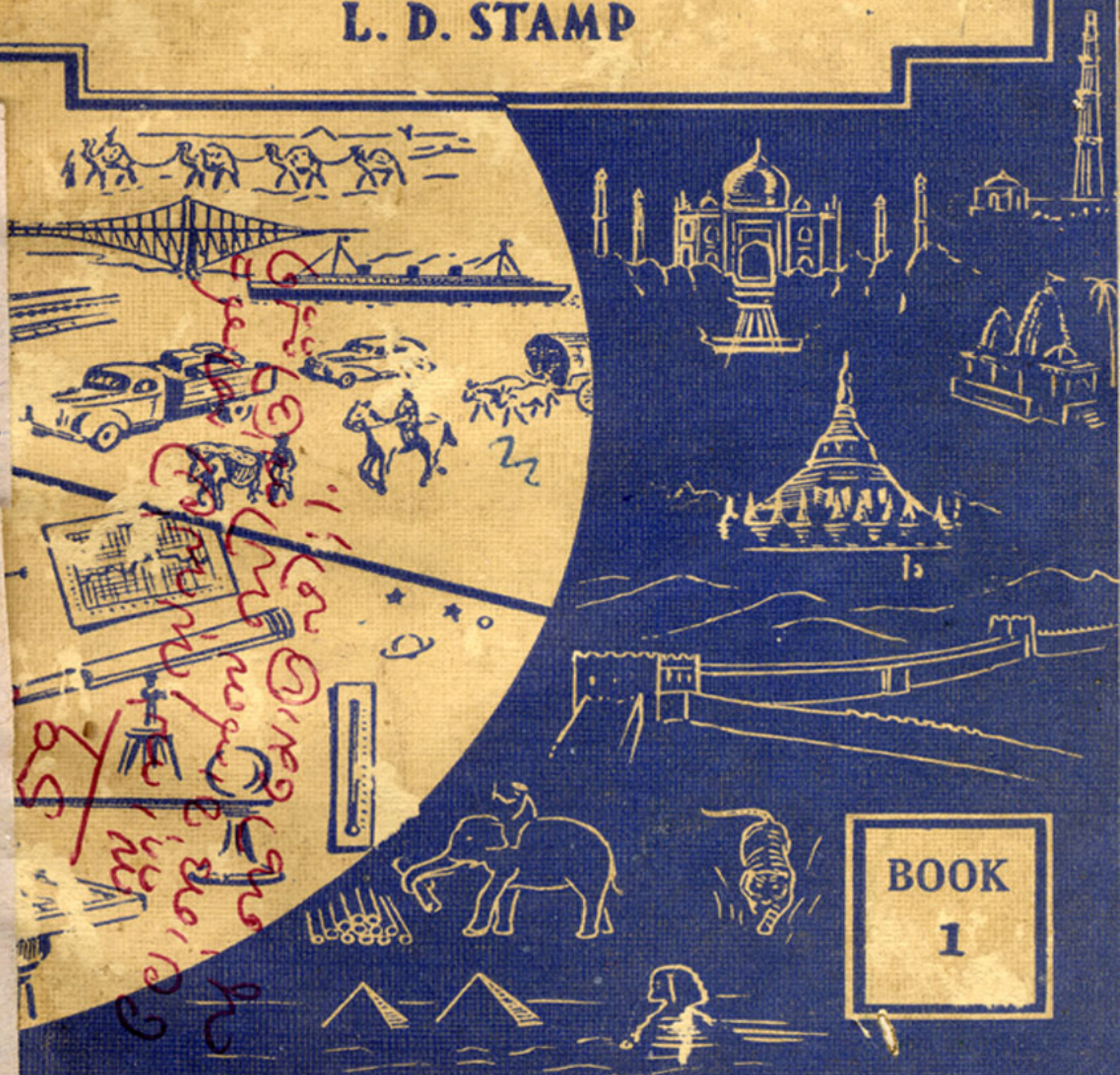


LONGMANS' 42352
DESCRIPTIVE GEOGRAPHY

L. D. STAMP



BOOK
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LONGMANS'
DESCRIPTIVE GEOGRAPHY
BOOK I

BY
L. DUDLEY STAMP, B.A., D.SC.



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NOTE

This book is intended for junior pupils in secondary schools and covers the ground for a year's course as contemplated by the Education Department. The treatment is descriptive and aims at bringing out the influence of geographical environment upon human activities. Care has been taken to make the language simple. It is hoped that in schools where English is the medium of instruction the book will be found useful.

NOTE TO THE REVISED EDITION

The book has been revised and rearranged in accordance with the new syllabus issued by the Education Department.

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(26 Lessons)

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Descriptive Geography

BOOK I

PENINSULAR INDIA AND LOCAL STUDY OF WEATHER, ROCKS, SOILS AND CROPS

1. The weather

Look out of the classroom window. Is the sun shining or is it raining? Is it very hot and dry or is it hot and steamy? If we answer these questions we shall be saying what the weather is to-day, and we are now going to learn something about weather.

How rain falls.—Have you ever wondered why rain falls? If you look at a map of India, you will see that on the west, south and east lies the warm Indian Ocean. For nearly half the year the wind blows over India from this ocean. I want you to think of this wind as a sponge. On its way to our shores it sucks up the water from the sea, just as you can mop up water spilt on the floor with a sponge. By the time it reaches us, it is full to overflowing with water. Now turn to the map of India and imagine you are living somewhere along the west coast. Immediately behind you is some highland. The wind is blowing towards that highland from the

sea. It cannot blow through the mountains, so it has to climb over them, carrying its water with it. (This water in the air is called 'water vapour'.) On the top of this highland you would find that the air is much cooler than it is in the plains below, and the poor wind finds it has drunk too much water from the sea and so cannot contain it in the cooler air at the top of the mountains. So some of it is changed back into tiny drops of water which we can see in the form of 'clouds'. These tiny drops join together to form larger drops which in their turn fall as rain-drops. (The changing of water vapour into rain is called 'condensation'.)

How rainfall is measured.—It is very important to some people, such as farmers, to know exactly how much rain is likely to fall at any given time. So clever people have measured rainfall at various places all over the world for many years. They can foretell roughly how much rain is likely to fall at any given time in a certain place.

The instrument they use for measuring rainfall is called a 'rain-gauge'. You too may be able to make a simple one for yourself. But before you do so you must realise exactly what you are trying to measure. Imagine the country round your home to be absolutely flat and smooth,

without houses, fields, nullahs or hills. Imagine it to be made of concrete so that no water can drain away and nobody can disturb the rain when it has fallen. Suppose at 8 o'clock one morning it began to rain, and rained on and off until 8 o'clock the next morning. Then your piece of level concrete land would have a layer of water all over it to the depth, say, of 1". We should then say that there had been 1" of rainfall in that place on that particular day. Fortunately for us, the real country is not flat or made of concrete, so we have to make an instrument to measure the rain.

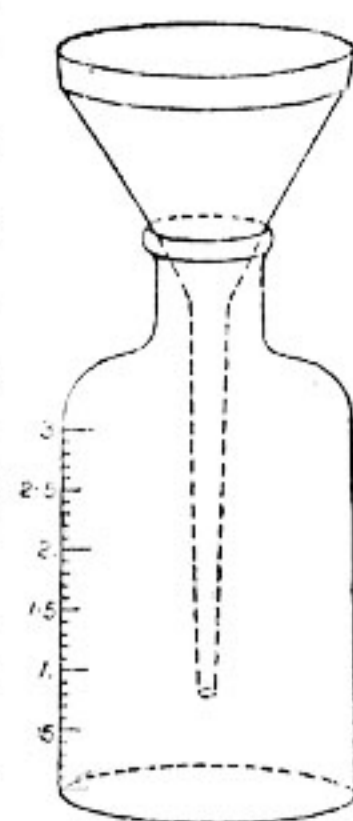


FIG. 1.—Picture of a rain-gauge.

First of all, we must get a bottle with as small a neck as possible (so that none of the water can escape back into the thirsty air). Next we must get a tin funnel whose rim is *exactly* the same size as the bottom of the bottle. Next we must mark with paint, by placing a ruler along the side of the bottle, the inches and tenths of inches, beginning at the bottom of the bottle. Thus we have a very simple rain-gauge. Figure 1 shows you a picture of this. We then put our rain-gauge in the open air, well away from houses or trees, so that the rain can fall into it quite easily.

Every day at, say, 8 o'clock in the morning, we must look and see how much water there is in the bottle, make a note of this and then empty the bottle so as to be ready for the next day's rain.

Preparation of a rain chart for recording daily rainfall.—Let us imagine that for the month of July the rainfall in the bottle has been something like this :

		Inches			Inches			Inches
July	1	0·6	July	11	0·9	July	21	0·8
„	2	0·9	„	12	0·9	„	22	1·1
„	3	0·4	„	13	0·6	„	23	1·3
„	4	0·9	„	14	0·4	„	24	0·8
„	5	0·5	„	15	0·8	„	25	0·9
„	6	0·4	„	16	0·9	„	26	0·9
„	7	0·3	„	17	1·3	„	27	0·8
„	8	0·7	„	18	0·9	„	28	0·5
„	9	1·2	„	19	1·1	„	29	0·9
„	10	1·4	„	20	0·9	„	30	0·9
						„	31	1·1

That tells us exactly how much rain fell on each day of July. But we might like to make a picture or chart of what has happened ; so we take a piece of paper ruled in tenths of inches. Number the days of the month along the bottom of the paper, allowing a square for each day. Now number the tenths of inches up the paper, beginning at the bottom, for two inches up the paper. The first day had ·6", so fill in column 1 up as high as ·6" with a blue pencil. The

second day had $\cdot 9''$, so colour column 2 up as high as $\cdot 9''$, and so on. Then you will have a chart of the rainfall of your town for the month. Figure 2 shows you this. If you add all these

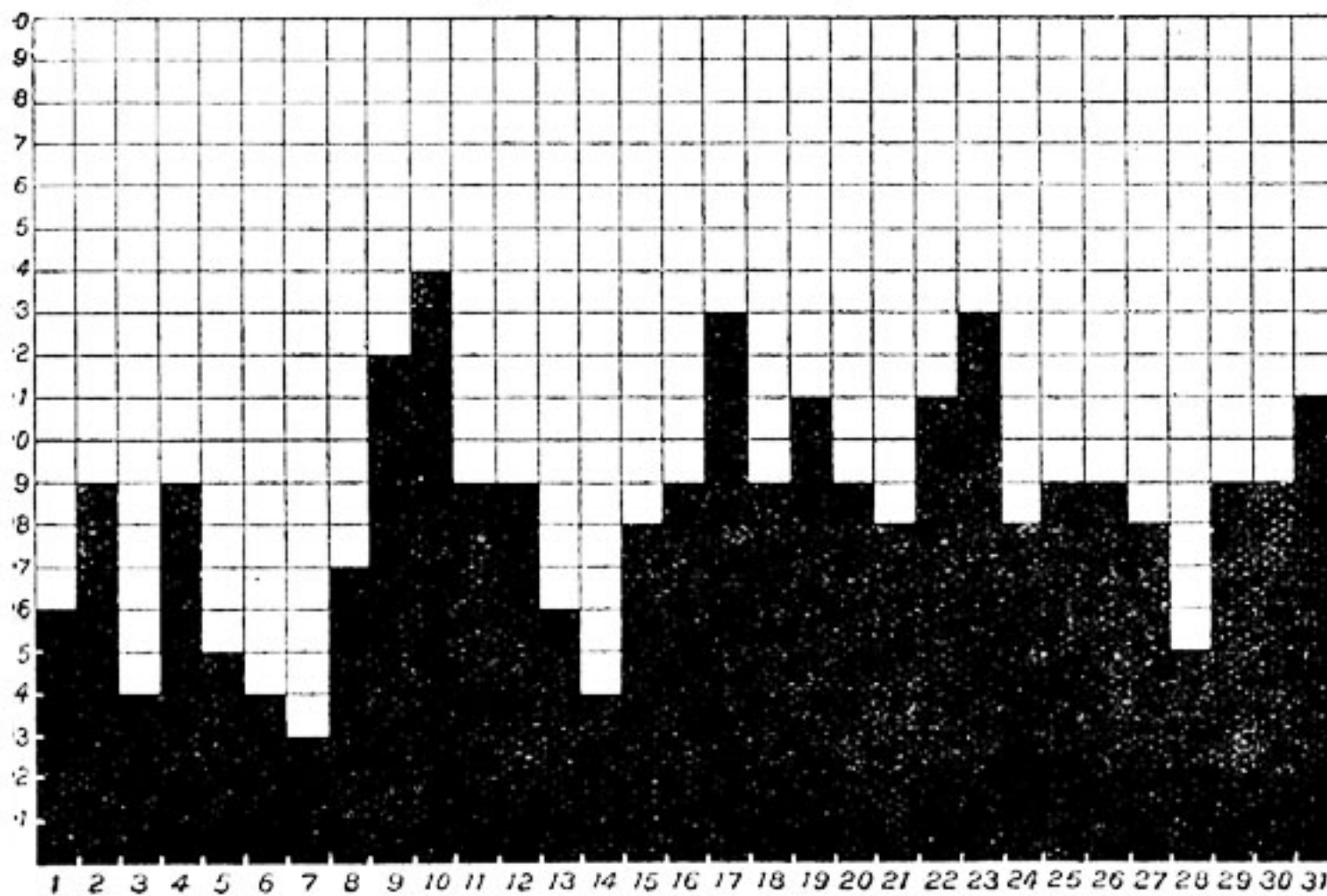


FIG. 2.—Rainfall chart for July.

figures together you will get $26''$ of rain, which means that if all the rain had remained where it fell, at the end of the month the water would have been $26''$, or more than two feet deep.

2. Wind direction: Preparation of a wind-rose

In the last lesson we were talking quite happily about the wind blowing over the Indian Ocean towards our shores, but we did not ask

ourselves *why* the wind blows. You have probably noticed that at certain times of the year the wind is much stronger than at others and sometimes blows in one direction and sometimes in another.

Let us first of all try to answer that question 'Why does the wind blow?' Wrapping the whole world round like a blanket, is the 'air' or 'atmosphere'. We cannot see it, but we can feel it. Sometimes the air is hot and sometimes cold. We can feel both these conditions. Sometimes it is 'damp' or filled with water vapour, and we can feel that too. The air is made up of a number of gases. The three most important are 'oxygen', 'nitrogen' and 'carbon dioxide', with a varying amount of water vapour. As far as we ourselves are concerned, oxygen is the most important of the gases, for, without it, we cannot live. A gas is a substance which is made up of millions and millions of tiny particles which are too small for anyone to see. All these tiny particles can move about from one place to another, and it is the movement of these tiny particles which we can feel and which we call wind. In Madras we can say roughly that from June to October the wind blows from the south-west and for the rest of the year from the north-east. (The wind

is always named by the direction *from* which it blows.) Suppose we prove that by means of a chart or diagram. Let us select July for the first period and January for the second. Every day in July we must note from which direction the wind is blowing, and write down our observations. For example :

July 1	S.W.	July 11	S.	July 21	S.W.
" 2	S.W.	" 12	SS.W.	" 22	S.W.
" 3	SS.W.	" 13	S.W.	" 23	S.W.
" 4	S.W.	" 14	S.W.	" 24	S.W.
" 5	SS.W.	" 15	S.W.	" 25	SS.W.
" 6	SS.W.	" 16	S.W.	" 26	S.W.
" 7	S.W.	" 17	SS.W.	" 27	S.W.
" 8	S.W.	" 18	SS.W.	" 28	SS.W.
" 9	S.	" 19	S.	" 29	SS.W.
" 10	SS.E.	" 20	SS.W.	" 30	S.W.
				" 31	S.W.

We can count up the total of days for each direction: for example, 17 days S. W., 10 days SS.W., 3 days S., 1 day SS.E. Now take a piece of squared paper marked in inches. Choose a central point as in Fig. 3, and mark the points of the compass. Beginning from the central point, count 17 little squares and

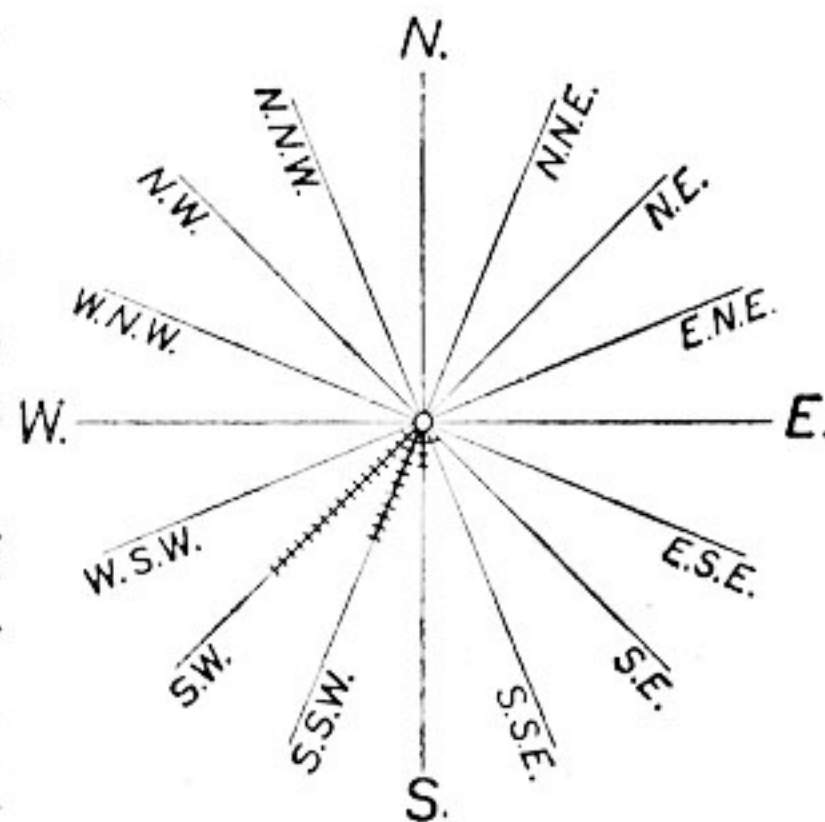


FIG. 3.—Wind-rose. (For July).

draw a line to the 17th square in the S. W. direction. Repeat the same thing for the S.S.W. days, S. days and S.S.E. day. (You are using a scale of one-tenth of an inch which equals one day.) Figure 3 shows you this completed. Now make one for yourself for January or for any other month of the year. Notice when you have done it how it differs from the one you did for July?

Peninsular India : Introduction

The country we live in is called India. It lies in the south of the continent of Asia. Notice that its southern part is triangular in shape and it is surrounded by water on three sides. A land surrounded on three sides by water is called a "Peninsula". On the north of this Peninsula are the Satpuras and the Vindhya Mountains, on the west is the Arabian Sea, on the south the Indian Ocean, and on the east the Bay of Bengal.

Peninsular India is a tableland. It is made up of old rocks. On the west of it are the Western Ghats and on the east the Eastern Ghats. The Eastern Ghats are neither continuous nor very high ; also, they run farther from the coast and have different names in different districts.

Regions which have similar physical features, climate, natural vegetation and mode of life of the people are said to belong to the same natural

region. Accordingly, we can divide South India into three major natural regions :

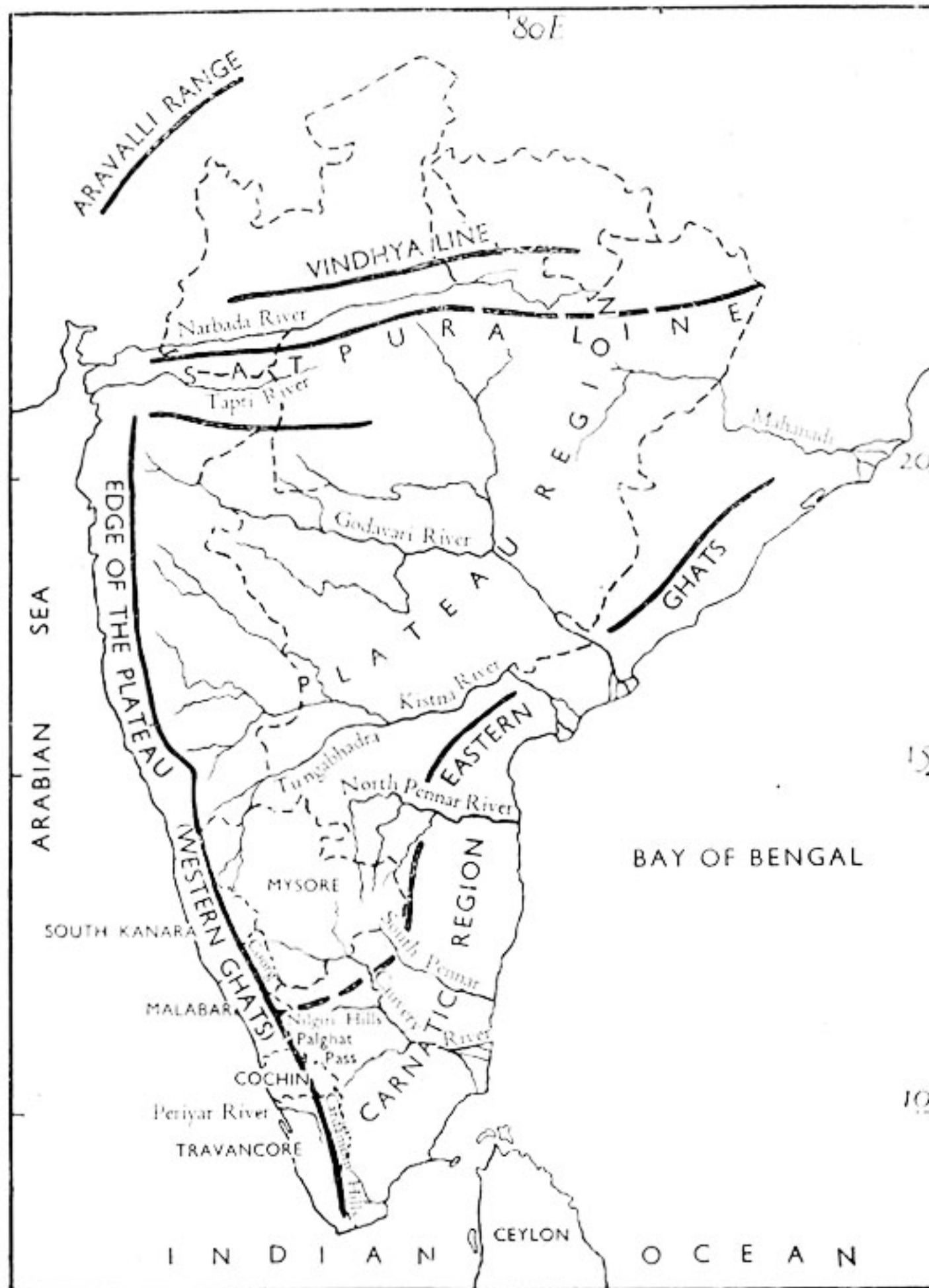


FIG. 4.—Map of Peninsular India.
(Notice the three Major Natural Regions)

(1) The West Coast Region,

(2) The Tableland,

and (3) The East Coast Region.

There are sub-divisions in each of these. We shall now learn about these major regions.

3. The Western Ghats and how they were formed

The great plateau of India is built up of very hard old rocks. Millions and millions of years ago there were great mountains and deep valleys there, but they have been worn down by wind and rain and rivers, so that the surface is now gently rolling instead of being covered with steep mountains. A huge block of this ancient land has been raised by earthquakes high up above the level of the sea so that it now forms a plateau or tableland. But it is not a flat tableland, for the western edge is the highest and the surface slopes gently to the east. We call the high western edge the Western Ghats, and when we see this edge from the sea it looks like a steep range of mountains, but we know there is flat land at the top. So the Western Ghats have a steep face facing the sea on the west. This side faces the strong monsoon winds and so, from June to October, they bring a very heavy rainfall. The hills on this side are steep, the rocks are hard and there is not very

much soil—there is not much land for farmers nor many places to build villages. Instead, high dense forests cover the hills and so heavy is the rain that in the wettest parts the ground remains damp the whole year and the forests are ever-green. Where it is a little drier, the fine teak tree grows.

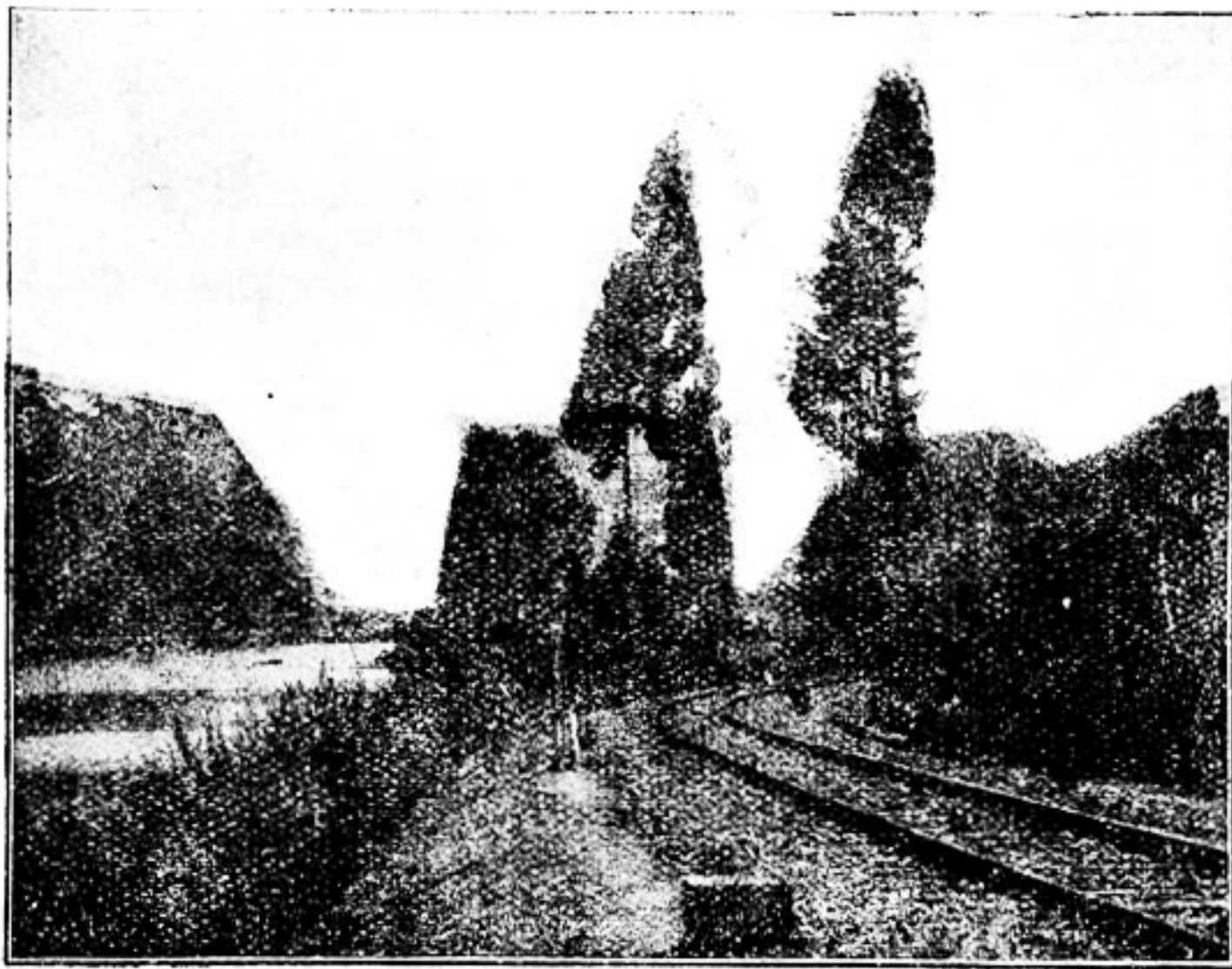


Photo: Klein & Peyerl.

FIG. 5.—A view of Ootacamund.

It is difficult to cross the Western Ghats, because they are so steep on the western side. But in the Madras Presidency there is one great pass or gap called Palghat Gap which makes it possible to get from the east coast to the west

coast of Southern India by railway and by road. South of the gap the continuation of the Western Ghats is called the Cardamom Hills.

High up on the slopes of the Western Ghats it is much cooler than on the hot plains and so there has been built a hill station where Government officers can work in the hot weather. It is called Ootacamund.

The growers of tea and coffee.—On the slopes of the Western Ghats around Ootacamund are to be found many tea gardens. What we call tea is really the dried broken leaves of a small shrub. The tea shrub likes a deep rich fertile soil with plenty of water and is usually grown on hill slopes. If the shrub were left to itself it would grow into a small tree, but it is pruned to a small bush. When the young leaves or the new shoots have reached a certain size they are picked. There may be ten or more pickings in the season. The picking of the leaves has to be done carefully by women. When the leaves have been gathered, they are spread out on wire trays and dried in the sun, or perhaps in sheds. After this they are passed between rollers. India grows more tea than any other country except perhaps China. Most is grown in Northern India—in Assam—but the slopes of the Western Ghats and Nilgiri Hills

in Madras have many tea gardens or plantations. Often the plantations are very large and the man in charge is called a 'tea planter'.

Not very far away from the tea gardens we find also coffee plantations, especially in Mysore.



[Photo : Exclusive News Agency.]

FIG. 6—Tea-picking.

The coffee tree is a small tree growing to a height of about 18 or 20 feet and has shiny, evergreen leaves. The tree has white, scented flowers, and

coffee is obtained by roasting the seeds or beans of the tree. One way of gathering the fruit is to shake the tree! The coffee tree requires a rich soil and is usually grown where forests have been cleared away. There used to be very much coffee



FIG. 7.—An Indian coffee plantation.

grown in Madras Presidency, but many of the plantations were destroyed by disease.

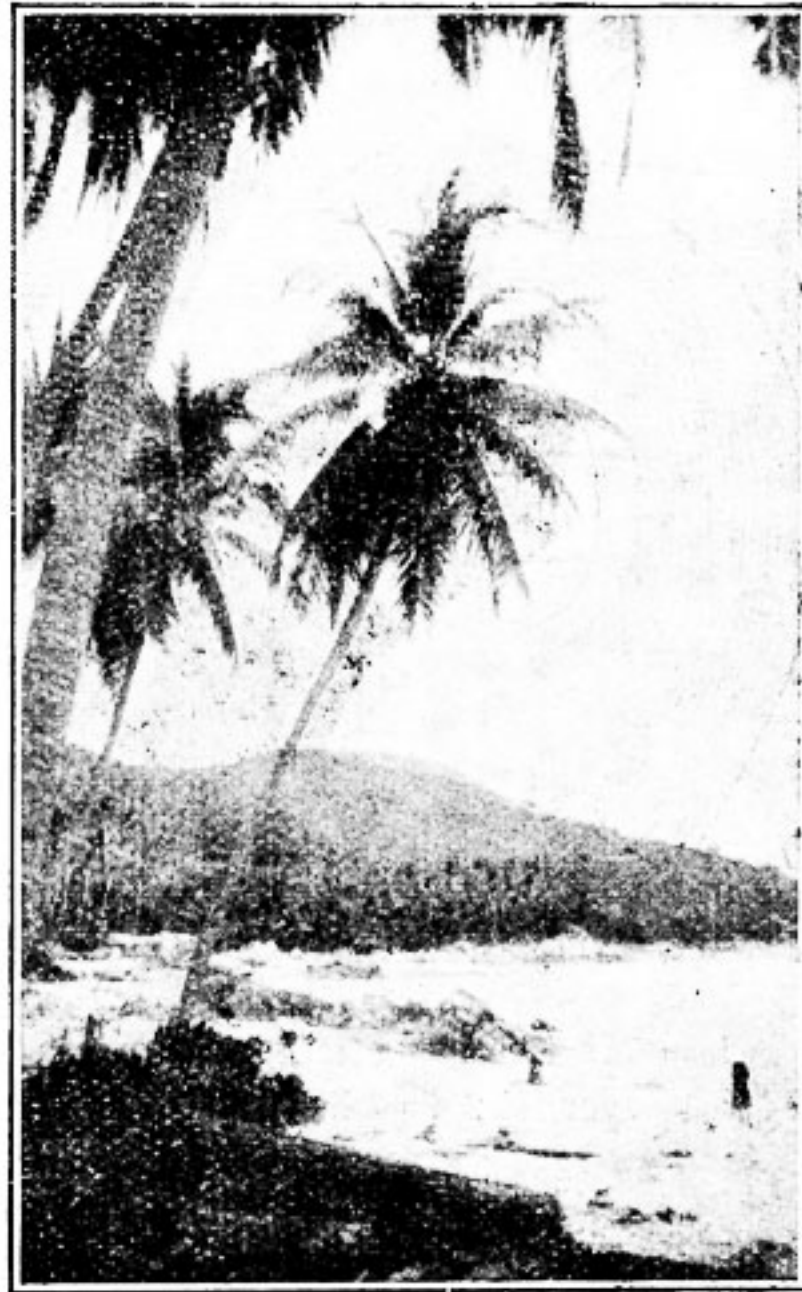
4. Life and occupations of people on the West Coast

We have already spoken of the steep western face of the Western Ghats and how it gets a very

heavy rainfall from the South-West Monsoon. Between the Western Ghats and the sea there is a strip of flat land where many people live.

The northern part of this West Coast region of Madras Presidency is called Malabar and South Canara. Here the great waves from the ocean have piled up lines of sand-dunes which are now covered with coconut palms. The huts of the people are to be found amongst the coconuts and many of the people of Malabar earn their living

by gathering coconuts and preparing 'copra'. Copra is the flesh of the nut dried in the sun. The outside husks of the nuts they put in shallow lagoons to rot, and so collect the fibre



[Photo : L. D. Stamp.]

FIG. 8.—Coconut trees on a sandy sea shore.

or 'coir'. Many of the people are fishermen too.

Protected from the sea by the line of sand-dunes are stretches of very wet, flat land with many shallow lakes or lagoons.

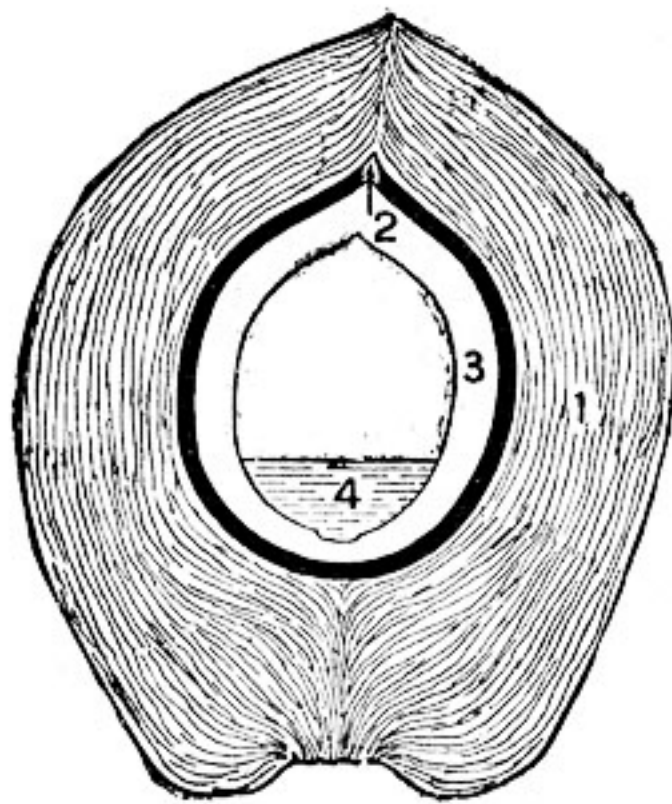


FIG. 8 (a).—Section through a Coconut.

