egyptian and Asiatic cottons were not found as good as the upland varieties. Other factors under investigation are spacing, seedling number per hill and manure.

Cotton produced in the Island is bought by the Wellawatte Spinning and Weaving Mills, which is the only mill in Ceylon.

### Orange

Another crop that may in the future be successfully grown in the Dry Zone is the orange. This too like the cotton plant thrives in lands of a marked wet and dry period where the fruits can ripen in the bright sunshine. Further, even in the driest areas the orange can grow on irrigated lands.

In ancient times oranges grew in the Dry Zone, for Queyroz in his *Conquista de Ceilão* refers to excellent oranges grown in Wellassa. There is nothing in the natural environment of the Dry Zone that prevents the cultivation of the orange. But of course there are immense obstacles in the way of its being grown successfully—and these may be overcome by effort and organization. We are not concerned with these. We are only thinking of possibilities and the lessons of orange cultivation in other countries where climatic conditions are more or less the same fill us with hope.

### Sugar

Sugar is another crop that may one day be largely grown in the Dry Zone. Experiments were carried out at Allia in the Trincomalee district and this is what the Director of Agriculture said in 1928. The best results were gained

by planting canes in February, March and July for by the time the rains of the north-east monsoon arrived the plants were well established. The figure worked out gave Rs. 331 as profit per acre. The profits would have been more but for the fact that the jaggery had to be sent to Jaffna and Batticaloa for sale and rail freight and transport charges reduced the profits. The report goes on to say 'with the completion of the Verugal anicut there will be a large area of land available for sugar-cane cultivation and in view of the high profits which can be made in Ceylon owing to the import duty on manufactured sugar, it should be considered whether it is not an industry worthy of assistance and encouragement'. It is possible that sugar-cane may be grown on paddy land in rotation with paddy as is done in Java to the great advantage of the cultivator. Here is a typical rotation of crops practised there:

1926 April	} Sugar	
1927 July-August		
1927 August-November		Maize, manioc, sweet-potatoes and ground-nuts
1927 December	} Rice	
1928 April		
1928 May-November		Maize, etc. as above
1928 December		Rice
1929 April		Sugar

Applying this system to the Dry Zone one sees how well the period of rice cultivation fits in with the north-east monsoon rains. The harvest is in April. Then follows the sugar crop on the same field irrigated by water from the tanks. We once again come face to face with an agricultural possibility. Problems of capital, organization and markets have to be solved by men, but nature has given the opportunities for crop production, in the soil, sunshine and rain.

#### Ground-nut

Another valuable product which can be raised in the Dry Zone is the **ground-nut**. Here India has taught us a lesson. She too has her dry zone and her poor peasants and poor soils. But first let us examine the uses of the ground-nut. It supplies a cash income in the oil that is extracted from it. The refuse cake left after the oil is extracted forms a valuable manure or cattle food, whichever way it is used. The plant grows well on sandy dry soils and is invaluable to the poor peasant, supplying him with a fertilizer and

cattle food as well as with a source of income. In India before 1911, there was no acreage under this crop worth recording. By 1911-12, ground-nuts covered 394,000 acres and in 1925-26 the acreage was 3,768,000 acres in British India alone. Ceylon may follow the example of India in cultivating ground-nuts and this crop may enter a system of crop rotation suited to the Dry Zone and more so as it thrives in very light sandy soils in dry regions—often in regions where practically nothing else will grow.

#### Tomato

Another valuable crop suitable for cultivation in the dry zone is the **tomato**. It is grown largely, round Ambalantota, Tissa, Ranna and Wiraketiya in the Hambantota district. Of all the garden crops grown in this district tomatoes give the best and quickest returns. The plant thrives in sandy loams. The seeds are grown in nurseries in August and September. Transplanting begins early in October and extends as late as the middle of November. After the first shower of rain when the ground is moist especially on a cloudy day, the tender plants are set in the field.

The plants flower from when they are four to five weeks old. The fruits are picked once a week. This begins early in December and extends up to the first week of February. The crop is sent to market, e.g., Colombo—between December and January when the up-country tomatoes are scarce. Thus the dry zone tomatoes can fetch good prices, e.g., 25 to 50 cents per 100 fruits of local varieties and 50 cents to one rupee per 100 fruits of imported varieties. Transport is difficult as the fruits are easily crushed.

**Pine-apples** thrive in a sub-tropical climate with alternating wet and dry seasons, a temperature of 70 to 80 degrees and an annual rainfall varying from 50 to 100 inches. Unlike the tomato the pine-apple can be easily transported in special crates and find a ready market in Colombo. Moreover pine-apples may be grown for a foreign market and the fruits can be canned as they are in the Straits Settlements.

Other crops which may in the future be cultivated with success are **chillies** and **tobacco**. The former is a chena crop and the chillies are easily dried during the dry months of June to August and May. But it is possible to grow chillies in a more systematic way and dry them in drying sheds. These dried chillies can supply the local demand



for them as today we import 26.5 million rupees worth of dried chillies from India.

**Tobacco** has been grown successfully in the Dry Zone. The climate is in no way injurious to the plant as the cultivated gardens of Jaffna testify. Muslim cultivators grow tobacco on the banks of the Gal Oya and the Mahaweli and Sinhalese peasants grow it in the Wannu Hatpattu of the Kurunegala district. These prove that the geographical conditions of the dry zone are suited to the tobacco plant, for cultivation begins with the monsoon rains and the harvest is gathered after the rain and before the long dry period sets in. Much has to be done in improving the quality of the tobacco and in organizing markets at home and abroad. But as we have said before we are concerned only with 'possibilities'.

Other plants worth cultivating are **beans and pulses**. These were extensively grown in early days and inscriptions refer to taxes being paid in beans. Pulses and beans appear to have been consumed by the inhabitants, and medical science recommends these foods for their high food value. Beans and pulses appear to be the cheapest substitute for meat food.

In many other ways too the Dry Zone is full of economic possibilities. Hitherto the Island has prospered on the plantation industries of tea, rubber and coconut of the wet zone. This naturally leads to the neglect of the dry zone with its jungles and fever and lack of roads and an almost helpless people. But some day or other the dry zone will have to be developed. Population grows apace in the wet zone and other countries enter into fierce competition with Ceylon tea, rubber and coconut. And soon a day will come when the Ceylonese must think of utilizing the three-quarters of the Island which today is mostly jungle land. It will take years of trial and experiment before crops, a suitable crop rotation, roads and markets, etc., can be found out.

### Breeding of Animals

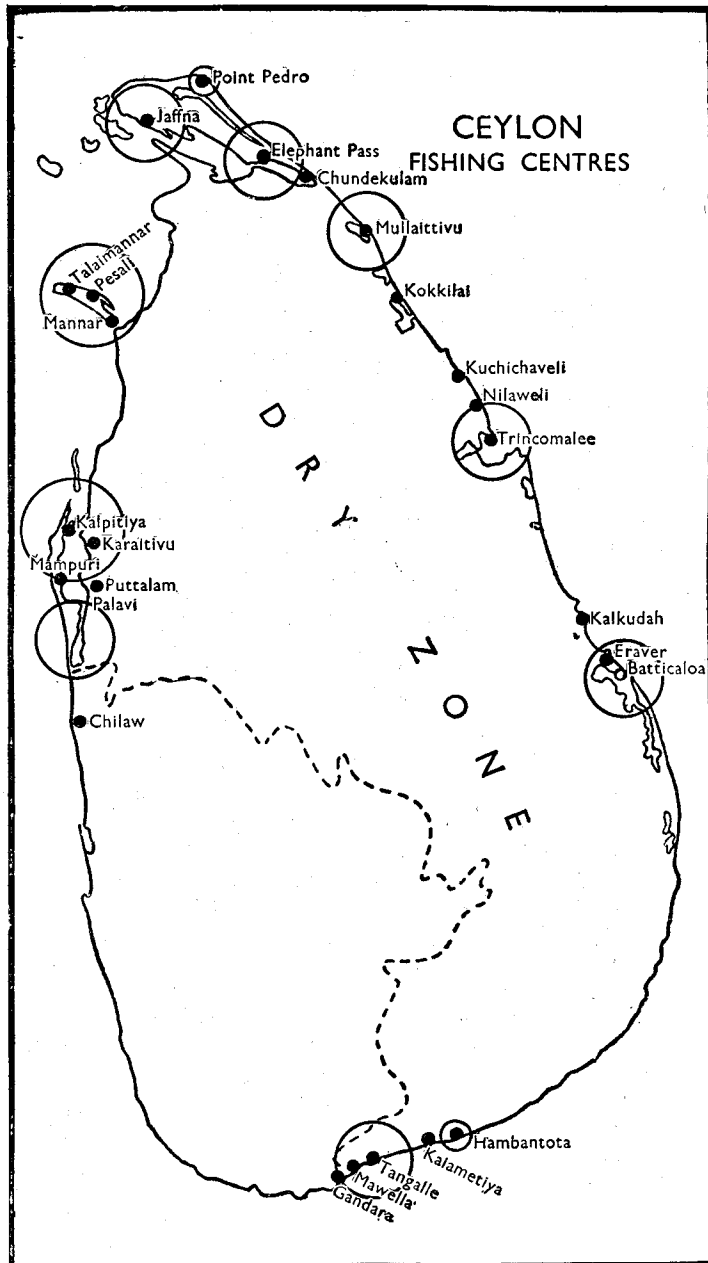
Nor is it in the way of agricultural development that the dry zone gives to men opportunities of wealth or the means of a living. In the Tamankaduwa district of the North-Central Province are areas of open land called talawas and these form feeding land for cattle. In the Walawe-Kirinde area too are good cattle lands and the peasants market the milk in the shape of ghee or curd as fresh milk

cannot be brought to towns owing to distance away from them. The Tamankaduwa area appears rich in possibilities of **cattle** breeding especially in the neighbourhood of Manampitiya with the railway as means of transporting the cattle of the Colombo or Kandy markets. But it must be noted that Ceylon is very poor in pasture lands. The existing ones are cropped over and over again and no attempt made to cultivate grass or fertilize the pastures that are cropped. The future lies in the way of cultivated fodder grasses and these can be grown with the aid of tanks to supply the necessary water.

**Goat** farming too appears to be a profitable industry for the people of the dry zone. Animal husbandry ought to receive the most careful attention of those whose care it is to develop the Island's resources. We import annually animals and animal products to the value of nearly 7 million rupees, goats being imported to the value of 2 million rupees.

Goats are the animals of the dry lands of the earth. They do not thrive on wet lands. They do not live on grass although they eat grass, but they thrive best on the leaves of shrubs. 'Areas of scrub jungle on light sandy soil provide favourable conditions. Such conditions are found in the dry zone of Ceylon and good breeding should provide a valuable adjunct to village agriculture in these areas'. But the obstacles in the way are many. First, the villagers will not take up goat farming for slaughtering or selling to the butchers. Next, losses from wild animals like the jackal and the leopard are bound to be great. Worst of all, the dry zone lacks facilities for marketing the goats. The best market is Colombo and the butcher would like to have his animals delivered to him at Colombo. This is a very formidable task for want of roads, etc. but it is possible for a co-operative society to have its own mutton stalls both in Colombo and the chief outstation towns where mutton is sold.

The Government has in recent years opened up a farm at Polonnaruwa. Imported bulls, cows, goats, buffaloes, pigs and poultry are kept here so that they may in the first place get acclimatized. Later select animals are used for stock-breeding purposes so that in course of time the local breeds may be improved. These will be a great boon to the farmers in this region because they need good cattle and buffaloes for a variety of purposes. Good draught oxen are very necessary to cart produce to markets, while buffaloes are also needed to plough the paddy fields. Improved milk



cattle will be a boon to the peasants in that milk or curd or ghee can either be consumed by them or sold.

The farm demonstrates the most improved methods of storing fodder for use in the dry season.

Village cattle have very little food on the pasture lands in the months of June, July and August and their condition makes them useless as draught oxen, or milk cattle or beef cattle. Cultivating fodder grass is impossible without irrigation facilities. Thus the 'silo' in which grass can be stocked for months together, will save the villager's cattle. Very cheap and simple methods are shown to him so that he may make a silo for his cattle in his own farm land.

**Fishing** too is another branch of human industry in the Dry Zone which can easily be improved. In 1950 we imported dried or salted fish to the value of Rs. 33,738,759. Imports of Maldive fish and tinned fish totalled in value 4.7 million rupees.

The Dry Zone coasts are certainly rich in fish while away from the coast are two large fishing banks, the Pedro and the Wadge Banks where trawlers can be used to catch the fish. These were worked for many years by the Colombo Fisheries Company and the catch was kept in cold storage at Colombo. But owing to lack of support the Fisheries Company has suspended operations.

Inshore fishing by means of nets and deep sea fishing by boats are carried on in Mannar, Batticaloa, Puttalam and Trincomalee. In the absence of roads to transport the fish fresh to Colombo, etc. most of the catch is dried. The dry fish trade seems to be on the decline especially with the coming of roads and railway.

Thus before the Talaimannar railway was constructed all the fish caught at Mannar was dried. At present most of the fish is sent to Colombo on ice and the value of the fish trade is said to amount of Rs. 600,000 a year. The dried fish industry is more or less confined to the east-coast and the north-west between Point Pedro and Chilaw, parts not tapped by road and railway. With the coming of the railway and even before, the fish from Trincomalee was transported to Anuradhapura by 'buses to be sent by rail to Colombo. So fish from Batticaloa was sent and is now being sent by road to Badulla and fish from Tangalla is sent to Matara.

The most valuable fishing areas on the coast of the Dry Zone are found on the continental shelf which here is broader

than in the south-west of the Island. Moreover the main surface currents of the Bay of Bengal and the Indian Ocean pass along the eastern and southern shores of the Island. Since the majority of shoal fishes move with or against these currents this region is likely to be better suited for the development of shoal fishing. This is supported by the fact that fishermen concentrate on certain points on the east and south coast during the shoal fishing season.

The region where large scale fishing is likely to prove successful is in the north and north-west where the continental shelf is at its broadest. Here too improvements can be made by the employment of faster fishing boats and better methods of catching and storing as well as packing the fish. In the north are the Pedro and Wadge Banks where trawlers can be successfully employed.

There remains to be examined one other industry which is typical of the Dry Zone. **Salt making** was even in the early days confined very naturally to the dry coasts and the Kandians used to get their supply from Hambantota, Batticaloa and Puttalam.

The Island consumes about 660,000 cwt. of salt per annum. The bulk of this is made in the Island, shortages being met by import from India. The salt pans are found at Puttalam, Hambantota and Nilaweli (eight miles north of Trincomalee) and Elephant Pass.

At Hambantota the salt is collected from saucer-like depressions called 'levayas'. These are filled by the rain and when the dry season sets in the water gets evaporated. But the water has in the meanwhile dissolved the salt in the soil which is very saline and the salt is left as a crust on the surface of the levayas. This is gathered by coolies.

In 1919 Government decided to improve the salt made in the Island. Accordingly a salt adviser to the Government was appointed and he recommended the construction of three large salterns at Elephant Pass, Palavi and Hambantota. In 1926 the Elephant Pass saltern produced 151,000 cwt. and the Palavi saltern 4,000 cwt. of salt while in 1938 Elephant Pass saltern produced 163,337 cwt. and the Palavi saltern 101,590 cwt. In 1948 Palavi produced 6,375 tons; Puttalam, 27,664 tons; Elephant Pass, 17,835 tons; and Hambantota, 13,863 tons. These, with other salterns produced a total of 77,429 tons.

In these Government salterns sea water is pumped into banked enclosures which are built at varying levels.

The sea water pumped into the first enclosure is evaporated by the sun's heat until its density is increased. It is then allowed to pass into a second enclosure where the water undergoes further evaporation and then is allowed to flow into a third enclosure. Here it crystallises into salt which is then broken up for sale.

There are many who believe that the supplies of salt which can be secured can be made the basis of important industries. The Palestine Potassium Company operating on the salt manufactured from the Dead Sea brine is cited as an illustration. This company utilises hydro-electric power for its work and in Ceylon too similar supplies of power are available. If chemical fertilisers are made of the salt manufactured here, it would be a boon to the peasant in fertilising the impoverished fields.

Having thus briefly reviewed the activities of man in the Dry Zone we may look back over the field we have covered and consider how this vast region can be developed. We have been for years dependent on tea, rubber and coconut to bring prosperity to the land and the claims of the peasantry and others have been overlooked. But we cannot let two-thirds of the land remain unproductive while the population is slowly increasing and means of employment are getting more and more restricted. Endeavours are being made at the present time to open up the Dry Zone and this start is most promising.

What are the conditions essential to develop the Dry Zone and bring back prosperity to the ancient homeland of the Sinhalese? It is not possible for anyone to state dogmatically what these conditions are, but the geographer can make a few suggestions which may be helpful. For, to develop this land one must pay heed to the nature of the environment of the land. The rainfall regime and the incidence of drought clearly point out the fundamental need of irrigation works. History has proved the value of these works and without attempting to control and store up water supplies, it is impossible to make crops grow in this land.

Another problem that has to be tackled and solved before the land can maintain people in health is the gradual eradication of malaria. This has already sapped the vitality of the peasant and has made him a feeble and pathetic worker.

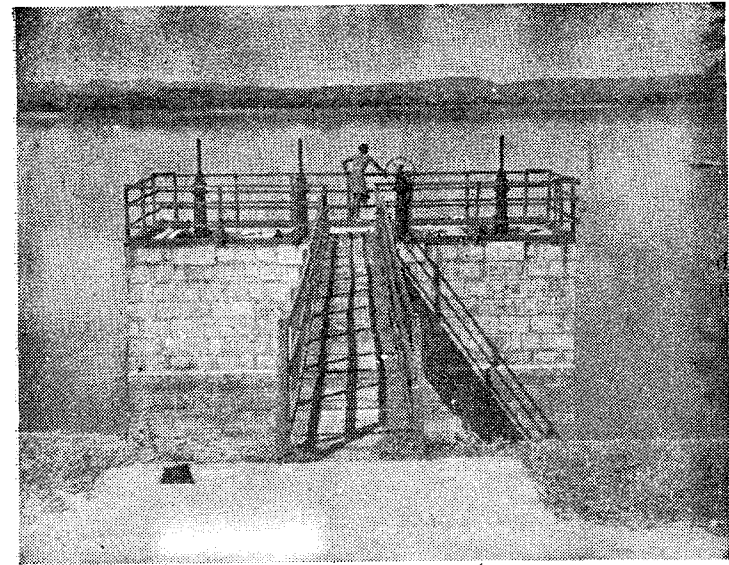


Another condition that nature seems to impose on man ere he can realise the possibilities of this land, is the building of roadways. The market centres of the Island are far away from most parts of the Dry Zone and the Port of Colombo will continue to be the 'gateway' for trade.

Hence without efficient means of contact with the Port of Colombo and the more densely peopled parts of the Island, the crops of the Dry Zone will not easily and profitably be brought to the markets. Moreover the wants of the people of the Dry Zone itself will not be efficiently supplied if roads are wanting. Roads sow the seeds of life and with road development people will settle down on the land in small numbers at first—but soon the number will increase for land can be cultivated and crops despatched to market and the land in the vicinity of the road will sooner or later be cleared of jungle and planted with crops. Today, only trunk roads and railway lines cross the land and the villagers live in isolation from the rest of the Island, with foot-paths to serve for roads and the jungle enveloping them.

Another problem is the development of a system whereby the highlands can be cultivated, for the lowlands are paddy lands and may in time to come grow sugar-cane in rotation. In devising a form of crop rotation we have to place foremost in our minds the rainfall regime of the land and think out ways and means and crops suited to it. The Dry Zone is undoubtedly a grain land and fruit land as well. Perhaps it is on these fields that success can be achieved. It may take years and years of experiment before man can claim the Dry Zone from the forest and the wild beasts. In this connection the State will have to provide assistance if not undertake the work of experiment wholesale. Scientific research will have to be undertaken by the State for the problem is too vast and expensive for any individual or company at present to solve. If some day a crop system is devised there remains other problems. The peasant in the Dry Zone is poor and ignorant and lacks capital. He is always indebted to the local dealer who has advanced his seed, paddy, etc. and food. The solution may be in the direction of thrift encouragement by co-operative societies, of training in better methods of cultivation by State schools, of farming by State aid in the form of loans, etc. All this will take many, many years to be realized.