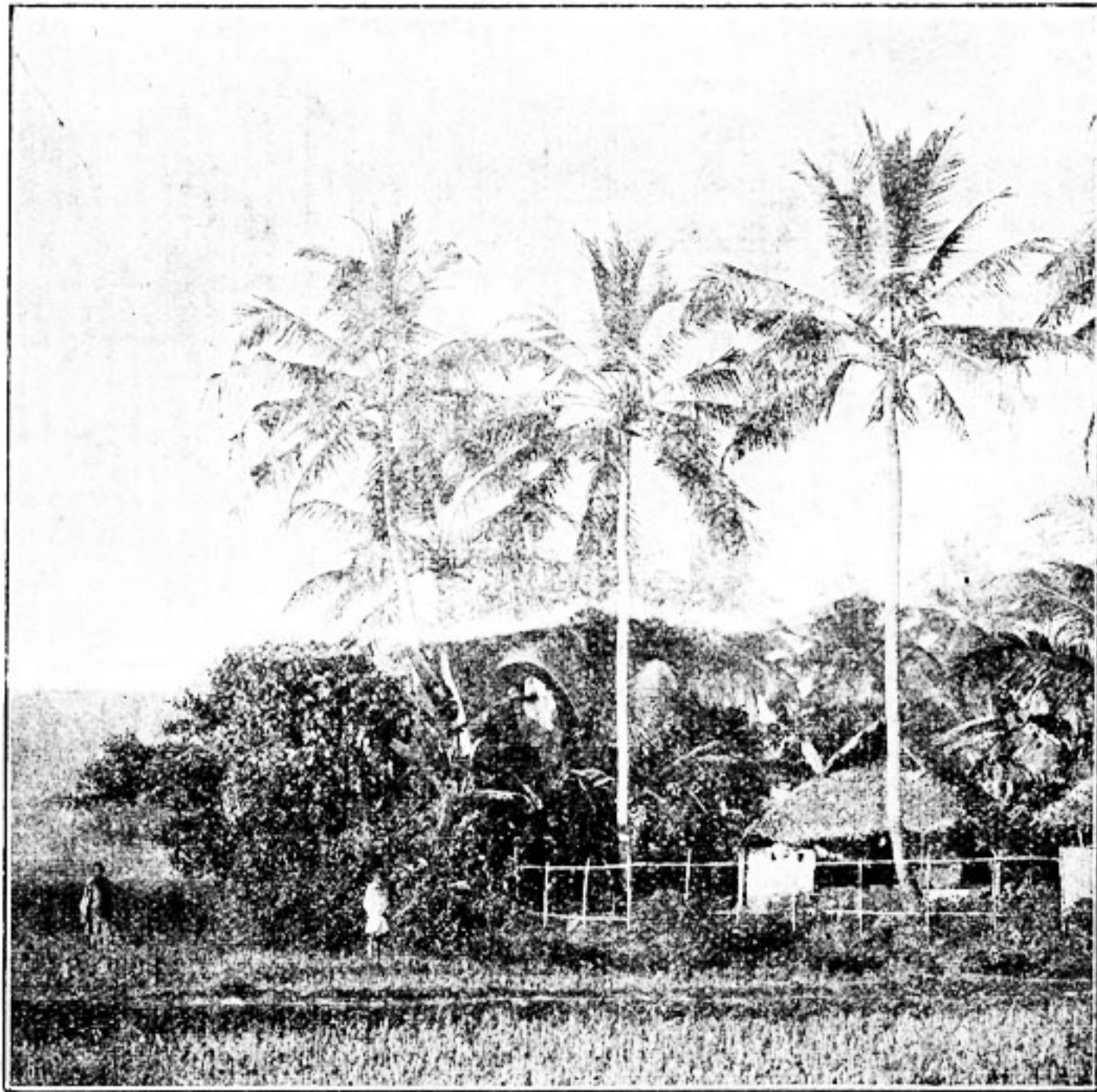
1 = Husk ; 2 = Shell ;
3 = Kernel ; 4 = Milk.

These lagoons have been joined by canals, and the easiest way of travelling in this very wet country is by boat. The houses are built of wood and bamboo and are thatched with leaves of the coconut palm. They have to be raised up above the ground because the land is often flooded in the rainy season. On the fine rich soil round the

lagoons the people grow rice—they are nearly all rice farmers and rice is their chief food. In September or October they are busy planting the little rice plants in the flooded fields ; as the rains cease the plants grow very quickly and in January the crop is ripe, or harvested.

The slopes of the Western Ghats are covered with fine forests and many of the people are busy here with the work in the forests. The

trees are cut in the dry season, and the great logs are dragged by buffalo or elephant to the stream



[Photo: Exclusive News Agency.]

FIG. 9.—A West Coast village.

courses. When the rains come they are floated down the streams to the lagoons and to the sawmills.

South Kanara District.—Mangalore is the principal town and is noted for tiles. *Udipi* is



[Photo : Klein & Peyerl.]

FIG. 10.—Timber working on the Western Ghats.

a religious centre. *Kāsargod* and *Coondapur* are other big towns in the district.

Malabar District.—The chief town is *Calicut*, which is a small port. The other important towns in the district are *Cannanore*, *Tellicherry*, *Tirur* and *Palghat*.

The easiest way of reaching the West Coast from Madras is through the great pass or gap of Palghat. Find it on the map. When we have travelled through the gap, we can either turn to the north into Malabar or to the south into Cochin and Travancore. The railway runs north to Calicut, the fourth largest town in Madras Presidency, and on to Mangalore.

The West Coast strip is wider in Cochin and Travancore. Here the soil is rich, there is abundant rain and it is always hot. So crops grow very quickly and well, and very large numbers of people live in this region. Many are rice farmers and many are fishermen or growers of coconuts. Some of the lagoons have channels connecting them with the sea so that they can be used as harbours. Cochin has an important harbour. Coconut palms fringe the lagoons and there are groves of the areca-nut palm. The region has long been famous for pepper, and spices are also grown. *Cochin* was once a great spice port.

In Travancore are India's largest rubber plantations. The rubber tree was brought to India from South America. It is a big tree which will grow only where it is always hot and always



Courtesy of the Rubber Growers' Association.

FIG. 11.—Tapping rubber.

wet. When the tree is about 7 years old, it is ready to be 'tapped'. In the early morning, a man comes along with a very sharp knife and cuts a tiny strip of bark. A thick white juice runs out and into a small cup. About an hour

later this white juice or latex is collected and taken in pails to the factory. From this juice rubber is made. A number of the people of Travancore work on the rubber plantations. *Trivandrum* is the chief city of Travancore.

5. The work of rain and streams in wearing away the surface as seen in the locality *

At the beginning of this book we learnt about rainfall, why the rain falls and how it is measured. You must have noticed that sometimes the rain falls gently, while at others it pours in torrents. What happens to the rain when it reaches the surface of the earth? In the towns, it falls on the houses and runs down the gutters and drains until it reaches the level of the street, where it is taken away by other gutters and drains. The water which falls in the streets also runs away down the drains. The drains help the streets to dry up quickly and were made by men who want to have dry, clean streets. The drains run along the streets and join together in what is called a sewer, and the water in the sewer finally runs into a river or the sea. But in the country districts we do not find so many drains and so the water often

* In schools in places where the main rainfall occurs at the time of the North-East Monsoon, this lesson would be better taken later in the year.

has to make its own way to the rivers and finally to the sea. Much of it, of course, sinks into the soil and helps the crops to grow, but some of it forms little brooks which gradually become bigger and bigger as they go on their way and become rivers.

Have you ever watched water at work? The next time it rains hard, you should watch what

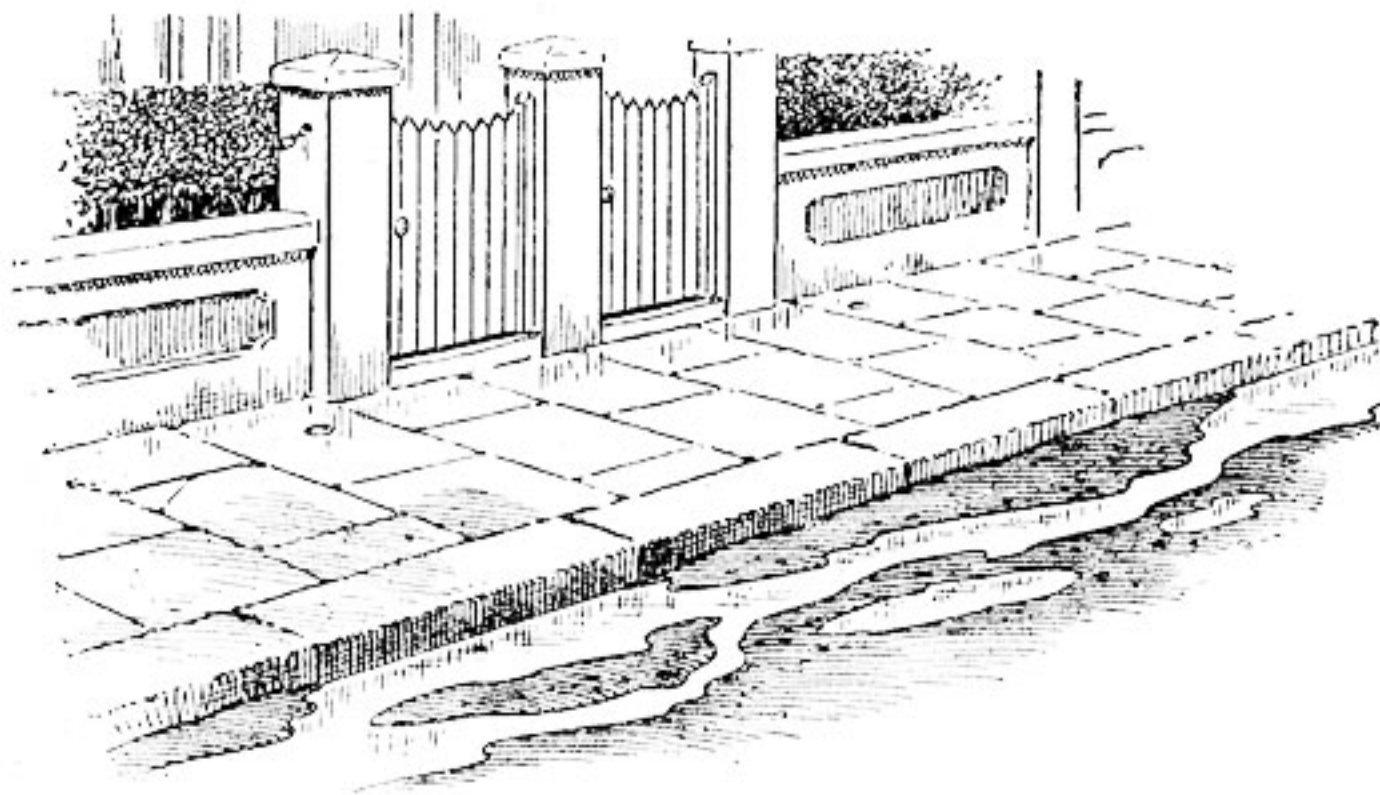


FIG. 12.—How rain water runs off.

happens in a gutter at the side of the road. The first thing you will notice is that water *always* flows *downhill*. This is a very important fact and one that you must remember. As the water flows along, it has power to carry sand and small stones, bits of broken wood and all kinds of rubbish along with it. This carrying power of

water is also very important, and if you look at your stream in the gutter you will see this happening for yourself. Figure 12 shows you a picture of this. Now I want you to study the work of a stream somewhere near your school. You can also do a very delightful experiment. Make some little boats of paper or of wood and put them into the water and you will be able to see where the current is running fastest. Look

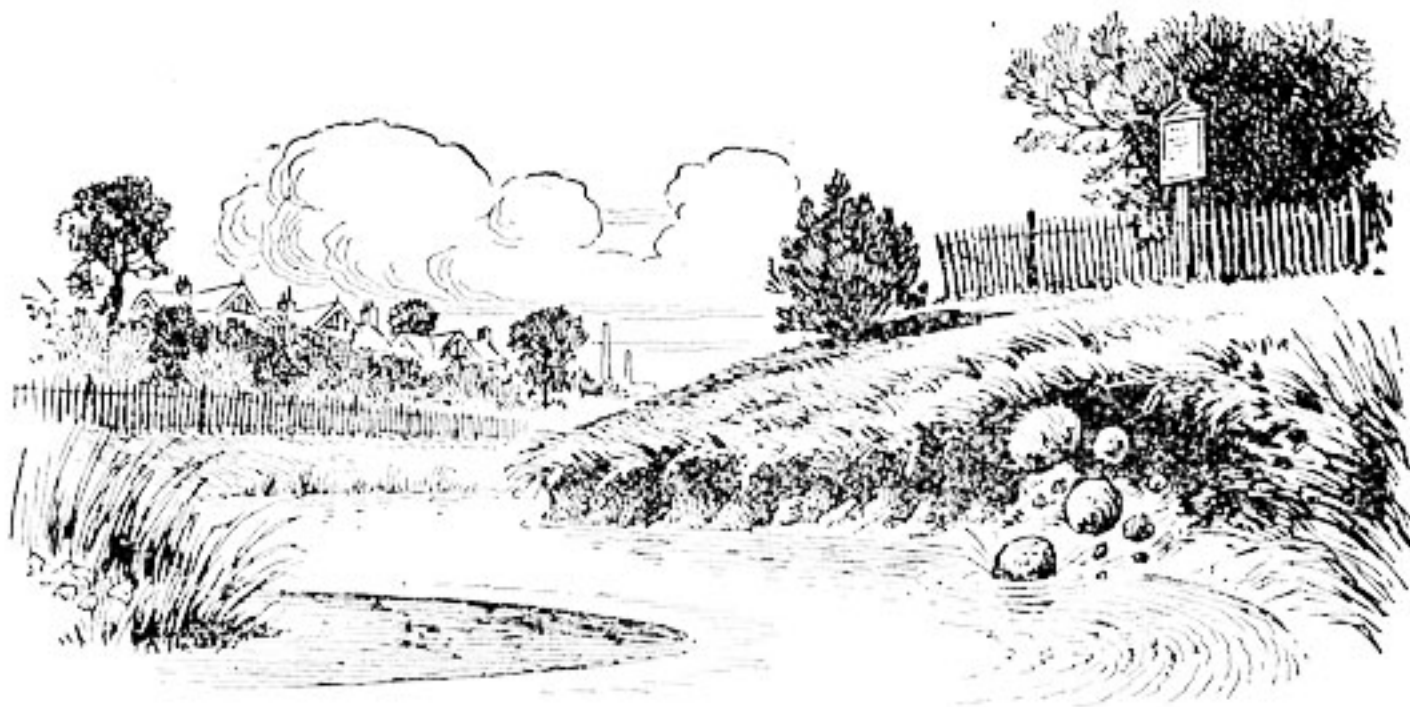


FIG. 13.—Picture of a stream with bends and sandbanks.

at Figure 13. In this picture, you see how a river bends as it runs along its course. Notice that when the river bends to the right the current swings to the right too, and is fastest along the right bank, while on the left there is a bed of mud which the slow-flowing water could not carry along with it and so had to deposit on the bottom. The opposite happens when the river bends to the

left. Then the current swings to the left bank and there is a sandbank in the shallow water on the right.

Now I want you to imagine a very, very bad storm. There is a very strong wind, pieces of trees are blown down and crash to earth. The rain pours down in torrents, and soon the river begins to rise and comes tearing down the valley, bringing down broken pieces of wood and stones. As these stones are carried along by the water, they knock against other stones and the water loosens these and they too are swept along by the water, and the river bed after the storm is wider and deeper than it was before. Sometimes much damage is done to the people, their houses and animals, if the river floods its banks. So in some places where there is danger of this happening, big stone walls are built to keep the river from overflowing. This work of a river is usually called 'denudation' because it denudes away the surface of the earth, or 'erosion' because the river erodes or gnaws out its bed.

6. How rocks are formed—Examination of typical rocks of the locality

In the last lesson we learnt how the wind and the rain are always hard at work trying to wear away the land. During the rainy season the

streams and rivers are full of very muddy water. Where is this muddy water going? It is all moving towards the sea and when the rivers reach the sea they drop their load of sand and mud and the larger stones which they have rolled along. Later, after many thousands of years, instead of being under the

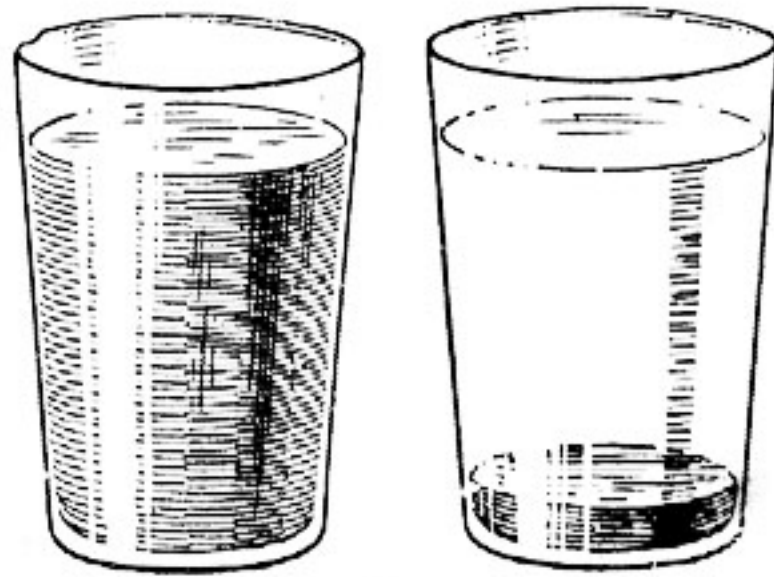


FIG. 14.—Muddy water from a stream.

sea, these layers of sand and mud are raised up to form dry land. Most of the lowland of Madras was once covered by the sea in exactly this way. Of the different rocks that have been formed in this way, some are very old and very hard; others are not so old, though they were formed a very long time ago. So we can say there are two kinds of rocks formed under water—old, hard rocks and young, soft rocks. It is the old, hard rocks that make up the mountains, and the young, soft rocks the plains.

Perhaps it is difficult to believe that where you live was once under the water. But we have sometimes read in the newspapers of great earthquakes and how, after the earthquake, part of the

sea bed has been raised up to form dry land. We do not have many earthquakes in Southern India

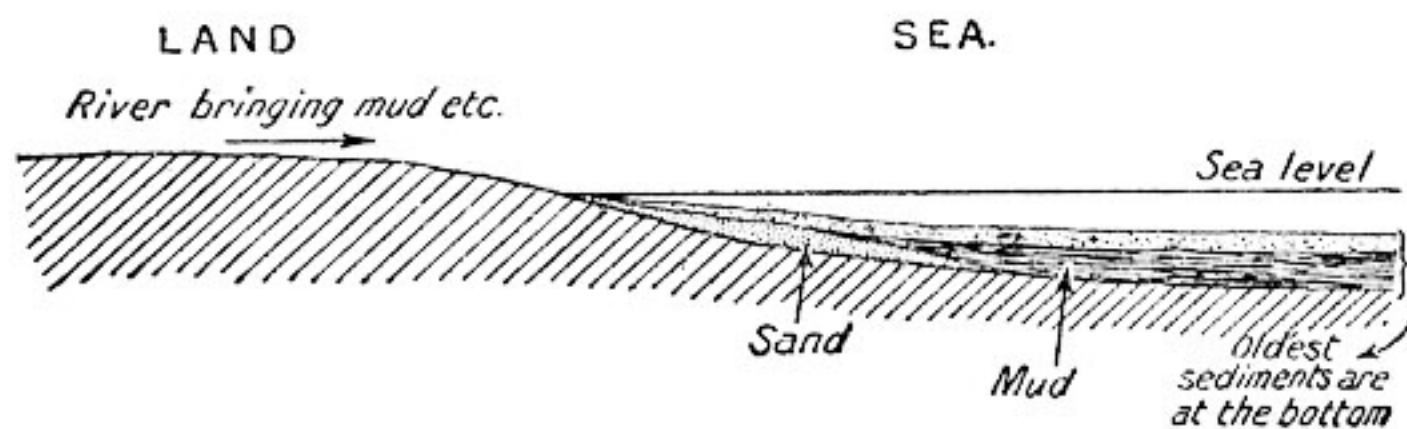


FIG. 15.—How mud and sand are laid down under the sea.

now, but long ago they must have been very common. Examples of rocks which have been formed under water are sandstone, shale, clay and sand. Sometimes the mud brought down by the rivers does not quite reach the sea but is piled up at its mouth to form a great delta.

You have all heard of a volcano. Deep down in the earth it is very, very hot, so hot that the hard rocks become liquid, just like water, and when there is a crack leading to the surface, the

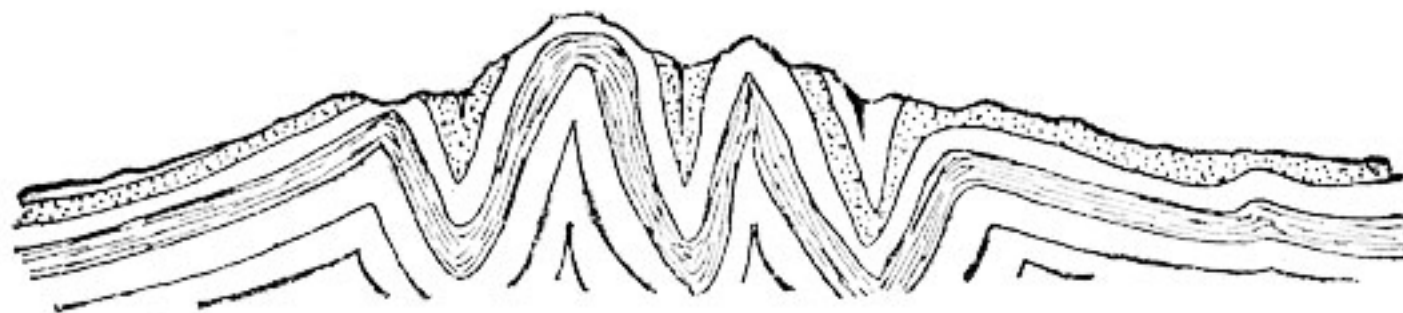
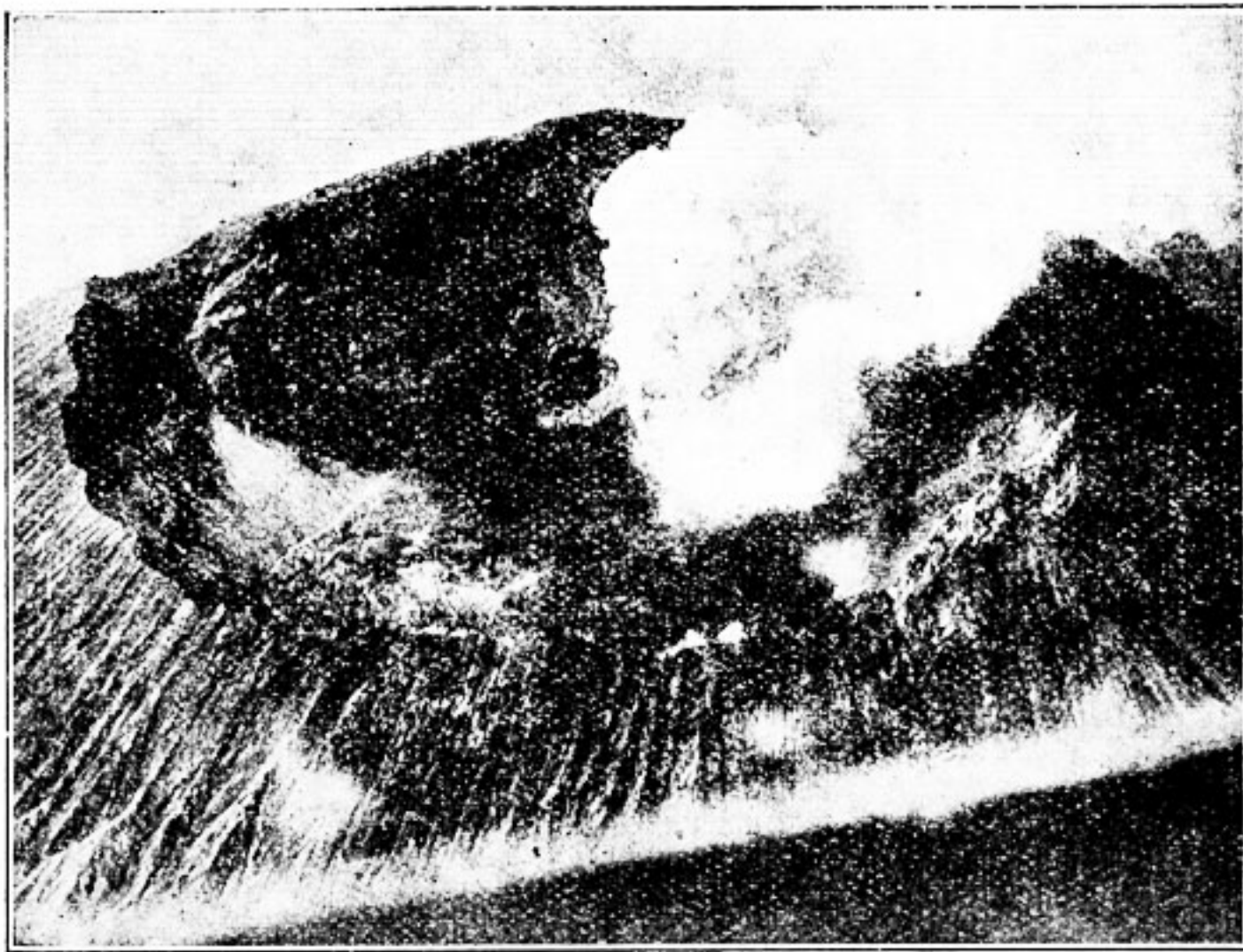


FIG. 16.—Bed of rock folded by earthquakes.

molten rock will reach the surface and will pour out through a volcano, together with steam and

ashes. When the 'lava', as we call it, has become cool, it gets hard and forms what we call a 'volcanic' rock. In the Bombay Presidency there are miles and miles of land covered with a volcanic rock called 'basalt'. Sometimes the liquid rock does not quite reach the surface of the



[Photo : Aerofilms.]

FIG. 17.—A volcano.

earth, but cools slowly and forms a great mass underground. Such a rock is granite.

The great plateau of the Deccan was formed a very, very long time ago and it consists of very hard old rocks. Many of them were once sandstone and clay, but they have been changed by

many earthquakes. In some places there are granites, but in many places there are what we call 'crystalline' rocks because of the shining crystals in them. These are very old rocks which have been changed.

7. Crops and soils—How soils are formed

If we can find a pit or a hole which has been dug in the ground we shall be able to see how the

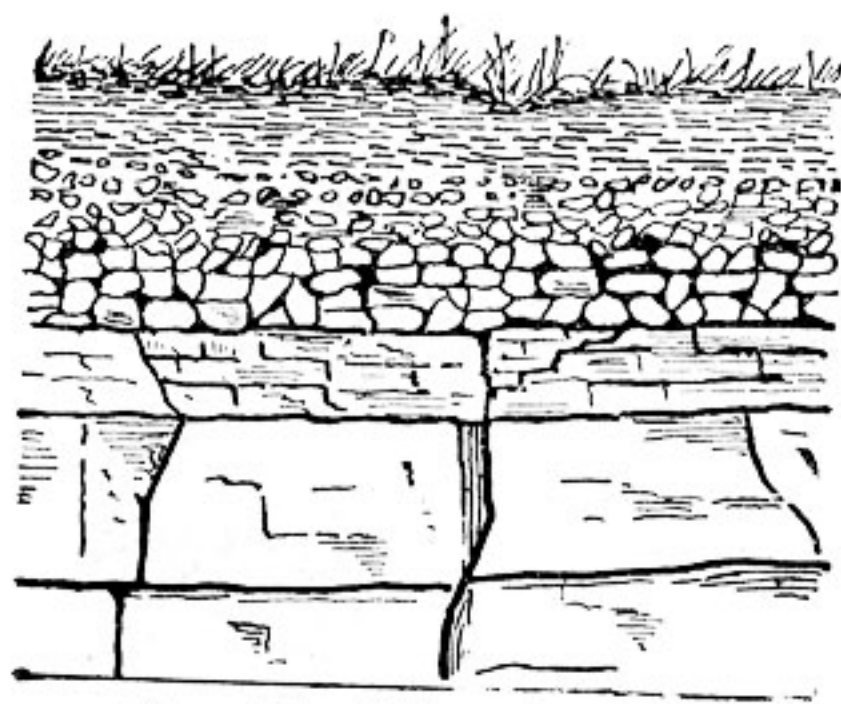


FIG. 18.—Soil and sub-soil.
(*a*=soil ; *b*=sub-soil ; *c*=rock)

soil is formed.

The side of the pit will look like Figure 18. On the surface there will be grass or trees growing, under this will be the soil, full of the roots of the grass or trees.

Some soils are

dark, almost black in colour and these dark soils are often very good for plants. Other soils are red or yellow and are not so good. Sometimes the soil is full of sand—a sandy soil—but sometimes it is like dust when it is dry, but very sticky when it is wet. The soil in the paddy fields is very sticky when it is wet, but very hard when it is dry. This is a clayey soil.

Under the soil there is another layer, marked 'b' in Figure 18, which consists of broken pieces of rock or is formed of clay or sand, with only a few plant roots. This is the sub-soil. Underneath this is the rock itself—it may be hard granite or sandstone or it may be soft sand or clay.



FIG. 19.—Picture of a dry sandy land.

Some soils are thick or deep and these are best for crops ; other soils are thin and poor and the hard rock is only a few inches below. We shall find that there are two things which make a great deal of difference to the farmer :

- (a) The soil—whether it is good or poor ; and
- (b) water—whether there is enough, too much or not enough for his crops.

If the soil is not rich enough in natural plant food, it is necessary to add manure—animal manure or artificial manure.

8. The Madura plains and how men bring water to parched lands

We have just learnt how wet it is in Travancore on the west side of the Cardamom Hills. But as soon as we cross to the east side we find a great change. Here the land is very dry and parched for lack of rain. It lies in the 'rain shadow' of the hills, just as if it were protected by a huge



FIG. 20.—Diagram showing the wet and dry sides of a range of hills.

umbrella. The soil is made from the very hard old rocks and so is not very good. In those years when the rainfall is better than usual, the farmer can grow good crops of millet, but what happens when there is a poor rainfall year? His crops fail and he is faced with starvation. So the Madura plains used to be one of the great 'famine belts' of India. The farmer tried his hardest to prevent this by keeping in repair the 'tanks'. These tanks were made by building

an earth dam across a river valley. In the rainy season the tank becomes filled with water and this water can be used later for the crops. But in poor rainfall years the tank might not be filled at all.

In many parts of the world man has fought hard against famine. Where there is not enough rain, he brings water to his fields from the rivers, from lakes or from wells. This bringing of water to the land we call 'irrigation'. Many of the drier parts of India are now irrigated and grow fine, rich crops on land which would be too dry if it had to depend on rain alone.

Amongst the irrigated lands are the Madura plains, which are watered as a result of a very clever and wonderful scheme. On the *west* side of the Cardamom Hills it is very wet and there is too much water; on the *east* side it is very dry and there are no large rivers full of water. One of the rivers on the wet west, in Travancore, is the Periyar River—full of water rushing down to the sea. First, a very high, strong wall or dam was built across its valley and the water collected behind it to form a large lake or reservoir. Then a tunnel was cut right through the hills to the dry eastern side and the water allowed to flow through the tunnel. Then it was led through big canals, specially dug for it, to the flat lands near

Madura. Then some of the water is led into small canals, then into smaller canals and finally into the farmer's fields.

So the farmer in the Madura plains is an 'irrigation farmer'. When his fields are covered with water he can grow rice, just like the farmer in the wet lands of the West Coast. Later in the year, when he has gathered his rice crop, there is often enough moisture left in the ground for him to grow a crop of millet. Cotton and tobacco are also grown in this region.

There are other parts of the Madras Presidency where rivers have been dammed and their water brought to the land. But it costs a lot of money to build great dams and to dig canals, and so these big works can only be carried out when there is a strong or good government willing to help the poor farmers.

The principal rivers of this region are the Vaigai and Tamraparani which run eastward and flow into the Palk Strait and Gulf of Mannar respectively.

Tinnevely District.—The chief crops are rice and cotton. Palmyra trees are numerous in this district and a kind of jaggery or sugar is made from the juice obtained from them. The principal town of the district is *Tinnevely*. *Tuticorin* is a port.

Madura District.—The principal town is *Madura* which is situated on the *Vaigai*. This

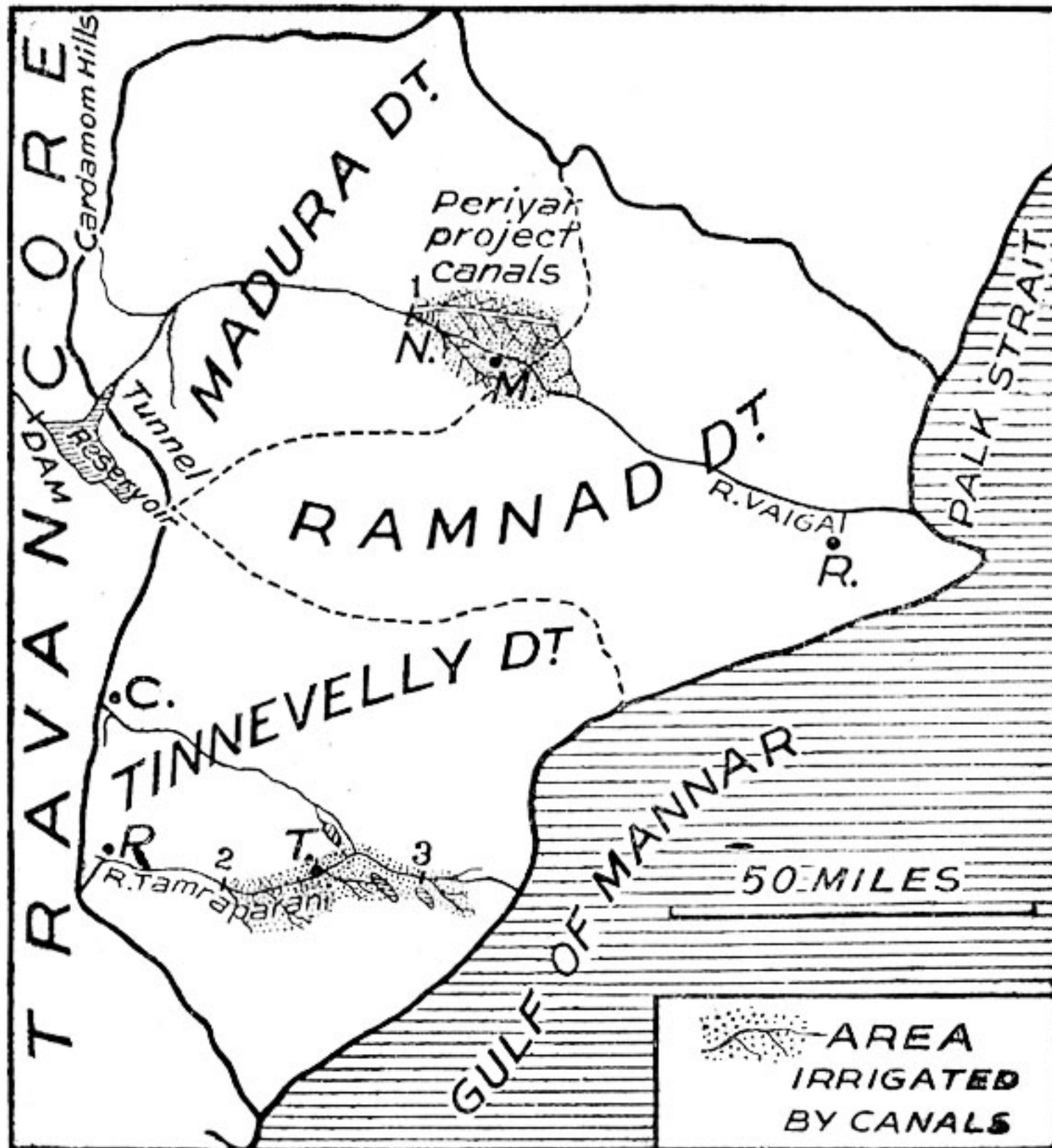


FIG. 21.—Map showing the irrigation canals.

town is next to Madras City in population, and was once the capital of the Pandya kingdom. *Kodaikanal* is a hill station and is about 7,000 feet above sea-level. *Palni* is a place of pilgrimage.

Ramnad District.—The Collector of the District has his headquarters at Madura. *Ramnad*, *Srivilliputhur*, *Devakotah* and *Karaikudi* are the important towns in the district.

9. The Cauvery River : Life in the delta and on the plateau

The Cauvery is one of the great rivers of Southern India. Let us follow it from its source, or beginning, to where it reaches the sea. High up where the Western Ghats receive a heavy rainfall the water drains away in swiftly-rushing streams. Some flow to the west and quickly reach the ocean ; others start on a long journey across the plateau eastwards towards the Bay of Bengal. A number of these streams join together to form the Cauvery River, which then flows gently over the surface of the plateau in the State of Mysore to the border of Madras Presidency. Soon it begins to descend to lower ground and winds amongst the hills till it reaches its broad lower valley and then past the town of Trichinopoly. But the river has brought down huge quantities of mud, and on the plains where the water moves more slowly it has dropped this mud and choked its own bed. So the river divides and the water finds its way slowly to the sea through a number of different channels across its great flat delta.

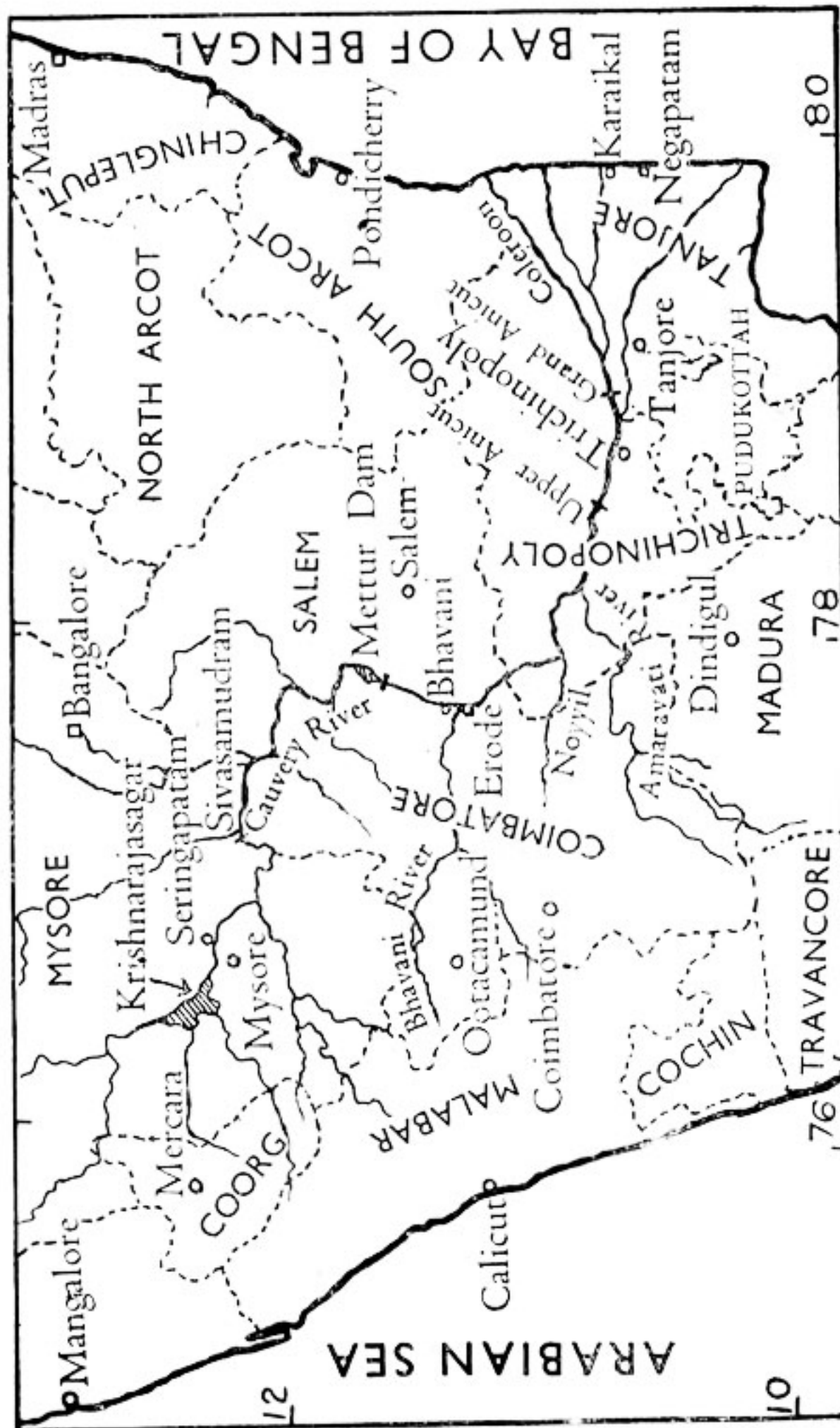


FIG. 22.—Map of the Cauvery basin.

So the people who live near the Cauvery River can see a river which is very different in its different parts.

In the plateau region of the Cauvery are the districts of Coimbatore and Salem, which lie on either side of the river. Here the river turns

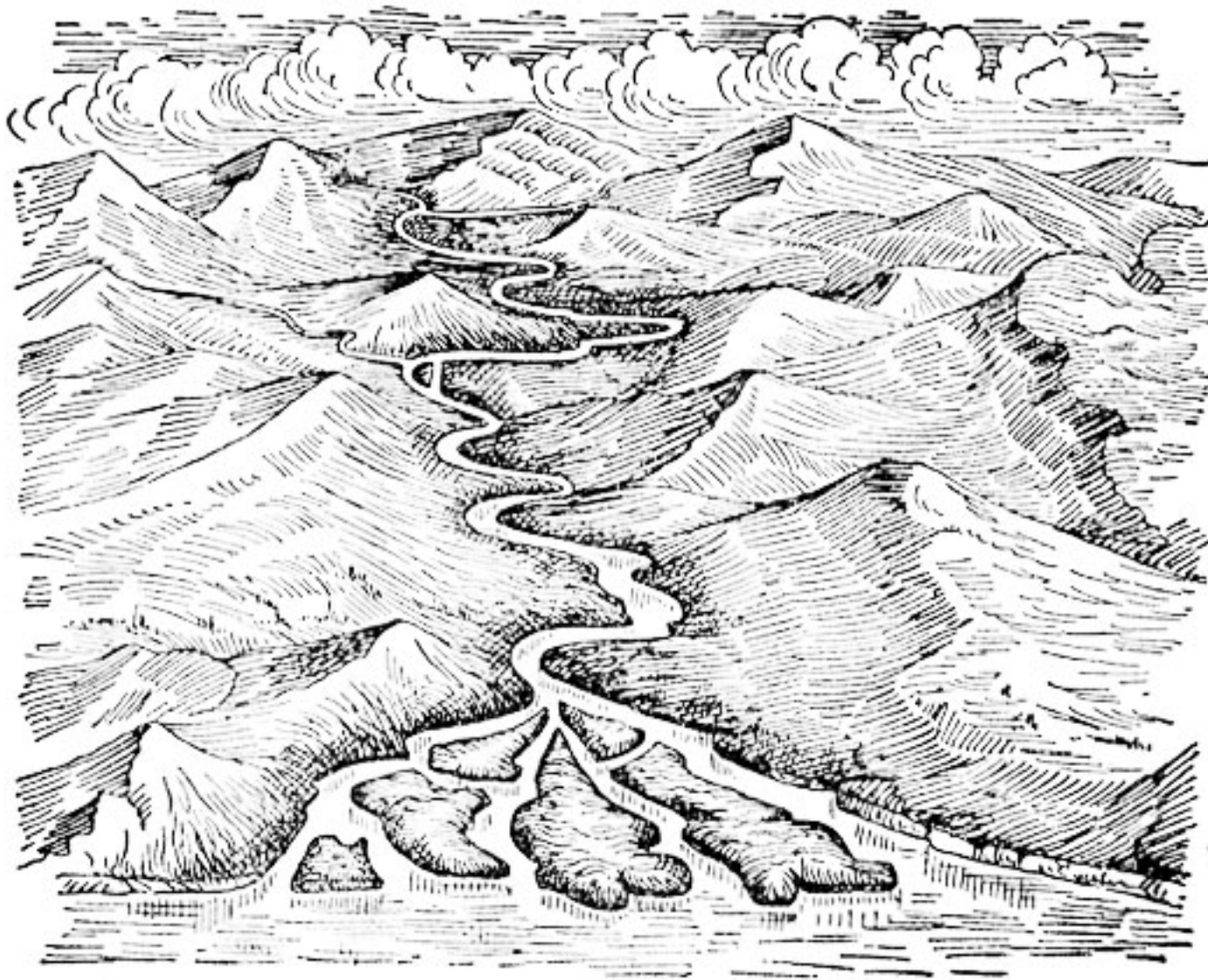


FIG. 23.—A river basin and delta.

eastward and enters the district of Trichinopoly. Tanjore District is in the deltaic region.

Let us first look at the people who live on the plateau or tableland. Here the land is rolling and many of the low hills are covered only with a thin

red soil and the hard old rocks are near the surface. They feed their sheep and their goats on the poor grass, the little boys watch that they do not stray away, and later the farmer will sell the wool or the hair and the skins. The plateau is sheltered from the rain-bearing winds by the high Western Ghats, and so the land is dry. The farmer can grow little rice ; millet will be his chief food grain. The best soil has collected in the valleys, and here the farmer has often made tanks to water his crops. Sometimes too he uses water from the river. But there is not enough flat land for large irrigation canals, and there are large stretches of dry land with very few people.

How different is life on the delta lands ! Here the mud and sand brought by the river make wonderful rich soil spread evenly over the whole land. The land is very flat, there are no hills to be seen anywhere. The climate is dry and much of the rain comes late in the year—October, November and December. Long, long ago, the people knew how useful it would be to spread the water from the Cauvery River over the delta lands. They dug hundreds of miles of canals to bring the water to their crops. More than a hundred years ago, clever men studied the land very carefully and joined up some of the old canals and made new ones, and, from that time to

now, have been busy making them better and better. Now there are more than 1,500 miles of big canals in the Cauvery delta, and more than 2,000 miles of small canals taking the water to the fields, and more than 1,000,000 acres of land are watered every year.



[Photo : Klein & Peyerl.]

FIG. 24.—Ploughing rice fields.

In this wet delta land it is not easy to make roads nor build railways. The farmers grow rice on their flooded fields and perhaps other crops too when the rice crop has been harvested. Everywhere the land is rich and fertile, and so there is little land wasted and many people live

here. In some parts there are more than 1,600 people living on every square mile of land.

Coimbatore District.—Cotton, sugar-cane, groundnuts and millet are the principal crops in this district. Cattle are reared in some parts. *Coimbatore* is the principal town and cotton weaving is an important industry. Cement is now manufactured here. *Tirupur*, *Pollachi*, *Kollegal* and *Erode* are other important towns.

Salem District.—Cotton is grown also in this district. Coffee is grown in the Shevaroy Hills. *Salem* is the principal town. *Mettur*, where a big dam has been built across the Cauvery, is also in this district.

Trichinopoly District.—The chief town, *Trichinopoly*, is the third largest town in this Presidency. The South Indian Railway has its headquarters here. The Rock Fort, situated in the centre of this town, is famous in history. *Srirangam* and *Tiruvanaikaval* are two important religious centres. *Karur*, *Kulitalai*, *Lalgudi* and *Musiri* are some of the other important towns.

Tanjore District.—Rice is the principal crop in this area. Plantains and betel leaves are also important. The chief town of this district is *Tanjore*. There is a famous temple in *Tanjore* built by the Cholas. *Negapatam* is a port. *Nagore*,

Kumbakonam, *Mayavaram* and *Tiruvarur* are some of the other important towns in this district.

10. The Carnatic country and dry crop farmers

We have now learnt something of the life of the farmer on the wet West Coast, on the fine



[Photo : Klein & Peyerl.]

FIG. 25.—A village in the dry hilly country.

irrigated plains around Madura, on the plateau near the Cauvery River and on the rich irrigated land of the Cauvery delta. But how do the people live in the Carnatic country, where there

are no great irrigation works? This region comprising the districts of Nellore, Chingleput, Chittoor, North Arcot and South Arcot is a land of dry-crop farmers. The land is often almost flat over wide stretches, in other places there are low hills and broad, shallow valleys, but nearer the



[Photo : Klein & Peyerl.]

FIG. 25 (a).—A tank or lake in the dry part of Southern India.

plateau the hills are higher and the valleys narrower. Often the soil is thin, or poor and sandy and all parts of the region are rather dry. Most of the rain comes in October, November and

December and less from June to September which is the rainy season in other parts of India. The farmer must make the best use he can of the water, and so everywhere he has built low earthen banks across the valley and made shallow tanks or lakes. The villages are to be found near these tanks, for they form the drinking supply for both man and beast. The small carefully-farmed fields are used for crops of millet, cholam, cambu, ragi and varagu and sometimes for sugar-cane. Where the soil is very poor and sandy, it is still possible to grow groundnuts, and land is now used for this valuable crop which, until recently, could not be used at all.

Nellore District.—The chief river that flows through this district is the North Pennar, which has been dammed and made useful for the cultivation of rice. Mica is mined in some parts of this district. *Nellore* is the chief town.

Chingleput District.—This lies south of the Nellore District, surrounding Madras. *Conjeeveram* and *Mahabalipuram*, the latter famous for temples cut out of rocks, are important places. The Buckingham Canal which starts in Guntur District, runs through the Chingleput District and ends at Marakanam in the South Arcot District. Salt manufacture is carried on in the coastal

regions. *Sriperumbudur* is the birth-place of Sri Ramanuja, the famous Vaishnava saint.

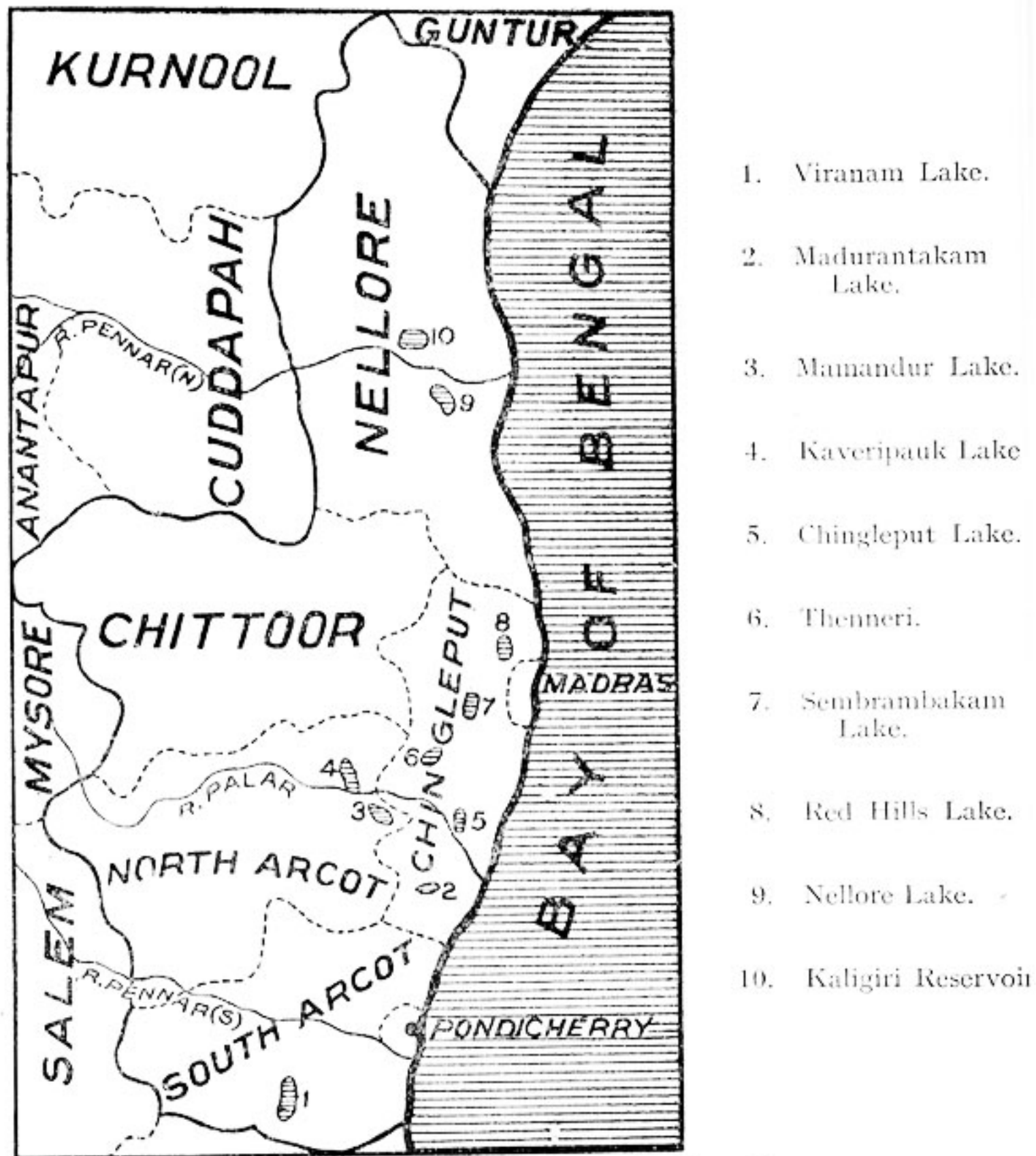


FIG. 26.—Principal lakes in the Carnatic.

South Arcot District.—The South Pennar flows through this district. In some parts sugar-cane is an important crop and there is a sugar factory in *Nellikuppam*. Groundnuts are largely grown. The principal town is *Cuddalore*, which is also a seaport. *Chidambaram*, *Tindivanam*, *Porto Novo*, *Vriddachalam* and *Panruti* are other important places in this district.

North Arcot District.—*Vellore* is the chief town. *Jalarpet* and *Kalpadi* are two railway junctions. *Arcot*, *Ranipet*, *Vaniyambadi*, *Arni* and *Tirupattur* are some of the important places in this district.

Chittoor District.—This lies in the plateau region. *Chittoor* is the principal town of this district. *Madanapalle*, *Kalahasti*, *Tirupati* and *Tiruttani* are other important towns.

11. Madras and its harbour

Madras has more than 700,000 people and is the third largest city of India, coming after Calcutta and Bombay. It is not one of the very old cities of India, for it was founded only in 1639 or about 300 years ago.

Let us look first at the situation of Madras. It is on the east coast, and we remember there are many large rivers which take their load of sand and mud to this coast. This is one reason why

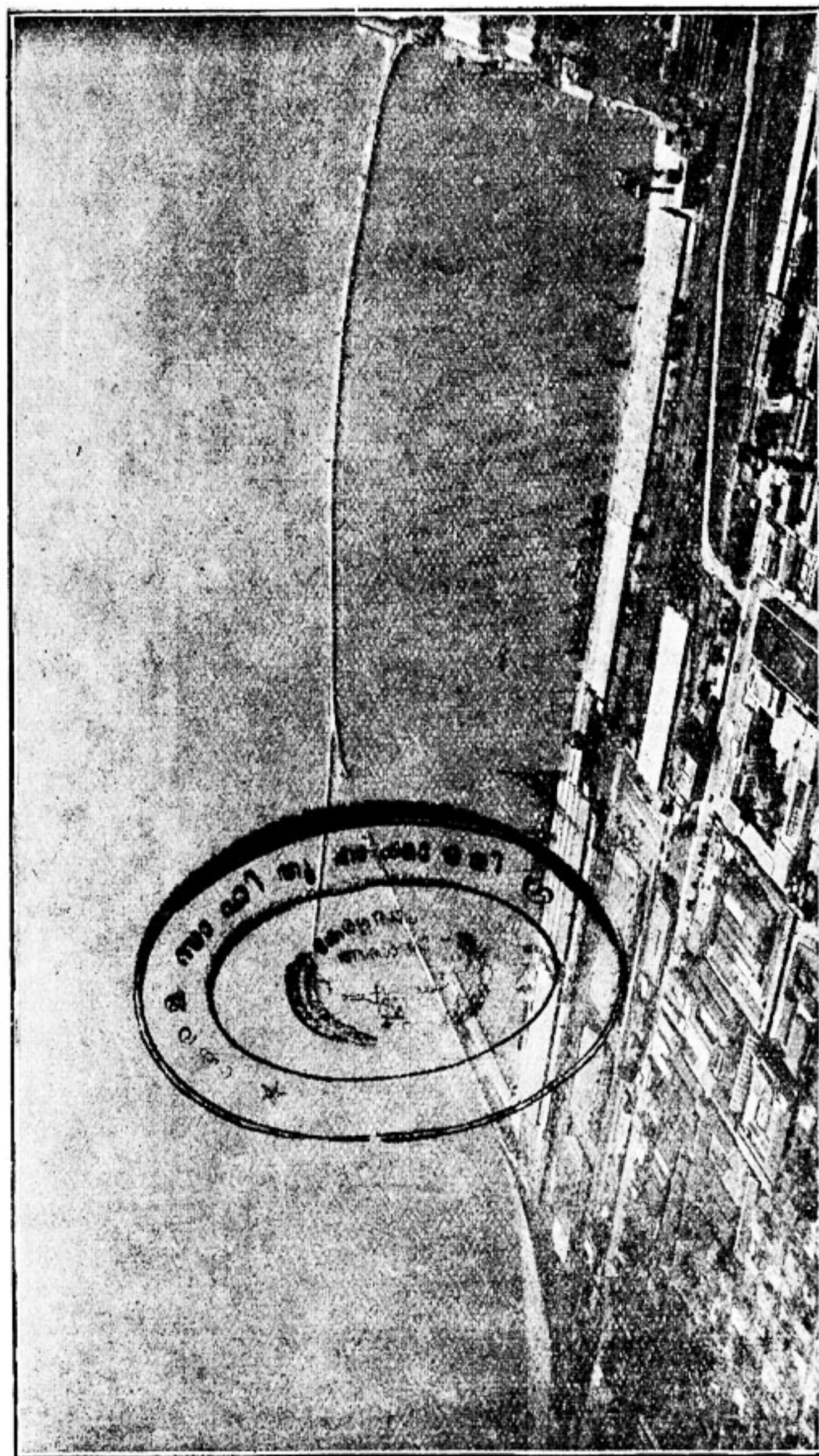
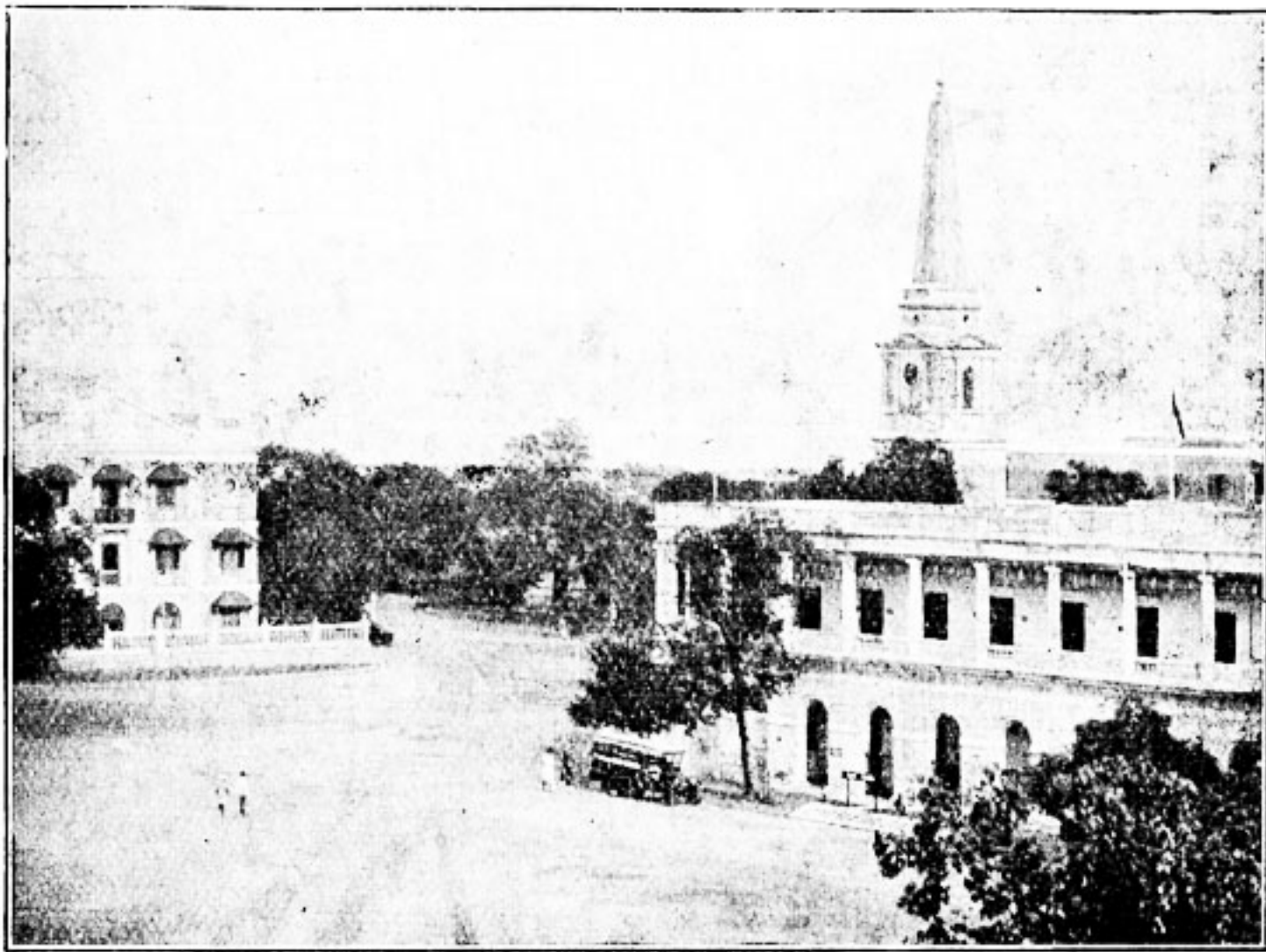


FIG. 27.—Aerial view of Madras Harbour.

all along the coast the sea is very shallow and large ships cannot come near the shore. In the old days, if they wanted to trade with Madras, they had to anchor some long distance off the shore. The passengers and goods were then put into small boats or 'mussola' and rowed ashore. The journey in the small boats was a dangerous one, for they had to cross the line of surf where the large waves were breaking. Sometimes the boats were upset and people drowned; very often the goods were spoilt by salt water. So, much money was spent in building a fine artificial harbour. Two hundred acres of calm water are now protected by great 'breakwaters' and into this safe harbour come the ships, with their passengers and goods. The harbour was finished only in 1909, and has been much improved since then so that now large ocean liners can use it. As a result of its fine harbour, the only one, except Vizagapatam, on the east coast of India, Madras has now half of all the foreign trade of the Presidency.

Along the sea face near the harbour are the Customs House, the banks and many other fine buildings. Just at the back is the densely-populated area known as George Town, which is the business part of Madras. South of George Town is to be found the old fort, Fort St. George.

It was here that the East India Company started a settlement in 1639, and built the fort which they called Fort St. George. The great city of Madras grew gradually round this centre. Near the Fort are many fine buildings, including Government House, and open spaces.



[Photo : Klein & Peyerl.]

FIG. 28.—A view of Fort St. George, Madras.

Further south and west again are crowded parts of the town, but Madras spreads itself over a large area—nine miles along the coast and four miles inland, so it is sometimes called the City of Distances.

Amongst the industries of Madras are the cotton mills, engineering, dyeing and cement works, iron foundries and tanneries for leather.

From the farming districts all round, Madras collects skins and hides for the making of leather, wool, hair and cotton. Such an important centre can only be formed if it can be reached easily from all parts. So Madras has become the centre of the railways of Southern India. The Madras and Southern Mahratta Railway has lines running along the east coast towards Calcutta, across the Peninsula to Calicut and Mangalore, and north-westwards also to Bombay. The South Indian Railway runs southwards.

But before the coming of the railway, it was difficult to bring goods to Madras from north and south. If boats came along the coast it was stormy and dangerous. So a canal was dug, quite close to the coast, but safe from storms, which is called the Buckingham Canal. It is different from the other canals we have talked about—they are for watering the land—but the Buckingham Canal is for navigation, that is, for boats. It runs north and south through Madras for 250 miles.

The big ships that come to Madras harbour bring many of the foreign manufactures which we

can buy in the bazaars. They unload their goods in the safety of the harbour and these goods can then be sent to all parts of the country by railway, and the cotton, wool, skins and hides received in exchange.

12. The Tungabhadra: Cotton growers and manganese miners

If you look carefully at the map you will see that in the north, Madras Presidency joins the

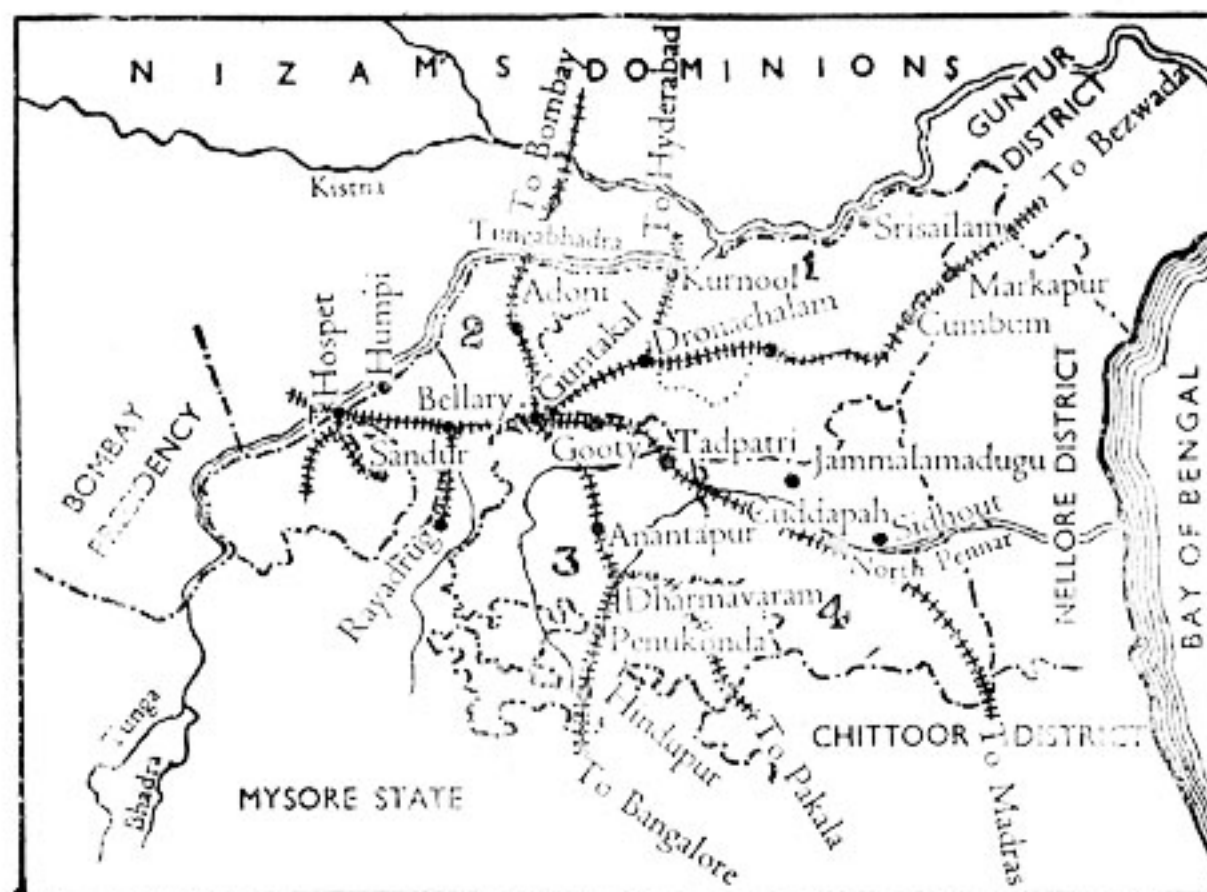


FIG. 29.—Map of the Tungabhadra basin.

- | | |
|------------------|-----------------|
| 1. Kurnool Dt. | 2. Bellary Dt. |
| 3. Anantapur Dt. | 4. Cuddapah Dt. |

Nizam's Dominions or the State of Hyderabad. For some distance the boundary is formed by a river, the Tungabhadra, which later joins the

great Kistna. In the valleys of the Tungabhadra the farmers grow many dry crops, but the red soils here are particularly good for the growing



FIG. 30.—A cotton boll.

of cotton. The cotton plant is a small plant which is planted every year and has large yellow flowers. After the flowering is finished, the seed pods form and, when they are ripe, they burst open. Inside is a big, white, fluffy ball. The little seeds of the cotton plant are covered with long white hairs which form cotton. In the best cottons, the hairs are long and silky or smooth; in the poorer cottons, they are shorter and coarser.

When the seed pods have burst open, the farmer with his wife and children picks the cotton and puts it into bags. It must then be taken to a cotton ginnery, where the hairs are separated from the seed by machinery. The 'raw cotton' is ready to be sent to the factory, or the port of Madras for sale.

In this part of Madras Presidency, the red soils overlie the ancient hard rocks, which here yield

several important minerals. One of these is manganese ore, which is dug up from pits in the ground. The metal manganese, which is obtained from the ore, is used for mixing with iron to make certain kinds of steel.

Bellary District.—This district formed part of the ancient Kingdom of Vijayanagar. You can



[By kind permission of Mr. A. P. Narasimham.]

FIG. 30 (a).—Picking cotton.

still see the relics of the ancient City of Vijayanagar near *Hampi*. Kannada and Telugu are the principal languages spoken here. The

chief town is *Bellary*. *Hospet* and *Adoni* are two important towns.