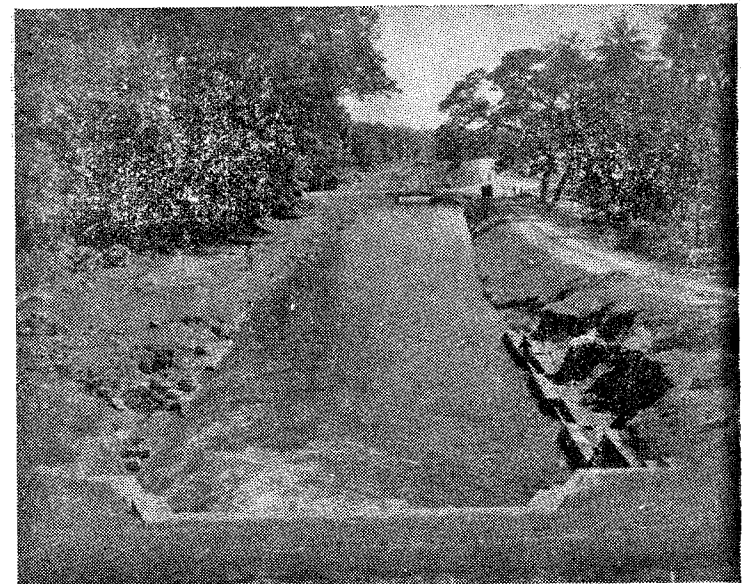
Then there remains another very vital problem—the marketing of crops. The peasant cannot organize this for he is ignorant of world conditions of trade, etc. Markets



Photo

IRRIGATION SLUICE

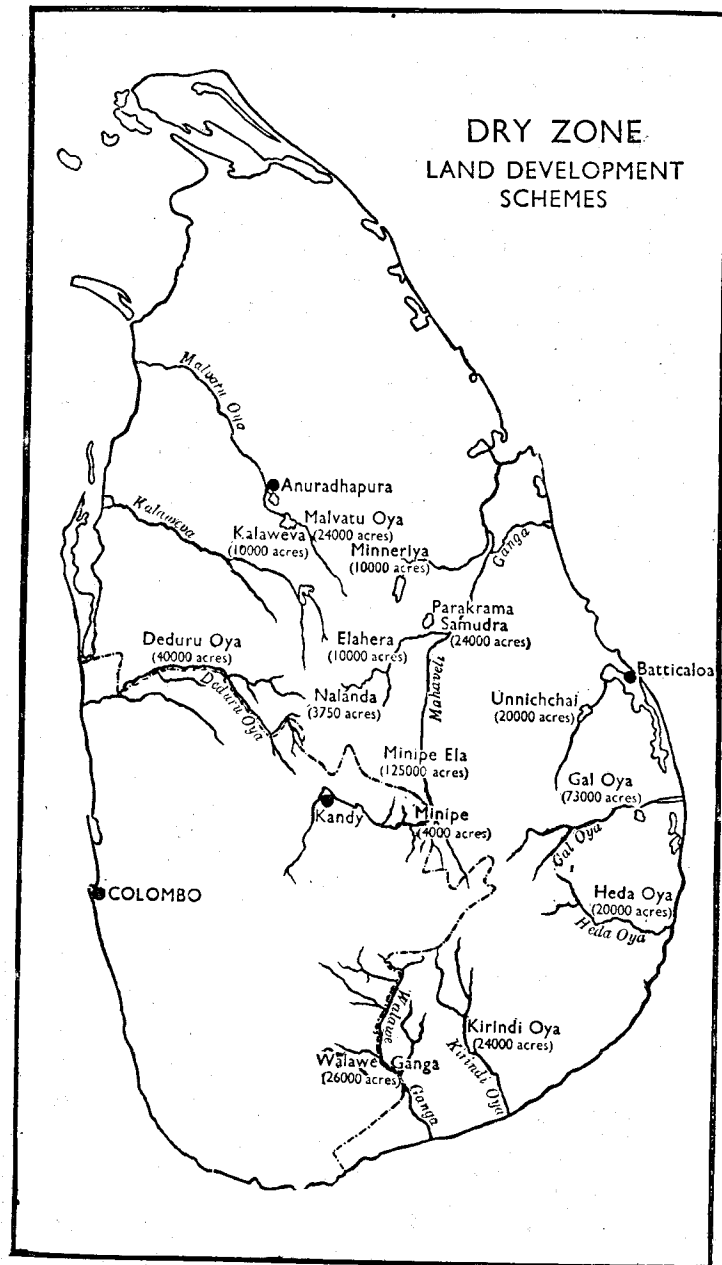
Geo. Koch



Photo

IRRIGATION CHANNEL

Geo. Koch



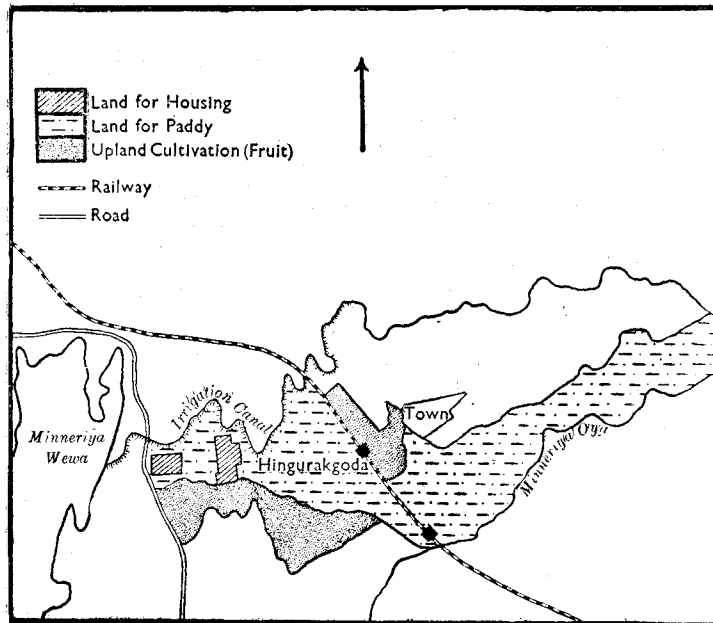
at home or abroad for his crop have to be found out and this means organization from the villages to the markets, local or foreign. In a country like Ceylon State aid is essential. The welfare of the peasantry must be one of its great concerns and without State help the peasantry is helpless. Private enterprise in crop cultivation, in the Dry Zone should be encouraged by State aid and assistance given until it has gained a footing. The State can control prices in these aided industries, it can offer scientific advice regarding cultivation, packing and transport of goods and conduct research work for the benefit of the peasant and small cultivators, it can supervise and guarantee to the customer the quality and grading of products.

Such are the lessons we can learn of the value of State aid from other lands—Australia, Canada and Japan. If the Ceylon Government will not give a helping hand the problem of the development of the Dry Zone will never be solved. And the Dry Zone is well worth the attention of the country, not on sentimental grounds of its past history, of the poverty of its peasants today, but that it is well worth cultivating. History teaches us that the ancient civilizations arose in dry lands which were irrigated. The fertility of the soil is never washed away by heavy rains and the dry air and the bright sunshine are valuable assets to the farmers. And so with care and foresight the dry lands can be made productive.

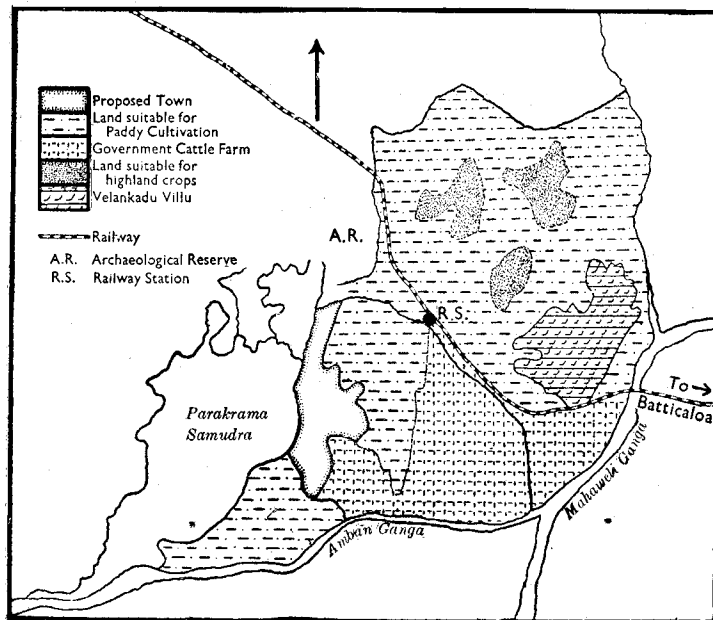
Take the Sind region of the Indus Valley. It has often been called the 'unhappy valley' but with the coming of irrigation 13 million acres were rendered cultivable and thus the desert 'will rejoice and blossom like the rose'. And so it may be with the Dry Zone of Ceylon. It blossomed forth once when wise kings looked after it. Later its beauty faded and its glory disappeared.

The second world war has brought home to the people of Ceylon the importance of growing their own food crops. The Agricultural Department has calculated that the Island needs two million acres under paddy to feed its six million inhabitants. The acreage under paddy today is 850,000 so that a further 1,150,000 acres have to be brought under the plough.

Geographically the Dry Zone is the one region where the land necessary for this purpose, is to be found. The total extent is 12 million acres and there is not the least doubt that here the 1,150,000 acres can be found. The relief of the Dry Zone and above all, its climate makes it, the one area in Ceylon where paddy cultivation on a large scale



MINNERIYA



POLONNARUWA

should be attempted. Success however will depend on irrigation, so that two harvests can be secured for the year,

Irrigation can be of use in developing other crops than paddy. The ancient Sinhalese could not irrigate high land, so that seasonal cultivation only was possible in them. It is so today. But if with the development of hydro-electricity at stations on the Mahaveli Ganga, water could be pumped to high land, then the present seasonal and casual, upland cultivation will no doubt disappear and its place taken by fruit cultivation, etc.

The importance of irrigation is thus twofold. One to keep the cultivation of paddy on low lying land and the other to make the uplands more productive than they are today.

Many schemes of land development have been planned and taken in hand by the Government. The map on page 220 indicates the sites of some of the major schemes. The acreage contemplated under each scheme is also given.

Of these, Minneriya has proved a great success and there is no doubt that in course of time the others will be equally successful. Twenty-five years ago there were hardly a hundred people at Minneriya. Today there are 5,000 (vide map) opposite.

The following figures will be of interest to the reader and are given here in tabular form for greater convenience:

I. *Under Construction:*

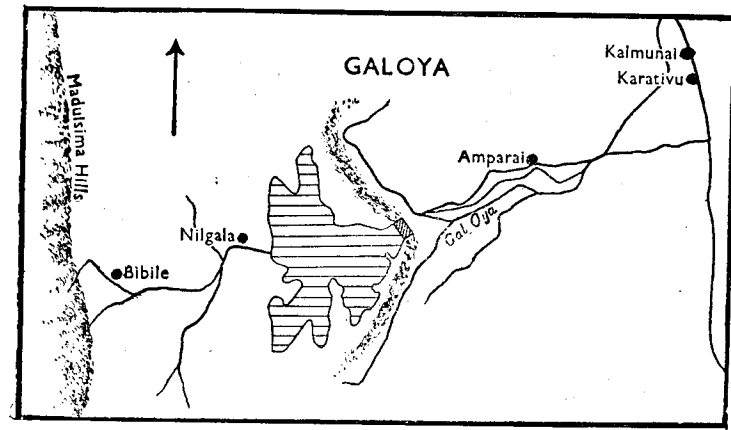
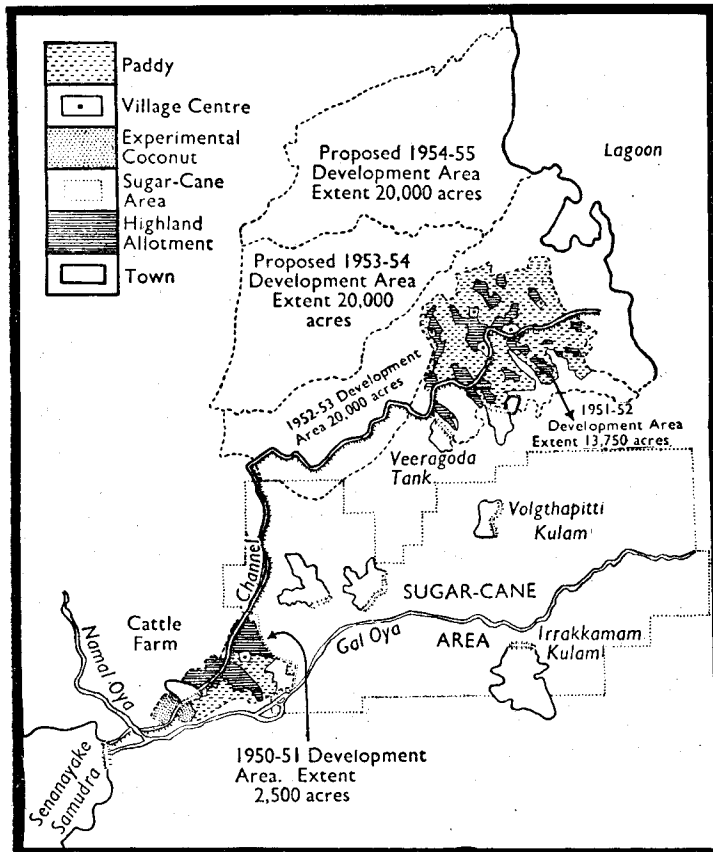
Parakrama Samudra Scheme	..	24,000 Acres	vide map on p. 220
Elahera Scheme	..	10,000	..
Minipe Scheme	..	4,000	..
Minneriya Scheme	..	10,000	..
Kalaweve Scheme	..	10,000	..
		58,000 Acres	

I. *Projected Schemes:*

Gal Oya Scheme (completed)	..	73,000 Acres
Malvatu Oya Scheme	..	24,000 ..
Walawe Ganga Scheme	..	26,000 ..
Unnichchai Scheme	..	20,000 ..
Nalanda Scheme	..	3,750 ..
Deduru Oya Scheme	..	40,000 ..
Kirindi Oya Scheme	..	24,000 ..
Heda Oya Scheme	..	20,000 ..
Minipe Ela Scheme	..	125,000 ..

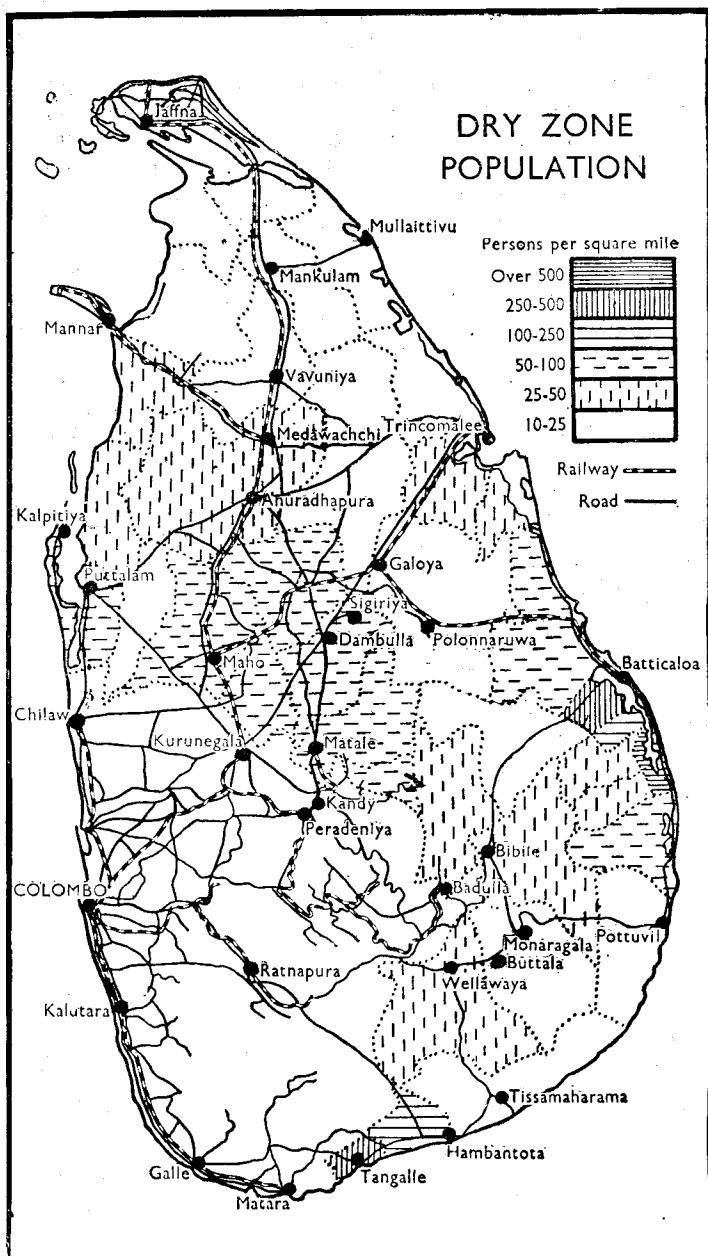
355,750 Acres





etc. there will be 200,000 acres to be ultimately developed. To this formidable task, that of clearing, rooting and rendering the land for cultivation, there is the added responsibility for a road system and irrigation distribution system: the construction of 25,000 cottages for colonists, etc. The full scheme will take at least ten years to accomplish.

The map opposite shows you the plan of the Gal Oya development area. It is blocked out into divisions to be developed by stages. Note the area set apart for the cultivation of sugar-cane and for a cattle farm. These are upland areas. Some of the village centres in existence (1953) are also shown. Close to each are paddy fields and upland allotments for dry grains, fruits and vegetables. This will be the pattern to be followed in the other areas.



## CHAPTER XII

### The Dry Zone

#### A. Population and Settlements<sup>1</sup>

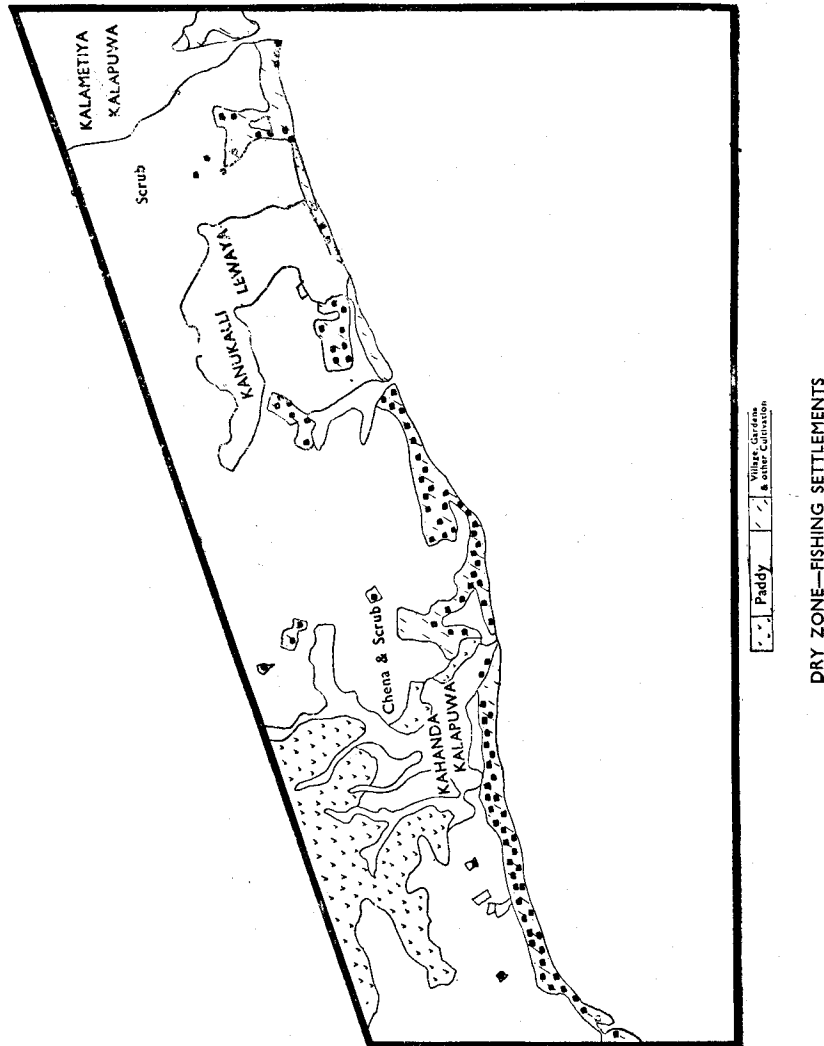
The Dry Zone today is an unpeopled land. The reasons for it are obvious in that jungle covers the greater part of it and malaria takes a heavy toll of human life. Let us now examine the map (opposite) showing us the distribution of population in the Dry Zone. Over the greater part of it, the density is below 25 persons to the square mile. Such divisions are (vide key map for divisions) the Magam Pattu, Panama, Buttala in the south. Vast forests cover these tracts and they are roadless but for a trunk road from Tissamaharama to Wellawaya and hence to Potuvil on the east coast. Other scantily peopled divisions are the Bintenne Pattu of the Eastern Province, the Tamankaduwa and the Hurulu Palata of the North-Central Province and the Northern Province excluding the Jaffna Peninsula. In all these divisions the density of population is below 25 persons to the square mile.

In many other divisions as the map will show, the population is below 25 to 50 persons per square mile. In these are found innumerable small tanks each with its little village and paddy fields. But all the same, forest covers the greater part of the land. Roads are few and the death rate due to malaria is great.

Another group is found in divisions showing a density of population ranging from 50 to 100 persons per square mile. These are found about the lower land between the Wet and Dry Zones where land is more cultivated and the conditions of life are better. Examples are Puttalam Pattu, Wanni and Hiriyala of the Kurunegala district. These have extensive coconut lands or paddy fields and the death rate is less than 30 per 1,000 people. Kalagam Palata in the North-Central Province with the Kalawewa fields show a density of 50 to 100 per square mile. Matale North and East come under this grouping.

The highest density of population is found in the Giruwa Pattus of the Hambantota district and the Manmunai Pattus

1. The reader's attention is directed to the Administration Reports of the Departments of Agriculture and Irrigation as well as to Sessional Papers on 'Colonisation Schemes', e.g., Minneriya.



of the Batticaloa district. The Giruwa Pattu West has over 250 to the square mile while the Giruwa Pattu has over 120. Both divisions have some of the finest paddy lands in the Island and in the Giruwa Pattu West which is on the border of the Wet Zone, are found large villages of cultivators of paddy and vegetables. These find a market at Matara.

In the Manmunai Pattus we find again some of the best paddy lands of the Island. The silted lagoons are today fertile fields, while the coastal belt is one large grove of coconut trees.

The sea supplies both salt and fish so that from earliest times these pattus never lacked food. But the most densely peopled section is along the coast of Batticaloa where one passes through densely packed lines of houses until further south the population gradually thins out. The density of population here is over 1,000 to the square mile. Fish, paddy and coconut have been and are today the support of these people.

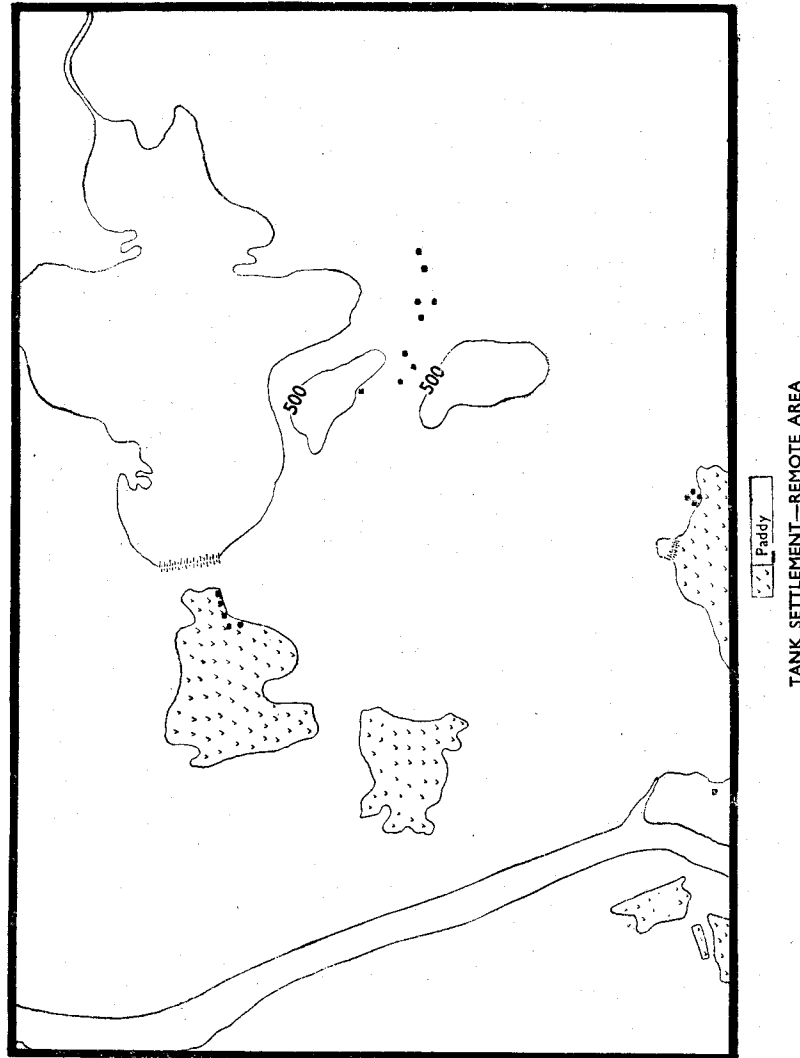
### B. Types of Settlement

The earliest of the settlements of the Dry Zone were undoubtedly the **fishing settlements**. Centuries before Aryan settlers came, there is no doubt that the South Indian people visited Ceylon, at least periodically, for fishing. Tamil names like Kudremalai, Trincomalee denote headlands and these are of value and interest only to sea-farers. These early fishermen undoubtedly established fishing camps where they dried the fish they caught and took them back with them. But some of these fishermen perhaps remained behind—at any rate they are today scattered along the north-west and eastern coasts of the Dry Zone—fishing settlements that remind one of these earliest types. The houses are grouped together round or near a well. Coconut groves hide the houses from view and the houses are walled and thatched with coconut leaves. In front of the village is a broad beach on which is often seen the boats of the fishermen and their nets and their fishing tackle drying in the sun. Near by on the beach is the dry-fish yard.

Here is a tiny agglomeration of men, forming a fishing village dependent for its livelihood on the harvest of the sea.

Another type of settlement of very ancient date is the **tank settlement**. In a dry land man and beast will congregate where there is water and when tanks were constructed, little settlements of men also came into existence. The





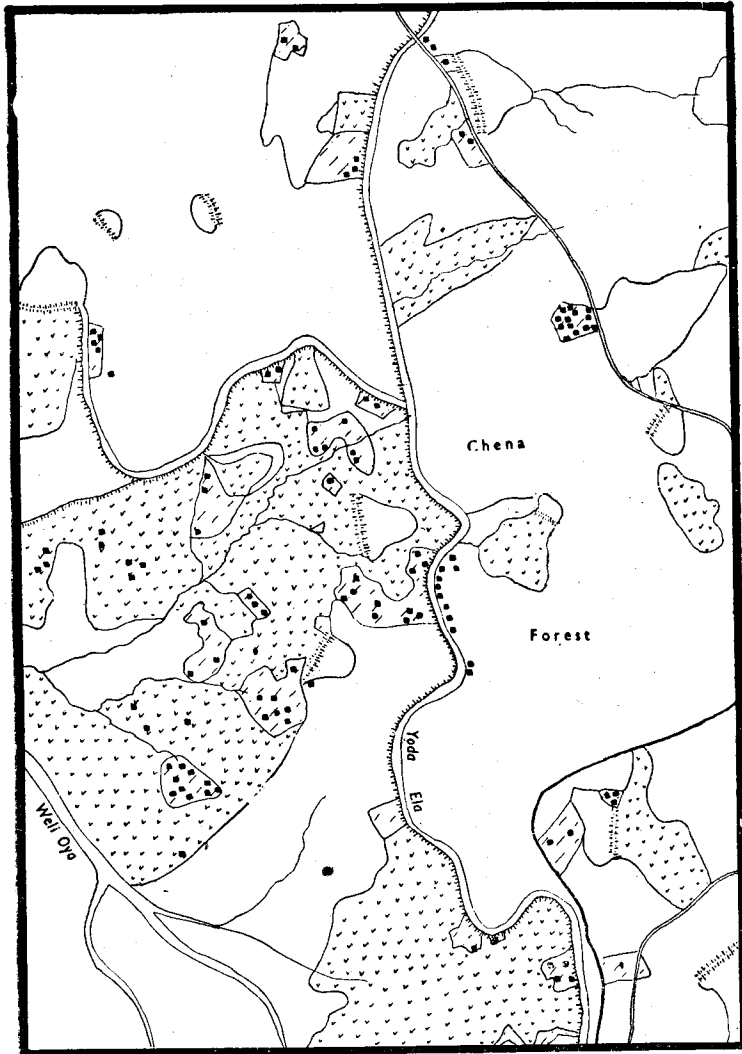
map (opposite) shows one of these types. Each settlement consisted of (a) the tank, (b) a strip of paddy land called 'mada bima' which in ancient days was cultivated by the villagers as it is to this day, (c) high land near the bund called the 'gangoda' on which all the houses were built and which contained small vegetable gardens, (d) a vast extent of forest where the villagers could tether their cattle or fell wood, etc. These features are all seen in the map here given. The old form of settlement maintains itself still, but with the coming of the roads and railways changes will no doubt take place.

Even Anuradhapura and Polonnaruwa which were royal cities are really tank settlements. They are so to this day for the supplies of water for men and fields still come from the tanks. Anuradhapura has become modernised with the coming of the railway. A busy bazaar has come into existence and the town of Anuradhapura is the focus of roads from Mannar, Puttalam, Kurunegala, Trincomalee and Dambulla.

Polonnaruwa today is a ruined city. The railway station is three miles from it and in course of time the town may become as large as Anuradhapura.

One feature most noteworthy about both towns is that the cities have been built on a north-south ridge of granite rock. These ridges are among the commonest features of the relief of the northern plain, being as explained in an earlier chapter the remnants of the peneplain which forms the north plain of the Island. The rock ridge at Anuradhapura can be traced from Vessagiri past Isurumuniya along the foot of the bund of the Tissa Wewa and then on to the 'Galge Vihare'. The Polonnaruwa ridge is as clearly seen. It starts in the south with the rock on which the so-called 'Parakrama Bahu' statue is cut and is then seen due north to crop out as the 'Gopala Pabatta near the ruins described as the Badha Sima Prasada'. The religious buildings have all been built on these rock ridges and caves and statues have been cut out of them.

We may consider along with tank settlements, towns that were important in ancient days. These too were tank settlements but the sites were chosen more for defence than anything else. The most famous of these are Sigiriya and Yapahuwa. The former was chosen as a fortress by the parricide Kasyapa because a pillar-like rock rising out of the plain served as a castle of defence. The royal palace was built on top of the citadel rock with a gallery leading



CANAL SETTLEMENTS

to the summit. A wall was built enclosing the citadel rock and within this were lakes and ponds, an audience hall, etc., while the Sigiri Wewa supplied Sigiri Nuwara with water. Rock cisterns cut on the top of the citadel also supplied water. These cisterns are seen to this day. Yapahuwa became the capital of Ceylon about 1272. These were the days of the decline of the Sinhalese power and capitals were mostly in places defended by nature. The rock of Yapahuwa served as the 'Citadel' though no signs of building of any note have been found on the citadel. A rampart that encircled the citadel as well as the moat that defended the rampart can be seen to this day. Dambadeniya is yet another of this type of city.

Two other settlements of ancient fame still survive. They are Tissamaharama and Alutnuwara. The former is situated in the midst of fertile fields and is a place of pilgrimages to this day. Alutnuwara was in the days of the Kandyan Kingdom a very large city as Valentyn, the Dutch writer informs us. Today it is a fever-haunted, straggling village.

### Canal Settlements

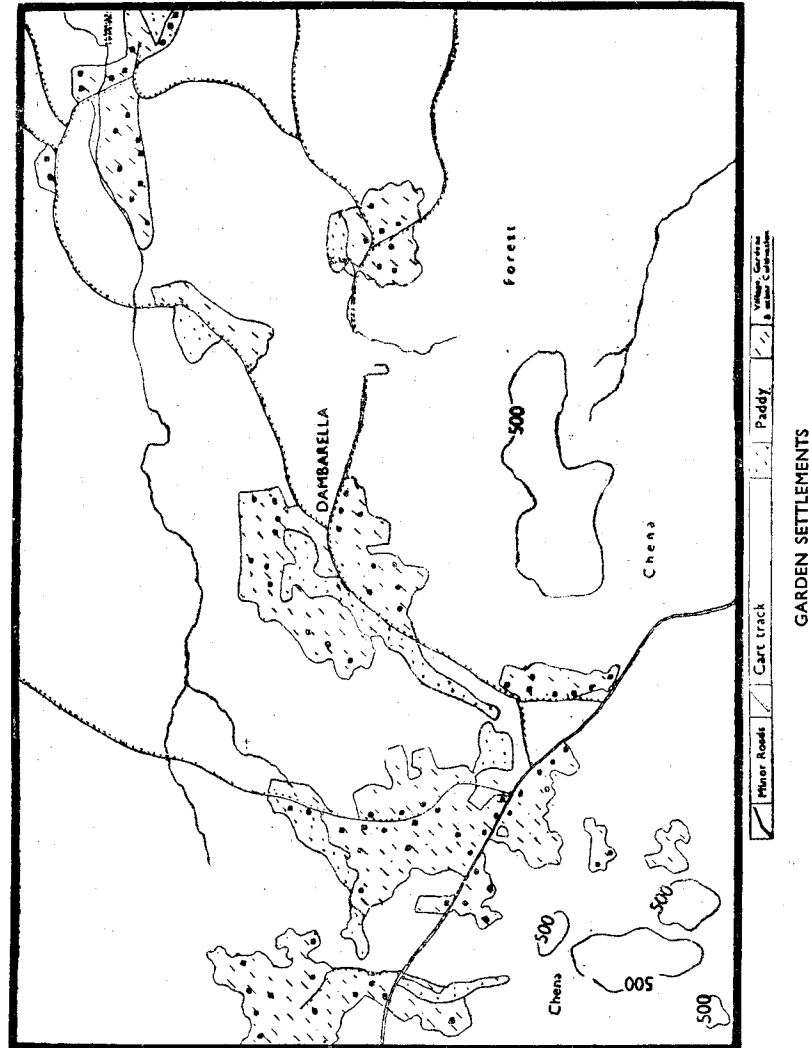
These, like the Tank Settlements depend on water for their existence, but as the canal is the means of supplying water to the cultivated land, the settlements are not so compact as in a tank settlement.

### Garden Settlements

These are based on the cultivation of 'high' land not capable of irrigation by tanks. Rain water is the source of life in such areas and fruit trees are the plants of commercial value. As the fruits, such as the orange, have to be transported for sale these settlements are strung on to the roads.

### Ports

We next have settlements which arose round harbours and which were once famous **ports**. Mantota, the great port of ancient days is no more, but opposite its site on the Island of Mannar is the Port of Mannar. The Portuguese and the Dutch were the first to realize its importance as the 'key' to Jaffna. As the town commanded a narrow seaway between the Island and the mainland sloops and ships of the day could make their way easily to Jaffna from Colombo. So the town was fortified and garrisoned.



Besides this, the town and Island brought revenue from the pearl fisheries, dye roots and salt. Elephants, from the Wannī were brought to this town for sale.

Mannar today is no more the seaport it was. The days of sailing vessels seem over now and with it the fate of the port is sealed. Fishing is now the most important maritime activity of the town.

Another old port is Puttalam. Muslim merchants visited this town in the thirteenth and fourteenth centuries A.D. for arecanuts and cinnamon. The name means in Tamil 'puda'—new and 'alam' salt pans, and salt was the great commodity sent from Puttalam to the Kandyan Kingdom. In fact Puttalam was the western port of the Kandyans, and the Dutch realizing this, could often bring pressure on the Kandyan kings by closing this port and either depriving the Kandyans of salt by cutting off their trade in arecanut, etc. To guard the port, the Dutch, in 1646, built a fort at Kalpentyn at the mouth of the Puttalam lake. The ruins of the fort are still to be seen.

Neither of these towns are ports today save for a few sailing vessels. Nevertheless the town still indicates its former maritime importance in the high percentage of Muslims found in them, 54 per cent. of the population of Puttalam are Muslims while Kalpitiya shows 58 per cent. Salt and fish are the important articles of trade of these towns.

Mullaitivu, Trincomalee and Batticaloa are three other important examples of the 'port' type of settlement of the Dry Zone.

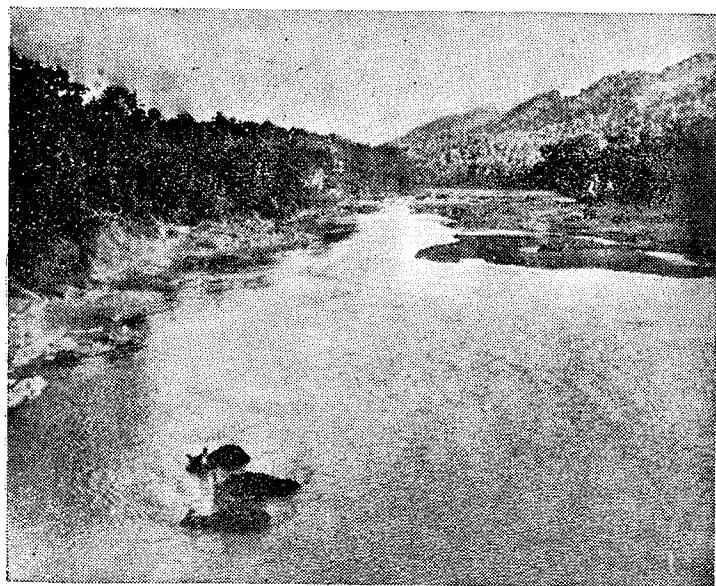
Mullaitivu was founded by the Dutch and it has been the headquarters of an Assistant Government Agent since 1898. It is a fishing port today and small sailing vessels touch here for straw and vegetables to be taken to the Jaffna Peninsula. Paddy fields and tobacco gardens are also found, but the town and the district are intensively malarial. The population of the town is a little over a 1,000 inhabitants.

Trincomalee is situated at the northern end of the great Koddīyar Bay. It was undoubtedly a Tamil settlement and very likely these settlers moved along the Mahaweli Ganga southward and established an early Tamil settlement which later came to be known as Pullathi—Nagara or Polonnaruwa. Trincomalee or rather Koddīyar was one of the eastern ports of the Kandyan Kingdom and paddy and salt were sent from this port. But Trincomalee is not a port in a commercial sense today. Though it has one of the



finest natural harbours of the world no trade centre developed there. It is more or less away from the great sea lines of traffic. Thus its low commercial value. But if some day the North-Central Province and the Eastern Province get developed and trade with India or South India arises then Trincomalee may become a port.

Its value has always been strategic. In fact the main reason for British intervention in Ceylon in 1794 was that the British East India Company, then engaged in a war with the French, discovered that in the event of a naval action in the Bay of Bengal they had no port to refit vessels



Photo

THE MAHAWELI GANGA

Geo. Koch

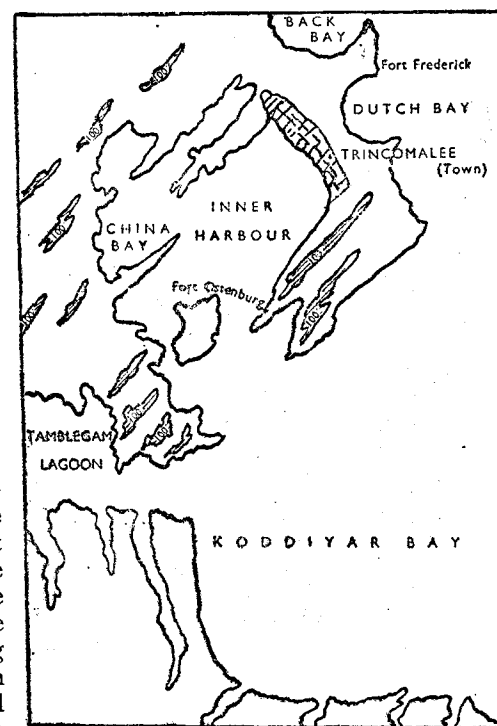
close at hand. The nearest was Bombay on the western side of India. Hence the request by the British East India Company to the Dutch to permit a British fleet and troops to enter Trincomalee harbour lest it fall into French hands. The refusal was the occasion for war between the British and Dutch in Ceylon. The Port of Trincomalee was captured in 1795. So great was the attraction of this splendid harbour that Cordiner writing in 1800 says that 'thoughts have been entertained of rendering Trincomalee the seat of government in preference to the fruitful district of Colombo,' while Tennent states that 'projects were in contemplation to

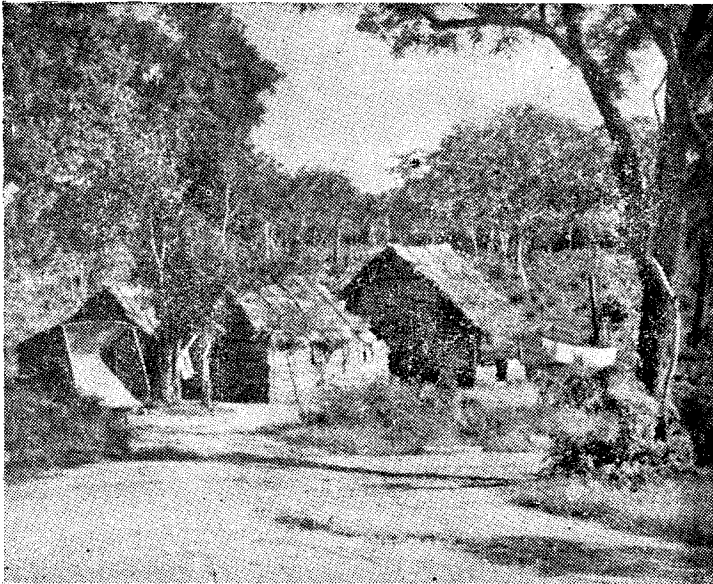
render it the grand emporium of Oriental Commerce, the Gibraltar of India and the arsenal of the East'.

From 1795 to this day the real value of Trincomalee harbour has been purely due to its strategic position in the Bay of Bengal as well as to the large size of its harbour. The population of the town is about 9,000 and in 1920 the town was connected with the capital by the construction of a light railway. This was bound to have a great effect on the future of the town as well as its trade. One sign of it is the penetration into Trincomalee of the Colombo fish dealer who transports to the Colombo market local stocks of fish.

Batticaloa was also one of the Kandyan Kingdom's eastern ports. The name means 'muddy lagoon' for the town came into existence on the bar of sand that almost blocks the mouth of the lagoon. The neighbouring lands were rich in paddy, and ghee was an important article of trade in the days of the Kandyan Kingdom. Coconuts grew on the sandy land bordering the lagoon on the seaside and it was on this sand bar that the earliest village of Batticaloa stood.

At the southern end of the sand bar there was an outlet from the sea to the lagoon and this was used by sailing vessels to enter and leave the lagoon. Thus a port arose and it is interesting to note that the Dutch Admirals Spilbergen and Westerwold, both landed here and made their way to Kandy via Alutnuwara. Batticaloa continued to be a port during

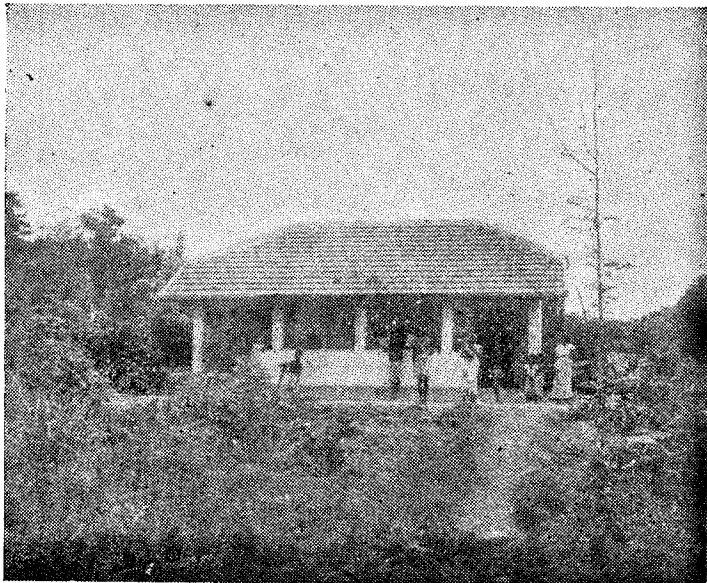




Photo

COLONISTS' HOUSES, OLD STYLE

Geo. Koch



Photo

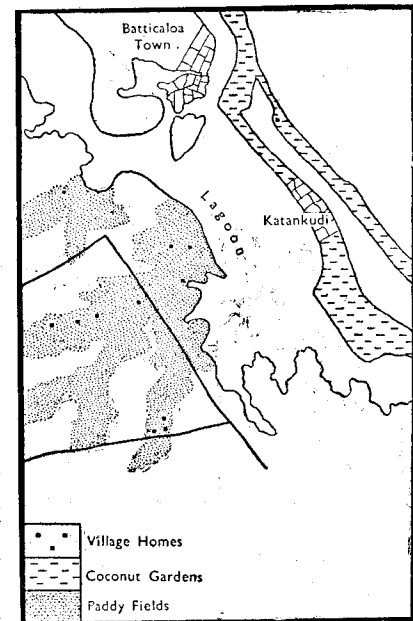
COLONISTS' HOUSE, NEW STYLE

Geo. Koch

the Portuguese and Dutch rule of the Island. But today it is a port only for small sailing vessels taking paddy, straw and coconuts to Jaffna. The town has about 10,000 people, 81 per cent. being Ceylon Tamils, 5 per cent. Moors and 7 per cent. Burghers. The last is interesting in that Batticaloa was a centre of Dutch interest in the days of Dutch rule in Ceylon.