Kurnool District.—Manganese is mined in some parts of this district. Telugu and Hindustani are the principal languages spoken here. *Kurnool* is the chief town. *Nandyal* is a business centre. *Srisailam* and *Ahobilam* are two religious centres.

Cuddapah District.—This district is noted for a kind of stone called 'Cuddapah slabs'. *Cuddapah* is the chief town and *Sidhout* is noted for melons.

Anantapur District.—Anantapur is the principal town of the district. *Guntakal* is a big railway junction. *Dharmavaram* is noted for weaving.

13. The Northern Circars and the delta lands

Look at your map and notice that, north of Madras, there is only quite a narrow strip between the edge of the plateau and the sea. But in some places great rivers, especially the Godavari and Kistna, have crossed this strip and have built for themselves large deltas like the delta of the Cauvery. This region is called the Northern Circars and it comprises of the districts of

Vizagapatam, West Godavari, East Godavari, Kistna and Guntur in the Madras Presidency. Where the strip is narrow there are many small hills with only poor, barren soil, and the farmers live on the flat lands between, keeping either sheep or goats on the hills. The rainfall is only enough to grow millet and there is little rice. But if we go to the north we find the rain increases and the farmers are able to grow more rice.

But on the wide flat lands of the deltas it is quite different. There, the farmers have plenty of water, and so they grow their rice just as the farmers of the Cauvery delta do.

Along the coasts of the Northern Circars region, there are lines of sand dunes and many fishermen live along the coast, although their work is a dangerous one. Sometimes the strong winds blow the sand inland and it does much damage. Some parts of the delta lands cannot be used because the land is too salt. But the winning of salt is an important industry. Salt water is allowed to collect in lakes or pans and, as the water dries up with the sun, the salt is left behind.

In the middle of this coast is Vizagapatam, sheltered behind a headland. Here a fine harbour

has now been made—it was finished in 1933—and a railway built across the mountain to the heart of India.

Guntur District.—Rainfall is scarce in this district and in most places millet is the chief crop. Rice is grown in places where there are irrigation canals. *Guntur* is the principal town. *Ongole* is noted for cattle and *Tenali* for rice.

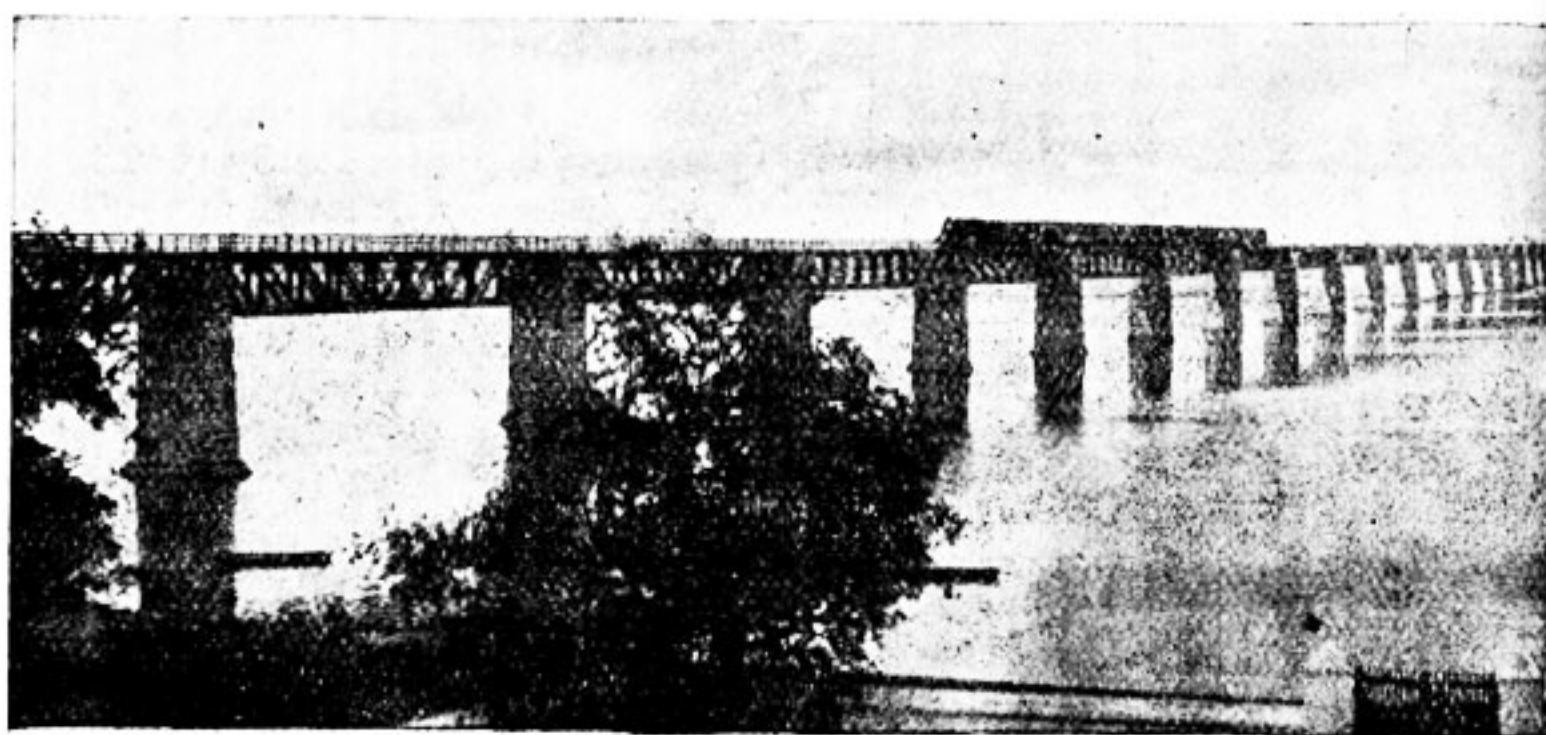


FIG. 31.—The Godavari bridge.

Kistna District.—This is a fertile district and rice is grown largely. *Masulipatam*, the principal town of this district, is a sea port. Dyeing is an important industry. *Bezwada* is a railway junction.

West Godavari District.—Rice is the principal crop. The chief town is *Ellore*, which is noted

or carpets. *Palacole* is noted for oranges. *Nidadavole*, *Bhimavaram*, *Narasapur* and *Tanuku* are other important towns.

East Godavari District.—The deltaic area is very fertile and rice is grown. Sugar-cane and millets are other important crops. In the *Lankas*, a group of islands in the deltaic area, tobacco is grown. The interior of this district is a hilly

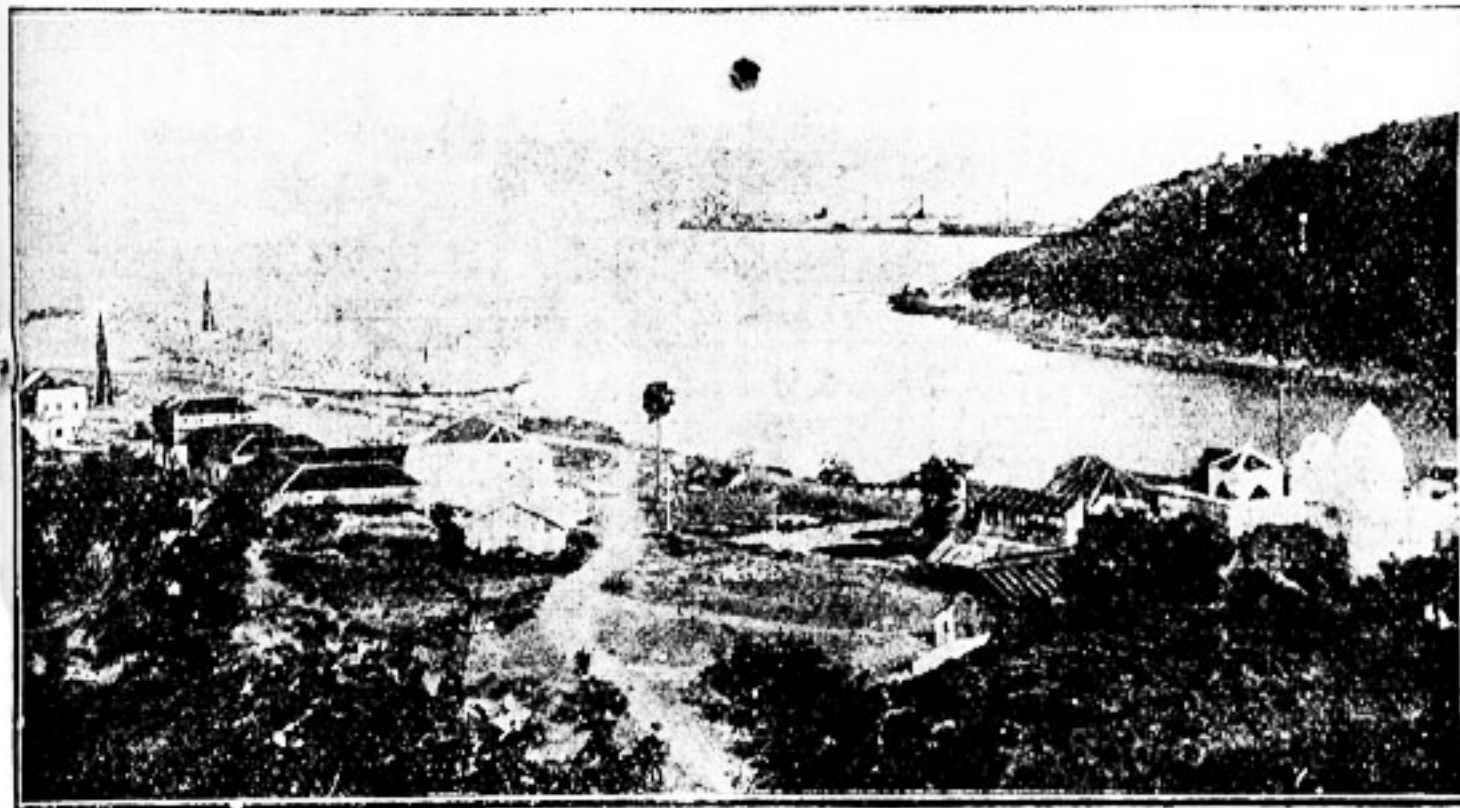


FIG. 32.—Vizagapatam Harbour.

tract with dense forests called the *Agency Tracts*. The chief town is *Cocanada*. *Rajahmundry*, on the bank of the river Godavari, is a big town in this district. The river affords transport facilities and goods are sent through by boats. The river is dammed near *Dowleswaram*. At *Samalkot* sugar is manufactured.

Vizagapatam District.—The coastland is fertile and rice is the principal crop. Sugar-cane, tobacco and millets are also grown. Manganese is mined in this district. *Vizagapatam*, the principal town, has a fine harbour. The Andhra University has its headquarters here. *Waltair* is a sanatorium and it is here that the Madras and Southern Mahratta Railway terminates and the B.-N. Railway to Calcutta begins. *Anakapalle*, *Bimlipatam* and *Chicacole* are other important towns.

14. **Varying length of day and change in position and time of sunrise and sunset throughout the year**

You may have noticed that the sun does not always set at exactly the same time every day. At certain times of the year, for example, in June, the sun sets much later than it does in December. Why does this happen?

Look at Figure 33 and you will see there a picture of the world. You will notice that it is a round ball. At the top of the picture you will see the North Pole and at the bottom the South Pole. Between these two Poles runs a line called the "Equator" which is exactly halfway between the Poles. Of course, there is not a real line on the earth's surface, but the Equator is

an imaginary line drawn through all places which are at an equal distance from the two Poles. Now look closely at the picture and you will see that India lies to the north of the Equator and that Madras is not very far from the Equator.

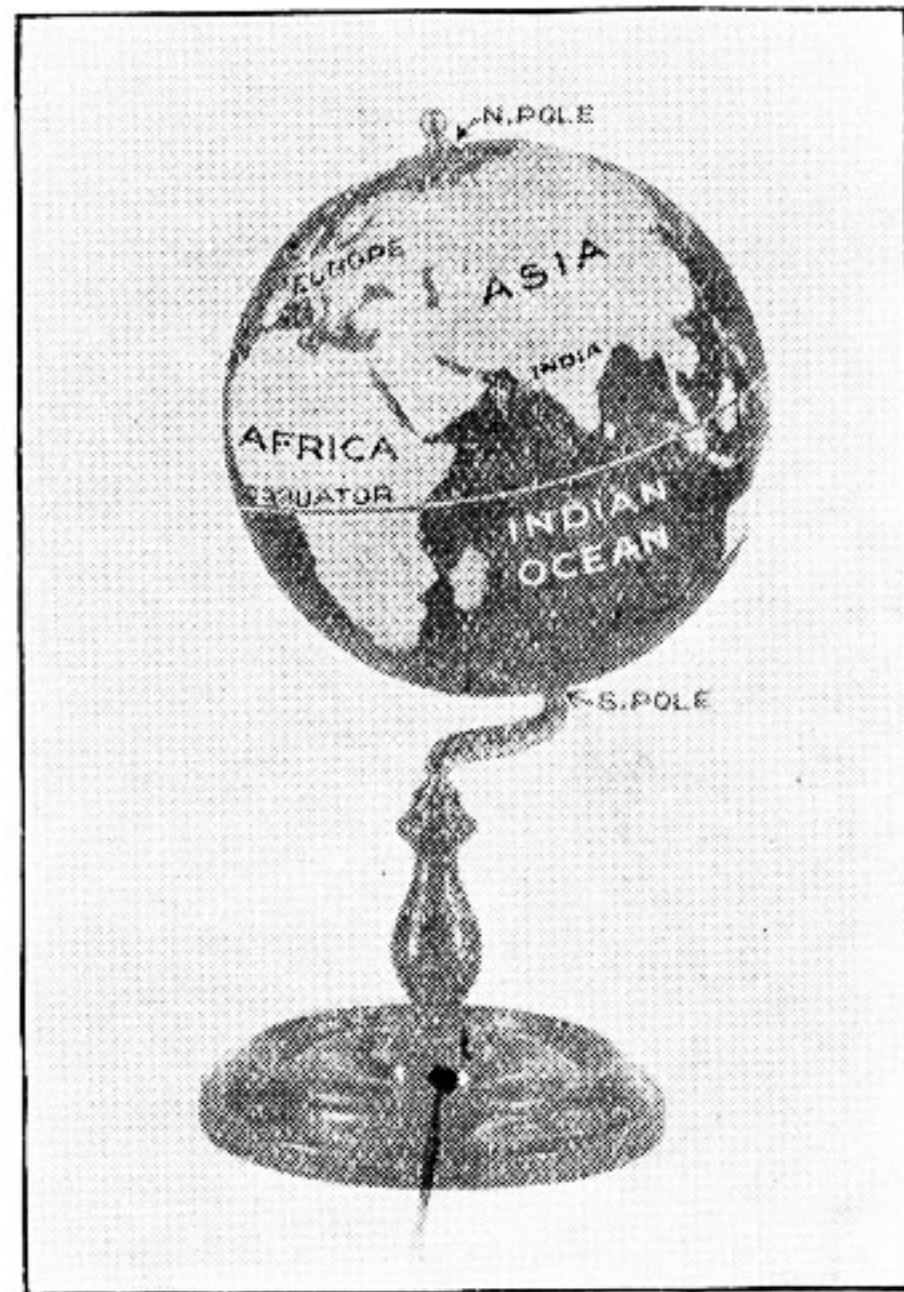


FIG. 33.—Picture of a globe.

Every twenty-four hours, which equal one day and night (which, in geography, is called a day), the earth turns round on its axis. The earth's axis is a line drawn through the middle of

the earth from the North to the South Pole. Now I want you to think of the sun as a fixed point. It does not move; it is the earth which revolves on its axis from left to right. At midday the sun is very nearly above our heads—sometimes it is quite above our heads. As the afternoon goes on, the sun appears to be sinking towards the west.



FIG. 34.—How day and night are caused.

Actually the earth is moving. If you want to prove this for yourself, get a ball and light a candle in a darkened room. Hold the lighted candle level with the ball. Mark a spot on the ball and then turn the ball round slowly, and you will find that your spot will gradually disappear into the darkness and will come out into the light again if you turn the ball completely round until the spot faces the candle again. Figure 34 shows you a picture of this.

Not only does the earth turn round on its own axis every day, but it also travels round the sun once in a year. The earth's axis is slightly tilted so that on only two days of the year, namely,

March 21, and September 21 (called the Equinoxes), is the sun directly over the equator at midday. Look at Figure 35 and find these two positions. Halfway between these two dates we (in the northern hemisphere) have the longest and the shortest days, namely, June 21, and December 22, respectively. The part of the

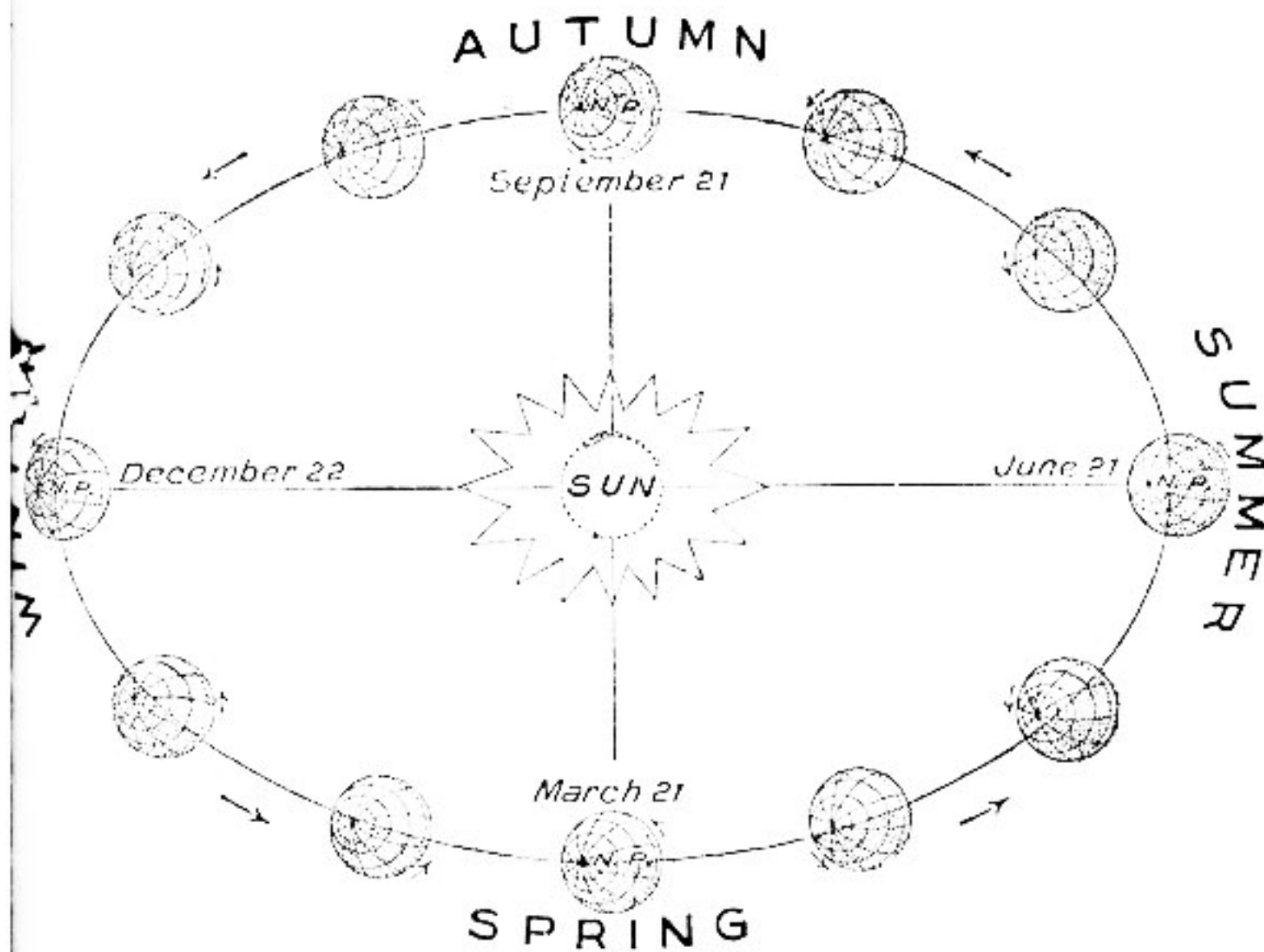


FIG. 35.—The seasons in the Northern Hemisphere.

world between the Equator and the North Pole is called the Northern Hemisphere, and the part between the Equator and the South Pole is called the Southern Hemisphere. India is

therefore in the Northern Hemisphere, so our longest day is June 21, and our shortest day is December 22. If we lived in South Africa, June 21 would be our shortest day and December 22 would be our longest day.

Note well that the farther we go from the Equator the greater is the difference between the length of days in winter and summer. Suppose you could visit London in England during December, you would find that the sun would set about 4 o'clock in the afternoon and it would not rise until about 8 o'clock the next morning, while if you were there in June the sun would not set until 8 o'clock in the evening and would rise at 4 o'clock the next morning. If you could go to the North Pole you would find that for six months it never rises, giving you six months' light and six months' darkness.

So we see that the farther we go away from the Equator the greater becomes the difference of length of day and night, according to the season of the year. If you study Figure 35 carefully, you will understand all these things and you can test them for yourself with a ball and a light.

✓ 15. How plans and maps are made

Before we discuss the ways in which maps and plans are made, I want you to have a little exercise

in drawing. You will need a piece of paper, a ruler marked in inches and a pencil. Next you will want a box measuring about 6" long and 4" wide. The actual measurements do not matter very much so long as they are not much greater than 6" and 4". Place your box on the piece of paper and draw round its sides with your pencil, and when you have removed the box you will have a plan in actual size of the box.

Now suppose you can get a larger box which is too big to stand on your paper. You cannot draw round that one and you cannot find a piece of paper large enough to fit your plan. What can you do?

Drawing to scale.—You will have to 'draw your plan to scale', which means that you will have to measure your box very carefully and then write the size at the top of your paper. Suppose the box is 16" long and 12" wide. We could choose this scale for a plan of the box: let 1" on the box equal $\frac{1}{2}$ " on the paper. We should then draw a rectangle or oblong 8" long and 6" wide.

Suppose again we want to draw a plan of the teacher's desk. Suppose the desk measures 5 feet long (5 feet = 60") by 3 feet wide (3 feet = 36"). We should not be able to use the scale $1" = \frac{1}{2}"$ as we did for the second box, because we should have to have a piece of paper 30" long

and 18" wide, so we must choose a smaller scale. Let us imagine that 1" on the paper measures 12" or 1 foot along the desk. Then we should have to draw our oblong 5" long and 3" wide. Always when we draw a plan we must state the scale at the bottom of the page. For example, 1" = 12" or for larger things, such as houses, 1" = 5 feet, or for the plan of a town 6" = 1 mile. Scales are usually actually drawn as well, thus—



This means that on your plan each of those small divisions represents one mile of the ground pictured in the plan.

Maps.—We generally call the picture drawn to scale of a box or a garden or a house or a town a 'plan', while a 'map' is really a plan of a much larger thing, such as a country. If you draw a plan of your schoolroom, you can put in all the desks and cupboards etc., but if you were drawing a plan of the whole town, the scale would have to be so much smaller that details in your schoolroom would have to be left out, as they would be too small to show.

I want you to imagine that you are going for a ride in an aeroplane. You start off on your

journey and look over the side of the 'plane and you can see below you the school and the houses



FIG. 36.—View from aeroplane of a town in a dry part of India.

and trees and fields. Fig. 36 shows you this. As you go higher and higher, these become less and less distinct. The town becomes black and white spots and the fields a green carpet. Figure 37 shows you this. Now imagine that you have

gone very very high in the air, so that you can see all the coast line of India, with the lofty Hima-

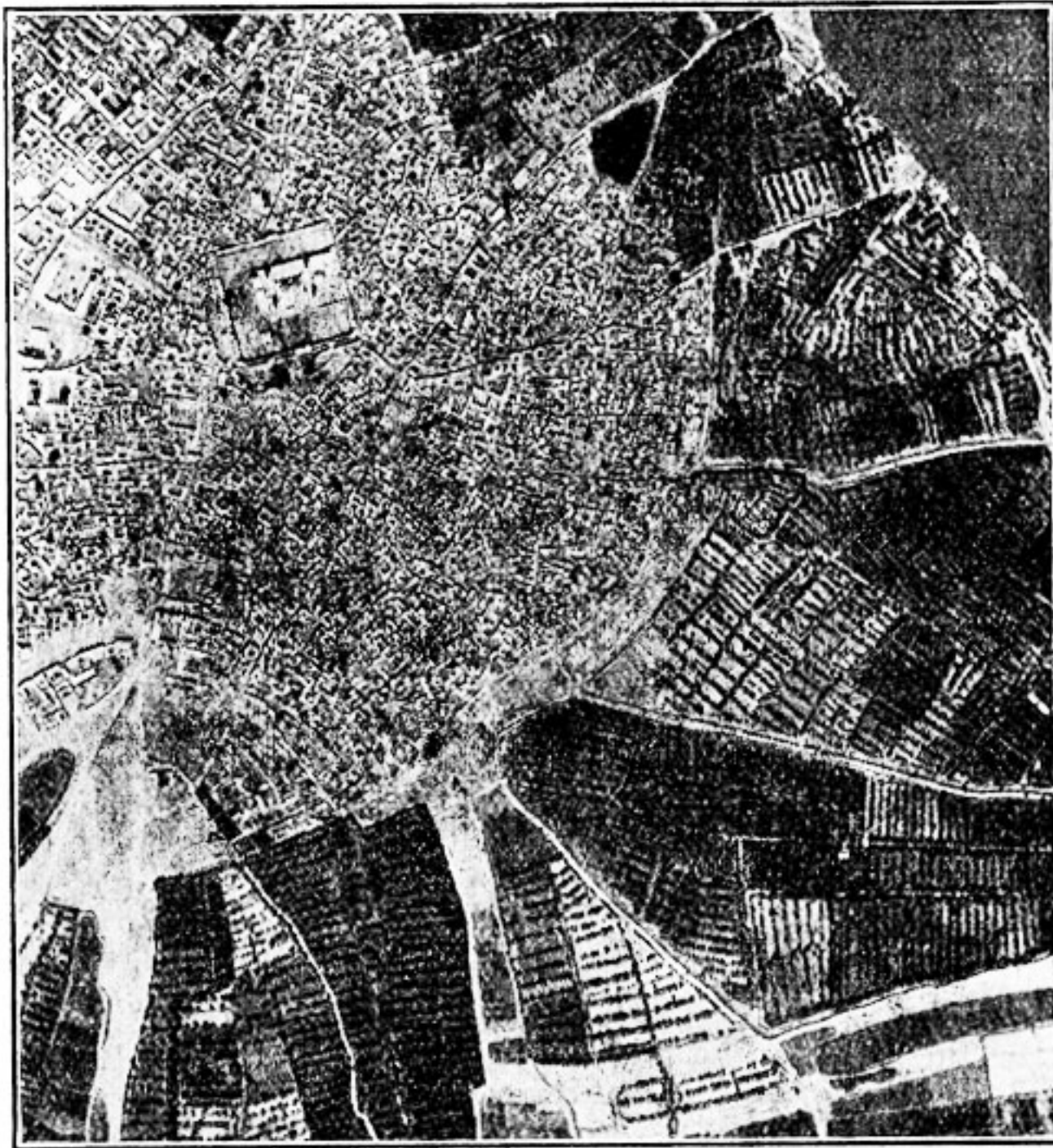


FIG. 37.—View from aeroplane of the same town—very high up. Note the surrounding irrigated fields.

laya Mountains in the north. That view would really be a map of India. You would only be able to see tiny dots for the very largest cities

and shiny lines for the biggest rivers and bumpy lines for the mountains. Maps of countries like India have to be drawn on a very small scale. Look at your atlas and find out the scale at the

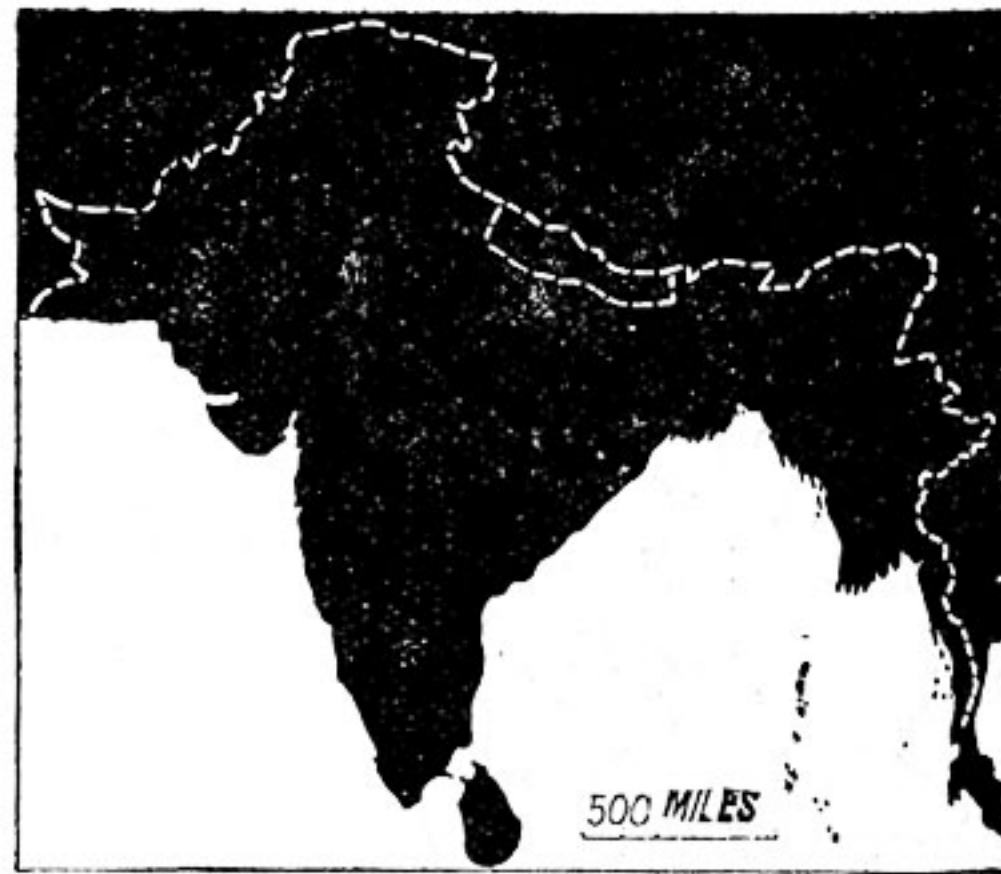


FIG. 38.—A map of India.

bottom of the map of India. In my atlas it is $1'' = 200$ miles. What is yours? ✓

16. The Districts of the Madras Presidency : Railways

The Presidency of Madras is a very large tract, and so it is divided into districts. There are, including Madras City, twenty-five districts, each with a chief town. Districts are divided into subdivisions called taluks. Each taluk comprises a number of villages.

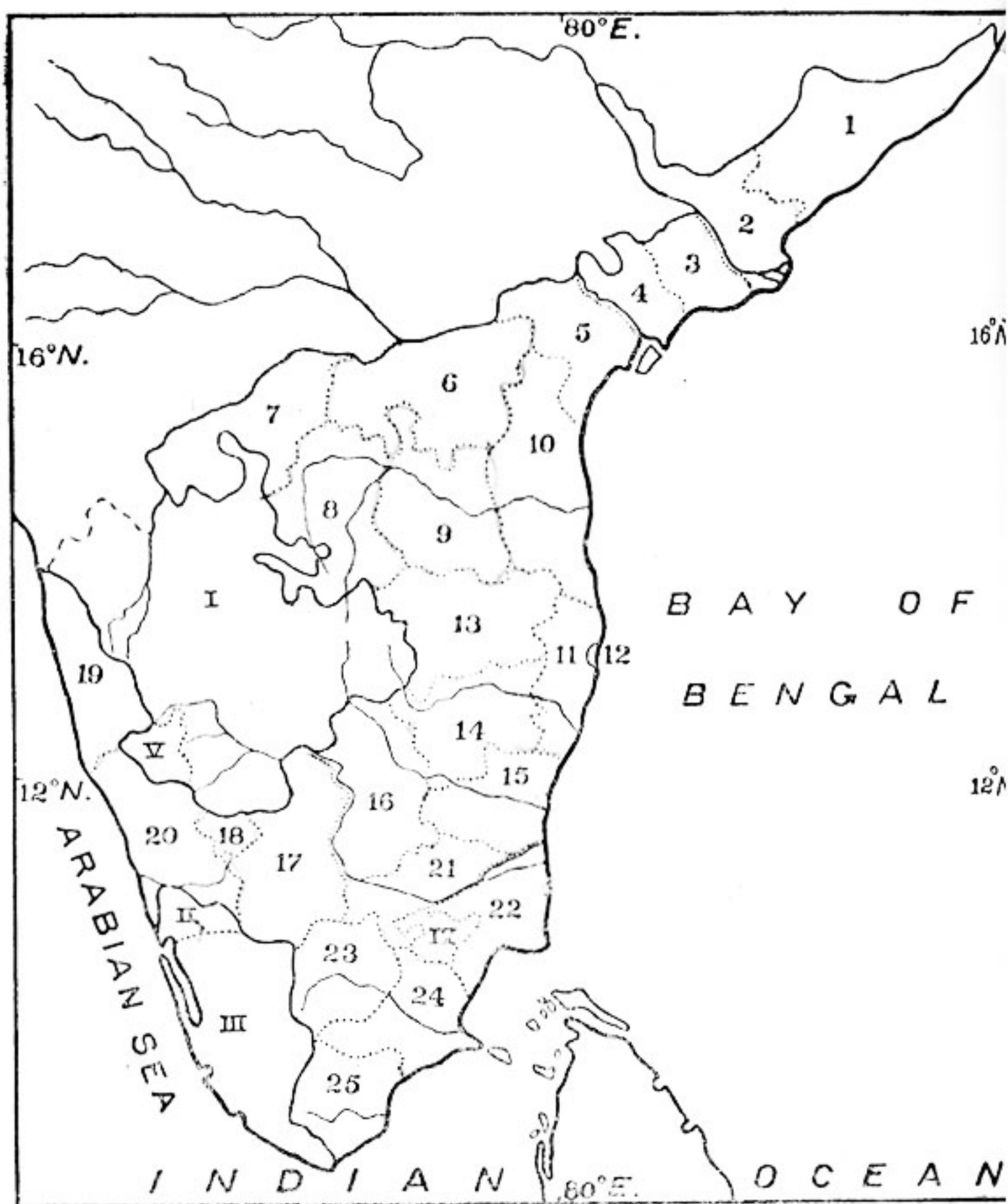


FIG. 39.—Map of the Districts of Madras.

[The numbers in the map denote the various districts. Try to know them from the list on the next page. What do I, II, III, IV and V represent?]

Let us try and think of the districts which are connected with each of the regions we have described.—

(For reference to numbers see map on p. 66.)