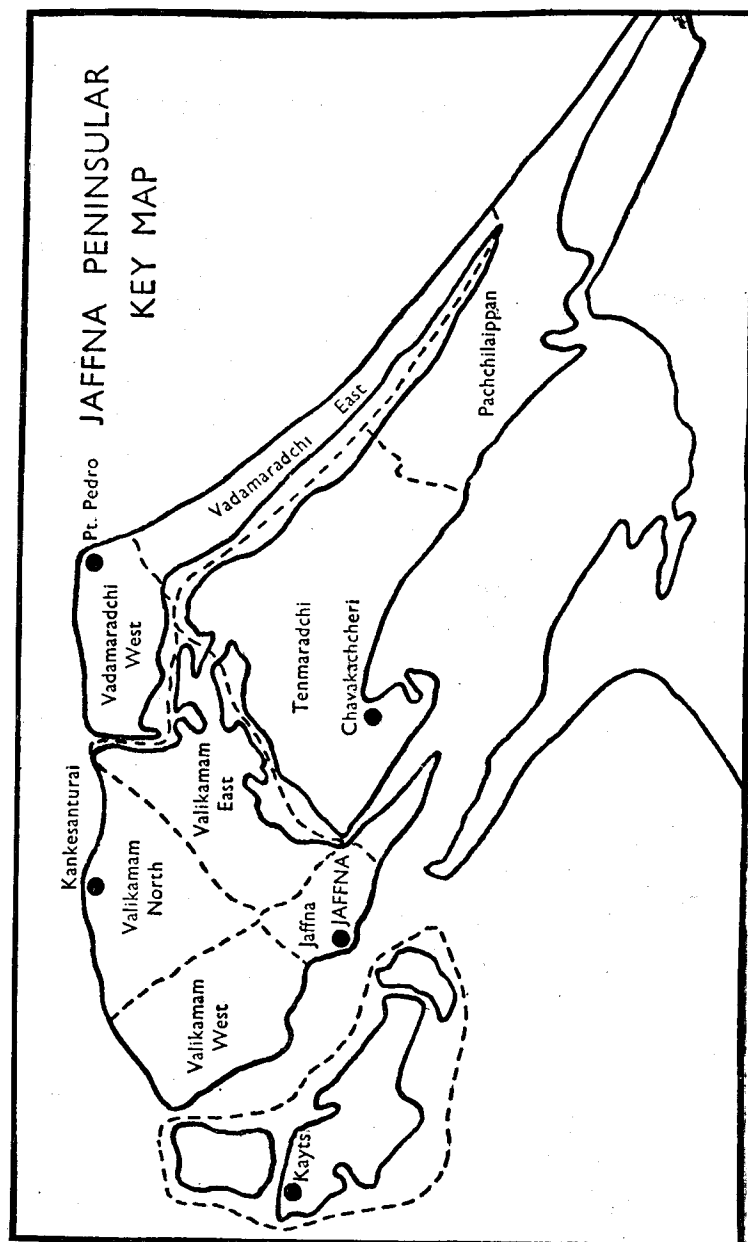
Batticaloa today is the centre of administration of the Eastern Province. Two roads link the town with the outlying districts—the coastal road to Trincomalee and Potuvil and the main road to Badulla. A light railway now connects the town with Colombo *via* Galoya and Maho.

The other types of settlement in the Dry Zone are the railway towns. These are merely halting places for the trains going through the land but they nevertheless show signs of developing into settlements. Apart from the railway station and the bungalows of the railway officials these settlements often show a few houses with a caddy or two run by the industrious Moor or Low-country Sinhalese. Thanks to the railway some of these stations have been centres of timber and fuel exploitation. Such centres, are Galoya, Mankulam Vavuniya, etc.



A new type of settlement has in recent years sprung about colonisation centres. Minneriya for instead had some years ago a handful of settlers but today the new colony has 5,000 inhabitants. A new township has been planned with schools, parks and gardens. Another similar settlement likely to come into existence is Polonnaruwa when the Parakrama Samudra Scheme is put into operation. In course of time when the schemes indicated on the map on page 220 have been worked similar settlements will arise in these places. On page 222 are two maps which illustrate these new settlements.





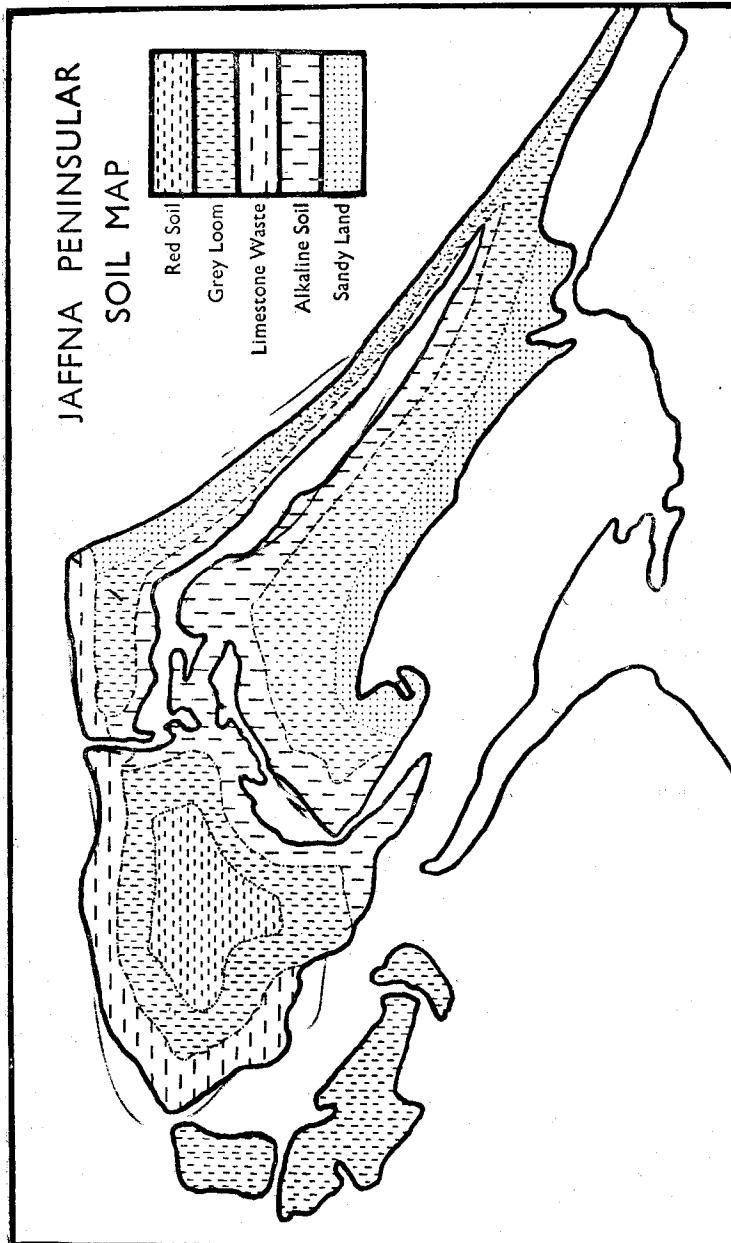
## CHAPTER XIII

### The Jaffna Peninsula

The Jaffna Peninsula has been marked out in an earlier chapter as a geographical region in itself. It is a huge limestone block—limestone laid down when the Island was submerged in Miocene times. How deep the layer is one cannot say. In the northern parts of the Peninsula this limestone crops up to the surface and the limestone is weathered by the action of rain into rock pitted with large numbers of tiny holes. In other parts of the Peninsula this parent limestone is mantled by layers of sand as in the north-east or by red or grey soil. One point of interest to the student of the geography of the Peninsula is that the limestone has stored up vast quantities of water and these can be tapped by wells. The map on the next page shows the distribution of soil in the Peninsula. On the northern and western fringes, limestone wastes are found. These are not confined to these sections only but are found scattered throughout the Peninsula especially on the western half. In these tracts the parent limestone appears on the surface. It is a hard rock and is broken up for road metal just as granite rock is broken up in other parts of the Island to serve the same purpose. These wastes are very unproductive—in fact they contain little or no soil covering and hence tiny shrubs or cactus plants alone find a means of living. Not these alone, because the palmyrah plant too grows in these divisions and its long root forces its way down to tap the water underneath the surface. In some parts of the Peninsula the surface limestone is dug out and removed and in its place a thin covering of soil and leaf mould is spread to form garden soil for tobacco. This process of soil reclamation is forced on the inhabitants by the small extent of arable land found in the Peninsula.

Along the lagoon is a narrow strip of land where the soil is alkaline. This is no doubt due to salt water having covered these parts, for the soil is salt impregnated to such an extent that only grass of very stunted type can grow. If these lands are irrigated the salt in the soil is dissolved and is drawn up to the surface where it forms a thin crust of salt and plants are killed.





Along the north-east and south-east margins of the Peninsula there are extensive areas of sand. These have been blown in by the north-east and the south-west monsoons and sand dunes thus formed are seen to this day. The sand steadily encroaches on the cultivated land as the wind sweeps it landward. In many places wooden palisades have been put up to check the progress of the dunes. This sandy tract is over a mile in width and the sand dunes are 10 to 15 feet or more in height.

All these sandy tracts are unproductive save for a few palmyrah palms, and fields can often be seen in these districts more or less covered by sand.

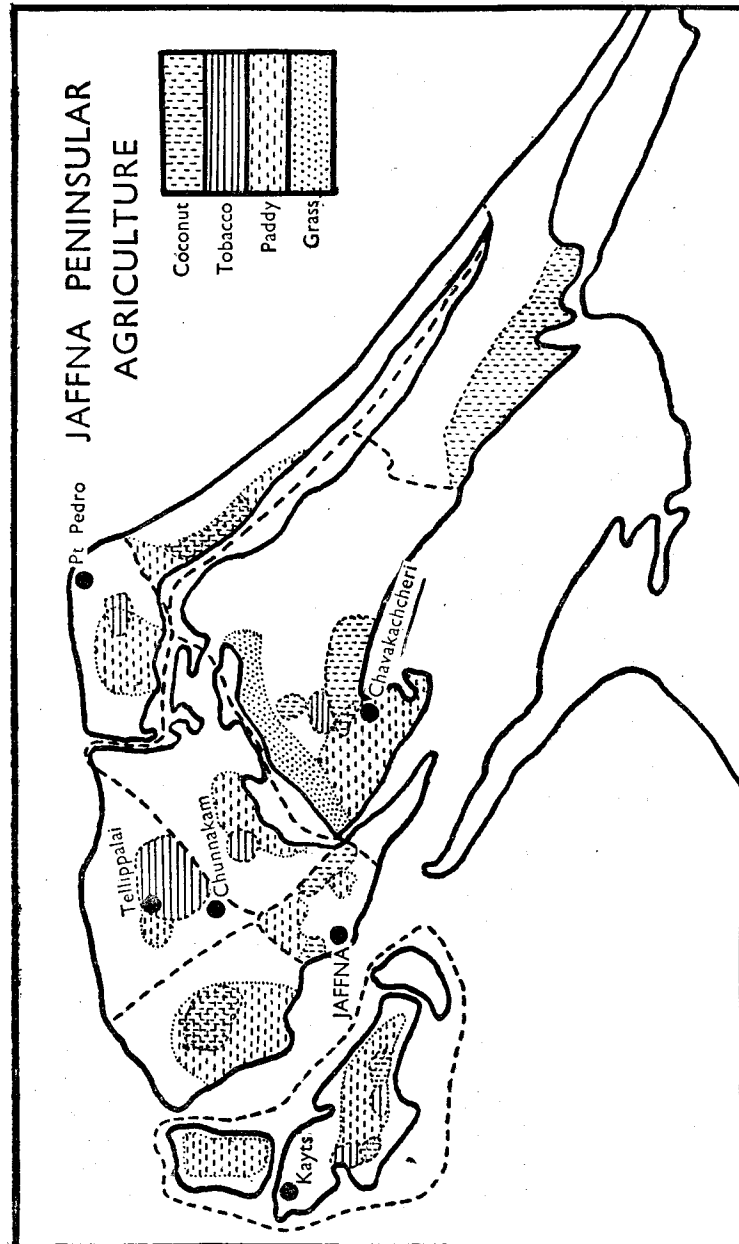
Next the map shows fairly extensive sketches of grey loam. This soil is the result of the decay of the limestone and is in itself unfertile. Most of the paddy lands of Jaffna have this grey loam. It is somewhat clayey but in the dry weather it gets caked and breaks up into a fine white powdery soil.

On the western half of the Peninsula are the red soil areas where the most valuable tobacco and garden lands are found. These soils like the grey loams are very fine grained but they differ in their colour. There are many theories regarding the origin of these red soils, but the most likely explanation is that they are results of the decomposition of the parent limestone and the red colour is due to the soil not being leached.

Leaving the unproductive soil aside we shall now examine some of the qualities of the red soil and the grey soil of the Peninsula. In the first place we must bear in mind that the amount of arable land is small compared with the extent of the Peninsula and this has compelled the peasants to direct their industry and care to intensive cultivation of the soil. As the population is very great the extent of land holdings is small, the average for a family being one-fourth of an acre.

Both grey and red soils are derived from the parent miocene limestone. Both soil types have a very fine texture permitting root development and aeration of the soil. These are valuable assets in any garden soil. The soil layer is on the whole rather thin and therefore is not quite so suited to extensive growth of trees as it is very well suited to the cultivation of vegetables.

The soils of the Peninsula are not naturally fertile, lacking plant food and humus. As the soil lacks humus it retains very little moisture especially when a long dry period sets.



in about May. But if man will by his industry manure the soil then the soil can become highly productive. Good soil in this district is certainly man-made. Accordingly, one of the most characteristic features of farming in Jaffna is the skilful use of manure both farmyard and leaf manure. Full use is made of every scrap of leaf mould, or house and village sweepings. Decayed thatch and fencing, in fact every available form of manure is utilized to the fullest. Economy of manurial substance has developed into a fine art among the peasants for the soil if fertilized rewards the peasant well for his toil. As the soil is lacking in humus much use is made of leaf manure. The leaves of the tulip tree (*Suriya*) are the commonest in use and a cart load costs 10 to 20 rupees. The leaf is at times so much in demand that it is sometimes bought from Trincomalee and Batticaloa. The trees are seen lining roads and gardens everywhere in the Peninsula, and they all bear the appearance of being pruned, for the trees have a thick trunk, but few branches, all knotted and twisted. Sixteen to twenty cart loads of leaf are buried per acre and these when decayed fertilize the soil as well as help it to retain moisture.

Farmyard manure is used with the greatest care. A cart load costs about Rs. 7.00 and hence the peasant has devised a most skilful way of economising all his resources of farmyard manure. The field is dug or ploughed and cattle or sheep and goats are penned in it. Cattle are penned in the following way. A small movable shed is made and this is placed on the field. Four bulls or cows are tethered to this and allowed to spend a few nights in the plough lands. The urine and the droppings of the animals are all well trampled into the soil. The shed is then moved to another part of the field which is manured in the same way. Thus the movable shed or sheds are made to cover the entire field in turn and the cattle manure fully utilized. The rate of cattle then used for manure purposes is about 1,340 cattle per acre. In some fields sheep and goats are penned. Here a small movable enclosure is made and placed on the field. Sheep and goats are driven in and allowed to spend a few nights in it. The field thus collects all their waste matter and besides, the soil is well trampled by the animals. The enclosure is then shifted to another part of the field and manured in this way, and so on until the whole plot of land has received its quota of manure. It is a common practice to rent out sheep and goats for this purpose.



Photo

JAFFNA—PALMYRAH PALMS

Geo. Koch

Soil fertilization is thus secured, without which the soil is unproductive. In fact the soil is kindly only to the industrious skilful farmer but is harsh and unproductive to those who are lazy and indifferent. For nature in this land is a stern mother giving her rewards only for hard and earnest toil.

The climate is very much the same as that of the Dry Zone. But the annual rainfall is lower, being 25 to 50 inches for the year. It is distributed much the same way as in the Dry Zone. The major wet period comes with the north-east monsoon in November and ends about January. February and March are dry and the crops sown before the monsoon rains ripen in these months. April is a minor rainfall month but May to August is dry. As in the Dry Zone, cultivation is possible if fields can be irrigated. As there are no rivers flowing through the Peninsula we do not find tanks of the type we find in the Dry Zone. Instead, the land is studded with wells, for the limestone underneath the soil holds water. They are tapped by means of wells and the labourers of the peasant or pumping machines must raise the water to irrigate the fields. If the Dry Zone is the land of tanks where settlements grow alongside, then Jaffna is the land of wells where farms and homesteads gather round a well of water.

#### Jaffna Peninsula—Occupations

It is not possible to trace in any detail the history of man's settlement and utilisation of the Peninsula. But we may recall a few geographical 'controls' that have exercised an influence on, or supplied opportunities for, men's activities. Most likely the earliest settlers were fishermen of South India who came there periodically for fishing and a few may have settled down permanently. Even to this day fishing settlements are found along the north coast of the Peninsula. The palmyrah tree which may have grown wild was of great assistance to settlers in a land where food was hard to get. Moreover the Peninsula was never forested and land clearing presented no difficulty as the natural vegetation was of the jungle or scrub type. The presence of underground water was a blessing to the people in a dry land, and has been the most important condition for human settlement in the Peninsula. The limestone derived soils are naturally unfertile but when worked are productive, so that all in all the environment was not soot or kindly to man. Nor should we forget the geographical fact of the nearness to South India. It is from this region that the Peninsula received its earliest



inhabitants and more than that, the language and culture as well as the religion of the people. It is this combination of peculiar physical as well as human conditions that gives the Jaffna Peninsula an individuality of its own distinguishing it from all the other regions of the Island.

We shall now examine the occupations of the people of Jaffna today.

### Fishing

This old time occupation of sea-faring people or those whose homelands are barren and unproductive is carried on to this day along the coasts of the Peninsula. During certain seasons, the bulk of the business is in the hands of Sinhalese capitalists from the Western and Southern Provinces who occupy the shore along the Pachchilaippali and Vadamaradchi divisions and their catch is sent out to other provinces either iced or dried. The loss and hardships caused to the fishermen of certain localities by the disturbances of their quite enjoyment of fishing in the portion of the sea in the neighbourhood of their villages have formed the subject of complaint to the Government Agent on more than one occasion. The absence of legislation of the rights of the prescriptive use of the sea within the three-mile limit has been keenly felt (Administration Report, 1928).

Chunks and Beche-de-Mer are caught in the seas in the Tenmararadchi and Island Divisions for export chiefly to India.

### Agriculture

This is the most important occupation of the people of Jaffna, and it is in this field that we see the influence of geographical factors most clearly. We have pointed out the nature of the soil and the distribution of sandy areas and limestone wastes and this is reflected in the fact that only 28 per cent of the Peninsula is cultivated even by those who are undoubtedly the most industrious peasants of Ceylon. The scarcity of arable land and the large numbers it has to feed explain why the extent of land per family is as low as one-fourth of an acre:

According to the agricultural practices of the Peninsula the arable land is classified as follows: (a) dry lands, (b) wet lands, (c) garden lands. We shall study the methods of cultivation on each type. We should also bear in mind that the agricultural map of the Peninsula corresponds to the

soil map in that paddy and coconuts are grown on the grey loams and tobacco and vegetables flourish on the red soils.

*Dry Land Cultivation.*—These are the very poor lands and most of them grow dry grains like kurakkan, *tanahal*, (*varagu*), etc. Yams are also grown in rotation with dry grains.

*Wet Land Cultivation.*—These are the paddy lands of the Peninsula. The soil map shows the distribution of the grey loams and these areas are more or less identical with the paddy lands. Those grey soils are found in the island divisions of the Peninsula, namely, the Islands of Delft, Karativu and Kayts. In these places too the grey loam soils are paddy lands.

All these paddy lands are rain fed. By September the fields are ploughed very lightly and the soil, loose and powdery, is then ready to absorb the rains of the north-east monsoon. The field bunds are very carefully made so that the rain that falls in each lot of paddy lands is held within it and fully absorbed by the thirsty soil. After the ploughing manure is applied to the field and with the first rains of September the fields are sown. All through the wet months of October-December the plants grow and by January sunny dry weather begins. The grains harden and ripen and by February the harvest is gathered. The yields are low being about 20 bushels per acre but the value of the straw is high. Natural grass being scarce, straw as fodder is in great demand and at times a pound of straw costs ten cents. The quantity of paddy grown in the Peninsula is insufficient for the demands of the people and paddy is imported from Trincomalee, Batticaloa and Akyab in Burma.

If the paddy fields can be irrigated by means of wells then the harvesting of paddy is followed by the cultivation of vegetables. The land is ploughed up and the roots of the paddy plants are buried deep. The land is marked out into plots and manured. Chillies and brinjals are then planted in alternate rows—two crops off every plot of ground. As these plants have to live through the dry months of May and June the peasant is compelled to water the plants. This is done by means of a well and well-sweep. Every visitor to the Jaffna Peninsula must have been struck by the presence of these wells, each well being indicated by the tulip trees and a coconut tree or two. The well-sweep is a mechanical device to facilitate drawing water from the well



Photo

A WELL SWEEP

Geo. Koch.

A palmyrah trunk is supported horizontally on supports with the thinner end of the trunk just over the well. To this end is fixed a pole or a rope that can be dropped into the well and at the end of the pole is a bucket. Two men walk up and down the palmyrah trunk and as they walk towards the thinner end their weight dips the pole and its bucket to the mouth of the well. As they walk towards the thicker end of the beam they bring up the thinner end and with it comes the bucket filled with water. This is emptied by a third man into the field. Thus for hours two men run up and down the palmyrah beam working it in a see-saw manner while a third man lifts the bucket and empties it into the field where the little channels carry the water all over the garden. But today in many parts of the Peninsula water-wheels such as Persian wheels are used and in the future with the development of co-operative societies, peasants may have the capital to purchase in common more efficient means of irrigating their lands than the well-sweep.

The chillies are harvested in May and sun dried. Often a crop of manioc is planted along with the chillies. Unlike in other parts of the Island, the manioc cutting is planted bolt upright and only one shoot is allowed to grow, the others being destroyed as they come. Here again is an example of the efforts of man to gain much out of little in a land where the soils are poor and food is hard to get. By thus destroying superfluous growth the plants develop more yams and this is the aim of the cultivator. He leaves nothing to chance nor does he slacken his efforts to grow—as the saying goes—two blades of grass where nature would grow one.

Plantain trees are often grown on these grey loams and are an important source of income to the peasant. The soil is well manured and plantain suckers are set in the field in rows about ten feet apart. No tree is allowed to develop more than two suckers. The purpose being to concentrate more on the size of the plantain fruit than on the number of trees. The yields are about forty bunches per acre and are sold at two to three rupees each. As soon as the trees are cut down for their bunches of fruit the trunks are chopped up and buried, thus providing—as the Indian Department of Agriculture has shown—the best manure for the plantain tree.

*The Garden Lands.*—These are the best worked lands of the Peninsula and show at their best the remarkable skill, patience and industry of the Jaffna peasant.



The garden lands are red soil lands and are found west of the Tondaiman Aru, or the inland lagoon of the Peninsula, in the division of the Valikaman East, North and West (vide key map). It is on these soils that tobacco is grown.

### Tobacco Cultivation

There are three varieties grown in the Peninsula. 'Thaddjan', for the making of cigars for the local markets. 'Naramban', a chewing tobacco grown mainly for the Malayalam market and the third 'White Burley'. This was introduced to the Jaffna Peninsula in 1915 and in this year only six took up cultivating the new tobacco. Government assisted the farmer by providing seed and arranging for the sale of the tobacco in England. At the present time there are about 5,000 acres under tobacco in Jaffna and the Northern Province.

Tobacco is grown to a very large extent on red soil lands. As they are lacking in humus and plant food, the lands have to be carefully tilled and manured. The preparation of the soil takes place in July. In August and September the cultivator digs and then ploughs his garden and the soil is manured by penning cattle, goats and sheep. How heavy the application of manure is, can be gauged by the fact that an acre of land will have animals penned on it at the rate of 1,300 cattle or 4,000 sheep or goats. The fields are ploughed again in October so that the manure is mixed with the soil. In the same month nurseries are prepared after the soaking rain of the north-east monsoon. In November 16 to 20 cart loads of green manure are buried in the field and about 16 cart loads of cattle manure are sprinkled per acre.

The land is then levelled and plots are marked out with little drains running down each little plot. In December the tobacco plants are taken from the nurseries and transplanted in the plots prepared for them, one plant being 18 inches away from the other. Every day the plants are watered by means of well-sweeps. In February the heads of the plants are topped or plucked off. This tends to check the height of the plant and make the leaves broad. In March and April the harvest is gathered. The average yield per acre is about 560 lb. and the sums realised by their sale amount to Rs. 360,000.

Once the tobacco is harvested the land is not allowed to rest idle. Other crops are planted in succession for good land is limited in extent so these must be made productive



Geo. Koch

TOBACCO CULTIVATION

Photo



all the year round. Such a system of cultivation is exactly the opposite of chena cultivation, for in Jaffna the peasant grows many crops in rotation on the same piece of land whereas the chena cultivator changes his plot of land in rotation whenever it shows signs of decreasing yields.

Here are few examples of the type of crop rotation practised in Jaffna.

- (1) *November to March.* 'Period of the north-east monsoon rains'.

Tobacco occupies the land during this time and the harvest is gathered in March.

- April to July.* 'Period of rain scarcity'.

Thana-hal and kurakkan (dry grains) are grown and along with this 'king yam', manioc and other yams are planted. Thana-hal is harvested in July and the yield is about 48 bushels per acre. The straw of the thana-hal and kurakkan plants provide fodder for cattle. After the harvest of thana-hal, etc., in July the land is given a hoeing and fresh beds and channels are prepared. Green gram is then sowed and it forms a good crop with manioc.

Manioc and other yams are lifted in December and are followed by a crop of chillies. These occupy the land till April and are harvested in May. The land is then prepared for tobacco.

- (2) *Here is a second type of crop rotation:*

In a standing crop of tobacco, cultivators sometimes grow plantains. After the harvest of tobacco the plantains are allowed to occupy the land for two or three years to be followed again by tobacco.

- (3) *A third system is as follows:*

A crop of paddy is followed by chillies, vegetable and manioc. An acre of chillies will yield 4,000 lb., the gross income from it being Rs. 500 to 600.

In all these forms of crop rotation the peasant's idea is not only to make the fullest use of the land but also to gather food crops like paddy and dry grains and yam and cash crops like tobacco, chillies and vegetables.

Besides the crops referred to there are others, the most important being betel leaf. This is marketed at Chunakam and as there is a very good demand for it, it fetches good prices too. Betel leaf cultivation is interesting to the geographer in that he sees in it another form of man's response

to his environment. We have seen that the Jaffna Peninsula is a land of poor soil and as the population is very great the need for food and cash crops on the land is very great too. This leads to a wise and careful use of the available land and the magnificent system of crop rotation and soil fertilization is the result of a very wide experience. Nature is not bounteous and hence man has had to work hard to earn his living. Thrift and prudence as well as patience and industry have been the quality of the Jaffna peasantry.

The betel vine is planted in little plots of land a yard square. This has of course been well tilled and manured. Along with the betel vine cutting a live stake is planted, e.g., (Eramudu). The betel vine is trained to this and the peasant plants alongside the betel vine, a 'king yam' cutting. This latter is a quick growing creeper and soon mantles the live stake with its leaves. The tender betel vine grows slower and as it is very susceptible to the heat of the sun and the dry parching winds of May, July, the king yam leaf-covering acts as a shade. When the betel vine has got a foot-hold and the creeper grows to maturity, the king yam creeper's leaves drop and the yam is then lifted—two crops of yam and betel per square yard of ground. The economy and use of the scanty resources of nature have reached almost the level of an art.

In many other ways the peasant makes 'much out of little'. Often on the borders of vegetable lots, or gardens of chillies, bean creepers are grown providing a second crop. Where garden plots are fenced in, the fences are used as a trellis for snake gourds and other vegetables. Sometimes at the four corners of a small plot, a yard square containing a brinjal plant one discovers four Indian corn plants and to these are trained bean creepers.

Land utilisation in Jaffna is limited by two factors—facilities for irrigation and extent of arable land. As the Peninsula holds vast stores of water underground modern pumping machinery can help to bring this water to the surface or irrigate the land. Such a scheme is in hand. The famous tidal well at Puttur holds an apparently inexhaustible supply of water and thus will be utilized for a modern scheme to irrigate the land in the vicinity.

The other scheme is to wrest land from the sea. Suggestions have been made to close the sea outlets of the Jaffna

lagoon and then to pump out the sea water. Once the sea water is cut off from the lagoon, the land, now impregnated with salt, can in course of time be made arable. The reclamation of the Zuider Zee in Holland is an excellent illustration of this. If the Jaffna lagoon can be reclaimed, it is believed that about 50,000 acres of land will then be rendered useful to man.

## CHAPTER XIV

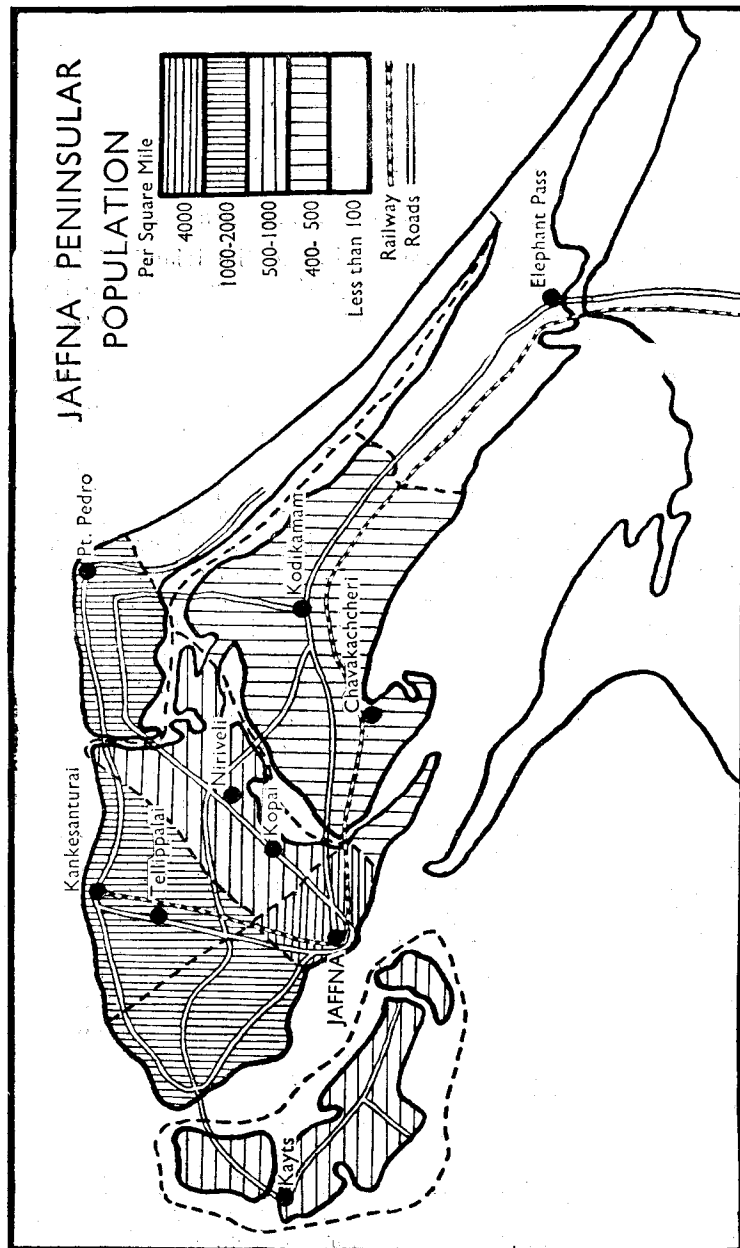
### The Jaffna Peninsular

#### Population and Settlements

Although the Jaffna Peninsula and the Island divisions are not naturally fertile and only 28 per cent. of the land is cultivated yet the Peninsula shows a very high density of population. The density per square mile is 331 but the number of persons to the square mile of cultivated land is 1,616, the highest for the Island. This indicates the importance of agriculture in the Peninsula but at the same time the land can support this population because there is a regular despatch of money, etc., by the Jaffna people who find employment outside the Peninsula as well as in other lands, e.g., Straits Settlements. 'The emigration is heaviest from the Jaffna Peninsula and consists largely of educated young men who have been successful in securing clerical and other posts in the other districts of Ceylon and in the Straits Settlements. In 1910 the figure of remittances from the Straits Settlements and the Malay States was put at Rs. 602,878. In 1920 this figure had risen to Rs. 2,120,000'

This emigration of the educated and ambitious persons from the Peninsula is an illustration of what normally takes place in any land where natural resources are poor and opportunities of earning a livelihood few. The Jaffna Tamil has been humorously referred to as the 'Scotsman of Ceylon' and there is a great deal of truth in this description.

The map on page 258 shows the distribution of population in the various divisions of the Peninsula. Vadamaradchi East and Pachchilaippali show the lowest density for the Peninsula, the number of persons to the square mile being less than 100. That is no doubt due to the stark barrenness of the land in the case of Vadamaradchi division. The soil map shows areas of alkaline soils and barren sands but even in these divisions the number of persons per square mile of cultivated land is 1,000. This points to heavy concentration of population where land is arable or where fishing can be carried on. The Pachchilaippali division is very malarial and hence the number of persons per square mile of cultivated land is the lowest for the Peninsula, being 275 per square mile of such land.



Tenmaradchi has 400 to 500 people per square mile, while the number of persons per square mile of cultivated land is 1,000. This division has a fairly extensive area of barren land in the sandy tracks towards the south and alkaline soil on the north and west. The arable land is mostly grey loam. Hence paddy and coconut are grown, the division having 21 per cent. respectively of these products for the whole Peninsula. There is very little here of that intensive cultivation of the land we find on the red soil areas of the Peninsula. This may be the principal reason for the density of population per square mile of cultivated land of this division being less than that of the garden lands.

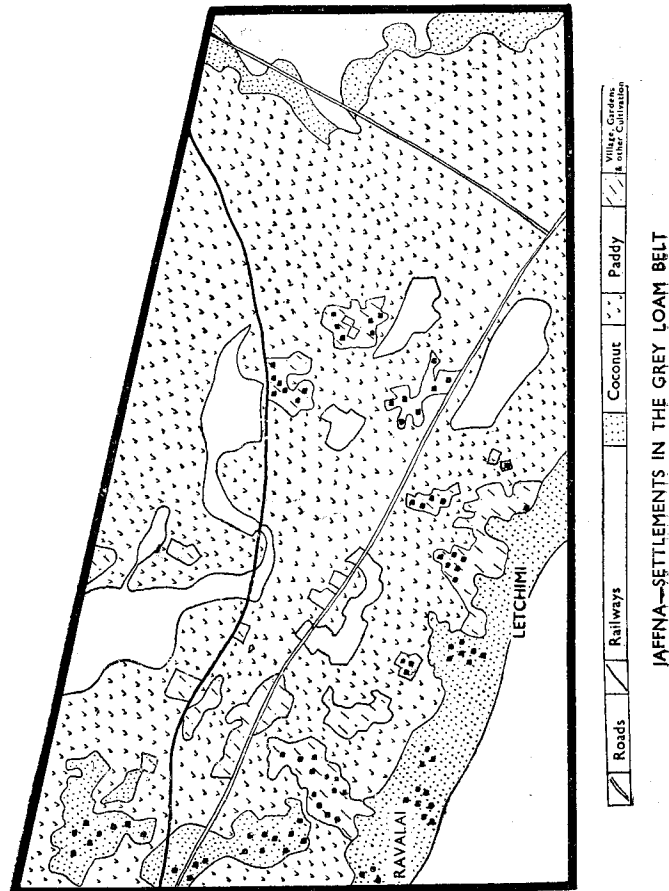
Valikaman East shows 500 to 1,000 persons per square mile. Here too the land bordering the lagoon is barren and only 16 per cent. of the total area of the division is cultivated while the soil of the rest of the division is so cultivated that the number of people per square mile of cultivated land is 4,000. The principal occupation is tobacco cultivation and market gardening; places like Kopay and Neerveli being justly famous for their vegetables. Thus the lands intensively cultivated carry 4,000 to a square mile, a figure not approached by that of any other division or district in the Island.

Vadamaradchi West, Valikaman North and West have 1,000 to 2,000 persons per square mile. But the number of people to the square mile of cultivated land is 5,000 in the first two divisions and 2,000 in the third. Valikaman West has many extensive tracts of limestone wastes and grey loams where paddy is the principal crop. 27 per cent. of the total area of this division is under paddy and only one per cent. of the total area is under tobacco. As in the Tenmaradchi division absence of intensive cultivation shows itself in a smaller number of persons per square mile of cultivated land.

Vadamaradchi West and Valikaman North are divisions where intensive agriculture with systematic crop rotation prevails. In fact the former has 13 per cent. and the latter 30 per cent. of the total acreage under tobacco for the whole Jaffna Peninsula. This means that the soil is put to its fullest use and the number who earn a living thereby, is great.

Jaffna town and Jaffna division have over 4,000 to the square mile. This is more a town grouping of population rather than a village grouping as one finds in Vadamaradchi West, Valikaman North and East where agriculture is the sole means of employment for men and women. Moreover





Jaffna town is the 'metropolis' of the whole Peninsula as well as its market and business centre.

Summarising the features of the distribution of people in the Jaffna Peninsula we find that nowhere else in Ceylon is there a higher density of people per square mile of cultivated land than in the Jaffna Peninsula. This is due to the two reasons mainly—the money sent by those who have migrated from the Peninsula and secondly to that system of cultivation where the same land provides a money crop as well as a food crop thus enabling a hardy and thrifty people to live on the land. It is true that there is a steady decline in the number of those whose occupation is agriculture as the younger generation is seeking employment in other walks of life.

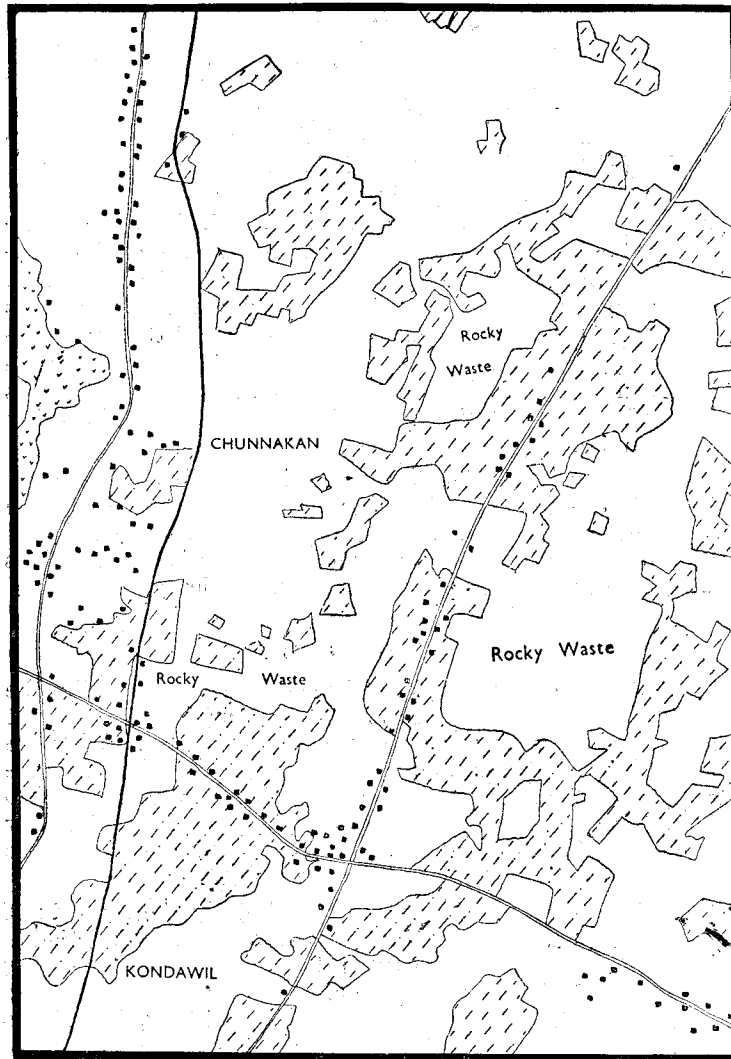
Another interesting feature of the distribution of population in the Jaffna Peninsula is the correspondence between distribution of people and the types of soil. The red soil with its garden lands naturally supports the largest numbers while the barren sandy lands support the least.

### Settlements

The oldest types of settlement are undoubtedly the fishing settlements. These are found along the north coast and along the sandy east coast of the Peninsula. They are only clusters of houses of the poorest description and the sea provides them with means of livelihood. It is also interesting to note that the limestone wastes and sandy areas contain these fishing areas, for it is where the land is harsh and barren that man takes to the sea.

Along with fishing ports we shall study the seaports of the Peninsula. Most picturesque of all is Kayts situated on the north end of the Island of the same name and guarding the channels leading to Jaffna. Kayts is referred to as Uratota in the earliest days of Ceylon's history, but Kayts owed its importance to its strategic site for, like Mannar, it guarded the sea entry to the town of Jaffna.

The Dutch were among the earliest to recognise this, for the Dutch Commander of Jaffna in 1697 says, 'The fortress, Kayts, serves on the north like Mannar in the south to guard the passage by water to the castle (fort of Jaffna) and also serves the same purposes as Point Pedro for searching of private vessels. Kayts continues to be a small port still, and its channel is most picturesque with sailing vessels that recall to mind the sea trade of the middle ages'



Roads
 Railways
 Paddy
 Village Gardens & other Cultivation

SETTLEMENTS IN THE RED SOIL BELT

Kankasanturai, Valvedditturai and Point Pedro along with Jaffna are the other ports of the Peninsula. All these are open roadsteads and not sheltered harbours, and trade with other parts of Ceylon, India and Burma is carried on. Sailing vessels do all the transport. The total quantity of goods imported via these northern ports in 1950 amounted to 7½ million rupees. The chief imports were beedies, textiles, tiles, cement, rice and flour. The value of the exports was two million rupees. They were chiefly tobacco, chanks and coconut.

The demand for grain in the Peninsula where paddy fields are few and poor is indicated by the customs revenue derived at these ports from the import of grain. Among other goods should be noted, pottery, tiles, bricks and straw—products which can be profitably shipped in sailing vessels.

Jaffna is the administrative centre of the Peninsula and is connected by rail with Colombo. It is thus the distributing centre of foreign goods for the Peninsula. The town still bears traces of Dutch rule especially in the fort which is very well preserved to this day. Jaffna was in the days of Dutch rule the administrative centre of the Dutch Commandant and collected the revenue of the whole province. Besides the trade in elephants (from the Wanni) wrote Zwardcroon in 1687 the company deals here only in pepper, some copper, zinc, sugar and arecanut. Besides these, traders from South India came to Jaffna.

But the modern importance of Jaffna dates from British times. It is the capital town to the Northern Province and is connected with Colombo by road and railway. This greatly encouraged trade with other parts of the Island as well as encouraged people to migrate in search of employment. Many excellent schools are found in the Peninsula and these trained generations of Jaffna young men and women to play their part effectively in the affairs of this country. The population of the town is 62,543.

The other settlements of the Peninsula are mostly rural. Villages are common but the prevalent type of settlement in the garden lands is not the village. Houses are very scattered and strung like beads along the roads. This is of course due to the land being cultivated and thus the homesteads are on the margins of fields and gardens. But in the paddy and coconut lands houses tend to group together

into villages with stretches of paddy fields between village and village.

Centres of roads and railways in these rural areas tend to become market centres, Chavakachcheri and Chunakam being the best examples. The latter is the more important as it is situated almost in the centre of the garden lands of the Peninsula.

## CHAPTER XV

### Ceylon—Trade and Internal Communications

Having now studied the geography of the various natural regions of the Island it is best to look back on the Island as a unit so that the natural regions may, like parts of a picture fit into the whole.

Let us study the map of Ceylon showing us the roads and railway lines in use today. This map tells us at a glance the relative importance of the various natural regions. Thus the most densely peopled or the most cultivated regions will show the largest number of roads. While the least populated or cultivated regions will only show main lines directed to the important towns in these regions.