West Coast Districts—

South Kanara. (19)
Malabar. (20)

Western Ghats—

Nilgiris. (18)

Along the Cauvery River—

Coimbatore (hills). (17)
Salem (hills). (16)
Trichinopoly (centre). (21)
Tanjore (delta). (22)

South of the Cauvery River—

Madura. (23)
Ramnad. (24)
Tinnevelly. (25)

Carnatic Country—

South Arcot. (15)
North Arcot. (14)
Chittoor. (13)
Chingleput. (11)
Nellore. (10)

Deccan Districts—

Bellary. (7)
Cuddapah. (9)
Kurnool. (6)
Anantapur. (8)

Northern Circars—

Guntur. (5)
Kistna. (4)
West Godavari. (3)
East Godavari. (2)
Vizagapatam. (1)

Presidency City—

Madras. (12)

Chief Towns

Mangalore.
Calicut.

Ootacamund.

Coimbatore.
Salem.
Trichinopoly.
Tanjore.

Madura.
Ramnad.
Tinnevelly.
(also note Tuticorin).

Cuddalore.
Vellore.
Chittoor.
Saidapet.
Nellore.

Bellary.
Cuddapah.
Kurnool.
Anantapur.

Guntur.
Masulipatam.
Ellore.
Cocanada.
Vizagapatam.

Madras.

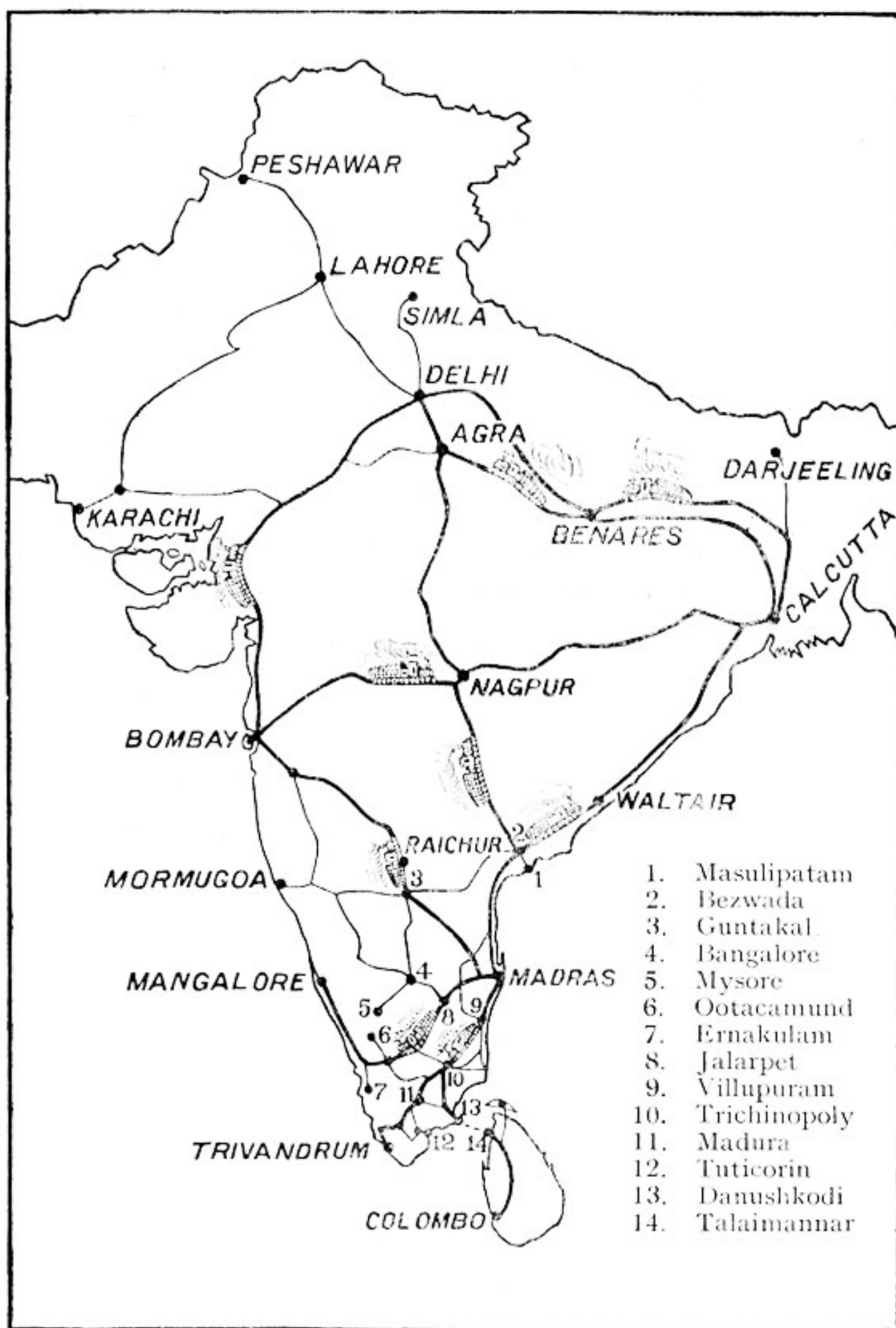


FIG. 40.—Railway map of India.

Then we must not forget the important *States* on the West Coast—Cochin and Travancore, and in the Carnatic—Pudukotah.

The Railways of Madras.—Now let us look carefully at the railway map and see how all these places can be reached. We should remember that some of the railways of Southern India are 'broad gauge'—there is a distance of 5' 6" between the two rails—others are 'metre gauge' and there is only one metre (3' 3 $\frac{3}{8}$ ") between the rails.

Now let us see how we should go from Madras to some of the important places.

The journey to Bombay would be easy. We could get in a train at Madras—on the Madras and Southern Mahratta Railway—and go straight to Raichur in Hyderabad. We should probably stay in the same train, which would take us over another railway—the Great Indian Peninsular Railway—across the Western Ghats to Bombay. The whole journey takes about 26 hours. The journey to Calcutta is very easy too, for one train will take us all the way in 38 hours to Howrah, which is a suburb of Calcutta. We should travel all along the east coast, by great bridges across the Kistna and Godavari rivers and near Vizagapatam.

The journey to Colombo is not so easy, because Colombo is on the island of Ceylon. We could

go direct by an ocean steamer from the harbour of Madras to the harbour of Colombo. But trains travel more quickly than boats and so it would be quicker to take a train on the South Indian Railway from Madras to a place in the south, Danushkodi, where a small ferry steamer will be waiting to take us across, only 22 miles of sea, to the railways of Ceylon, where we could take another train to Colombo. Still another way is to go from Madras to Tuticorin by train and then by steamer to Colombo.

The journey to Delhi is a long one by train. We can go to Bombay first and then by another train, or to Calcutta and then in another train. There are other ways too. But now we can go straight to Delhi, in about 48 hours, via Bezwada, Nagpur and other places without changing trains on the way.

AFRICA

Introduction

Up to the present we have only spoken about our own land. Now we are going to learn something about other countries and other peoples.

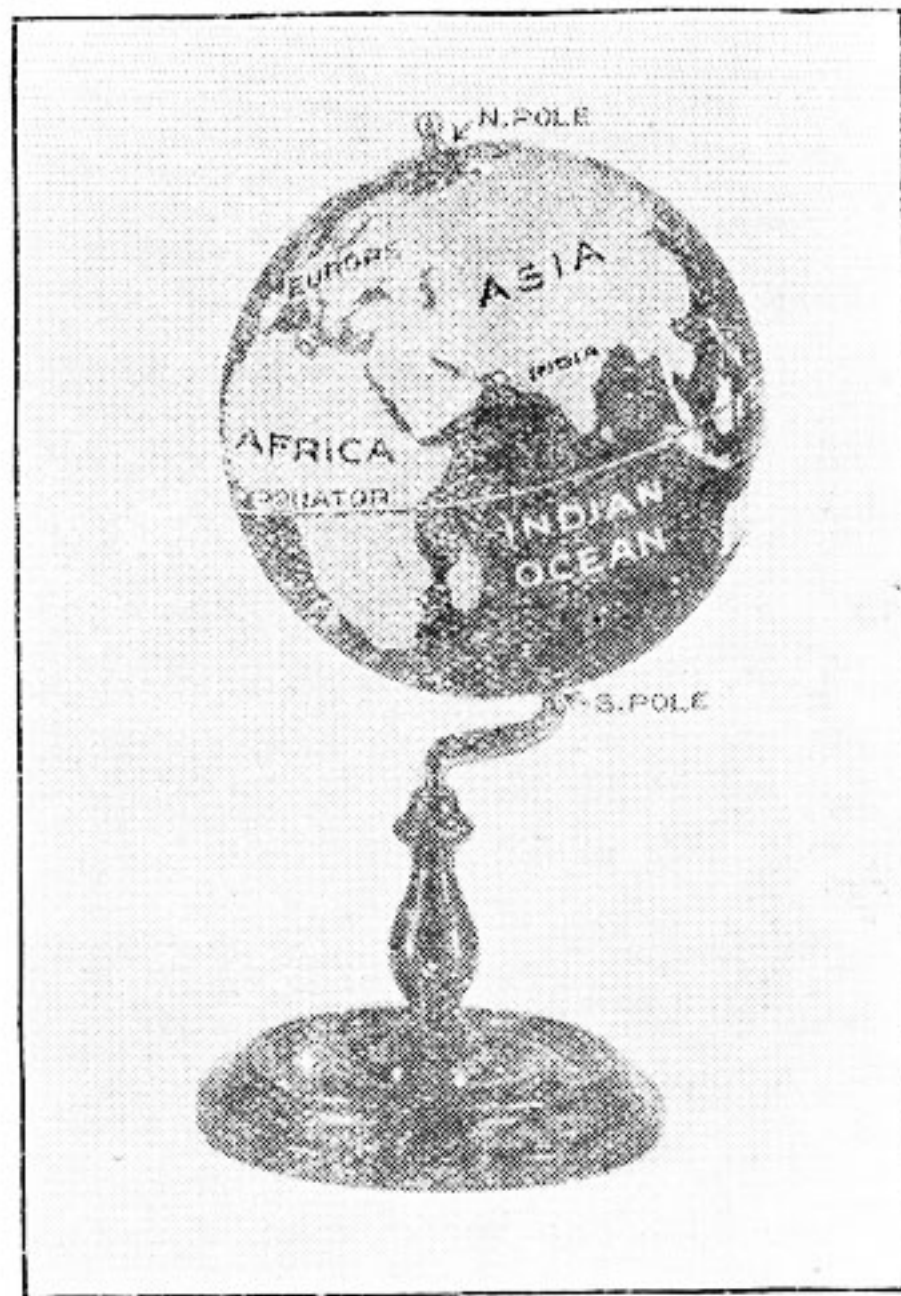


FIG. 41.—A globe.

Look at Fig. 41. Right in the centre of the picture you will see the words 'Indian

Ocean'. If you look above the letters D I A you will see India with the small island of Ceylon at its south-east tip. Now trace your finger across the globe westwards until you come to Africa. This is the land we are going to study. You will see that it is a very large piece of land, many times bigger than India. In fact, it is so large that it is called a 'continent'. There are seven of these large land masses, or continents, in the world. They are :—

1. Asia (of which India forms a part).
2. Africa.
3. Europe (of which Great Britain forms a part).
4. North America.
5. South America.
6. Australia.
7. Antarctica (the land round the South Pole where nobody lives because it is too cold).

Now let us look at Fig. 42 which shows you a picture map of Africa. We said just now that Africa is a large continent. If you travelled in a bullock cart, doing 15 miles a day, straight from the north of Africa to the south, it would take you about 334 days to complete your journey. And if you travelled in the same way across the broadest part, it would take you about

315 days. So you see it is really a very big land.

Now let us examine the surface of the continent. You will notice in the north-west corner there is



FIG. 42.—Picture map of Africa.

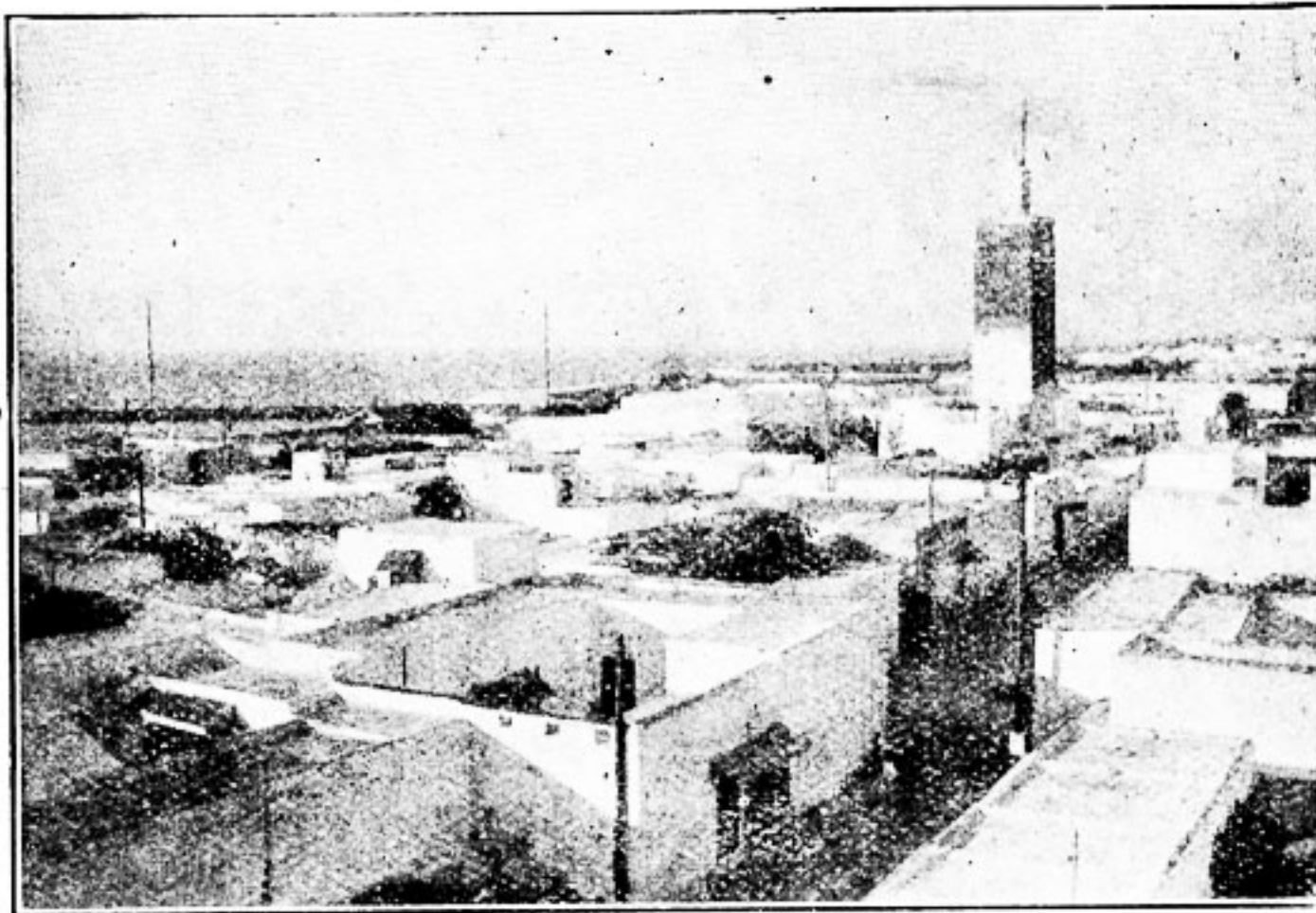
a range of mountains called the Atlas. As we come southwards, we pass over a very broad belt of rolling country, not very high above the sea,

In the far eastern part is another knot of mountains which form the country called Abyssinia. The rest of Africa is really a gigantic 'plateau' or 'tableland' which has been worn down in various places by big rivers. A plateau is a piece of flat land which has been raised up high above the sea. When you climb up into a plateau, the land will appear flat, instead of lumpy as it does in the case of a mountain range. If the plateau has been denuded by rivers, all the hills left by the denudation of the rivers will be roughly the same height.

1. The Lands bordering the Mediterranean Sea: Barbary States

The continent of Africa is bounded on the north by a long, narrow sea called the Mediterranean Sea, which divides Africa from the continent of Europe. About 2,000 years ago, there lived in what is now called Italy a very strong race of people called the Romans. The Romans conquered nearly all the peoples living in the land north of the Mediterranean Sea and a few of the peoples living south of the Mediterranean Sea in Africa. And it was the Romans who called the sea the Mediterranean, which in their language means 'the middle of the earth'. After some hundreds of years the Roman Empire fell and Arabs from Arabia conquered the lands,

and it is the descendants of those Arabs who live in the Mediterranean lands of Africa to-day. Before we learn any more about these people, I want you to look at Fig. 42 and find the Mediterranean Sea and the lands which lie to the south of it. You will notice that in the west there is a range of mountains which are called the



[Photo : L. D. Stamp.]

FIG. 43.—An Arab town in Morocco.

Atlas Mountains, and that between them and the sea coast there is a little flat land—flat land near the coast is always called a ‘coastal plain’. This coastal plain and the Atlas Mountains are divided politically into three countries, Morocco in the west, Algeria in the middle and Tunis in

the east. If you could visit some of the towns and villages, you would find that, on first sight, they are not very unlike some of the towns in the Punjab, of which you may have seen pictures. You would see rather square flat-roofed white-washed houses and the minarets of many mosques, for the people are Moslems. You would see bazaars and narrow streets, but the things for sale in the shops would be different, as would be the trees also.

We have already said something about the 'climate' or 'weather' of a country. There is a difference in meaning between these two words. The climate of a country means the conditions of the atmosphere during a long period of time. For example, we may say 'Madras has a hot climate' which means that for the greater part of the year the temperature of Madras is high. It does not mean necessarily that it is never cold in Madras, but that on the whole it is usually hot. We might say too 'England has a damp climate' which means that, as a rule, there is a great deal of moisture in the atmosphere in England, but it does not mean that it never stops raining there.

When we speak about weather, we mean rather a smaller thing, and speaking about the weather implies a short period of time, such as a day or week. You may have heard people say 'The

weather has been very fine this week' or 'The weather is very bad to-day'. So 'climate' means the condition of the atmosphere over long periods and 'weather' means the condition of the atmosphere over short periods.

Now having got that clearly in our minds, we are ready to learn about the climate of the Mediterranean lands. In India we have three big seasons, namely, the cold season, the hot season and the rains. But that is rather a special type of climate, for in most other countries north of the equator there are four seasons, namely, Spring—March, April, May; Summer—June, July, August; Autumn—September, October, November; and Winter—December, January, February. The hottest period of the year is Summer and the coldest period is Winter.

The Mediterranean lands have a very interesting and very definite climate and one which is easy to remember. Nearly all the rains fall in winter and very little in summer. So we say a 'Mediterranean Climate' has winter rain and summer drought, with mild wet winters and hot dry summers.

Where there are long periods of drought in a climate, which occur regularly every year, the plants have to make special arrangements about storing water to keep them alive through the hot,

dry summer. They do that in many different ways :

1. The orange and lemon trees have small, hard, shiny leaves which prevent the plant from perspiring, or 'transpiring' as it is called in the case of a plant. You know that, if you work hard on a hot day, water appears on your skin through the little pores and you become very thirsty. Just the same thing happens to plants, so they have covered their leaves with a hard outer covering to stop the loss of their water.
2. The vine, the plant which produces grapes from which wine is made, does it in another way. It has extra long roots which grow far down into the ground where there is always water to be had.
3. The olive tree, which produces a fruit called olives from which olive oil is made, covers its leaves with tiny hairs to stop transpiration.
4. The cacti have leaves in the form of spines, whose surface is so small that not much water is lost by transpiration but is stored in the thick stems.

Nearly all the plants in the Mediterranean lands do not lose their leaves altogether at any time of the year and are called 'evergreen trees'.

If you could visit a bazaar in Morocco or Algiers, you would find many lovely fruits for

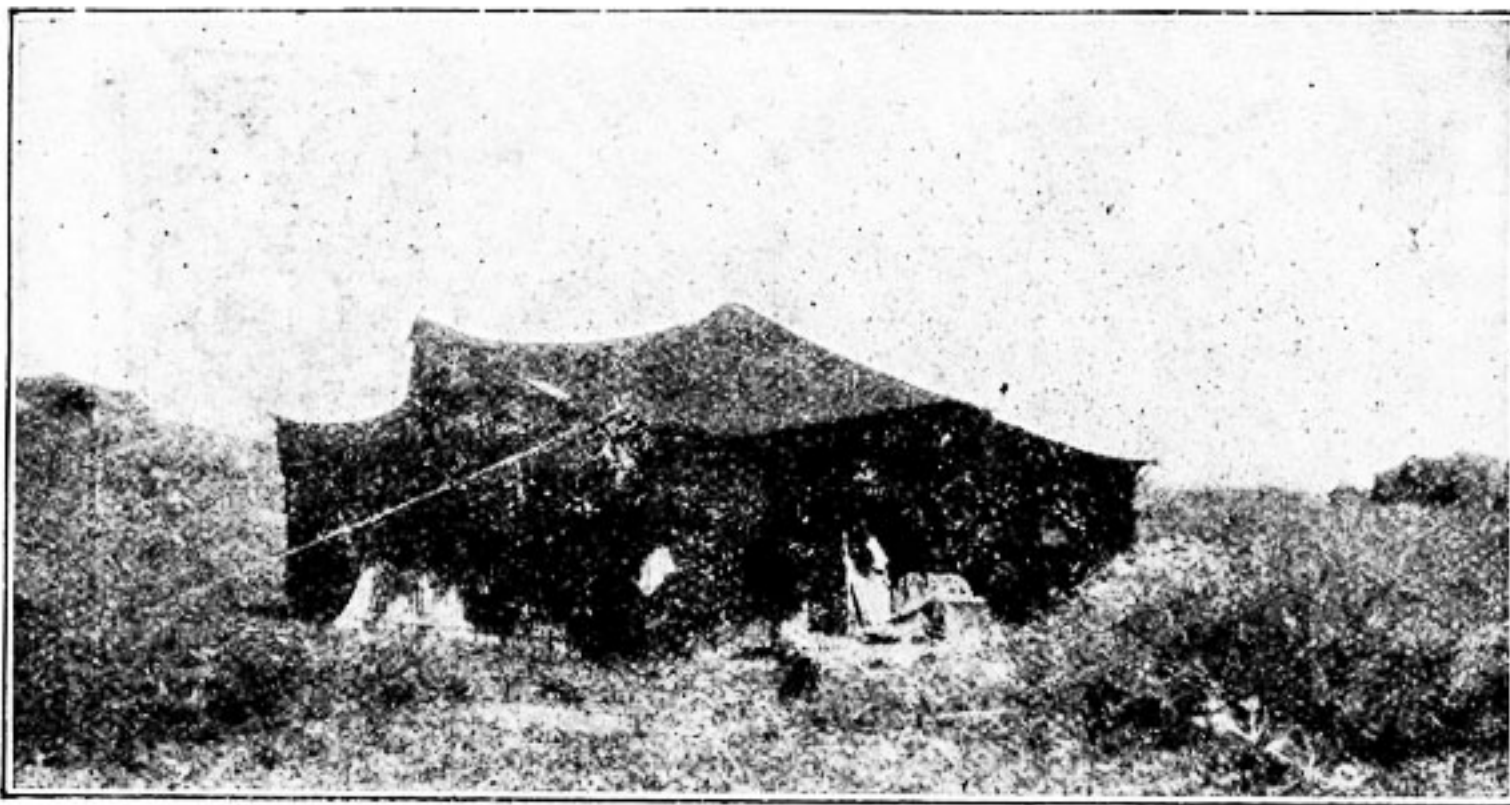


[Photo : L. D. Stamp.]

FIG. 44.—Arab men.

sale. You would see piles of oranges and lemons, grapes and peaches, figs and olives. The olives are sometimes eaten raw, or the fleshy part is crushed to make the best vegetable oil in the

world for cooking purposes. You would also see leather shops, where shoes and saddles which are made from the skins of goats and cattle, are kept in large numbers in the country. The Arabs are very clever at tanning leather and tooling it in many beautiful patterns and in dyeing it bright colours. Their clothes are usually made of fine wool grown on the backs of the local sheep, and



[Photo : L. D. Stamp.]

FIG. 45.—An Arab tent.

of cotton or linen which is also grown a little locally or imported from other countries. Fig. 44 shows you a picture of Arab men. Notice the long, flowing robes which protect them from the cold of winter and from the great heat and glare of the sun in summer.

Many of the people are farmers who live in villages all along the coastal plain, just as we do in Madras, but some of them in the drier districts away from the coast live in tents and move about from place to place with their flocks of sheep and goats, as soon as the animals have eaten up all



[Photo : L. D. Stamp.]

FIG. 46.—Old and new transport in Morocco.

the grass. Fig. 45 shows you a picture of one of these tent homes. Many of these people have very beautiful and swift horses, which they use as the principal form of transport. But nowadays they are building many good motor roads, and

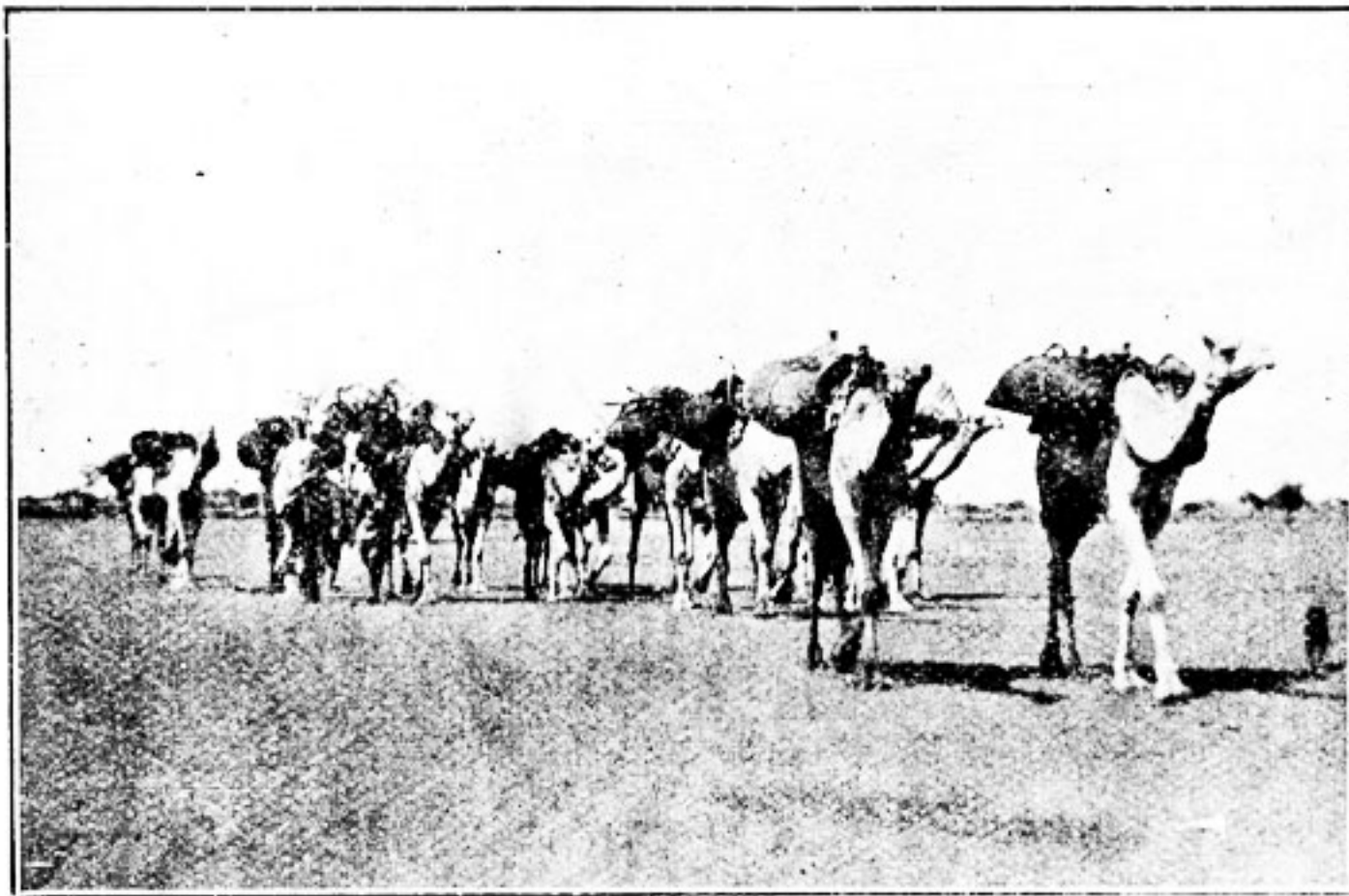
motor buses are becoming a popular form of transport. Fig. 46 shows you the old and new forms of transport.

2. The desert and the camel men

Look at Fig. 42 again. South of the Mediterranean lands you will see a very big and wide, gently rolling plateau, stretching from the west coast to the Red Sea. From the Atlas Mountains southwards to the most northerly bend of the River Niger stretches the great Sahara Desert. Here the climate is extremely dry and the summers very, very hot. There are no rivers and nothing will grow. Masses of bare rocks and large stretches of sand form the landscape. Very little rain ever falls and, when it does, it comes as thunder-storms and the water soon disappears into the earth or is sucked up by the intense heat.

Very few people can live in such a climate, for there is no food nor water. Luckily there are certain places, called oases, where springs of water appear and it is in these places that most of the people live. If one can obtain water, the earth is often fertile and date palms flourish, and a settlement or village springs up. There is quite a large number of these oases, which are used as halting places by people who wish to travel across the desert from north to south. The beast of burden in the desert is

the camel, who is very sure-footed and can go for several days without food or water. Let us imagine a town in the south of Morocco on the edge of the desert. It is evening. In the market place stand many camels, their bales of merchandise ready to be hoisted on their backs. Men stand about in groups, discussing the journey, for



[Photo : Sudan Government.]

FIG. 47.—A camel caravan.

they are setting out to cross the desert. Besides the merchandise there are skins of water and supplies of food, enough to last them for the journey to the first oasis. The camels are at last laden and the caravan starts off on its journey. Perhaps there are altogether as many as one

hundred and twenty camels. They file majestically and slowly out of the town and make their way out into the desert. The brilliant stars in the clear dry atmosphere guide the men, and on and on they travel until daylight comes and the sun rises, and the heat becomes intense. Then a camp is made to shelter them from the fierce



FIG. 48.—An oasis.

rays of the sun. Man and beast rest and rise at sunset to set out once more on the journey towards the first oasis, where fresh supplies of food and water can be bought for the whole caravan. People usually travel together in large numbers, for help in case of sickness and also as a protection against robbers, for there are sometimes

fierce tribes who make a living by robbing travellers. After many days of rest and nights of travelling, the caravan winds its way slowly into the town of Timbuktu on the river Niger, and the journey is over. Fig. 47 shows the caravan on its way, while Fig. 48 shows a picture of an oasis. Notice the date palms and the camel.

3. Egypt and the Nile

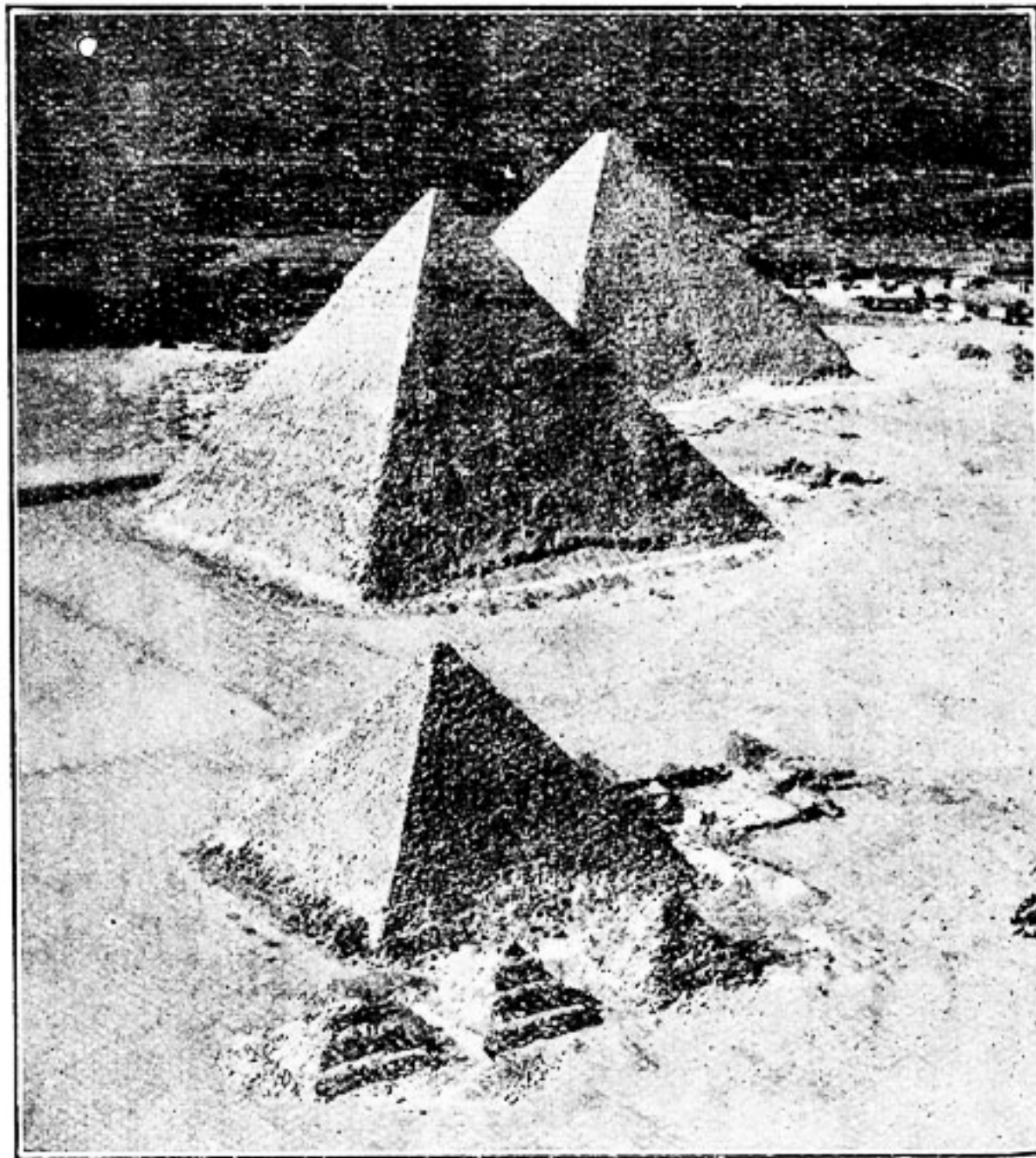
Turn once more to Fig. 42 and find the equator. If you follow the equator from west to east, you will find it crosses a large lake which is called Victoria Nyanza. In this lake rises the largest and perhaps the most interesting river in Africa. The Nile flows northwards through wooded country and through the tall grass country where lions and elephants roam wild until it reaches the eastern side of the Sahara Desert. On and on it flows still northwards, its constant supply of water fed by two other rivers, the Blue Nile and the Atbara, which rise among the mountains of Abyssinia in the east, until it finally reaches the Mediterranean Sea. As it crosses the desert, it runs through a narrow valley only ten miles wide, bounded by cliffs, and its waters are very precious to the people who dwell upon its banks. The water is

used for drinking by the people and their flocks and herds, and for pouring on the thirsty land. (This watering of the land you have learnt about already and you know it is called irrigation.)