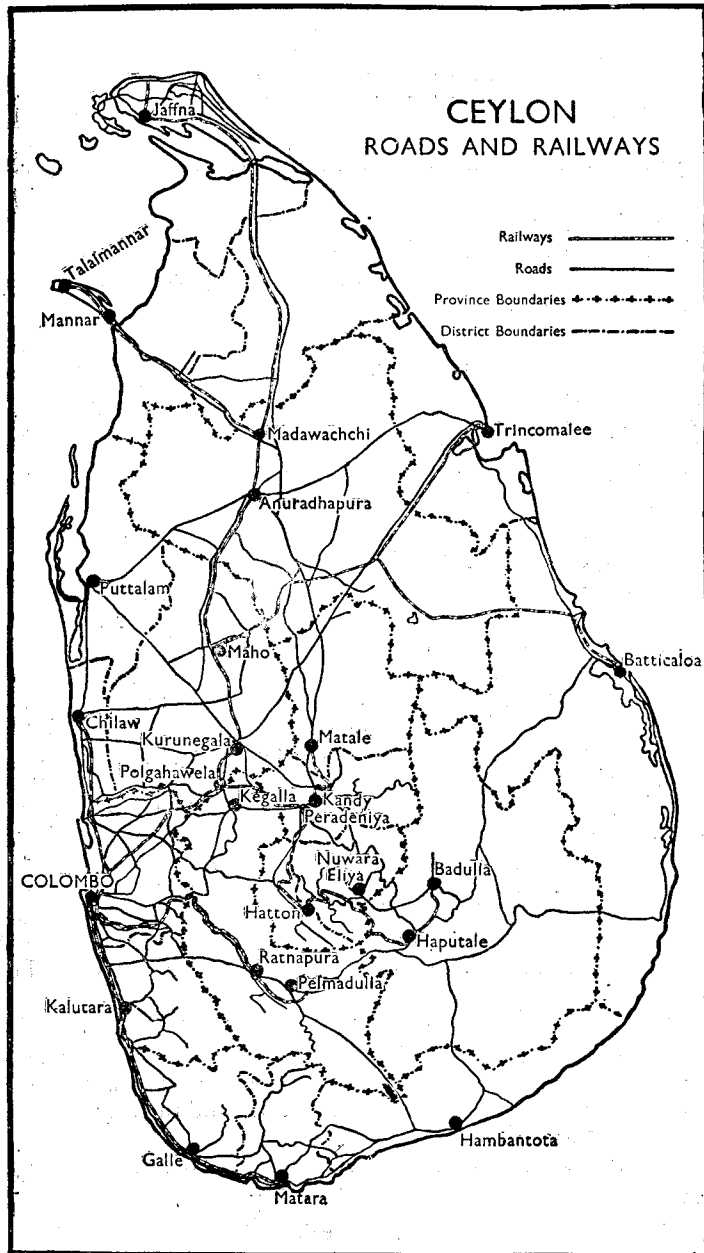
The South-west Country and the Hill Country are both well supplied with trunk roads and many feeders to every part of the region. Thus in the South-west Country we find Colombo as the centre of all road and rail transport. From Colombo an important road runs north to Puttalam and another runs north-east to Kurunegala. These two roads run east and west of the coconut lands and many feeders run across this division east and west. Almost parallel to the roads are two railway lines—one to Chilaw and the other to Kurunegala and beyond. Eastwards, a road leaves Colombo to Kegalle and Kandy—to Avisawella, and thus to Hatton on the one hand and to Ratnapura on the other. A narrow gauge railway links up Colombo with Ratnapura and Opanaika. Southward, road and railway proceed to Matara, the road being continued eastward to Hambantota. Along this coast line are important road and railway centres while feeder roads bring the inner districts in touch with the coast way.

The road and railway lines bring together into the central market town and port of Colombo all produce for shipment abroad. And in like manner imported goods are distributed throughout the land by means of this road and railway system of transport inland.

Roads and railways in the Hill Country are really the servants of the great plantation industry there.

From Colombo via Polgahawela a broad gauge railway runs to Kandy and is continued to Matale. The main line





up-country turns hillwards at Peradeniya Junction and runs via Gampola, Nawalapitiya and Hatton to Nanu Oya and on to Badulla where it terminates. This trunk line runs through the most important tea districts of the Hill Country and towns like Gampola, Nawalapitiya and Hatton are foci of roadways feeding the railway traffic.

From Nanu Oya a narrow gauge line runs to Nuwara Eliya and terminates at Ragalla. This line is now closed to passenger traffic.

The principal roads entering the Hill Country are the Colombo-Kegalle-Kandy road, the Colombo-Yatiyantota-Ginigathena-Hatton road, the Colombo-Ratnapura-Haputale-Badulla road, the Dambulla-Matale road and the Batticaloa-Badulla road. All save the last two are economically important as goods and passenger traffic make very frequent use of them. Within the Hill Country are important trunk roads such as the Kandy-Gampola-Nuwara Eliya road to Welimada and Badulla. The Kandy-Nawalapitiya-Kotmale road to Dimbulla, the Nawalapitiya-Hatton-Maskeliya road and finally the roads radiating eastward from Kandy to the tea district of Madulkelle and the Hanguranketa road past Taldeniya to Madugoda.

These roads serve the estates and they concentrate on the important railway towns of Badulla, Hatton, Kandy, etc. Thus we see that regions which are populated and under cultivation are well supplied with road and railway. And they in turn all lead to the great port of Colombo for the major products of the wet and dry zones are the principal export commodities of the Island.

The road and railway map shows the great contrast between the Wet and Dry Zones. For in the latter we find a few trunk lines of roadway and railway and these lines traverse the land through jungles and waste places. No feeder lines join the main roads and railways and only a few stations and towns are found along these routes. This is true of all roads and railways traversing lands which are yet forested or unproductive.

Thus the railway line from Colombo to Jaffna crosses the Dry Zone with a branch at Madawachchi to Mannar and another to Maho whence the Trincomalee-Batticaloa light railway begins. These railways link towns of the Dry Zone, especially the provincial administrative centres, with Colombo. They have besides assisted in forest exploitation and the development of the timber trade. The principal roadways

too are trunk' lines with little or no traffic. From Kurunegala, roads run to Puttalam from where the main road goes to Anuradhapura and on to Trincomalee. Next from Kurunegala another road runs north to Anuradhapura and Jaffna. Two branch roads go west to Mannar and east to Mullaitivu.

Another road from Kurunegala runs to Dambulla where the road to Kandy joins it and a road runs north-east to Trincomalee. At Habarane a branch runs south-east to Batticaloa. From Batticaloa a road runs south-west to Passara and then to Badulla. Another runs north along the coast to Trincomalee while a third goes south to Pottuvil. From thence a road runs west past Moneragala to Wellawaya and then south to Tissamaharama.

Now this road and railway system supplies means whereby goods are distributed throughout the Island as well as transported to Colombo for export.

Let us now examine what this export and import trade of the Island is like. It supplies an excellent summary of the geography of the Island for we see at a glance from export and import trade accounts what our country's needs are and what our country supplies others. These 'needs' sum up for us the geographical conditions of the land and how far we have utilised them for our service. The 'supplies' we have for others tell us what the major occupations of the people of the Island are and this sums up the economic geography of our land.

The following is a simplified account of the export and import trade of the Island for 1953 :—

Imports.	Value in Million		Importing Countries
	Rs.		
Class I. <i>Food, Drink and Tobacco.</i>			
1. Rice	323.5	Burma and China	
2. Wheat	163.6	Australia and Canada	
3. Coffee	2.6	Uganda and Indonesia	
4. Chillies	19.2	India and Thailand	
5. Other Currystuffs	9.7	India, Iran and Pakistan	
6. Fish Products	47.0	India and Pakistan	
7. Sugar	66.0	Australia and West Indies	
8. Onions	11.1	India and Thailand	
9. Potatoes	14.2	Holland, Cyprus and Italy	
10. Milk Products	30.9	Australia and Holland	
11. Tobacco	14.9	India and U.S.A.	
Class II. <i>Raw Materials mainly unmanufactured.</i>			
1. Coal	25.2	India and S. Africa	
2. Liquid Fuel	75.1	Iraq	
3. Fertilisers	38.0	France	

**Class III. Articles wholly or partly manufactured.**

1. Glassware	4.4	U.K.
2. Cement	16.5	U.K. and Germany
3. Machinery	68.0	U.K. and U.S.A.
4. Metalware	54.0	U.K. and Belgium
5. Cotton Piece-goods	123.9	India, U.K. and Japan
6. Kerosene Oil	11.7	U.K. and Arabia
7. Motor Spirits	26.0	Bahrein
8. Motor Cars	30.0	U.K. and U.S.A.
9. Motor Lorries	13.0	U.K. and U.S.A.
10. Tea Chests	9.0	Finland, Japan and Sweden

	Value in Million		
Exports.	Rs.		Exporting Countries.
1. Tea	825.0		U.K., U.S.A. and Australia
2. Rubber	337.0		U.S.A., U.K. and China
3. Copra	22.8		Pakistan and India
4. Coconut Oil	142.0		Holland, Pakistan and Italy
5. Desiccated Coconut	78.0		U.K. and Holland
6. Coconut Poonac	0.8		Belgium and Denmark
7. Coir Fibre	23.0		U.K. and Australia
8. Cocoa	9.7		Philippines and Holland
9. Plumbago	3.8		U.S.A. and U.K.
10. Cinnamon	7.7		Mexico and U.S.A.
11. Citronella Oil	2.7		U.S.A. and U.K.
12. Arecanuts	3.6		India

*The total value of Ceylon's principal Imports and Exports for the year 1953*

Imports				Rs. (millions)
Leading Countries:				
United Kingdom	..	..	..	359
India	..	..	..	200
Burma	..	..	..	129
Australia	..	..	..	75
Egypt	..	..	..	7
Canada	..	..	..	167
United States of America	..	..	..	52
Thailand	..	..	..	6
Japan	..	..	..	69
Iran	..	..	..	2
Exports				Rs. (millions)
Leading Countries:				
United Kingdom	..	..	..	384
Union of South Africa	..	..	..	57,722,614
Canada	..	..	..	80
India	..	..	..	40
Pakistan	..	..	..	5
Australia	..	..	..	131
New Zealand	..	..	..	33
Egypt	..	..	..	60
United States of America	..	..	..	119
Iraq	..	..	..	54
Germany	..	..	..	43
Holland	..	..	..	64
Italy	..	..	..	32
Sweden	..	..	..	3

Let us now examine the export table first. The most striking feature is that our Island does not export any industrial products. Ceylon is not thus a country which is industrialised to an appreciable extent and her needs in this connection are all imported from abroad. The next part to observe is that *all* the important exports are agricultural products, three occupying a dominant position in tea, rubber and coconut produce. These three form the foundation stone of the prosperity of the Island—and the greater is the danger too on our relying on just three products to ensure the prosperity of the Island. Other lands are fast developing their own tea, coconut and rubber estates and world competition is bound to reduce the value of these products unless the demand also proceeds apace. Ceylon's output in tea is a little less than one-third the world production, in rubber it is about one-thirteenth while the acreage of Ceylon coconut is only 15 per cent. of the world total. All this shows that even in our principal agricultural products we do not hold the key positions.

The exports show that Ceylon is an agricultural country. In fact about 64 per cent. of the people live on or by the production of primary produce. No food products figure in the export list while a glance at the imports will show the Island's dependence on foreign supplies of food. Thus the agriculture of the land is plantation agriculture for an export market not of food production for the home or foreign markets.

Besides agriculture there is just one mineral product exported from the Island, namely plumbago. Even this industry has fallen on evil days.

In the recently published report of the Banking Commission the Island's hazardous position is well shown. It is dangerous to depend entirely on a few export products with rivals in the field and it is the view of the Banking Commission that the problem of the middle and higher class employment must be sought in the *industrialization* of the Island and not in the *exhausted* resourcefulness of agriculture.

The imports tell us what the Island's needs are. She imports every class of food product: she needs, rice, wheat, curristuffs, sugar and milk foods. This may appear strange in the light of the fact that 64 per cent. of the population is more or less dependent on agriculture. Of course the agriculture referred to is plantation agriculture, whereas very little attention has been paid in the past to the raising of food crops. Attempts are now being made to encourage this and thus keep the peasantry on the land. The Island

can produce rice, curristuffs, etc., but the question is whether it can be made profitable to grow these products. We have referred to some of the difficulties in the way, the most formidable being the difficulty of obtaining easy credit. To meet this the Banking Commission has recommended a State Bank. The details of this plan belong to another sphere of study.

Besides food, the Island imports raw materials in the shape of coal for the railways and other industrial purposes. Liquid fuel and manures are two other important raw materials imported.

The importation of coal and liquid fuel indicates the Island's poverty in what are called 'Sources of mechanical power'. In most industrial countries liquid fuel and coal are used in the great land and water transport services besides being the principal source of power to drive machinery, etc. The Island's poverty in this respect can most easily be remedied by the development of hydro-electric power. The Banking Commission of 1934 believes that the Island should endeavour to establish local industries, and gives a list of imports, the raw materials for which are found in the Island (page 180 of the Ceylon Banking Commission Report 1934). Discussing the possibilities of industrialization in Ceylon the report says:

'Cheap and efficient mechanical power is another fact indispensable for industrial progress. Unfortunately neither coal nor oil is found within the country which depends on imported supplies to meet present requirements. Hydro-electric energy is however available . . . we understand that Government contemplates the resumption of work on the projected scheme. On our part we should remark that any delay in undertaking this scheme must necessarily mean the postponement of the hopes of Ceylon for developing domestic industries, and it is no exaggeration to say that for the general economic welfare of the country the hydro-electric scheme cannot be completed a day too soon'.

Under class III of the table of imports we have articles wholly or partly manufactured. This list does not give all the articles imported. It is only a selection to show that the country imports its textiles to clothe the people, machinery and vehicles for their use and even tea chests for the Island's foremost agricultural industry. As the Banking Commission's report tells us the sooner this Island begins to manufacture some at least of the articles she needs the



better for her. Her increasing population will find in this industrialization means of employment, for today the people of Ceylon are dependent on foreign countries for their necessities as well as luxuries. The Island is now on the threshold of a new era for the country has now realised after the sufferings of the great world depression that she must set her house in order and equip herself to face the changed world and save herself. Most thoughtful men believe that the stage has arrived when the Island must endeavour to feed the people even to some degree and to utilize the natural resources of the land to supply the people with some at least of the manufactured goods now imported from foreign lands.

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## APPENDIX I

### A Geographical Interpretation of Ceylon History

The Island's pre-history is wrapped in myth and legend which no doubt is based on a substratum of fact. The earliest known inhabitants were hunters, and we have evidence that even hunters of the stone age lived here. Evidence of this is found in the uplands of the Uva and the Mavalatenne Plateau where stone implements and caves containing artefacts have been discovered.

The Yakkas were no doubt a race of hunters, and if we believe that the Veddas are the descendants of these hunters, then they no doubt are kith and kin of the hunting tribes of the Deccan such as the Bhils and Gonds.

Recorded history in Ceylon begins with the coming of a community of farmers from the borders of Bengal. These were the forefathers of the Sinhalese. There is good reason to believe that they arrived in more than one stream of migration and that one of these settled in the north-west and another in the south-east of Ceylon. It was out of these settlements that the Sinhalese people and their Kingdom came to be established over the whole Island.

Our earliest records tell us of Vijaya and his band landing in the north-west and in course of time they built villages and made their home here. Such were Uruvela, Upatissagama, Vijita and Anuradhagama. In the south-east too village settlements were established, the most distinguished being Magama and Kajaragama.

These earliest settlements were made in what we call the *arid zone of Ceylon*. The rainfall here is seasonal and the annual varies from 25" to 50". The air is relatively dry and the sun shine more or less uninterrupted save for the wet days from September to December. The dry season begins in May and ends in August. Such conditions do not encourage thick forests. The natural vegetation is sparse and land can be easily cleared by fire in the dry season. Such an environment is favourable for the settlement of the land by paddy farmers. Moreover, the Kala Oya, and the Malvatu Oya, the Walave-Kirindi Oyas have built extensive flood plains providing suitable soil and land for paddy.

The wet season was the growing season and when February arrived the paddy was ready to be harvested. On the up-lands where there was less jungle, clearings were made by fire and garden crops cultivated. In this way the early agrarian people were able to establish themselves. Their houses were on the banks of rivers so that they were sure of supplies of water. Tank building had not yet begun.

There was, however, one disadvantage in this otherwise suitable environment. The rainfall of 25" to 50" was barely adequate as most of it was evaporated by the sun's heat. Above all, the rain was not reliable and the wet season did not bring adequate rain every year. This brought in an element of uncertainty and insecurity to the farmers. Very soon, migration to more favoured regions began.

You will perhaps appreciate the significance of the Arid Zone as the cradle of the Sinhalese and how suited it was, if you can imagine the early immigrants landing in the *Wet Zone* on the south-west of Ceylon. The paddy farmers would never have flourished here because the south-west of Ceylon does not suit paddy cultivation. This would have made settlements of paddy farmers here impossible and the history of Ceylon would never have been the story of the development of an agrarian community.

The first phase of Ceylon history is thus closely connected with the Arid Zone. It was the stage on which the first act of Ceylon's history was played.

The next phase in our Island's history is often called the *Anuradhapura Period*. The scene has now shifted to the *Dry Zone* where conditions are superior to those in the Arid Zone for the growth of an agrarian society based on *grain* cultivation.

Let us recapitulate the geographical conditions of the Dry Zone. The rainfall is once again seasonal but is much heavier than in the Arid Zone, being 50" to 75" for the year. This favourable factor would enable heavier and more certain harvests of grain to be collected and a large population to live on the land. Further, more *extensive* and *more fertile land* too was available in what is today, the Nuwara-Kalawiya district. In the Kalagam Palata alone, soil of extraordinary fertility is found and it is not in the least surprising that the Kalawewa was built to irrigate these lands.

In this second stage of our history, the Sinhalese developed a marvellous system of irrigation by banks and canals. This enabled the people to gather a second harvest so that

the September-January period was utilised for cultivation with the aid of rain and in the dry season of May-August fields were cultivated with the aid of tanks. The significance of these two harvests is great. In the *first* place, more people could be fed and the need to grow more was due no doubt to an increasing population. Increased paddy meant more revenue to the State so that the Anuradhapura period was a period of prosperity based on successful production of grain. The great reservoirs that supplied the life-giving waters through the land were the Nuwara Wewa, Kala Wewa and the Padawiya. It is not in the least surprising that the western part of the North-Central Province is called the Nuwara-Kalawiya district after these three great tanks. They are a memorial to the greatness and prosperity of the early Sinhalese.

There is one interesting fact to be noted about *paddy cultivation*. Paddy is the most difficult grain to grow. The land has to be levelled, ploughed and ridged. The water has to be let in and the soil worked into a fine paste. After the seed is sown the water has to be controlled until at harvest time the field is allowed to go dry. Then comes the harvest which was gathered by hand.

All these labours needed many workers and without the *corporate* effort of the inhabitants paddy cannot be grown where there is no machinery to take the place of men. Paddy cultivation lead to the *creation of gamas* where society was established on the basis of *groups*, one group co-operating with another for the general well-being of the whole of that society.

Paddy is also the *most* prolific of all grains and an acre under paddy yields more bushels of grain than any other food grain known to man. It can therefore *feed* and *maintain at home* large populations. If the population increased, more land was brought under cultivation and more harvests gained, by building tanks to enable cultivation to be carried on in the dry season. There was thus no need for people to go *beyond* the sea or to engage in other pursuits. It is interesting to note that the Sinhalese were never a race of seafarers or traders. They had no need to seek their living beyond the homeland by trade and traffic with other lands. In marked contrast are the people of South India where the barren land drove her sons beyond the sea to seek a living.

Paddy cultivation thus created a *static* society—a *stay-at-home* people. The village became the *unit* of settlement and administration and *co-operation* the way of life for all.

Towns were very few because townsmen do not grow their own food. They have to live on the food raised by the village dweller. Now, in those days when there was no extensive internal trade, the peasant produced as much grain as he needed for his food and the payment of taxes. There was no surplus grown for trade so that many towns could not exist for want of food. The result was that towns were few, the most important being Anuradhapura. This was the place of residence of the king and was naturally situated in the *heart* of the great agrarian district of the Nuwara-Kalawiya.

The next phase in the early history of the island is often called the *Polonnaruwa Period* after the capital city of the kings at this time.

Polonnaruwa was selected as a capital by the Cholians in 1015 when they made North Ceylon a part of their empire. This place was chosen for strategic reasons. The Cholians were aware that any attempts to wrest the North Country from them must inevitably come from the Ruhuna Rata. There were two important fords of the Mahaweli Ganga and it was at these points people crossed the river. One was at Dastota and the other at Mahagantota. Polonnaruwa is at a point equidistant from these two and it was also on the road from these fords to the old city of Anuradhapura. In fact, there was even in much earlier times, a fortress where Polonnaruwa now stands. Elala who conquered the North Country a hundred years before Christ, had his fortress of Vijitapura built to keep watch on movements of people across the Mahaweli. This fort was near to Polonnaruwa and even in the thirteenth century the southern suburb of Polonnaruwa was called Vijita.

Thus foreign rulers selected Polonnaruwa as a frontier capital to withstand attacks from the indigenous people in much the same way that *Peiping*, *Peshawar* (Purushapura) and *Delhi* (Indraprastha) were chosen as capital cities.

When the Sinhalese in 1072 drove the Cholians away and Vijaya Bahu became King, Polonnaruwa still remained as the capital city. Vijaya Bahu too had to face hostile attacks from Ruhuna because the feudal nobility here had not quite acquiesced in his rule over Lanka. Even after his death when Parakrama Bahu the Great was king, Polonnaruwa continued to be the royal capital and at this time too Ruhuna was far from being subservient to the rule of the Polonnaruwa kings. Parakrama Bahu the Great had to wage a ten-year

war with his relations in the Ruhuna before he was master of all Ceylon.

Another reason also explains the continuance of Polonnaruwa as a capital city. Like Anuradhapura it was also the centre of an extensive region of agricultural production. The Minipe Ela and the Kalinga Ela, together with the great Parakrama Samudra supplied the water used to cultivate what we today call the Tamankaduwa district. Its clay soils are to this day among the best paddy lands in the North-Central Province.

### The Drift to the South-West

The period of the Island's history from A.D. 1215 is often and rightly called a *period of decline*. When the Sinhalese were compelled to abandon the region suited to paddy cultivation for one like the wet zone not so well suited for paddy, the result was that *revenue* from grain declined and, what was worse, *food* also became less plentiful. In course of time the man-power of the country also declined so that the Sinhalese as a nation declined in prosperity and national strength.

The south-west of the Island belongs to the Wet Zone and this climate though unsuitable for paddy is nevertheless ideal for palms. The high temperature and steady rain throughout the year also encourage rapid vegetative growth so that the leaf, bark and sap of plants are maintained in vigorous growth throughout the year. If any of these are of *food* or *commercial* value, then there is the possibility of economic development of this region and the existence of a prosperous community.

The Sinhalese came into the Wet Zone for safety and the dense forests and marshes were certainly impenetrable defences. But *food* was hard to get, as grains do not grow well, and the Sinhalese were thus compelled to change their time-honoured and familiar mode of life based on subsistence agriculture, for the precarious one of trade. *Money* would thus become the *nexus* of society, not *land holding* as it used to be.