The southern part of this desert region, where the grass land gradually merges into desert, is called the Sudan, where much valuable and good quality cotton is grown under irrigation. When this cotton has been picked and made into bales, it is sent to a port called Port Sudan in the Red Sea, where it is collected by ships and taken to England to be manufactured into cotton cloth.

North of the Sudan the Nile enters the country called Egypt. Here we find the people are hard-working farmers, whose chief concern is the watering of the land by the precious waters of the river. In the olden days, the river used to overflow its banks each year, and spread both water and fertile mud over its valley. The farmers then sowed their crops and received good returns for their labour. But sometimes the monsoon in Abyssinia had been poor and there was not much water in the river. It could not overflow its banks and bring its water and rich mud to Egypt. Then there was famine in the land and men and beasts died of hunger. So the people decided to build big dams across the river and to store the

water, so that there would be a permanent supply at all times and no one would go short of water. There are several of these large dams, the most important being those of Aswan and Assyut.



[By courtesy of the late Major Cochran-Patrick.]

FIG. 49.—A scene in Egypt—the Pyramids with the fertile Nile Valley in the background.

The chief crops grown are grain crops, such as wheat and barley, cotton, beans and peas, and tobacco.

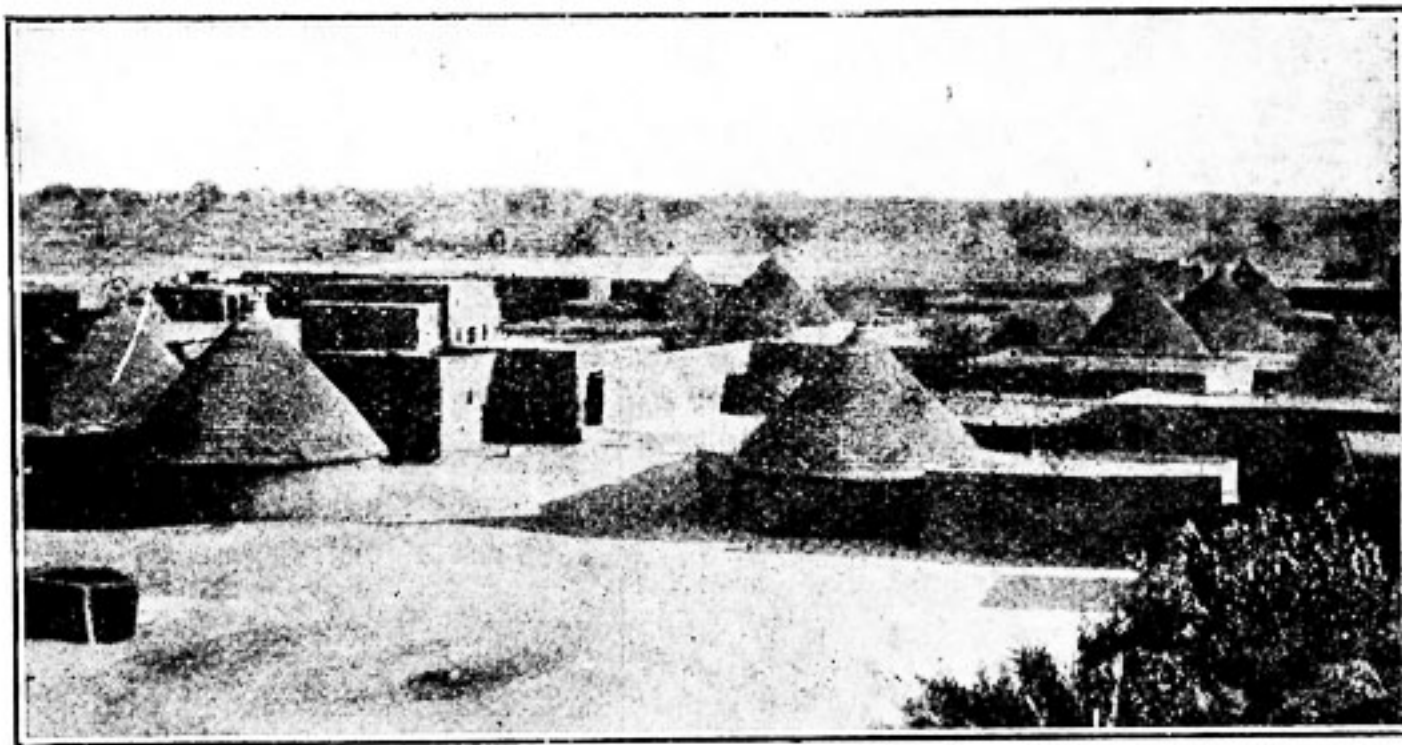
You must remember that without the water of the Nile, Egypt would be desert, exactly like the rest of the Sahara where nothing grows. But because of the Nile, Egypt is a very old and prosperous country, with a history which goes back over 6,000 years.

4. Negro farmers and cattlemen of West Africa

So far we have spoken about the Mediterranean coast lands, the Sahara Desert and the Valley of the Nile. You will remember that, in the Mediterranean region, there is plenty of rain in the winter, but as one goes southwards towards the equator the climate becomes drier and drier and there is very little rain at all. We spoke of our camel caravan travelling southwards to that northernmost bend of the River Niger, which is the southernmost limit of the great Sahara Desert.

I want you to imagine now that we are going to take a journey from this point on the Niger southward towards the coast. We should find that small spiny bushes begin to appear and then tufts of grass and occasionally a tree, and as we go southwards the vegetation becomes gradually richer and richer until there is excellent grass and scattered clumps of trees, which give pleasant shade. This type of grassland is called 'Savanna'

or ' Hot Tropical Grassland ', and covers a very large area in Africa. It stretches eastward from the West Coast to the foot of the Abyssinian mountains in a continuous belt south of the Sahara Desert. Its climate is the exact opposite of that of the Mediterranean lands. Here in these grasslands, the rain falls in summer and the winter is cool and dry. Although this region lies near the equator, it is so high up on the plateau above



[Photo : Sudan Government.]

FIG. 50.—A village in the African Savanna.

the sea that it is never very, very hot. This is the region where most of the wild animals live. They roam about over the rich grasslands and shelter among the trees. We should find large herds of elephants, antelopes, wild cattle, lions and leopards. Most of these wild animals live in the eastern part of the Savanna region,

for the natives in the western part have tamed many of the wild cattle, and are now rich cattle farmers owning large herds of cattle. The natives



[Photo : E. C. Stamp.]

FIG. 51.—An African native.

themselves in West Africa are negroes, or black men. They have very dark skins, broad faces with thick lips, frizzy hair and broad noses. They are big, strong and brave people. For many centuries before the white men came to West Africa they were hunters, making their living by hunting the wild animals. They had to be very strong and brave for that

work. They lived upon the flesh of the animals they killed and made their clothes out of their skins. As you know very well, ivory has always been a very valuable thing, and these people killed the elephants and sold the ivory to

people who lived along that west coast who, in their turn, sold it to passing ships.

Nowadays, most of these tribes have become peaceful farmers owning large herds of cattle and growing crops of maize and millet. Cotton, too,

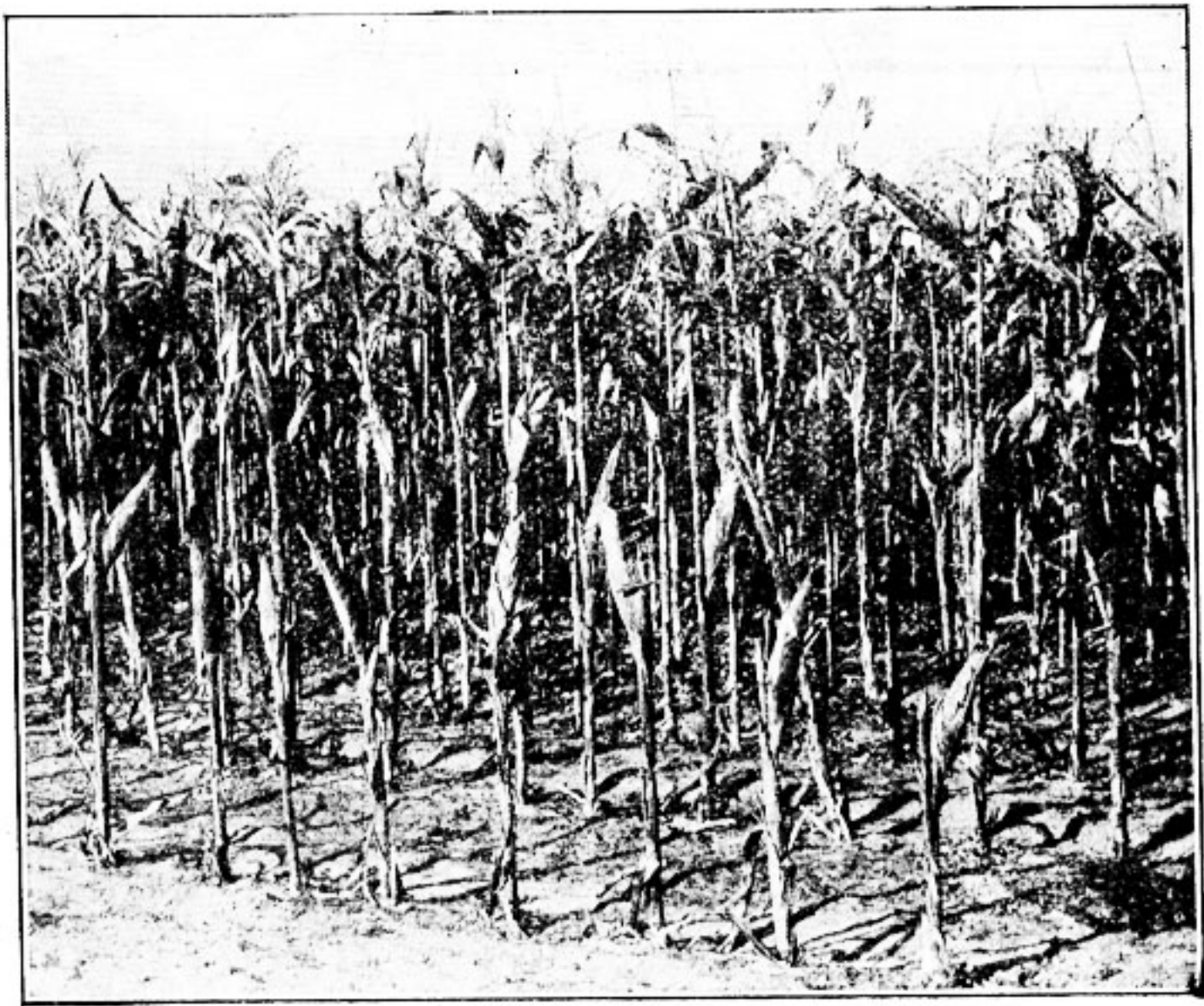


FIG. 52.—Maize crop.

does very well and is grown for export. The climatic conditions of this part of the world are very similar to those of the Deccan of India, where the cotton grows so well.

Some of the people are miners also. They find a very valuable mineral called tin ore in the hard old rocks of the plateau in Nigeria. There is also some gold found along the coast in a country which gets its name from that metal. The country is called the Gold Coast.



[Courtesy of Messrs. Rowntree.]

FIG. 53.—Cocoa pods.

Continuing our journey towards the coast, we descend sharply from the plateau and find ourselves on a hot, steamy coastal plain, where there are many evergreen trees and heavy summer rainfall, although rain falls at all times of the year. Here there is a very luxuriant vegetation,

and you would see the familiar paddy fields, for rice is the chief food of the people. There are also large numbers of oil palm trees, from which palm oil is obtained; also many trees such as ebony and mahogany which give such lovely woods. There is another kind of palm nut grown too, the Kola nut, which is used by the natives just as we use betel nut in India. Another very important product is the cocoa (which is obtained from the pod growing on the cacao tree), from which chocolate is made. You will realise that this is a very rich country with so many exports. We have used these two words 'export' and 'import' many times already. You must know exactly what they mean. An export is a product of which a country produces more than it needs for itself and therefore sends some away to other countries, and an import is a product that a country needs but does not produce at home and therefore has to buy from other countries.

5. People of the Congo basin

Look once more at Fig. 42 and find the equator. You will see, right in the centre of Africa where the equator crosses it, a large river. This river is called the Congo and it drains an area of many hundreds of square miles. The

Congo basin has what is called an 'Equatorial Climate', which means that it is always very hot and always very wet, but there are always *two* seasons when the rainfall is greater than usual. In such a climate of steamy heat, plants grow very easily and quickly and the trees are all evergreens. The great basin is shaped rather like a saucer and in no part is it very high above the sea. Unfortunately there are many rapids on the Congo and its tributaries—other rivers which join the main stream—and so it is impossible for boats to travel along the whole length of its stream. This, of course, has made travelling very difficult, but now there are railways constructed to make a *détour* round the rapids, so that passengers and goods can be transported more easily than before.

There are very few people living in the thick equatorial jungle, because it is difficult to cut down those huge trees to make even small fields in which to grow crops. The people are very small and weak, very unlike those living in West Africa on the farmlands. Fig. 54 shows you a picture of some of these people. They are called pygmies and they live in very poor huts, wear little or no clothing and still fight with bows and arrows—in fact, they are one

of the most primitive of all the peoples on earth.

A certain amount of hunting for elephant is carried on for the sake of the ivory and a little rubber is collected from the wild trees, but very few rubber plantations have been made as yet.



[Photo : *Exclusive News Agency*.]

FIG. 54.—A Pygmy village in the Congo forest.
Notice the huts thatched with leaves.

In the south-east of the Congo basin, but upon the plateau, is the famous Katanga district which is very rich in copper. It has become a large mining district with a centre at

Elizabethville. But so poor are the people living in the Congo basin and so little food do they produce that food for the miners has to be imported from other countries where conditions are better.

6. The eastern plateau

You will remember we were speaking about the plateau grasslands, called Savanna lands, in the lesson before last. We said that this belt of Savanna stretches right across Africa from west to east, south of the Sahara Desert. The dense equatorial forest belt of the Congo basin would stretch right across Africa to the east coast; only the plateau in the east is so much higher and, therefore, much cooler, and so the forest has given place to more Savanna land which here forms a wide belt running from north to south and broadens out westwards again, running almost to the coast south of the Congo basin. Look at Fig. 55, which shows you on a map of Africa exactly where this Savanna land lies.

Here we find many wild animals, such as elephants, antelopes, giraffes, lions and wild cattle of all kinds, and many of the natives still hunt these animals for food, and rich white men go

out to the country for sport just as they do in India.

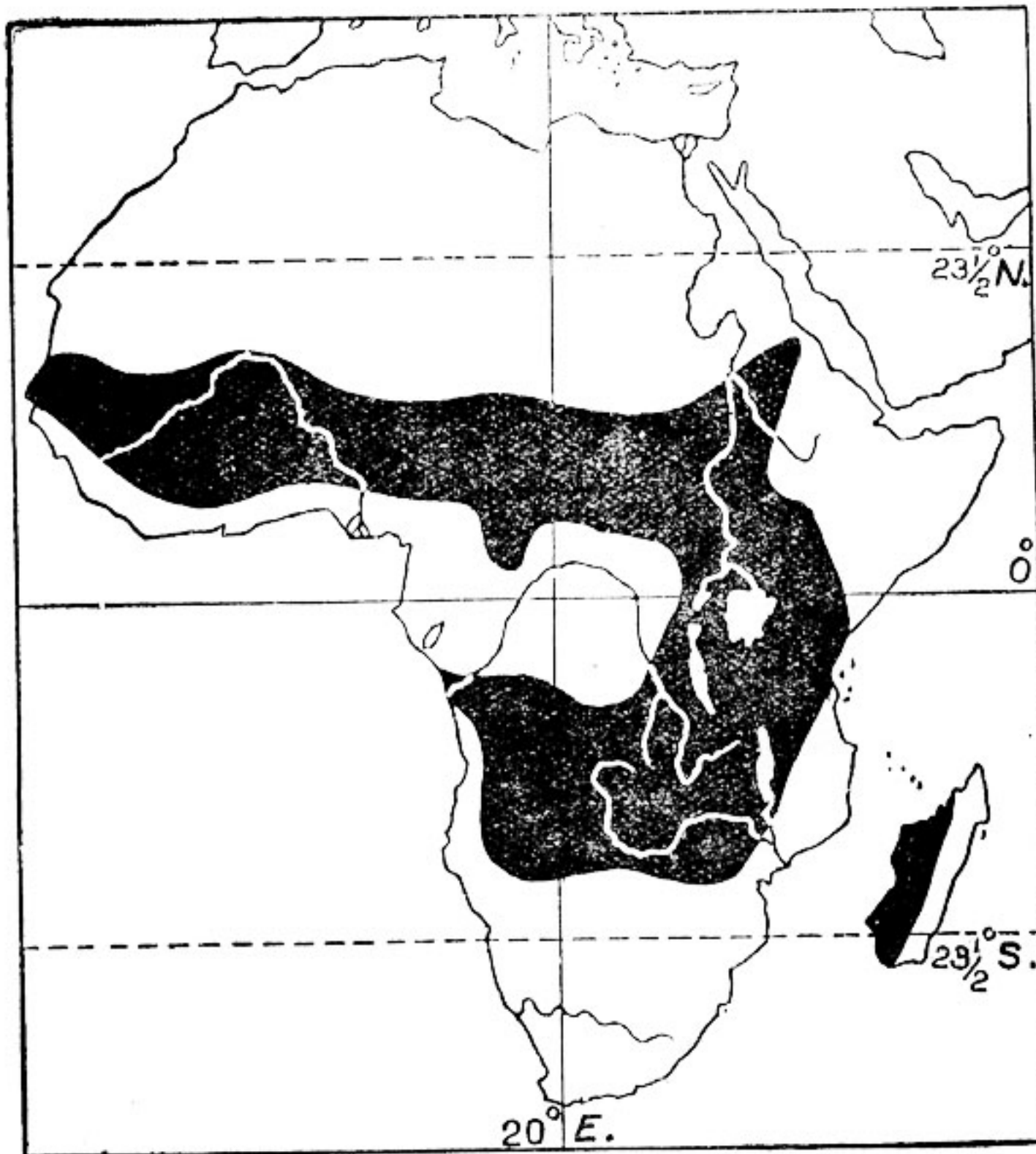


FIG. 55.—Map of Africa, showing Savanna lands.

Look at Fig. 42 again and you will see in this region many long narrow lakes like fingers. Nobody is quite sure when these lakes were

formed, but it is thought that there was a crack or rift formed in the earth's crust and that these lakes were formed in the rift valley which runs from the most southern lake, and follows a line west of the big lake, the Victoria Nyanza, about which we learnt before.

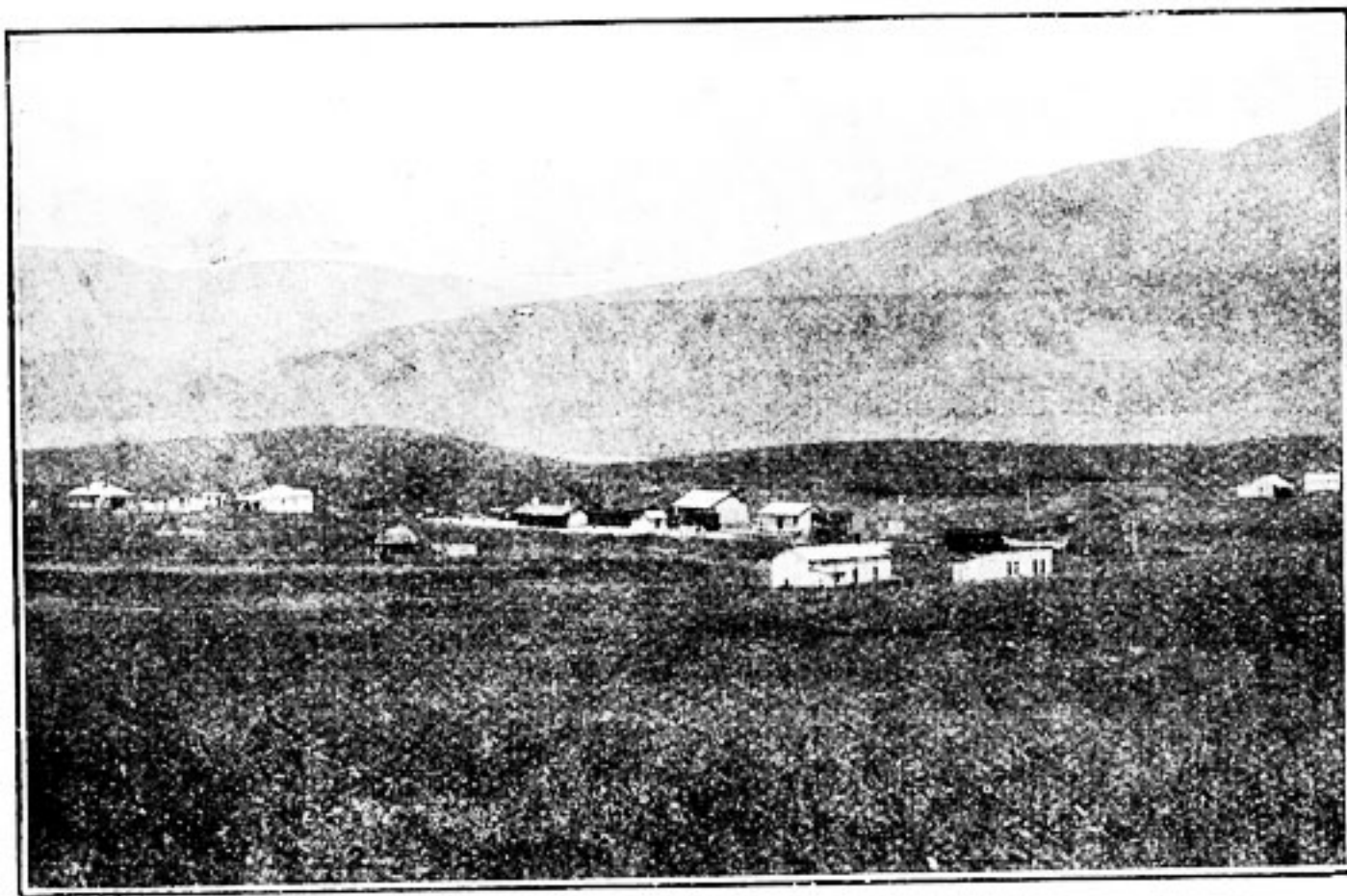


FIG. 56.—A farm in Kenya.

The plateau itself has a very pleasant, cool climate, with summer rain, and is quite suitable for European people to live in. Many of them do live there now, and much of the land, which has a rich volcanic soil, is used for farming such crops as maize for food and cotton, which is by far the most important crop. Fig. 56 shows

you one of these farms. The people also raise coffee and a plant called sisal hemp, which is used for making ropes.

If we leave the plateau and go towards the sea, we come to the coastal plain. Here the climate is once more hot and wet, rather like the Congo basin. Here we find evergreen forests once more, but much of the forest has been cleared and rubber and sugar-cane are grown. Rice forms the chief food of the people, and many coconut trees are grown along the coast itself, and copra, the dried kernel of the nut, is exported.

7. South Africa : Waterfalls and gorges

We can divide South Africa into several very distinct parts. Look at Fig. 57 and you will see how this is done.

1. Northern and Southern Rhodesia, which belong to the Savanna lands.
2. The Temperate Grassland belt.
3. The Kalahari Desert belt.
4. The Eastern coastal belt.
5. The Mediterranean belt.

1. Northern and Southern Rhodesia.—

Northern Rhodesia is just a continuation of that Savanna land we were speaking about in the last

lesson, but the chief occupation of the people living there is cattle raising, although maize and other foodstuffs are grown; and it is from this district that most of the food supplies come for the miners in the copper mines of Katanga. At

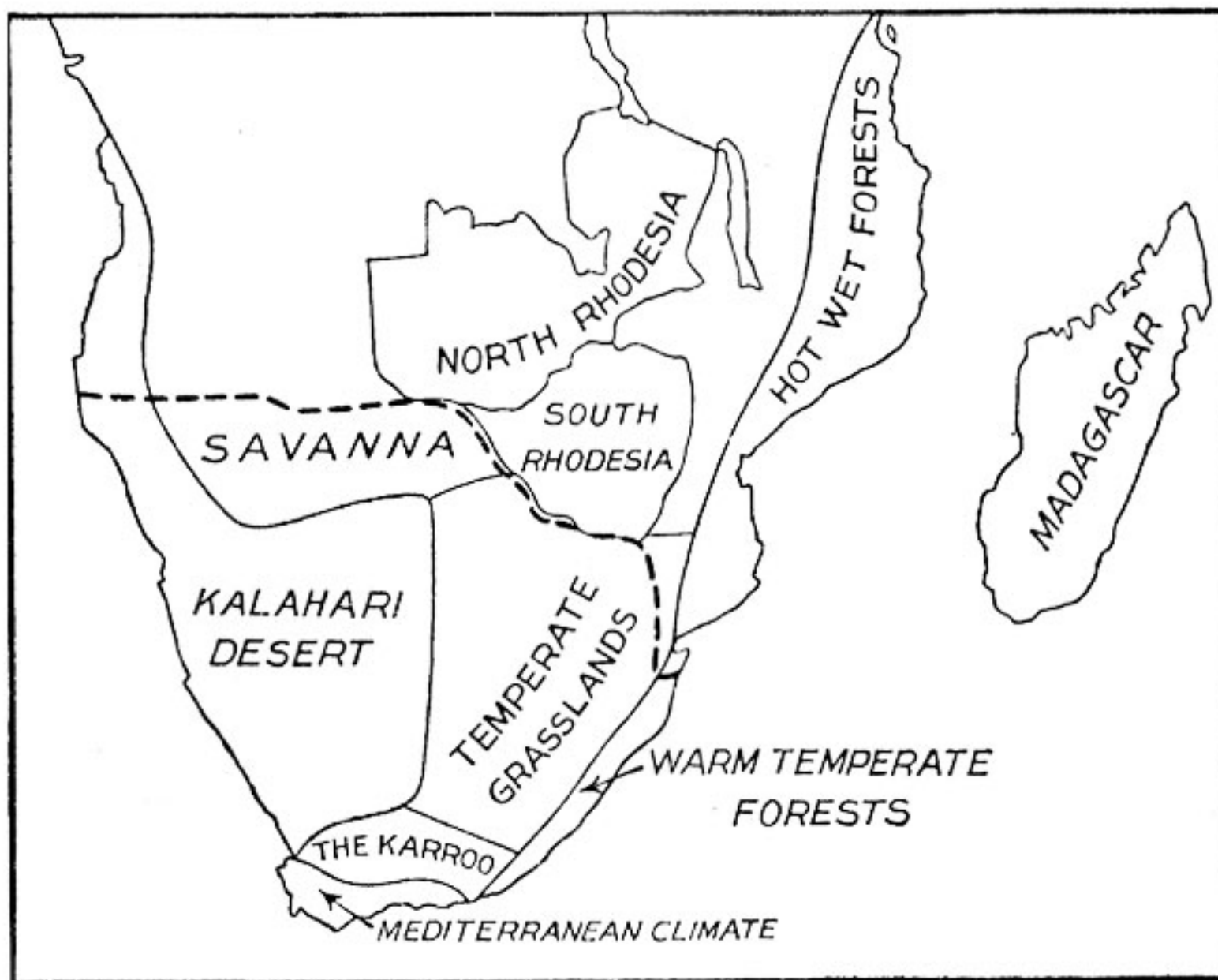


FIG. 57.—South Africa.

present, it is rather sparsely populated, but more and more people are settling there each year. Fruit farming is also carried on successfully in some places. There is one trouble in Northern Rhodesia which has worried cattle ranchers very

much and that is an insect called the tsetse fly whose bite is fatal to the cattle. So, in some districts it is impossible to breed cattle.

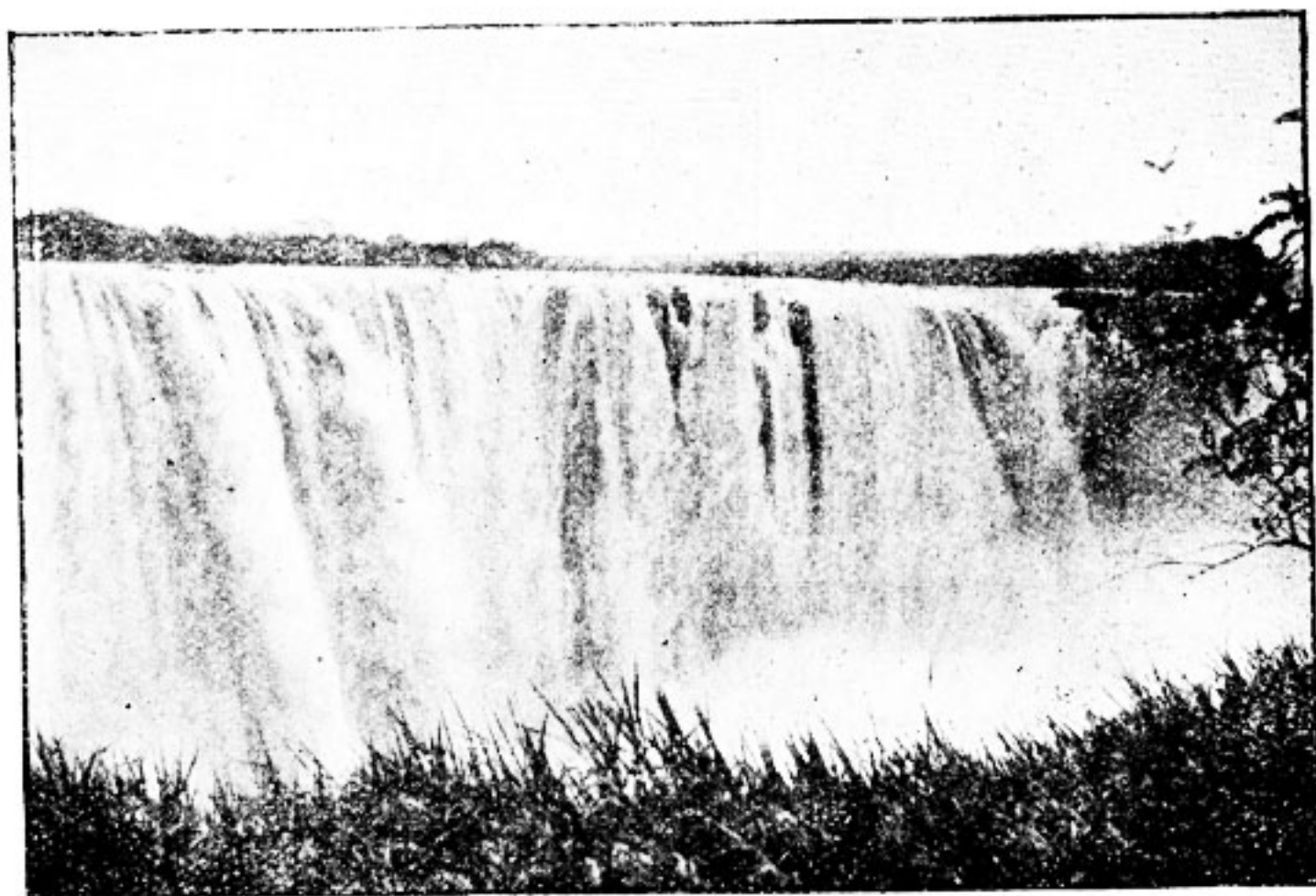
Southern Rhodesia has a cooler climate than Northern Rhodesia, and the tropical grasslands gradually merge into the temperate grasslands whose winters are colder and whose summers are not so hot. Do not forget that we are now south of the equator and that summer is now in December, January and February and winter in June, July and August. Southern Rhodesia is rich in coal, which is mined at a place called Wankie and is very important. Gold is also mined in Southern Rhodesia, but not in such large quantities as farther south. Many years ago a great pioneer called Cecil Rhodes, after whom Rhodesia



[Photo: L. D. Stamp.]

FIG. 58.—Bridge over the Zambezi River.

is named, planned that a railway should run through the length of Africa, starting at the southernmost point at Cape Town and ending at Cairo near the mouth of the Nile. The railway has not yet been entirely completed, but it is now possible to buy a ticket in Cape Town and travel by train, steamer on the lakes and rivers, and by car, and eventually to reach Cairo. So the



[Photo : L. D. Stamp.]

FIG. 59.—The Victoria Falls.

dream of Cecil Rhodes has partly come true. The railway from Cape Town passes from Southern to Northern Rhodesia over a very famous bridge over the Zambezi River. Fig. 58 shows you a picture of this bridge. It was a very

difficult bridge to build, and the Zambezi at this point tumbles over the world-famous Victoria Falls and has cut a very narrow and very, very deep gorge below them. Fig. 59 shows you a picture of these beautiful falls. Many people travel from all parts of the world to see these falls, but at present no use has been made of them for the purpose of generating electricity, as is the case of the equally famous Niagara Falls in North America.

2. The Temperate Grassland belt.—This is also a part of the great plateau of Central and South Africa, but, as we go away from the equator, the climate becomes much cooler, especially in winter. All this region is over 3,000 feet above the sea, but it rises in some parts to nearly 6,000 feet. The whole plateau here is tilted towards the west, just as the Deccan of India is tilted towards the east. And, just as the Western Ghats which are really the steep edge of the Deccan plateau appear as a range of mountains, so does the eastern edge of the African plateau appear as a range of mountains, which are called the Drakensburg Mountains. You will see Drakensburg Mountains shown in Fig. 42, and Fig. 60 shows you a picture of them.

The wind which brings the rain to this part of Africa comes from the south-east and is called the

South-East Trade wind. It has to pass over the Drakensburg before it reaches the plateau, and therefore the rainfall is not very heavy, except along the east coast. As the wind blows over the plateau, it becomes drier and drier, until by the time it reaches the west coast we find desert conditions rather like those in the Sahara Desert.