The first of the articles of trade was cinnamon as this plant grew wild in the forests of the South-West. Muslim traders came to ports such as Puttalam, Salwat (Chilaw), Migamuwa (Negombo) and Kolantota (Colombo) for cinnamon and we know that the Kings of Kotte certainly derived the greater part of their revenue from the cinnamon trade



In fact the capital city of Kotte defended by river and marsh, was in direct communication with the Port of Kolantota. Barges of cinnamon sailed down the Kelani Ganga and entered the harbour via a distributory of the river which flowed past the spot where the Khan Clock Tower stands today. Close to this distributory were the Moslem store-houses (Bangasala) along what is today known as Bankshall Street. We also know that the Kings of Kotte shipped cinnamon to South Indian ports such as Adriampet. But this new line of economic development was fatal to the economic structure of the earlier feudal state. The lack of land and the climatic unsuitability for paddy destroyed the *food* and *man-power* resources of the people. When later they had to face constant attacks from such foes as the Portuguese, man-power declined very rapidly and the Kingdoms of Kotte and Sitawaka fell never to rise again. Here is the proof that an ancient state based on paddy cultivation although it flourished in a climate suitable for this grain, declined rapidly when forced to occupy a habitat unsuited for paddy cultivation.

Another part of the Island was also occupied by the Sinhalese after they were forced out of the *Dry Zone*. This was the Hill Country of the Island where a Sinhalese kingdom lasted well into the nineteenth century.

The Kandyans, as this section of the Sinhalese people came to be called, to distinguish them from the Low-country Sinhalese, occupied the land over 1,000 feet and geographically called the 'Kandyan Plateau'. This included the Matale district, the Kandy district and the 'Uva Basin'. Dense forests enclosed this State on all sides and by Royal decree the forests were never cleared because they were nature's ramparts of defence. On the north there was a path-way through the Nalanda Pass to Matale and Kandy. On the west there were the Weuda and Balana Passes, while on the east there were the Alutnuwara Gap and Passara Gap leading to Kandy and Badulla respectively. On the south there were two high mountain passes, at Idalgashinna and Haputale, but very rarely did danger come this way. These passes were the only way whereby foreign trade from Puttalam, Batticaloa and Kottiyar entered the Kandyan Kingdom.

When the Sinhalese entered this mountain home, they were compelled to adapt themselves to its environment. Being paddy farmers they instinctively selected those regions within the Hill Country which favoured grain cultivation. If you draw a line joining up Matale, Kandy, Nuwara Eliya and Haputale you get two divisions of the Hill Country; the

one to the east is dry while the one to the west is a wet region. The dry region has a rainfall of 50" to 75" for the year and as this rainfall is seasonal it provides a regime most suited to the cultivation of grain, fruits and fibres. In fact, the climatic conditions here are akin to those of the Dry Zone lowlands save that elevation brings about a lower temperature.

In this dry zone of the hills the Kandyans found a home suited to the cultivation of paddy. But, of course, the more rugged relief compelled them to devise a *new technique* of cultivation and irrigation. The slopes had to be terraced with great care and mountain streams had to be utilized to irrigate the fields in the dry season. The terraced paddy fields are undoubtedly one of the greatest achievements of the Kandyans because it showed how well they had adjusted themselves to their mountain home. Paddy does not grow well above the 3,000 feet elevation as low night temperatures are hostile to the plant. In these elevated regions the forests grew thick and supplied the timber and game for the villages. In the Uva Basin, the upland grasslands known as 'patanas' were often used for 'chena' crops or for the grazing of cattle. In these ways the Kandyans made a home in the Dry Zone of the hills, but they never could develop the Wet Zone as it was in no way suited to their economy. The forests here were a wall of refuge from invasions from the south-west and many a time the Kandyans beat the Portuguese and Dutch who attempted to make their way through the forests.

The Kandyan Kingdom was, however, not a very rich or populous kingdom. It could not be, because a hill country may be a refuge of *freedom* but not a home of *prosperous men*. If we are to believe Knox, the standard of living among the Kandyans was not high and they were as a people poor. But in their forest encircled mountain home they developed a typically Kandyan culture. They specialised in *wood carving* and it is interesting to note that they made marvellous use of timber for structural purposes just as the kingdoms of the plains used clay, limestone and granite. The *Kandyan roof* as their characteristic roof style has been called harmonises wonderfully with a mountain environment in much the same way Nepalese and Chinese pagodas harmonise with the natural environment. The Kandyan Walauwas were in keeping not only with the land but the times as well. The Kandyans throughout their history had to keep watch against invasions and many a time foreigners, especially the Portuguese, harried the land. In such a land a home has to be a fortress as well and these features

are noteworthy in the more ancient Walauwas. Kandyan music too is characteristic of a mountain people and there is something most attractive in the Kandyan flutes as the music echoes from valley to valley.

The Kandyan Kingdom fell for many reasons, one of which was the gradual falling off in *man-power*. An agrarian community based on *paddy* cultivation cannot be very numerous if the environment is not altogether favourable for paddy. Such numbers as can exist will gradually fall if *constant* wars take away the manhood of the community. The invasions by the Portuguese and the final harrying and laying waste of the Kandyan Kingdom in 1818 broke the strength of a proud and independent people and Keppitipola's brave death was typical of the end of his people.

The scene of those activities which characterise modern Ceylon is the south-west and centre of the Island falling within the area known as the Wet Zone. This region is humid and the rainfall heavy and well distributed throughout the year. The temperature is also uniformly high, about 80°F. except on the higher hills. In such a climatic region forests will grow thick and fast because there is *no dry season* to check plant growth, and plants will develop leaf, bark and sap all the year through. Forests such as these which are evergreen, humid and with vast areas of swamp and marsh are *very* difficult to clear. There has to be a constant battle against the jungle even in places where man has succeeded in making a clearing for wild plants grow almost overnight.

Palms also thrive in this climate. The *coconut palm* grows best along the coast 'within sound of the sea' and up to an elevation of 2,000 feet at which the average temperature will be about 73°F. The *areca* and the *kitul* palm grow well inland but these too disappear about 3,000 feet above sea level.

The economic exploitation of the natural vegetation of the south-west began with the export of *cinnamon*. The Kotte kings drew a good share of their revenue from the sale of cinnamon and when the Portuguese took over the Muslim trade, they monopolised its exploitation and commerce. The Dutch realising that supplies of cinnamon were insecure as long as it grew in forests which the Kandyans could destroy began to *cultivate cinnamon plantations* close to *fortified* places on the coast. In this way 'gardens' were opened out near Negombo, Kadirana, Ja-Ela, Colombo, Mount Lavinia, Kalutara, Alutgama, Galle and Matara.

Labour supplies were ensured by the monopolisation of the labour of the 'cinnamon peelers' who were registered under a Captain of the Cinnamon Department and kept on the task by methods which were not far removed from slavery. Each cinnamon peeler had to pay a 'body tax' in cinnamon, his tax to begin at the early age of twelve and ending in old age. Any cinnamon peeled over and above the quota fixed as body tax was paid for at a very low rate.

Besides cinnamon, the plains too provided the Dutch with commercial products. Arecanut was sent to South India where there was an excellent market for it and one Dutch Governor reported that if the sale of arecanuts was well organised, the cost of maintaining the army could in this way be realised. *Arrack* was despatched to the East Indian and South Indian markets while *vinegar* was shipped to Holland. There was no great demand for coconut oil, but coir was needed for shipping and naval stores.

The Dutch attempted to introduce new crops to Ceylon but met with no great success. Among these were coffee, cotton and mulberry. Paddy was encouraged to cut out imports necessary to feed the company's employees.

When the British took over the Maritime Provinces, cinnamon was the most important product. But after 1818 when the Kandyan Kingdom was annexed and specially after 1832, *coffee* was begun round Kandy, Matale and Gampola. For many years *coffee* was 'king' in Ceylon. The forests of the wetter half of the Hill Country were cleared and estates opened up. Roads and railways followed because coffee was grown for export. Even the Kandyans were tempted by this plant as it grew well in village gardens and provided an ample return on small holdings. The rapid expansion of plantation agriculture was not altogether a good thing because very little was done to encourage *subsistence* agriculture. This led to the gradual impoverishment and decay of the *peasantry* who were drawn into the estates as daily paid workers. On the other hand, a new class of people arose, namely Sinhalese business men, who acquired *capital* and they later became the 'middle class' of a *new society* which arose with the development of plantation agriculture. The construction of roads and, later, railways helped to break up the isolation of the countryside; it increased internal trade and brought people into contact with one another. The attitude of mind that referred to people as of this or that village gradually disappeared and with it much of the parochialism common to a feudal community.

Plantation agriculture brought *cash* into common use. This helped to undermine the system of personal services known as Rajakariya, for now services could be paid in cash.

When coffee failed, tea took its place on the hills of the Wet Zone. It fitted the mountain environment because hill slopes can be utilized for tea cultivation. The heavy rain encouraged the growth of leaf and bud and these were the commercial products of the plant.

In 1902 rubber came to be systematically grown in the lower sections of the Wet Zone. Being a native of *hot-wet* lands it does not thrive at elevations of over 2,000 feet. The steaming moist foot-hills of Central Ceylon, the Kegalle, Ratnapura and Kalutara districts were ideal for its cultivation, and as these areas are close to the Port of Colombo the problem of transport was not at all difficult.

By 1911 coconut estates for the large scale production of copra, desiccated nuts and coir were opened out in the Chilaw, Kurunegala and Negombo districts.

The land utilization involved in the development of these forms of agriculture was confined to the *Wet Zone*. In course of time the scene of economic and political activity was shifted here, towns sprang up and the inhabitants of the Wet Zone had all the advantages of education, trade, and commerce and almost a monopoly of employment in all manner of ways. The English educated persons became aware of the value of political rights and began to ask for an increasing share in the government of the land. *Political associations* such as the Ceylon National Congress, the Low-Country Products Association, etc. organised an agitation for political rights and very soon newspapers devoted to Ceylonese interests took their place side by side with those primarily connected with European trade and business.

In these ways the south-west of Ceylon became the most populated and economically the most important region. The people living here came into active contact with the outside world and were thus more progressive than the people in the more remote parts of the Island. A complete transformation had taken place in the evolution of a feudal state into a modern democratic state. The habitat of the former was the Dry Zone favourable to paddy cultivation, while the habitat of the latter was the Wet Zone well suited to the development of plantation agriculture.

## APPENDIX II

### The Geographical Factor in the Economic Development of Ceylon

#### Early Ceylon

The economic structure of *early Ceylon* was feudal. *Land* was considered the most important source of wealth and even today in the villages, a landless man is held to be of no account just as in Greece a man of no city was looked upon as a vagrant. Land was primarily used to raise *food crops* and a surplus for purposes of paying taxes or bartering for other goods.

The economic unit in early Ceylon was the village. Each village was made up of certain types of land essential for its existence. There was, for instance, the '*mada bima*' which was used for the cultivation of paddy. Then there was the '*gamgoda*' on which stood the village homes and gardens and finally there was the '*gamvasiya*', an extent of highland covered with forests and containing open land covered with grass such as the '*damanas*' or talawas.

The *mada bima* was divided into allotments. The fields were naturally below the tank bund so that water from the '*Weva*' would flow by gravity to the fields. The paddy fields were divided into three sections in somewhat the same way fields were divided into strips in Medieval Europe. The section nearest the tank was called the '*Ihala*' or '*upper*' section. Next to it was the '*Meda*' or middle division and lastly, there was the '*Pahala*' or lower division. In fact, villages in the Dry Zone to this day have the name Ihalagama, Medagama and Pahalagama, reminding us of the feudal economic sub-division of land.

The *Gamgoda* was the communal centre, where the people lived and administered the affairs of the village. Very often people of the same caste lived in a village, hence the name '*govigama*' which has become the name of a caste. But in later times a village often consisted of families of various castes.

The *Gamvasiya* was a fairly large extent of land under forest. This supplied the timber and game and the meadows



in the forests helped to pasture cattle. In the forests of the Dry Zone there is very often open land under grass. These are called today 'damanas' or 'talawas'. The village cattle were driven here by the village cowherd and at sunset were brought back to the village. Those of you who have read Kipling's Mowgli stories will recollect similar scenes in the villages of India which, like those in early Ceylon, stood on the border of the forests.

In the dry season parts of the forest land was cleared for *chenas* on which food crops were grown.

The inscriptions of old Ceylon give us some details of the produce raised by the people. Paddy, of course, was the most important grain, but there is constant reference to *dry* grains such as *meneri*. There were three harvests of paddy. The great harvest (*maha-hassa*) was gathered in February-March. A *middle* harvest was possible if the tank was full, while the *third* was raised on tank-fed fields. Its success, of course, depended on adequate irrigation.

On the *dry land*, that is, the land which could not be irrigated by water from tanks and canals, 'undu', 'beans', sesame, green herbs, ginger, tumeric, sugar-cane and cotton were grown. Honey was gathered in the forests and as cattle were plentiful in those days, curd, ghee and buttermilk were very common articles of food. It is also interesting to note that the above foods constitute an excellent diet, nourishing and well-balanced, so that it is perhaps not at all surprising to note that the ancient people were able to put in more labour hours of work than their enfeebled and ill-nourished descendants today can.

Each village formed an administrative unit. The time-honoured *gamsabha* looked after its affairs and, except for the annual visits of the King's sheriff who came to administer justice and collect the King's taxes, the village was an autonomous unit. The Sabha was made up of the 'elders' of the village. They met to discuss village problems as well as to settle disputes. The Vevalkatiya inscription tells us much that is interesting about this aspect of life in an ancient village. The village was, for example, responsible for arrest of criminals and if it failed, the whole village was fined. Sometimes a household was fined for the sins of an offending member. Records had to be kept of all village trials to be put up to the Sheriff in case of an appeal. The interesting feature of the administration of the law is the fact that a community, or family was held responsible for the misdeeds of individuals.

The village *sabha's* had committees for special work. Thus, one inscription speaks of 'vel yut pasdena' the 'five of the fields'. Another speaks of *Adaviya atadena*—'eight of the forests'. Their duties were perhaps connected with allotments of land to the villages. The forests were often the haunts of robbers and no man was allowed into a village after sun-down. If at other times a stranger came to a village, he was required to give security. If a criminal escaped from one village and fled to another, he was arrested and sent back to the village which had jurisdiction over him.

Besides agricultural produce each village made the articles it needed. There were workers in metal such as gold and iron. Iron smelting was done with the aid of charcoal fires as in Medieval Europe. The rocks of Ceylon contain a fairly high percentage of iron and the so-called 'iron-stone' is widely distributed. There is ample evidence of iron ore smelting in the Wann and in later days smelters used to visit Kotmale and the Uva Basin to gather the 'iron-stone'. This was smelted on the hills where timber for wood-coal was plentiful. The iron was worked into small bars and then brought in to the village smithies to be fashioned into ploughshares, bill-hooks, axes and knives.

Stonemasons, potters, brick makers and lime burners were among the craftsmen of old Ceylon. Their work was specially needed in the construction of religious buildings. So were the carpenters and carvers in wood and ivory. Painters were often attached to the villages assigned to temples and their services were made use of in temple decorations. Then there were the weavers of cloth, especially cotton.

The existence of these craftsmen indicate a very high order of civilized life. Another class of skilled workers should also be mentioned—the engineers who built the great irrigation works which are the glory of old Ceylon. To them must be given the credit of having invented the 'vale pit' or *bisokotuwa*—a means of leading the water from the tanks to the field. Tradition tells us that the King of Kashmir sent to Ceylon for engineers skilled in constructing irrigation works. It is well worth while your studying the translations of the inscriptions of Mahinda IV at Mihintale. These give you a very full picture of the various persons living in a *vihara* and the dues each had to pay to his *vihara* and what land was assigned to each person. Payment for services in all feudal lands was in kind. For example, the Jetavana-Sanskrit inscription of the first half of the ninth century refers to 'clever stone cutters and skilful carpenters'.

To each of them was assigned a field of  $1\frac{1}{2}$  kiri ( $1\frac{1}{2}$  bushels sowing extent) and one *hena* (plot of dry land) for the purpose of sowing fine grain. Lands were assigned by the king for services performed by his chiefs. One very interesting record of pre-Christian times speaks of land given by King Gamini Abhaya to his general Mitta. Another at Devanagala records a grant to Kit Nuweragal by Parakrama Bahu I for his conquest of Burma. These fiefs were known as 'pamunu' lands. Details regarding other fiefs may be gathered from the Mihintale inscriptions referred to earlier.

Trade in feudal times was never very extensive, the reason being that each village was self-dependent for most of its wants. Trade was also restricted by the absence of roads and means of transporting goods in bulk. For these reasons commerce was confined to goods small in bulk, high in value and not liable to depreciation owing to slowness of transport.

Our Island's records and those of South India and China give us meagre details of our trade with foreign lands. Chinese records speak of cotton cloth from Ceylon of wonderful texture. These are described as 'woven air' by Chinese writers. Others speak of cloths noted for their fineness and transparency and much desired by ladies of Rome and Persia who, like their Indian sisters, loved to wear diaphanous robes. Juvenal has some biting remarks about this fashion. The Sigiriya paintings display to us ladies wearing such diaphanous garments while the serving maids wear garments made of coarser material.

Other articles of trade from Ceylon mentioned by Chinese writers were 'ivory carvings, pearls and precious stones, gold filagree work, gem-set necklaces, sandalwood and fine white cotton'. They also speak of marvellous Buddha images and one record tells of the coming to China of the 'peerless sculptor Nan-te'. We do not, however, know the Sinhalese name of this great and unknown sculptor. In return Ceylon received from China 'musk, silk, blue porcelain bowls, cups, basins and camphor'. From Western countries Ceylon received horses (from Sindh): beads of glass, agate, cornelian and coral from Egypt and from Greece and Rome, wine in Grecian jars. The fact that large numbers of Roman coins have been found in Ceylon serves to illustrate the nature of her trade with Ceylon. The Roman merchants who sought the goods of the East had no merchandise to give in exchange and so paid for Eastern produce in gold. Roman writers complain of the drain of gold to the East and according to

some, it was one of the reasons for the economic break-up of the Roman Empire.

The economic conditions of the kingdoms of the south-west and centre of Ceylon were different. Subsistence agriculture became less important because it could not be successfully practised. People therefore turned to products native to the climate of the south-west to supply them with the articles for trade. *Cinnamon* which grew wild in the forests became the most important product and as it had to be shipped abroad seaports of the south-west began to increase in importance. Chilaw, known as Salwat to Moslem traders, was an important centre of trade. Negombo was another and the lagoon at both places provided safe anchorages for ships. Ibn Battuta who visited Ceylon in 1347 tells us that he saw piles of cinnamon lying at Salwat to be put on board vessels at Chilaw. He also tells us that the other great cinnamon port of Kolontota was at the time in the hands of a Muslim Wazir by name Jaleste. Even earlier, in 1283, a Sinhalese King, Buvaineka Bahu I, sent an embassy to the Sultan of Egypt with proposals for trade in 'cinnamon, precious stones and elephants' which the King of Ceylon was able to supply.

Other agricultural products which became very important, especially in Portuguese and Dutch times, were *pepper* from the pepper vines which thrive in hot-wet lands, *arecanut* which had a good market in South India, and the produce of the *coconut palm*, especially *vinegar* and *arrack*, the latter being in great demand in South India and the East Indian Islands. The Dutch, unlike the Portuguese, opened out systematic gardens and the conditions of the Sinhalese were not by any means favourable. They became 'labourers' on land cultivated for others' profits and in this way the Colonies supplied the 'labour' which worked on the Colonial estates. Evidence of the great dissatisfaction of the native people is found in the pages of the Portuguese historian Queyroz who has a copy of a petition sent to the Captain General in which the sad plight of the people is set forth. Queyroz remarks that the contents of the petition were found to be true.

This *new kind of agriculture* which began in Portuguese and Dutch times developed in leaps and bounds under British rule. A study of this and its consequences brings us to a study of the economic conditions of modern Ceylon.

In the early years of British rule especially in the Maritime Provinces, coconut and cinnamon, especially the latter.

were the chief sources of revenue. By 1833 cinnamon ceased to be of great commercial value but fortunately a new crop was started in the Kandyan Provinces. This was coffee, and in the years that followed, its cultivation spread widely on the western sides of the Hill Country. It spread to Kandy and Matale and then south to Gampola until the whole Hatton Plateau was opened up. Later its cultivation was extended to the land round Badulla.

Coffee cultivation became very popular with the small landowner because it could very profitably grown in village gardens. Moreover, it was a 'tree crop' and was suited to the hill slopes which comprised the greater share of the arable land in the Hill Country. When the coffee estates were destroyed by leaf disease its place was taken by tea. This remains a major commercial product of the Island. Its extension opened up new land in the Hill Country and for reasons given elsewhere tea cultivation did not suit the small holdings of the peasant. Unlike the Japanese and Chinese peasants the Ceylon villager did not grow the tea plant for his own use, and as the plant is cultivated for export, large scale methods of production have been most profitable.

Rubber cultivation on a large scale began about 1902 and led to the opening up of forest land in the south-west of Ceylon. Rubber has become the chief product of the Kegalle, Ratnapura and Kalutara districts. In 1911 the large scale cultivation of coconuts was begun and the copra and oil found a ready market in the United Kingdom. The estates were largely confined to the Negombo, Chilaw and Kurunegala districts.

### Modern Ceylon

In the first place, plantation agriculture lead to extensive *land utilization* in the Wet Zone; forests were cleared and roads and railways were constructed and towns sprang up at the more important commercial centres. Next, it provided many *avenues of employment* so that the south-west became a region to which people in search of work migrated. The town of Colombo was the magnet of attraction as it provided work of various kinds to large numbers.

In this way a *landless class of urban workers* came into existence. They constitute a *labour class* in Ceylon.

A new *middle class* also came into existence. Many of its members found employment in the banking, business and commercial houses in Colombo. Large numbers also found work in Government departments, while the members

of the Legal, Engineering, Medical and Teaching professions are for the most part recruited from this class.

Agriculture, Trade and Commerce also helped to create a *Ceylonese capitalist class* and these own most of the *coconut* and *rubber estates* in the Island.

Those who suffered most from these changes in agriculture were the peasants. Their interests were neglected because plantation agriculture was paying and development was confined to it. Government gained its revenue from this source and as the peasant was politically powerless he was ignored and the plantation system held the field.

Two things, however, happened which shook the structure to its foundations. One was the depression of 1929 which showed how dangerous it was for a country to be entirely dependent on the export of just three commodities for its prosperity. It made people think of ways and means of being *less* dependent on exports, especially in a land so very suitable for agricultural production.

The other profound shock to the existing economic trends was the grant of *universal franchise*. This broke the monopoly of political power enjoyed by the middle class. The representatives of the people now were *compelled* to support the claims for redress made by the common man for he could no longer be ignored. His vote now mattered in every rural constituency. In fact, the record of the State Council has been one of the constant effort to devise ways and means to improve the conditions of the common man. Thus we have had important labour legislation; attempts have been made to provide peasants in the rural areas medical facilities which did not exist there before. Co-operation has been developed to improve his economic conditions and a marketing department was set up to facilitate the marketing of his produce. Colonisation schemes, the development of irrigation and the cultivation of paddy have benefited the peasant, while the Free Education Scheme is intended to provide the opportunities which hitherto were available in the towns for those who could pay for them.

The economic depression of 1929 and the second world war directed peoples' thoughts to the creation of a more self-dependent economy. Let us for the moment take the leading food imports of 1939. They were:

1. Rice	..	..	60½ million rupees
2. Sugar	..	..	9 " "
3. Chillies	..	..	4½ " "
			<u>74 million rupees</u>



This is a little less than one-third the total value of our imports.

We should now consider whether the geographical conditions of our Island in any way render possible the development of these *three* essential foods. Some of you will be able to see at a *glance* that these three are ideally suited to the climate of the Dry Zone. Paddy requires over 50" of rain and a temperature of 75°F with a dry season for reaping. All these conditions are present in the Dry Zone lowlands. The flat clay lands so necessary for paddy are also found in this zone. The North-Central Province has been since the days of the early Sinhalese a region most suited to paddy. The silted lagoons of the east coast, the basins of the Gal Oya, Heda and Wil Oya provide excellent land for paddy. In the Lower Uva and the Hambantota district, in the basins of the Walawa, Kirindi and Menik Gangas are lands excellent for paddy. In the central parts of Ceylon, the land on the west bank of the Mahaweli, once watered by the Minipe Ela, provide other suitable areas. These areas are being slowly utilized but they cannot be put into effective use *unless* the land is irrigated. The land development schemes under the Giant's Tank, the Minneriya, Elahera, Parakrama Samudra, Minipe, Walawe, Kirindi, Gal Oya, Heda and Wil Oya indicate the lines of development. These schemes are, geographically speaking, quite sound. Critics who are not well informed wish to know why with all this effort Ceylon cannot feed her people. The irrigation works we have named had all gone to ruin in the happy days of individual enterprise and quick money by growing tea, rubber and coconut. To get the forests cleared of malaria and jungle, to convert the neglected fields into cultivable land, to plough the land and build the ridges, to rebuild the tanks and canals requires a heavy *initial* capital expenditure. It should be remembered for example, that the Sind Barrage on the Indus alone cost Rs. 180 millions. But no one has ever said this was not a sound investment because today this scheme irrigates seven million acres of land. Similarly the money spent on restoring the irrigation works in the Dry Zone is investment for the well-being of the people and no one can deny the value of such investment. It may one day help to make the Island self-dependent in the matter of its staple food as well as provide employment for the peasantry of the land.

The next food imported is *sugar*, the amount totalling about ten million rupees a year. The sugar-cane too grows

well in the Dry Zone. It may be cultivated on paddy land in rotation with paddy as is the practice in Java, or it may be grown on the chenas. If these can be irrigated the position of the chenas as agricultural land will greatly improve. Hydro-electric power is available in Central Ceylon and it does not in any way appear fantastic to think of power developed on the Lower Mahaweli being transferred to the Dry Zone for pumping installations. If sugar-cane can be grown on the chenas a very great problem will also be solved. With regular systematic cultivation of these uplands, the present pernicious chena system will gradually die.

The next is the import of *chillies*. These are grown today in all chenas, but, here again, what is needed is systematic cultivation and clean modern drying yards. Chillies will constitute a very valuable *cash* crop.

It will thus be seen that if we plan and boldly carry out a scheme for the cultivation of paddy, sugar-cane and chillies, a sum of Rs. 74 million will be realized and diverted to internal trade. The urban dweller who now pays this bill to foreign lands will pay it to peasants within the country and this is to everybody's gain. Professor Brandt, formerly of Berlin University, has pointed out that successful agriculture depends on successful industries. This is true of Europe, but in Ceylon the welfare of the peasants will depend on the continued *prosperity of plantation agriculture* because *it is this which gives the town population its buying power*. Thus plantation agriculture helps and is helped by the development of subsistence agriculture. These two are complementary and will create in Ceylon a balanced economy because they are the *two* ways in which the *two* major climatic zones of the Island can be utilized for man's well-being. The wet zone is essentially the climate of our plantation agriculture while the dry zone is essentially the climate of our bread grains. These two types fit in so well into the scheme of things that the prosperity of the one increases the prosperity of the other.

We may now consider the question of *other lines of agricultural development in Ceylon*. The Dry Zone is the land of the future because it is here that we find land for cultivation and expansion of our settlements. What are the crops we should grow? In this connection it is worth while asking ourselves what is it that makes for physical well-being. For one thing, we need *food* which is valuable as 'protective foods'. These are foods that build up strong bodies and in,

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a land like ours, where very large numbers are ill-nourished, the cultivation of 'protective' foods is all important.

'First among these come *pulses, vegetables and related crops*. From the nutritional point of view a combination of *cereals and pulses*, particularly *legumes*, is strongly recommended. There is a need, particularly in *rice consuming* areas, to bring the average consumption up to three to four ounces a day. Similar remarks apply to *vegetables*. The particular importance of pulses and vegetables is that they offer immediate sources of supplementary foods to rural communities. The value of *ground-nuts* and *soya bean* as sources of protein and of fruit as a source of vitamins must also be borne in mind'.

This is a quotation from a valuable report on a 'Food Plan for India' written by a body of experts under the chairmanship of Professor Hill, the famous scientist.

How far can these recommendations be carried out in our Island? Do the climatic and soil conditions of our land make it possible for us to carry out these recommendations?

The answer is found in a second century inscription at Tonigala where one gets a short account of the diet of the people of early Ceylon. These foods were grown once in the Dry Zone, especially the *pulses, legumes, fruits and vegetables*. We can grow them today in the Dry Zone.

*Ground-nut* is a marvellous plant. It is the friend of man in areas where other plants cannot grow. It thrives on poor soil: it fixes nitrogen in the soil and thus enriches it: it gives man a valuable *food* and an *oil* of commercial value. When the seed is crushed and oil extracted, the 'cake' is excellent as food for cattle and food for plants. In fact, very strong efforts must be made to grow this plant in the Dry Zone. It will flourish on *chenas* even as a *chena* crop.

The *soya bean* too grows well in the Dry Zone although very little is known of the way it should be cooked. Education in this respect is necessary if this valuable food is to become popular. There are some who believe that the *soya bean* is the richest food known to man.

*Pulses* (e.g. green gram, horse gram, the cowpea) fit in very well with the climatic conditions of the Dry Zone. *Oil seeds* such as *sesame* and *pulses* such as '*undu*' were extensively grown and consumed in early times and should be cultivated in the Dry Zone. We thus see that we have all the *physical* conditions essential for the production of these protective foods so necessary for us, namely, dry grain such

as *meneri* and *legumes* such as *peas* and *beans*, *ground-nuts* and *soya beans*.

The Indian report also speaks of *fruits*. There are some which are admirably adapted to the conditions of the dry zone where high temperatures obtain all the year with rainfall which is characteristically seasonal.

The *orange, lemon and grape fruit* find here an almost ideal habitat and in early days the orange was grown in village gardens. Another common *fruit* grown by early people was the *mango* which is so well grown today by the Jaffna peasants. The *grape-vine* will also grow well on irrigated land. The wild grape of Ceylon (the *rata bulat-wel*) has a sour fruit but it is possible to graft to this better vines. The Jaffna, Mannar, Trincomalee and Batticaloa districts are the best areas for profitable vine cultivation. It is believed that if Australian and Indian varieties are grafted to the local wild vine it would be possible to make grape cultivation profitable in the Dry Zone.

Another most valuable tree which thrives in the Dry Zone is the *cashew nut* tree. The food value of the cashew is high and besides there are the possibilities of an export trade with the United States of America and South American ports. In fact, South India holds the market for cashew nut for South American countries.

Another fruit tree which will thrive on irrigated land in the Dry Zone is the *plantain*. These were cultivated in village gardens long ago and are referred to in inscriptions. *Plantain* trees figure prominently in pictorial designs of early days.

We should now consider the prospects of cash crops in the Dry Zone. Climatic and soil conditions favour the growth of plants yielding fibres of commercial use. Chief among these is *cotton*. Cotton was grown in this region in early days and even Chinese records speak highly of the cotton cloth woven in this Island. Like grains, the cotton plant must have a warm period for its growth, the night temperature never going below 55°F. Such a condition is assured to it in the Dry Zone. The other important climatic condition is that the rains should come during the growth of the plant, with dry weather when the pods are ripening. This condition too is assured in the Dry Zone. The cotton plant takes heavy toll of soil fertility and for this reason soils have to be fertile if cotton is to be grown successfully. Suitable areas are found in the Dry Zone, especially to the north-west and south-east corners of the Island.

Thus it is geographically possible to develop a balanced agricultural system suited to the climatic conditions of the Island. The Wet Zone will continue to be the home of coconut, rubber and tea estates. It may be possible, if market conditions are favourable, for this zone to develop *cinchona* plantations, and in recent years experts have pointed out the possibility of a silk-worm industry based on the cultivation of *mulberry*. This plant will thrive in the Wet Zone and, as the harvests of cocoons depends on the availability of mulberry leaf, there is no doubt that at least three harvests are possible because the mulberry tree will put forth leaves all the year round in South-West Ceylon. The great success of silk-worm breeding in the deltaic region of the Yangtse and Southern Japan is partly due to the fact that mulberry leaves are available all the year round enabling three harvests of cocoons each year.

In the Dry Zone we have the possibilities of developing a subsistence agriculture based on the production of protective foods. If these two systems work side by side it will mean much to the prosperity of a poverty stricken people whose income per head is only Rs. 10.00 a month!

Our imports include Rs. 12 million for *fish*. Most of this is in the form of *dry* fish. Once again, if we examine the Island's resources, we shall see that it is the over-emphasis on plantation agriculture that has led to the neglect of the development of the *other* resources of this Island.

Surveys made of the coastal regions indicate the presence of abundant supplies of edible fish. All round the coast is a continental shelf ranging from five to ten miles and this is rich in fish. Moreover, the seasonal winds enable fishing to be carried on in different parts of the Island at different times.

When the south-west monsoon is active there is a tendency for fish to migrate to the calmer waters off the east coast and *vice versa* when the north-east monsoon prevails.

The south-west coastal fisheries have markets close to them in the string of towns from Matara to Chilaw. But the Dry Zone is less well placed because the markets for fish are far from the fishing centres. But this disadvantage can be overcome when the land is developed and better and quicker means of transport are provided. The distance from Colombo, the principal market, brings into prominence the question of sending the fish in *cold storage* in either road or rail refrigerator vans. But the Dry Zone has one great

advantage in that fish can be caught and dried here just at a time when the fisheries of the south-west are closed by the monsoon. Experts have pointed out that dried fish such as 'sprats' and other small varieties are excellent food, cheap and nourishing.

The main problems connected with the development of the sea fisheries are improvements in the methods of catching and means of transport. The methods of catching now used are those of feudal times when the supply needed was only to feed the fisherman and pay his feudal dues. But to supply a market, large scale catches are essential. These can be devised by a study of the methods adopted in the great fishing areas of the world.

Deep sea fishing is also possible on the Dodge Bank and the Pedro Bank and trawlers have been suggested. Another great source of fish is to be found in the inland waters of Ceylon. In the Dry Zone the great 'Villus' teem with fish. In fact in the Velankadu Villu, not far from Mananpitiya, are excellent varieties of edible fish. It is thus possible for edible varieties to be bred in the 'villus', tanks and rivers of Ceylon, just as the 'fishing club' of Nuwara Eliya has succeeded in breeding trout in the streams of Horton Plains and other up-country streams.

*Milk* is another of those essential foods for physical health and well-being. In ancient Ceylon, when each village had its own herds, curd, milk rice and ghee were consumed daily. But with the break up of village life and organisation, caused by the rapid development of plantation agriculture under a government that believed in 'non-interference' with economic processes, herds became scarce because communal pastures were no longer available. The peasant being politically impotent could do nothing, but with his rise to political importance the State has again taken up the question of developing *cattle breeding*.

Ceylon does not have good natural pastures, but this is not a great handicap because all the world over beef and milk cattle are now fed on *cultivated* grasses and fodder plants. In the dry zone chenas and land under tanks can be cultivated with guinea grass, napier grass, lucerne, maize, etc., while ground-nut cake is also excellent cattle food. The dry zone presents a difficult problem of keeping cattle in good condition during the long dry season. This can be solved by the use of *silos* where fodder can be kept in good condition. This has been demonstrated by the silos in the Polonnaruwa State Farm which has been established to



improve local breeds as well as to develop strains suited to the country.

According to an Australian expert, cattle for beef can be reared in the Tamankaduwa district, with Mananpitiya as the rail head for transport.

The dry zone is ideal for goats and goat farming should be encouraged in the more arid parts of the Dry Zone. Goat's milk is very nutritious and its flesh very popular among all classes. The markets for mutton are in the south-west and the question of transport is not very difficult when we realise that today goats are imported from India for the Ceylon market.

We have so far pointed out that as is the geographer's main concern the possibilities and the lines of development indicated are geographical possibilities in that natural conditions favour them. But, of course, man must make use of these possibilities if he is to benefit by the gifts nature provides. 'We conquer nature by obeying her' and if we obey the conditions governing the development of our resources it will no doubt increase our well-being.

Let us now turn to other items of our Island's imports. These are either 'fuels' for use in developing mechanical power or manufactured goods. We shall have to import motor fuels for all time, but we have vast possibilities of developing power in the hydro-electric resources of the Island. A scheme was in operation when the second world war put a stop to it. The land above the 1,000 foot contour supplies falls and catchment areas receiving heavy rain and there is not the slightest doubt that vast power development is possible here.

If these resources are developed it is possible, in the first place, to provide power for lighting at a much cheaper rate than now. In fact, every town in Ceylon can be lit with electricity.

In the next place, it may be possible to electrify our transport services. The railway and road transport can be worked by means of electricity.

Finally, power can be supplied for industrial purposes. In their report on Banking, the Commissioners pointed out that among our imports are the following which may be

developed locally:—

1. Bricks and Tiles	..	..	Rs. 334,000
2. Earthenware	..	..	274,000
3. Cement	..	..	1,152,000
4. Soap	..	..	1,436,000
5. Chests	..	..	2,637,000
			<hr/>
			Rs. 5,833,000

Bricks, tiles and earthenware can be developed on local supplies of clay. Dr. Wadia, the former Government Mineralogist, pointed out that along the west coast are enormous supplies of china clay. With our resources of electric power we may certainly develop the manufacture of bricks, tiles and earthenware. Although we have china clay, the development of a high grade ceramic industry is not an easy matter. Expert labour is needed in this as in the glass industry and such labour is not available here.

Limestone is abundant in the north-west of Ceylon, especially in the Jaffna Peninsula and a cement factory has been started at Kankasanturai.

Coconut oil is one of the basic ingredients of the soap industry and there are many local firms making soap. This is an industry capable of development in the land as there are supplies of raw material available.

Our forests have not been developed as they are in other lands. The present practice is to grow forests, selecting useful trees for the purpose, some for fuel, some for timber, and other industrial purposes. We import timber from Burma and our tea chests used to come from distant Finland (Suomi) and Japan. There is no reason why the timber for fuel, structural purposes and the making of tea chests cannot be developed locally. One is, however, not so sure of such industries as the making of paper and 'venista' boards because these are high quality goods and this country cannot face competition from other lands. Besides, we have to consider whether it is not more economical to purchase these than to try to develop them here on the mistaken notion that we should develop industries locally at any cost. We should only attempt those industries in which we have conspicuous advantages. For this reason it is very doubtful if we can ever develop an iron and steel industry on our slender resources.

Some have advocated the development of a cotton industry in Ceylon. The climatic conditions of South-West

Ceylon are good and labour supplies are available in the towns and villages of the south-west. If cheap electric power is available it may be possible for factories to work even on imported yarn.

Taking all things into consideration, Ceylon does not appear to have the opportunities of developing industries on a large scale. Her *main* industry is agriculture and if this is *scientifically pursued* with *animal husbandry* as a valuable adjunct, it is possible to assure for the people a high standard of well-being. The urban population can no doubt find employment in minor industries and in engineering workshops, etc. Industrialisation does not necessarily bring prosperity. Denmark is a good example of a small country which has achieved a very high degree of well-being although she is not industrialised to the extent other lands are. **Ceylon should follow the path nature has indicated for her in developing to the fullest those possibilities in which she is best endowed.** They are namely, her **agriculture**, her **hydro-electric resources**, and her **fisheries**, and those **minor industries** which have been mentioned in the Ceylon Banking Commission's Report.

## APPENDIX III

### The Soils of Ceylon and their Utilization for Crops

The soils of Ceylon may be classified on a climatic basis broadly as follows :—

**Wet Zone Soils.**—These include :

(1) The laterite (*cabook*) and lateritic red to yellow loams derived from igneous and metamorphic rocks. They vary in texture and fertility but are generally fairly well supplied with organic matter and nitrogen. They are poor in available mineral constituents and are acid in reaction. They are best suited for perennial crops such as tea, rubber and coconuts, but with suitable treatment such as the application of cattle manure, liming and drainage, where necessary, as in the case of *deniya* soils, many of these soils could be utilized for the cultivation of food crops with good hope of success. These soils occur in the wet low-country.

(2) The cinnamon soils—bleached sands practically devoid of all plant nutrients but of comparatively small extent. These soils are also cultivated with coconuts, but for good crop returns the application of bulky organic matter such as green manure, coconut husks and cattle manure is essential. Potash is the chief manurial requirement of crops on these soils.

(3) The *patana* (grassland) soils of the wet highlands. These have a dark humic layer one to three feet deep, overlying the normal yellowish red lateritic and laterite loams. They are very acid in reaction and poor in bases. They are best utilized for tea and with adequate treatment—liming, cattle and artificial manuring—are suited for the cultivation of temperate vegetables, fodders, etc. The *kekilla* (fernland) soils of the Western and Sabaragamuwa Provinces are similar to the wet *patana* soils, but their humic top soil is less than a foot in depth.

(4) The paddy soils consisting of : (a) alluvial deposits and soil material eroded from adjacent hillslopes and deposited in the depressions. These are generally of good nutrient status ; (b) infertile laterite and lateritic clays (*karamettas*) formed *in situ* from the crystalline rocks. They occur largely

in the Gampaha area. They need liming, the application of bulky organic manures, and potash and phosphatic fertilizers such as wood ashes and bone meal respectively, for the production of satisfactory crop yields; (c) peaty soils resulting from the accumulation of decayed vegetation under badly drained conditions. These soils are markedly acid in reaction and give poor crop yields generally, unless attention is first given to drainage. They occur in the coastal area, in parts of the Sabaragamuwa Province, and in certain low-lying tracts up-country. Occasionally these peaty soils are associated with saline conditions in the soil as at Muthurajawela. Where this is the case, in addition to drainage, the exclusion of salt water from the area and the leaching of the salts present in the soil are essential operations. Phosphatic manures, e.g., bone meal, are very beneficial to paddy on these soils, and so also the natural potash manures, e.g., wood and coconut husk ashes.

**Dry Zone Soils.**—These mainly comprise:

(1) The red, brown, yellowish-brown and dark grey lateritic and non-lateritic loams of variable texture. They frequently overlie a gravelly sub-soil. Their depth is very variable. They are relatively rich in available mineral nutrients, but often suffer from a deficiency of organic matter, unless under virgin jungle. Bulky organic manuring is their chief requirement. These soils are primarily paddy soils, but many of them are also suited for coconuts and fruit crops such as mangoes, and for annual rotational crops. They constitute the main soils of the Dry Zone of the Island and, in so far as they have a wide agricultural usage, are an asset to the country. When utilized for rotational cropping in the Dry Zone, they would need to be put under temporary grass leys for two or three years, if their structure and fertility are to be maintained. Napier grass offers promise as a suitable ley crop, but it has certain disadvantages. Investigations are being carried out to determine the suitability of natural pasture grasses for the purpose.

(2) The brick red loams of the Jaffna Peninsula and the north-west coast of the Island. These are derived from miocene (calcareous) sedimentary limestone and are typical *terra rosa* (red earth) soils. They are deficient in nitrogen but are rich in mineral nutrients. These soils are very suitable for rotational cropping but require irrigation, bulky organic manures and nitrogenous fertilizers for continued high crop production.

(3) The grey calcareous loams, also derived from miocene limestone. These are the paddy soils of the Peninsula and occupy the low-lying tracts. They, too, need bulky organic manures in addition to nitrogenous fertilizers for good crop yields.

(4) The red loams derived from crystalline limestone (dolomite and calcite), e.g., the soils of Nalanda and North Matale. These could be used for rotational agriculture or for paddy, but their drainage becomes important when the former type of agriculture is practised. Their manurial requirements are similar to those of the Jaffna limestone soils.

(5) The red earths of the Pleistocene era. These are similar to the red lateritic soils in character and agricultural value and require the same agricultural treatment. They are of fairly widespread occurrence but their extent is not great.

(6) The brown and reddish sandy soils of the North-Western Province derived, according to the geologist Wayland, from the Pleistocene Plateau deposits. These are similar to the cinnamon soils and require bulky organic manures, potash and to a lesser extent, phosphoric acid, for good crop yields. Sandy soils derived from quartzitic rocks are also found in parts of the Eastern and North-Western Provinces, and where irrigable, are cultivated with paddy. Yields, however, are poor unless the soils are manured with organic manures and with nitrogenous and potassic fertilizers.

(7) The dry *patana* soils. These are very variable in texture and depth, but are generally light to medium loams of moderately acid reaction and generally poor nutrient status, both organic and inorganic. When cultivated with food crops they mainly require heavy applications of bulky organic manures, but in the case of some crops artificial manuring is also necessary. These soils, where their depth permits, are best suited for tea, but temperate vegetable crops, certain fruit crops, onions, garlic and paddy do well on some of them given suitable treatment.

(Courtesy—Agricultural Department).