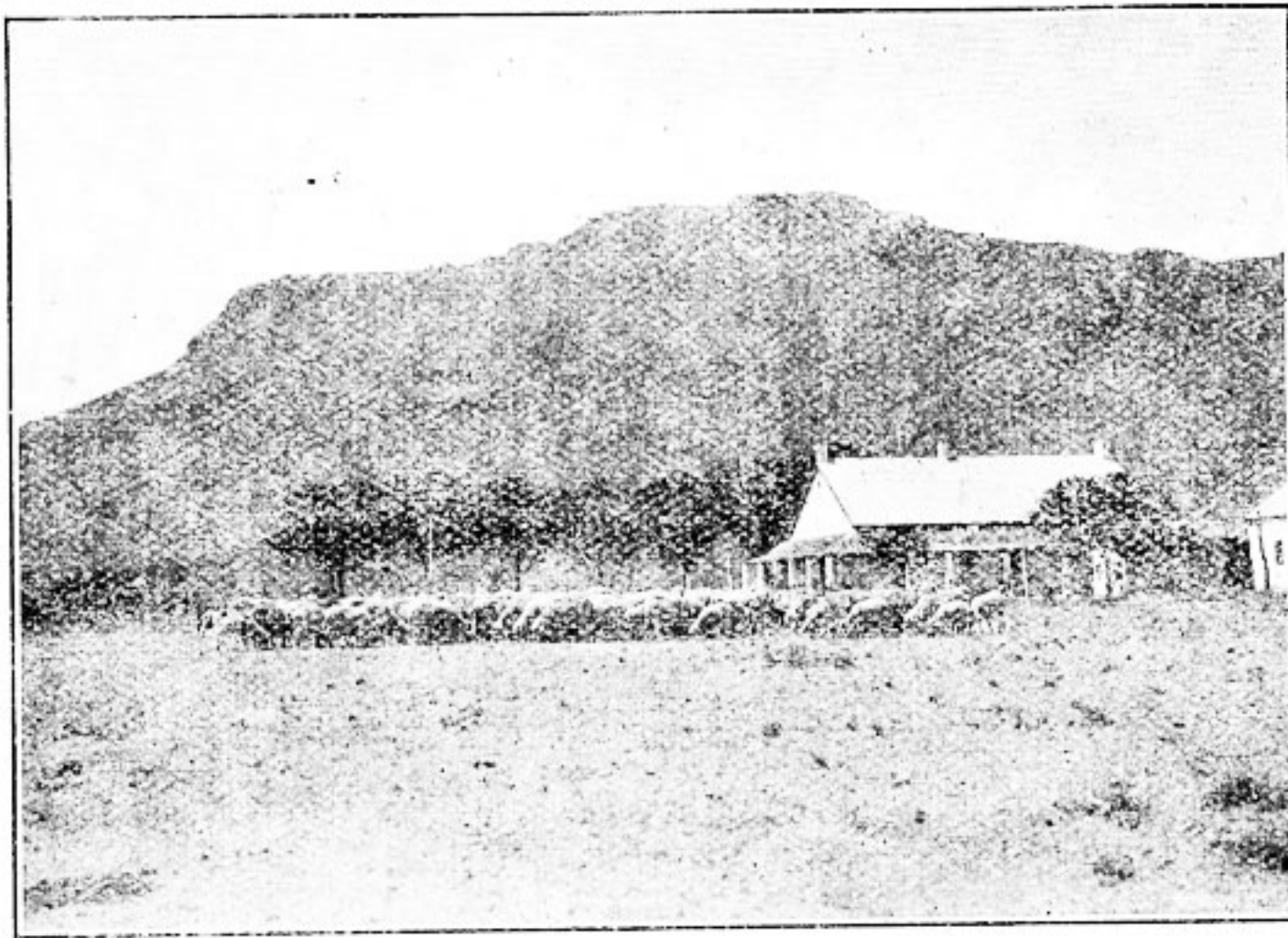


FIG. 60.—The Drakensburg Mountains.

The plateau of South Africa is called the Veld, which is pronounced 'Felt'. The rainfall on the Veld is not very heavy, but in the east maize is grown and, as one goes westwards, the grass becomes poorer and sheep are kept in very large numbers, mainly for their wool, which is exported

in large quantities to England to be woven into woollen cloth. Wherever maize is grown in the damper parts, cattle are also reared and are fed on the maize.

The Veld is very famous indeed for its rich mineral wealth. Both gold and diamonds are found in large quantities. The most famous goldfields is the Witwatersrand near the large city of *Johannesburg*. This district produces half the world's supply of gold. There are also rich coalfields near Johannesburg and some of the coal is exported to India. Diamonds are also found near the political capital of *Pretoria*, and at *Kimberley*.

3. The Kalahari Desert.—There are very few people living in this region and it is of little importance commercially. If one travels westwards, the grasslands which are used for sheep-farming in the east gradually become poorer and poorer, until only a few small spiny bushes remain and even these finally die out and true desert is reached. In a few places, where there is water to be found, and a little poor grass can be grown, we find natives with flocks of sheep and goats and sometimes cattle, but these people are wandering tribes and have to move on from place to place to find food for their animals.

4. The East and South coastland belt.—

This region lies between the plateau and the sea. The plateau does not end abruptly in a steep edge, but descends to the plain in a series of steps. Fig. 61 shows you a picture of these steps. The first step up from the south coast is called the Little Karroo and the next step is called the Great Karroo. The vegetation in the Karroo is very poor and only sheep and ostriches can be kept on its poor shrubs. As one goes eastwards, the rainfall improves on these steps and a little timber is obtained from the trees grown on the slopes, while maize is grown and large numbers of sheep and cattle are reared.

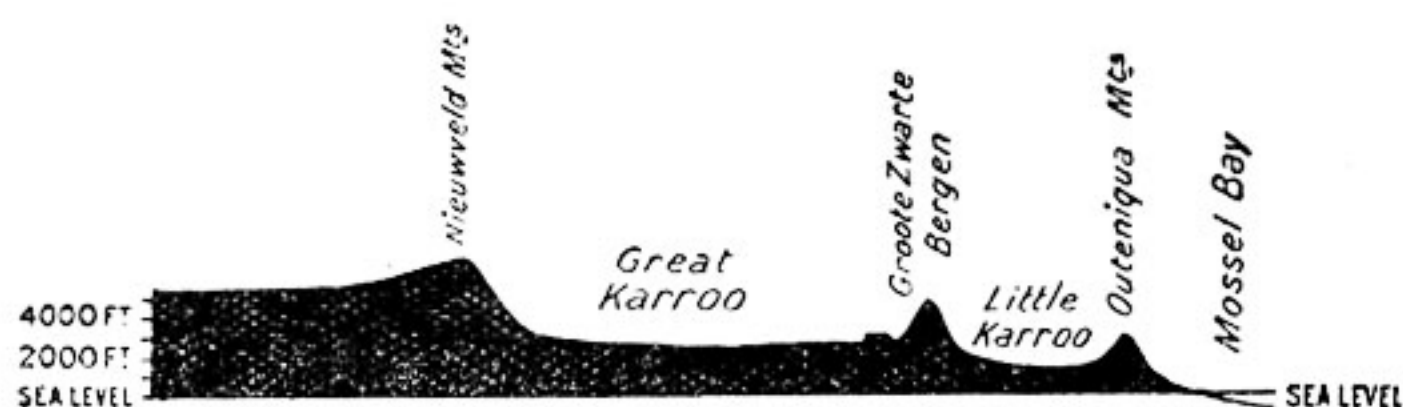


FIG. 61.—Section through the Karroos of Africa.

The coastlands themselves have a good rainfall and are warmer than the plateau, and most of this rainfall comes in summer—December, January and February. Here much sugar and tobacco is grown and it is interesting to notice that large numbers of Indians, mainly from Madras, have settled in this region, which is rather similar in climate to our own home.

5. The Mediterranean Region.—The extreme south-west corner of South Africa has a Mediterranean climate—that is, it has cool, wet winters and hot, dry summers. Here we find, just as we did in the true Mediterranean lands, large numbers of oranges, peaches, grapes and grapefruit being grown. These fruits are exported to Europe in ships especially constructed to carry them without damage being caused to them. Wine is made from the grapes, and many of the fruits are tinned or made into jams, also for export. *Cape Town* is the great port of this district, and most of the fruit is exported through Cape Town.

[*Note* :—In a school in an area which receives its main rainfall during the North-East Monsoon, the lessons dealing with the work of rain and streams in wearing away the surface, as seen in the locality (lesson 5) may advantageously be taught now].

AUSTRALIA

8. Introducing Australia

1. **Physical features.**—We are going to study another of the great land masses of the world, the

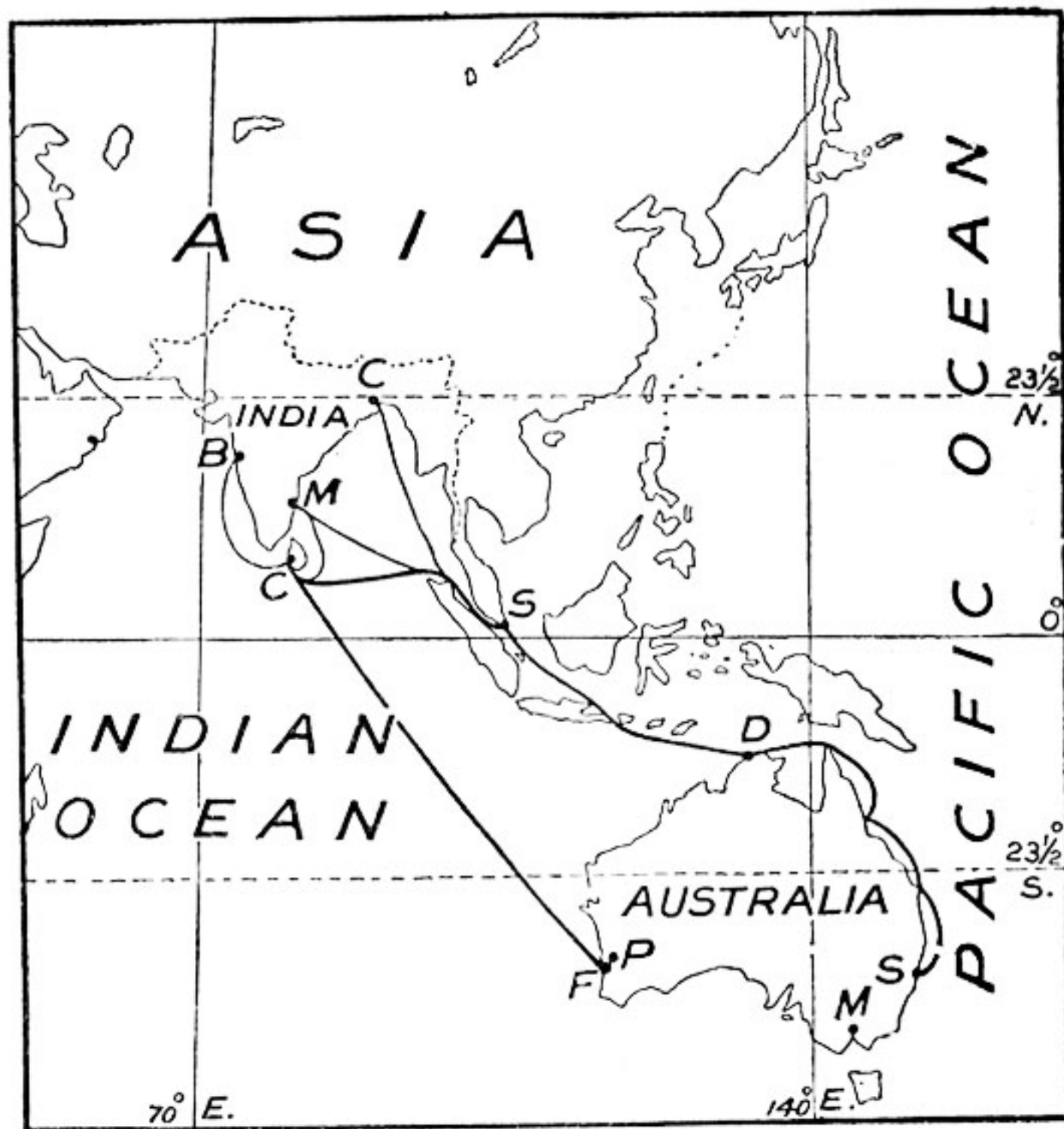


FIG. 62.—The route to Australia.

great island continent of Australia. It is often called the island continent because it is the only

continent which is completely surrounded by water on all sides.

It is very easy to reach Australia from Madras. The map in Fig. 62 shows you the route. You would have to travel by train or sea to the

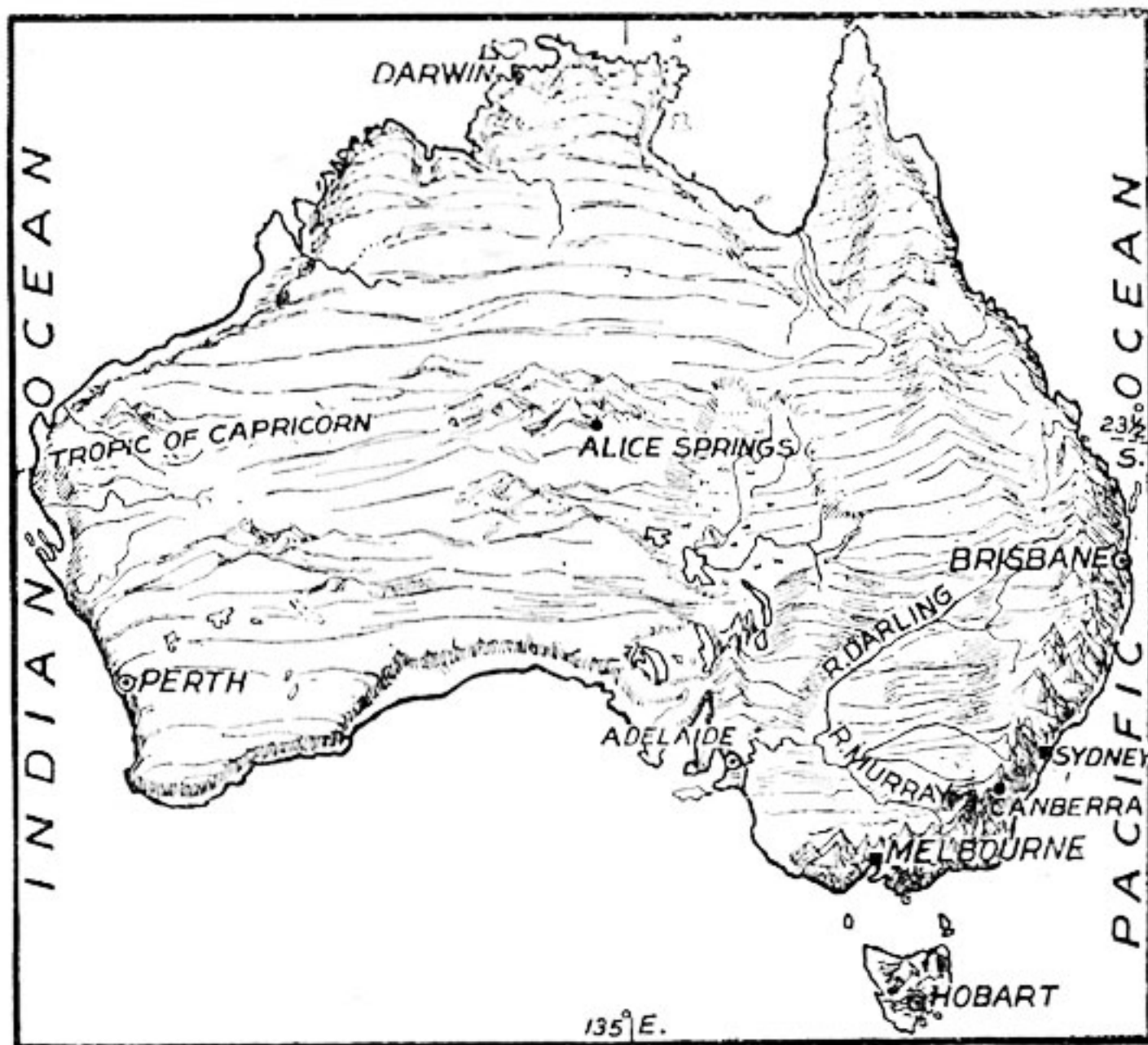


FIG. 63.—Picture map of Australia.

great port of Colombo in Ceylon and there you would take a big liner across to Australia.

I want you to look at Fig. 63, which shows you a picture map of Australia. The shape of it is

rather curious and the eastern part always reminds me of a donkey's head, with his nose in the south and his ears in the north. Now look carefully at the map and you will find that the structure of Australia is not unlike that of Africa, or the Deccan of India. It is a large plateau, once more with a steep eastern edge and depressions made by the great river basins, like great sausages in the central and eastern parts. The coastal plain for the most part is narrow and the plateau edge steep, especially along the east and south-east coasts where the plateau edge is so steep and cut up that it looks just like mountain chains. You can compare the Great Dividing Range, as it is called, with the Western Ghats in India or the Drakensburg Mountains in South Africa. So we can divide Australia into three physical divisions :—

1. The Western plateau.
2. The Central lowlands.
3. The Eastern mountains.

These three divisions show up quite clearly on your map in Fig. 63. Next, I want you to notice the rivers of Australia. The longest and biggest ones are in the east of the continent. We shall see the reason for that later. There is one large basin in the east called the Murray-Darling basin. Find this on your map. These

two rivers are by far the most important. Right in the centre, you will see some lakes with rivers flowing into them. These rivers do not reach the sea but end in the lakes, which are really salt pans. There is water in these rivers at only certain periods of the year, so that when there is plenty of water the lake basins become flooded and when the rivers are low the lakes begin to dry up. The water in them is therefore salt or brackish.

2. The climate.—If you could draw a line round the world from east to west, passing through the centre of Australia, keeping your line always at an equal distance from the equator, you would find this line, which would be called a line of latitude, would also pass through South Africa. If you have a globe in your school, you can try this for yourself. You remember we said that in South Africa the east coast had a warm, wet climate and that, as we climbed on to the plateau, the climate became drier and cooler and that, as we travelled towards the west coast, the climate became drier and drier, until at last we reached the Kalahari Desert. Exactly the same thing happens in Australia. The two tips of Australia both in the south-east and the south-west, have a Mediterranean climate, with cool wet winters and hot dry summers and, as you

would expect, those districts produce the usual Mediterranean fruits, such as grapes, peaches, apricots, oranges, figs, etc.

As we travel northwards along the east coast, we come to a region of heavier rainfall, where most rain falls in summer—December, January and February, for Australia is south of the

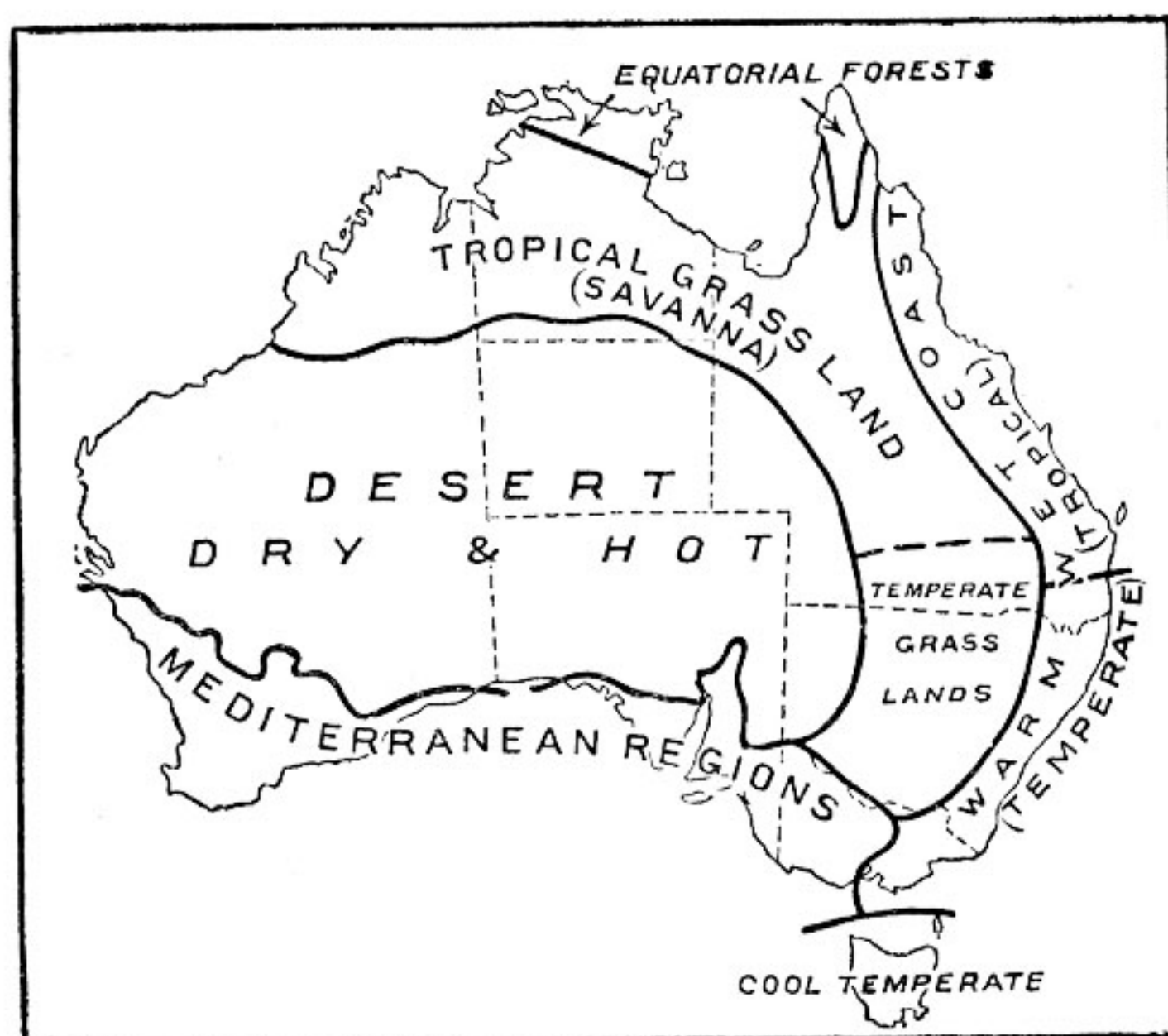


FIG. 64.—Map of Australia. (Climatic regions.)

equator. The same S.-E. Trade winds are blowing across Australia from the south-east and, of course, from the sea. They have sucked up much water from the sea as they pass over it and

so are very wet winds. As soon as they reach the east coast they have to rise immediately, and their water condenses, clouds are formed, and rain falls. As these winds are stronger in summer than in winter, there is a heavier rainfall in summer than in winter.

When the winds have passed over the high plateau edge, they descend on the other side robbed of most of their moisture and continue to blow over the rest of the country as *dry* winds, becoming drier and drier as they continue westward. Just as in South Africa we have a wet east coast, then a belt of drier grassland which gradually becomes desert, so we have the same things happening in Australia. But, as Australia is wider, from east to west than South Africa, we have in Australia a much larger desert than the Kalahari.

The far north of Australia, however, is not desert because, being so near to the equator, it has a fairly heavy rainfall and really corresponds to the tropical forest belt of Central Africa. Coming southwards from the northern coastal plains, we reach a region where the trees become scarcer and the grass grows well, and this region is exactly like the Savanna lands of the Central African plateau. Fig. 64 shows you a map of Australia divided into these climatic regions.

9. Australian shepherds and cattlemen: Savanna lands

Look again at Fig. 64. You will see a large belt of grassland beginning at the north-west coast and running eastwards across the continent



[Courtesy of the Commonwealth of Australia.
FIG. 65.—A cattle ranch in Australia.

and then turning southwards, parallel to the coast. This grassland is the Savanna type—the hot tropical grasslands of Africa—in the north and the Cool Temperate grasslands in the south.

1. Cattle ranchers.—There are no tsetse flies in the Savanna lands of Australia to worry and kill the cattle, so we find very large rich cattle

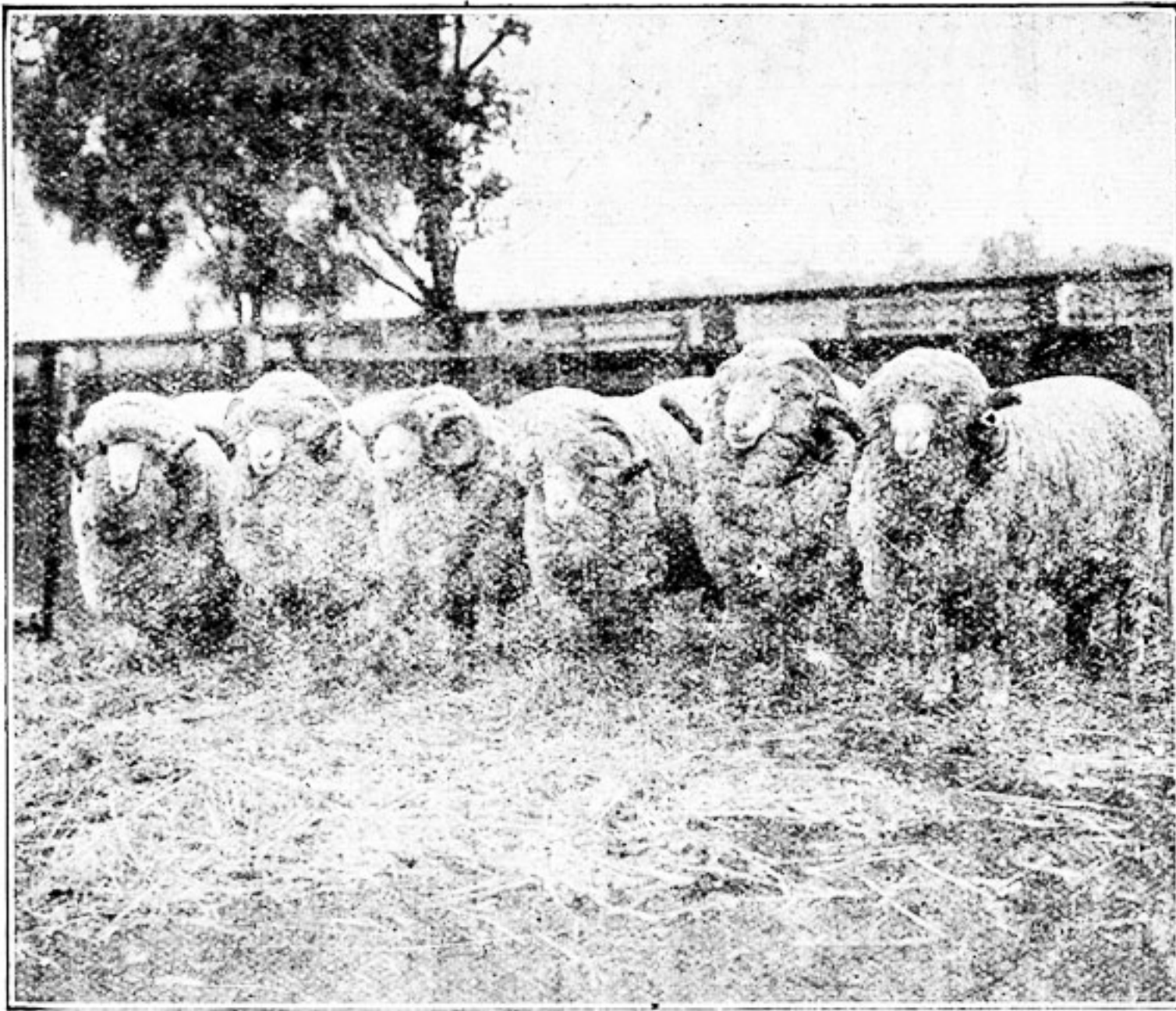
farms all over this belt, especially in the eastern part. Cattle like rich grass to feed on, so it is in the wetter parts of the grassland that we find most of them. There are two great uses for cattle:—

1. Cattle are bred for their meat and are called beef cattle.
2. Cattle are bred for their milk and its products of butter and cheese and are called dairy cattle.

The cattle bred on the great grasslands of Australia are almost entirely beef cattle. Much of their meat is eaten in the country, but some of it is exported to England. These cattle too produce good hides, which are also exported in great numbers. The dairy cattle like very rich grass, or they will not produce good creamy milk, so they are kept on the richest of all the grasslands, mostly on the east coast itself. Fig. 65 shows you a picture of one of these large beef cattle ranches.

2. Sheep farms.—The sheep is one of the most useful of all domestic animals. He gives us wool from his back for clothing and his flesh for food. He does not require very rich pasture nor a great deal of attention. We said just now that, as we journey from east to west across Australia, the climate becomes gradually drier and drier. We have learned too that cattle like rich or fairly

rich grassland, but when the grass becomes too poor for cattle, sheep can live on it quite comfortably. So we find very large sheep farms



[Courtesy of the Commonwealth of Australia.]

FIG. 66.—Prize Australian sheep.

all over the poorer parts of the grasslands. Australian sheep are world famous. They are bred mainly for their wool. It is curious that the sheep which give us the best wool do not give us the best mutton, and those which give us the best

mutton do not always yield first-class wool. In a short time we shall be learning about another country near Australia which gives us good mutton but less wool.

The Australian grasslands seem to be most suitable for the sheep giving us very good wool,

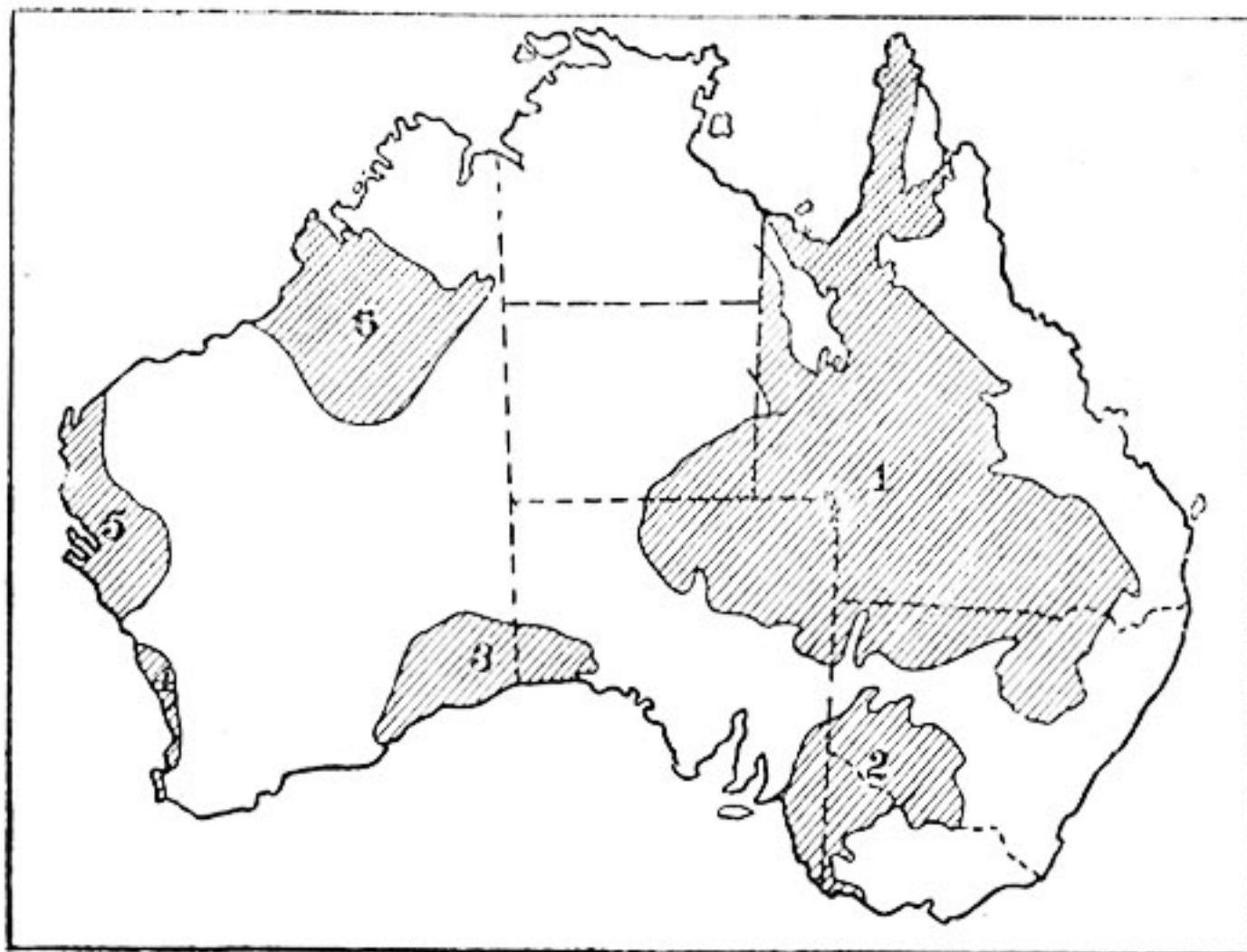


FIG. 67.—Artesian basins of Australia.

1. Great Australian basin. 2. Murray basin. 3. Eucla basin. 4. Coastal plain basin. 5. North-West basin. 6. Desert basin.

so that is the type of sheep bred on these enormous farms. Australia exports very large quantities of wool every year to England to be made into cloth, and wool is the chief Australian export. Fig. 66 shows you a picture from one of these big sheep farms.

3. Artesian wells.—Before we leave these farmers of cattle and sheep, we must notice a very interesting thing which has helped these men tremendously in their lands. Look at Fig. 67. You will see that part of the map is shaded. Deep down in the earth underneath all that shaded area there is an underground supply of water. Where it comes from exactly, people are not very sure, but that it **exists** is very important. When a farmer finds he is short of water, all he has to do is to dig a deep well and the water rushes out. Unfortunately, he cannot use this water to irrigate the land, as it is slightly saltish and would spoil the crops and grass but he can give it to the animals as the small quantity of salt is good for them. So you see this great artesian basin, as it is called, helps the farmers greatly with their animals.

10. Australian planters

1. Wheat.—You will remember when we began to study Australia, we spoke of the great river basin of the Murray and the Darling. Look again at Fig. 63 and find that great basin. The land between the Murrumbidgee and the Murray is very rich land and is well watered. In fact, it is the richest part of the grassland. Here we find the great Australian wheat farms. Australia produces large quantities of good wheat, although she does not produce as much as some other

countries, such as Canada or the Argentine, about which you will learn later.

The Australian wheat farms are very large, one farmer owning thousands of acres of land. His fields, too, are very large, for he ploughs his land and reaps his harvest entirely by machinery. Fig. 68 shows you a man harvesting wheat by machinery. The machines are very expensive to

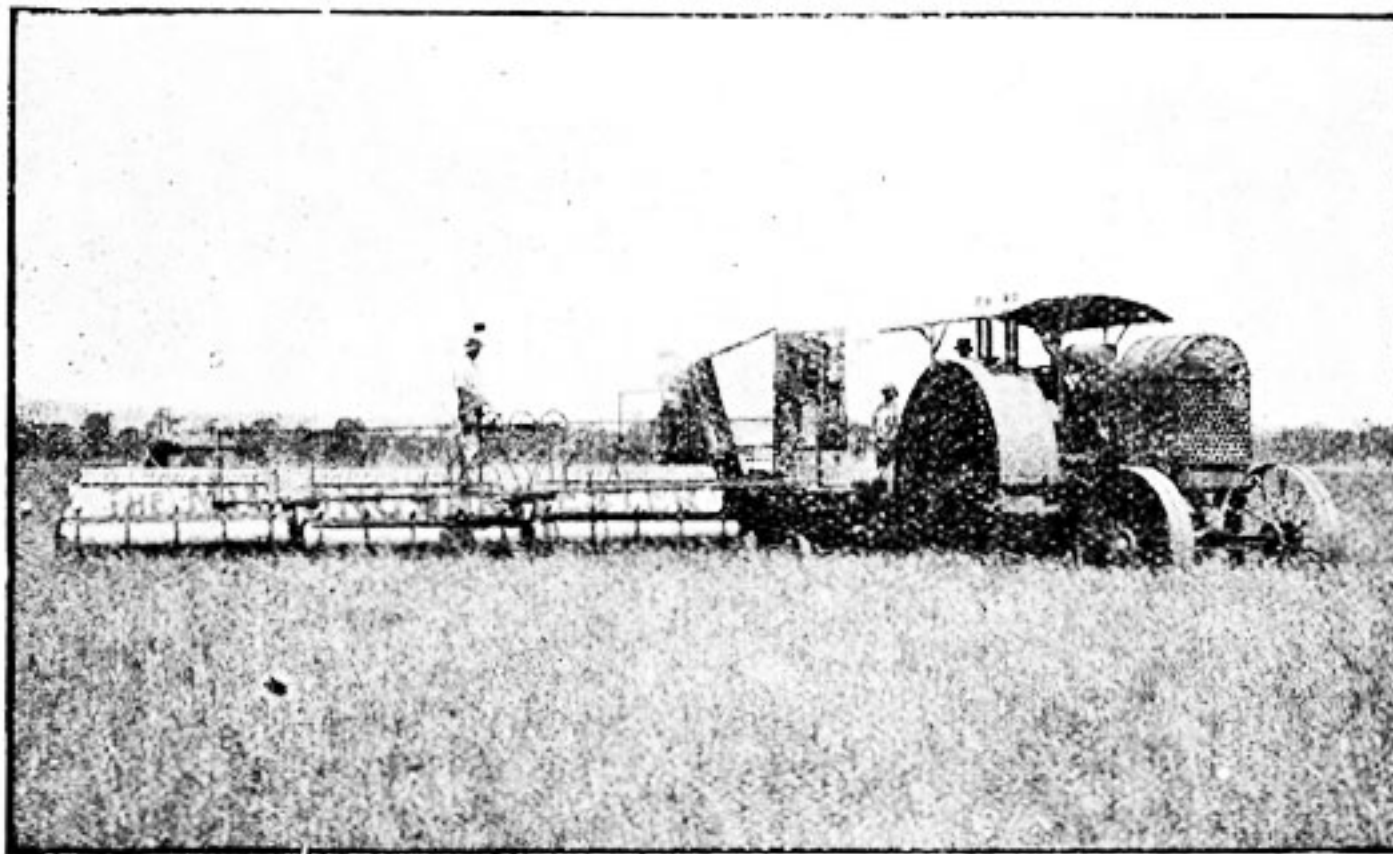


FIG. 68.—Harvesting wheat in Australia. (Look at the machinery used.)

buy and to run, so it is necessary for the farmer to have a very large farm in order to make enough profit to pay for his machines. There are very few people living in Australia, so labourers are difficult to get. Here again the machine is useful, for it can do the work of many men. All the processes are done by machinery. There

are motor ploughs, motor harrows, motor cutters and binders, and machines for thrashing the wheat after it has been cut. In some cases, it is even put into sacks and sewn up by machinery after it has been thrashed. Fig. 69 shows these



[Courtesy of the Commonwealth of Australia.
FIG. 69.—Bagging wheat for export.

bags ready for the steamer to take them to England.

2. Fruit.—All over the Mediterranean areas in the south of Australia, we find large fruit

farms. There are orchards of oranges, peaches, apricots, plums and figs. Many of these fruits are exported to England and Europe, either tinned or dried, for it takes a very long time for a ship to make the journey to Europe with fresh fruit. Many grapes are grown too, which are made into wine. Look at Fig. 63 again, and you will see in the south-east corner of the map a small island. This is called Tasmania. Tasmania produces some very good apples, most of which are exported to England, as apples are very easy to pack.

11. Australian workers in mines and factories : Minerals

Australia is inhabited almost entirely by white men. They are not the original inhabitants, but when they first landed in the country they found it very sparsely inhabited by a race of black men called 'aborigines'. These people were very primitive, poor in physique and short in stature, not unlike the pygmies of the Congo Basin. They died in large numbers, and to-day there are only a few of them left.

1. Gold.—The white people are nearly all of British ancestry. Many of them left the British Isles to seek their fortune in the famous gold-fields of Australia. Nearly a hundred years ago,

someone discovered there was gold to be found in the south-east part of Australia and many men and their families went out to Australia to try to find more gold. The most famous goldfield is that in South-West Australia, discovered later, called *Kalgoorlie*. It is in the desert region, and water has to be brought to the miners from many miles away. The goldfield does not produce nearly so much as it used to do. Many of the people who first went out to Australia in search of gold were disappointed and became farmers instead. There are two famous goldfields in the south-east, called *Ballarat* and *Bendigo*.

2. Silver.—At a place called Broken Hill, west of the Darling River, is an isolated hill which has the largest deposits of silver and lead in the world. Here, too, mining is naturally a very important occupation.

3. Coal.—A little way up the south-east coast at Newcastle there is a very large coalfield. The coal is of excellent quality, and is very easily mined. Being on the coast, it requires very little transport to bring it to the docks to load into the ocean steamers.

4. Iron.—Unfortunately, although there is good iron ore to be found in Australia, it is a long way away from the coalfields. Therefore there is very little manufacturing carried on in Australia.

Australia on the whole then produces and exports raw materials, such as wool, wheat, skins, butter, meat and minerals, and imports machinery of all kinds and clothing. It is therefore a farming and mining country, not a manufacturing country.

Factories.—There are several factories in New South Wales and Victoria and near the great cities. The chief reason for this is that comparatively more people live in these parts and coal and iron are available nearby. In several places, there are dairy farms and canning of dried fruits is also important. There are several industries in *Sydney* and *Melbourne*. *Newcastle*, near Sydney, is famous for iron industry. Steel and rails and machinery are manufactured there. In Australia, weaving is mostly confined to woollen goods. In Sydney, Melbourne and Ballarat there are several woollen mills. In Victoria there are also some cotton mills newly started. In recent years factories have been built for manufacturing aeroplanes and war materials.

12. New Zealand and the Maoris

If you could board a liner at Melbourne or Sydney, the two great ports of South-Eastern Australia, and sail east-south-east, you would soon reach the two islands which together make up the country of New Zealand.

Look at Fig. 70, which shows you a picture map of New Zealand. I want you to notice the physical structure of the country. Beginning with North Island, you can see that the highest



FIG. 70.—Picture map of New Zealand.

part is the east, along the coast. There is a central plateau area and a western coastal plain, which in the north juts out into the sea as a long narrow peninsula. Now look at South Island,

which is separated from North Island by a narrow neck of sea called Cook Strait. You will see that the mountain chain of North Island continues south-westwards curving across the island and running parallel to the coast from the centre of the island southward. The plateau, too, has changed its position here from the west of the mountains to the eastern side. And so has the coastal plain. The position of this mountain backbone has a great effect upon the climate of the country. The prevailing wind comes from the west. So in South Island most of its moisture is lost while crossing the mountain ranges and the eastern side is fairly dry, while the mountains are on the eastern side of North Island and the plains on the west. The wind therefore is not forced to rise as soon as it strikes the west coast of North Island and there is a good rainfall over the western plains. The country is not very near to the equator and, as no part of it is very far away from the sea, it is never very hot and never very cold. In fact, it is a very pleasant climate to live in.

In the mountains of North Island there are many volcanoes. Deep down below the earth's crust, the rocks are so hot that they are liquid instead of being hard and solid. In certain places, the earth's crust is weak and cracks and

holes appear. The liquid rocks are able to move easily and are always trying to reach the surface. Sometimes they manage to push their way through a weak spot or hole, which is called a volcano. When the molten liquid rock is pushing harder than usual, it manages to push its way out of the top of the volcano and pours down over the sides as a stream of lava. Some-



[Photo : L. D. Stamp.]

FIG. 71.—A volcano.

times volcanic ashes are thrown out, sometimes boiling water and steam and smoke. Fig. 71 shows you a picture of a volcano.

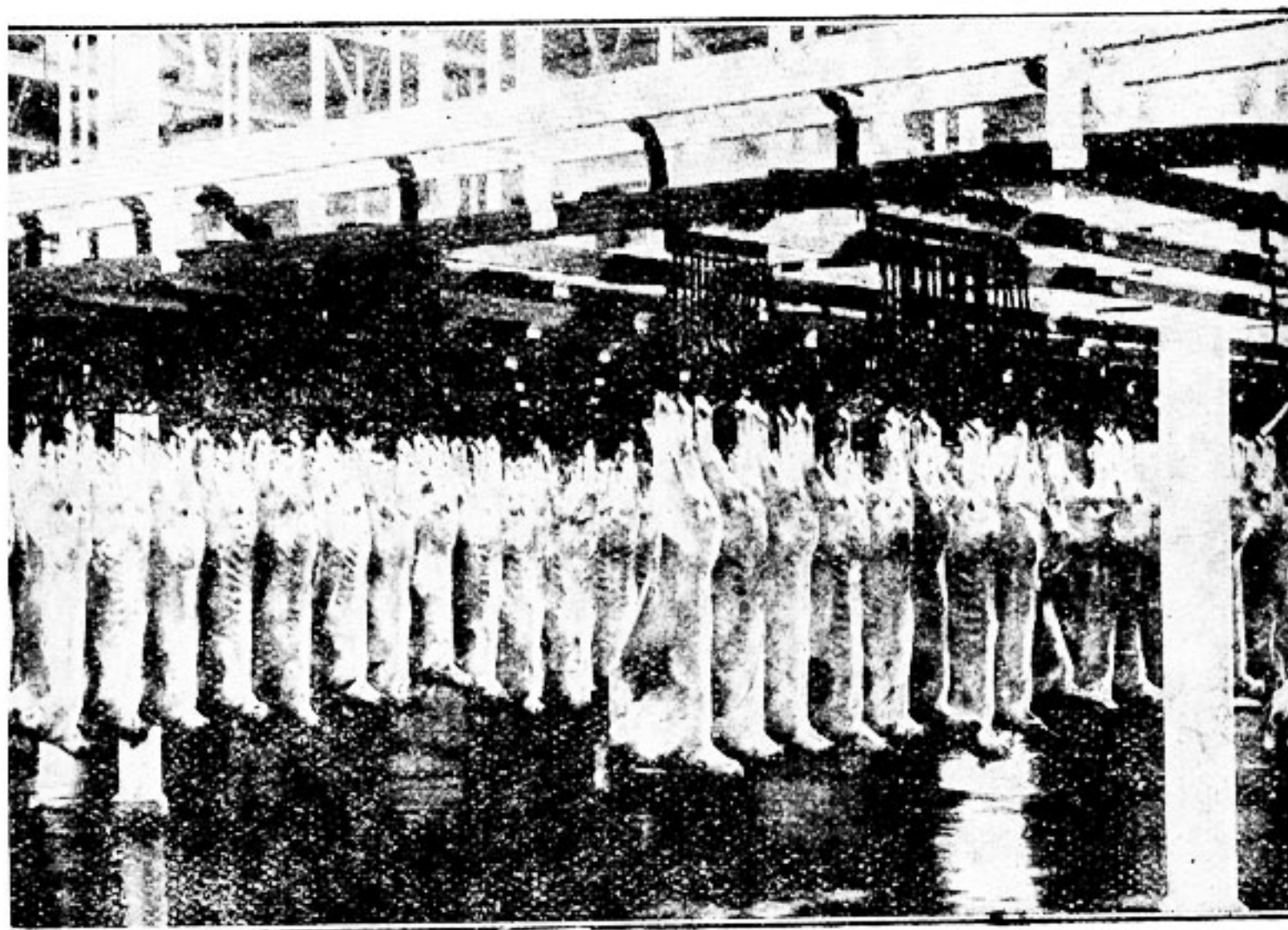
The lava thrown out by a volcano cools and becomes a hard rock. When it has become exposed to the air for a long time and the rain-water has worn it down and it has become

'weathered', as it is called, it produces a very fertile soil, in which crops grow very easily. Luckily nowadays there are no active volcanoes in New Zealand. Wherever we find these lines of weakness in the earth's crust, earthquakes often occur. They occur when the molten liquid rock moves about more than usual and bends and strains the solid rocks above it. You will probably remember that there was a very bad earthquake in Quetta in 1935, when many people were killed. Houses are often destroyed and great cracks appear in the surface of the earth. So you see that an earthquake is a very terrible thing. About seven or eight years ago there was a terrible earthquake in this part of North Island, and the two towns of *Hastings* and *Napier* were very nearly destroyed and many people were killed.

Sometimes there are beautiful hot terraces formed by boiling water, which bubbles out of the earth. This water is full of various minerals and, as it cools, it deposits the mineral on the ground in the form of terraces. (Hot water can dissolve many more minerals than cold water.) Some years ago there was a very famous set of these terraces in this district, which were coloured in many brilliant colours, rose, pink, red, yellow and orange. Unfortunately, they were destroyed by

an earthquake and have never built themselves up again.

The original inhabitants of New Zealand were called Maoris. They were tall and beautiful, brave



[Courtesy of the High Commissioner for New Zealand]

FIG. 72.—Mutton waiting to be shipped to England.

and gracious people. They were also very simple and childlike. There are still many of them living in New Zealand, mostly in the North Island, but the majority of the inhabitants are of British descent.

New Zealand is famous for two chief products.

1. Sheep.—The sheep of New Zealand are bred mostly for their mutton. The pastures are good

and the meat is excellent. New Zealand exports each year thousands of carcasses of sheep to Great Britain. The sheep are killed in New Zealand and are kept in large refrigerating chambers in ships especially built for the purpose. Fig. 72 shows a picture of mutton waiting to be shipped to England. In the North Island the sheep are bred on the drier eastern slopes of the mountains and all along the south-western coast. In the South Island they are bred on the dry eastern plains, especially round *Christchurch*. New Zealand sheep also produce good wool. The values of the export of wool and mutton are almost equal.

2. Dairy cattle.—The second great farming industry in New Zealand is the dairy farming. Most of the dairy cattle are to be found on the western side of North Island, where the land is fairly flat and the pasture excellent for dairy cows. New Zealand butter is excellent in quality and is exported in large quantities to Great Britain. Cheese too is greatly exported.

New Zealand manufactures practically nothing, and so she has to import all her machinery and clothes from other countries.

13. Islands of the Pacific

Scattered all over the surface of the Pacific Ocean are numerous groups of small islands.

Some of them are volcanic in origin, while others have been formed by corals. The coral is a small sea animal which has a hard outer shell. It lives in shallow warm sea water and multiplies very quickly. The corals grow one on top of the other, so that when the lower one dies another lives on above fastening its shell to the dead one beneath. There are many kinds of coral, most of which are very beautiful. The corals begin by building their colonies in shallow water. If you could drain away the water from the Pacific Ocean, you would see left behind many mountain ranges. Many of these mountains would be very high—in fact, some of them are high enough to stick up as islands above the present sea level, while others do not quite reach it. Naturally the small distance between the top of the mountain and the sea level makes the water in that spot very shallow and an excellent place for the corals to build their colonies. They usually build these colonies in the shape of a saucer, so that the rim of it sticks up above the level of the sea, leaving a shallow lake or lagoon in the centre. On the windward side, the sea washes up against the coral reef, bringing with it food for the corals to live upon. So you see the reef is usually thicker and stronger on that side, and there is often a gap

in the reef on the other or leeward side, through which boats can enter and anchor with safety in the calm *lagoon*. After some time, the coral reef becomes covered with vegetation and man is able to live there. Fig. 73 shows you a picture of one of the coral reefs or 'atolls' as they are called.

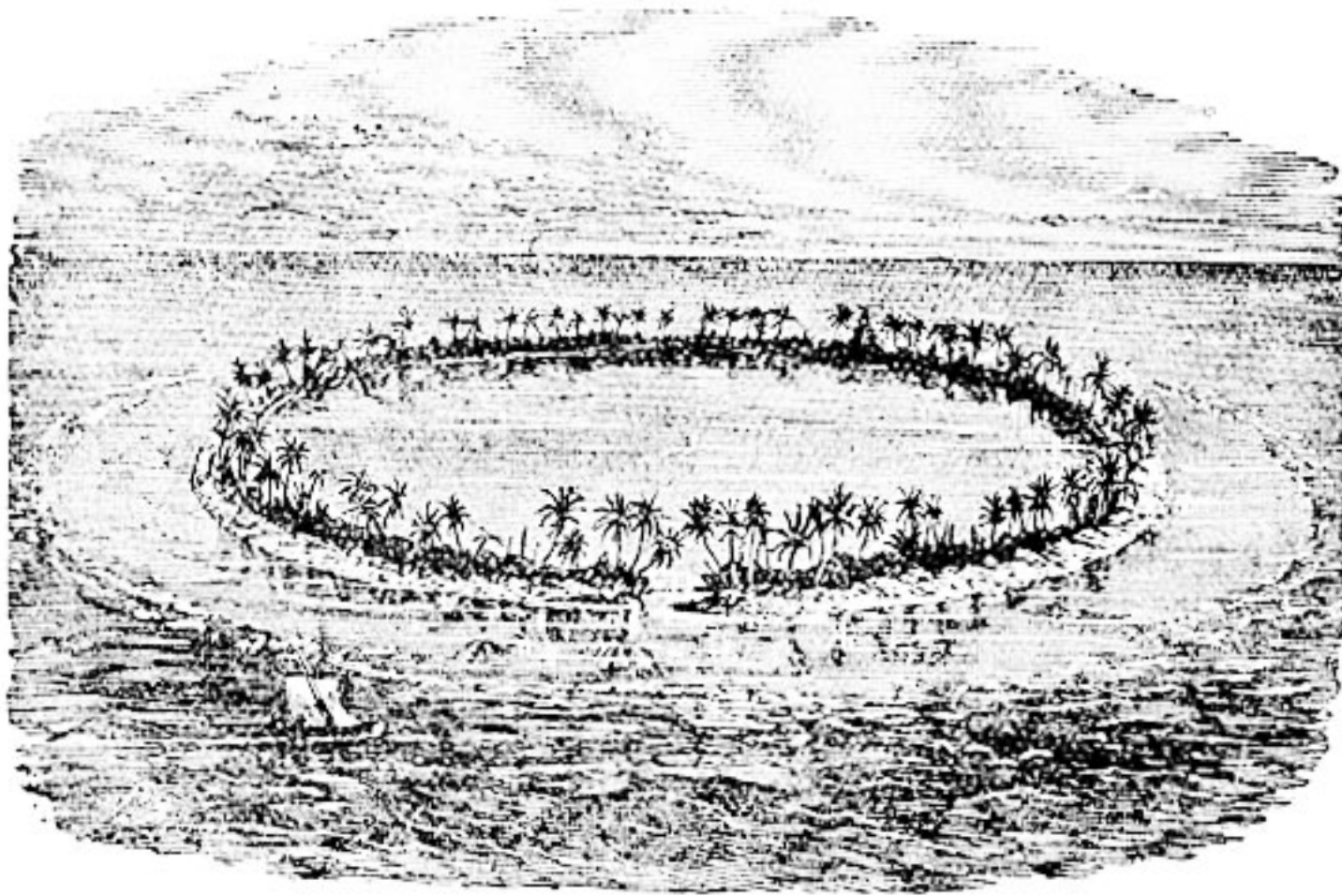


FIG. 73.—An atoll.

The coconut palm is the chief tree to be found on this type of island, for, as you know, it loves to grow in a warm climate near the sea. So the chief product of most of these islands is copra, or dried coconut. Many of the islands are volcanic and were formed by a volcano pushing its head above the waters of the ocean. The

most famous one is Mauna Loa in the Hawaiian Islands. The Hawaiian Islands belong to the United States of America, and are famous for their very fine pine-apples.

Many of the islands are useful as coaling stations for ships crossing the Pacific Ocean from Asia to the Americas. Some of them belong to the British Empire—for example, Fiji, Solomon and Friendly Islands—and many others belong to France—the Society Islands, Marquesas Island, the Paumotu Archipelago—while others belong to the United States—Hawaii and Samoa. ✓

SOUTH AMERICA

14. Introducing South America: Comparing it with Africa and Australia

Before we begin to study South America in detail, we must think once more about that great continent of Africa. Imagine yourself standing on the dock at that great port in the south-west tip of Africa. You are going to board a big liner and sail westward for about two weeks. One morning you would wake up in your cabin and find that the liner was not rolling any more but was quite steady. If you looked out of your porthole, you would see land for the first time since you left Africa. This land would be the coast of another great continent called South America.

Now I want you to study Fig. 74. Notice where the equator cuts across the broadest part of the continent. You will see that the general shape of the continent is not unlike that of Africa, only the whole thing is further south. The equator did not cut across the widest part of Africa as it does in South America, and the southern tip is longer and narrower altogether. You will see also that there is a long and very high range of mountains called the Andes, which runs the entire length of the west coast. This

range of mountains has a great influence upon the climate of the country. You will notice too that

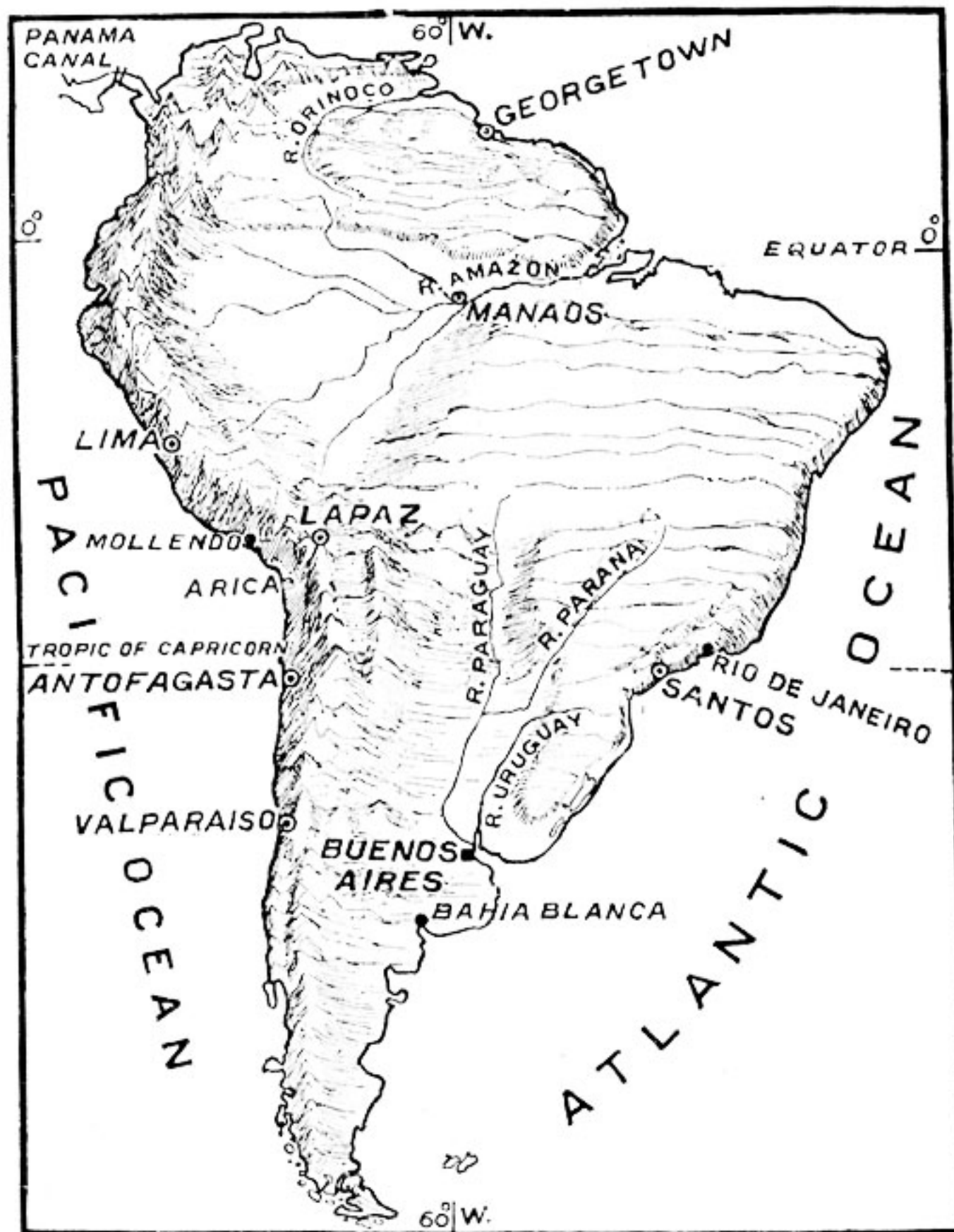


FIG. 74.—Picture map of South America.

there are three great river basins. The one in the north is called the Orinoco, the one in the

widest part of the continent is called the Amazon basin (the Amazon, by the way, is the largest river in the world) and the one in the south is called the Paraguay and Uruguay basin.

Between each of these river basins lie plateaux. The one between the Orinoco and the Amazon is called the Guiana Highlands and the one between the Paraguay-Uruguay basin and the Amazon is called the Plateau of Brazil.

So just as you had a plateau in Africa and in Australia so also you have plateaux in South America.

In South America, you have a long range of folded mountains which you can compare with the Himalayas in India, whereas there were no ranges of folded mountains in Australia and only a small knot of them in Abyssinia in Africa.

I want you to remember the Savanna lands we found in both Africa and Australia, those tropical grasslands with their wild animals and cattle ranches. You will find the same type of vegetation and climatic conditions generally on the Guiana Highlands and on the Brazilian Plateau.

You may compare too the hot wet forests of the Amazon basin with those of the Congo, but remember that Australia was too far south to have

a river basin with dense equatorial forests like the Amazon and the Congo.

I want you now, if you possess a globe, to draw a line round it once more, from west to east, keeping an equal distance from the equator.

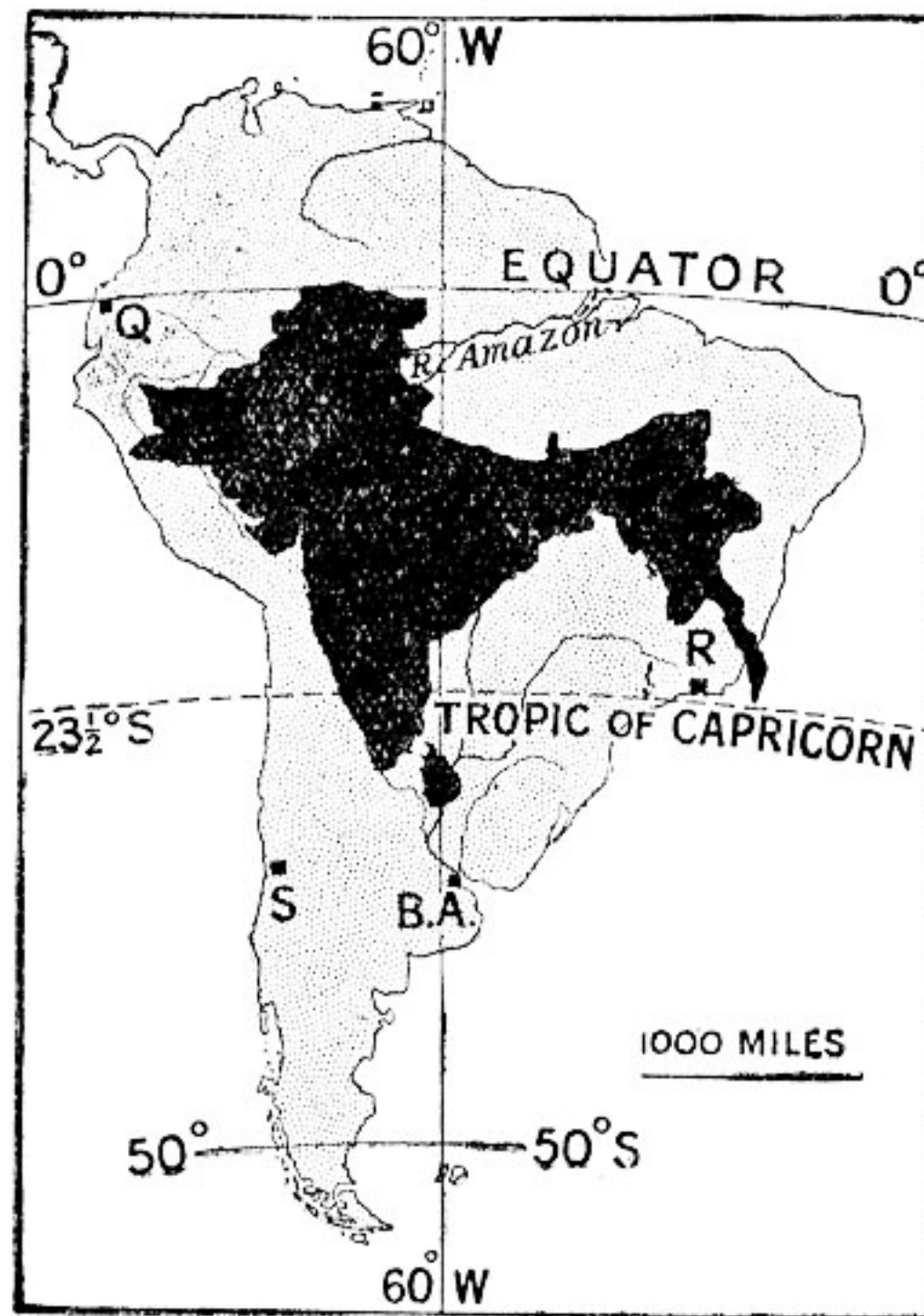


FIG. 75.—South America compared in size with India.

Begin your line at Capetown and travel eastwards. You will just touch the western tip of Australia and cut across the eastern tip and, if you continue

across the South Pacific Ocean, you will cut right across South America and will realise that quite a large part of the country stretches further south than either Australia or Africa.

Look at Fig. 75, which shows the relative sizes of India and South America. You will see from that map how big the continent really is.

The climate of South America.—Before we begin to study any particular districts in detail, we must have some general idea of the climate of South America. The one big fact you have to keep in mind is that there is a very lofty wall of mountains on the western side of the continent, parallel to the west coast. The mountains are so high that the wind striking against them from either side loses practically all its moisture in crossing these mountains.

In the north of South America, we find dense tropical forests growing near the sea coast and, far inland, all over the Amazon basin and extending along the east coast, well south of the equator. Here the climate always is hot and always wet. North and south of the Amazon basin are the two great areas of Savanna land, or tropical grassland. Look at Fig. 76 and you will find these regions marked.

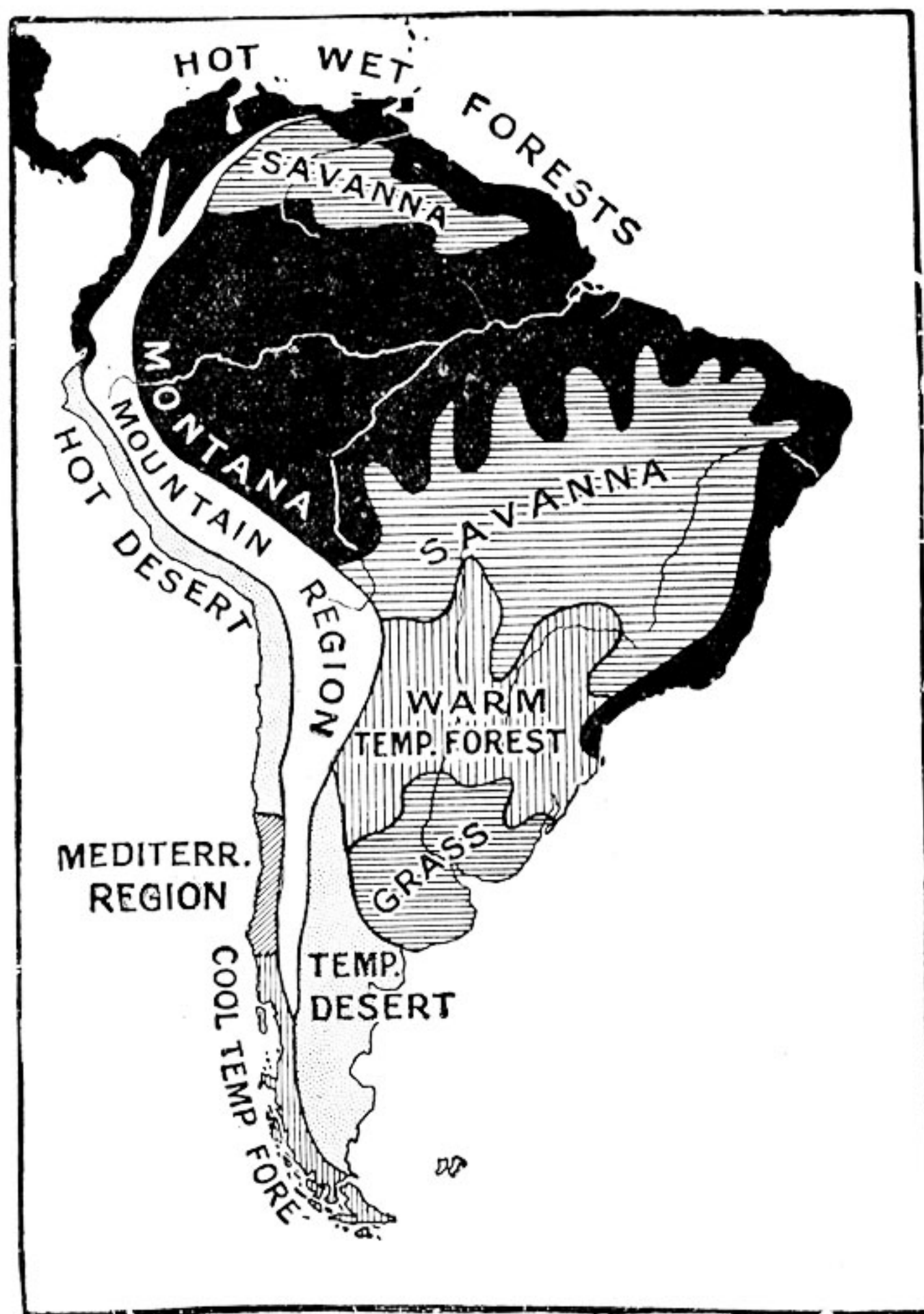


FIG. 76.—Vegetation map of South America.

South of the Brazilian Savanna region, we find a warm temperate forest region, and south of that again we find temperate grassland like that of South Africa or South-Eastern Australia. In all these regions, the wind has been blowing from the east of the sea, so that the greater part of the continent has been well watered. Now look at the west coast. The northern part has forests because, here there is always rain and the winds do not have to cross the mountains, but a little further south the trees disappear and absolute desert conditions occur. The wind in this district is blowing from the east and, by the time it has crossed the mighty Andes, it has lost *all* its moisture. So a large part of the west coast is a desert. Further south we come to the Mediterranean region, with its winter rain and summer drought. Here, in summer, the winds blow from the east and have to cross the mountains. Hence the lack of rain, while in the winter the winds are from the north-west and have crossed the sea. Hence the winter rain.

South of the Mediterranean region, we come to another region where the winds blow off the sea all the year round. So that the rainfall in this region is heavy and, as it is a long way from the equator, it is rather cold. So we find cool temperate forests growing there. On the other

side of the Andes, there is a desert because these westerly winds have lost all their moisture in crossing the mountains. Hence the desert. This is not a hot desert, however, as it is a long way from the equator and therefore never very hot.

Find all these regions in Fig. 76.

15. The Selvas of the Amazon

We said in the last lesson that the Amazon basin is covered with dense tropical forests very much like the forests of the Congo Basin in Africa. Look at Fig. 74 again. You will see that the equator runs right across South America. The mouth of the Amazon River is actually right on the equator. So you would expect this region to be very hot and very wet. At this stage, we can learn the reason for this type of climate, which is always found in places on the equator, especially if they are low-lying. All places near the equator are actually nearer the sun than places further away towards the poles. We said right at the beginning of this little book that if we look upwards at midday (from the equator) on March 21 and September 22 we should see the sun exactly above our heads. In other words, the sun is shining straight down upon the ground. Now

the earth is surrounded by the air or atmosphere, and the sun's rays shining straight down pass through the atmosphere by the shortest possible way. As one goes away from the equator, either towards the North or South Pole, the sun's rays enter the atmosphere slantwise and not straight. Therefore they have to pass through more atmosphere, which absorbs some of the heat, and they also have to cover a large area of ground. If you look at Fig. 77, you will see that this is

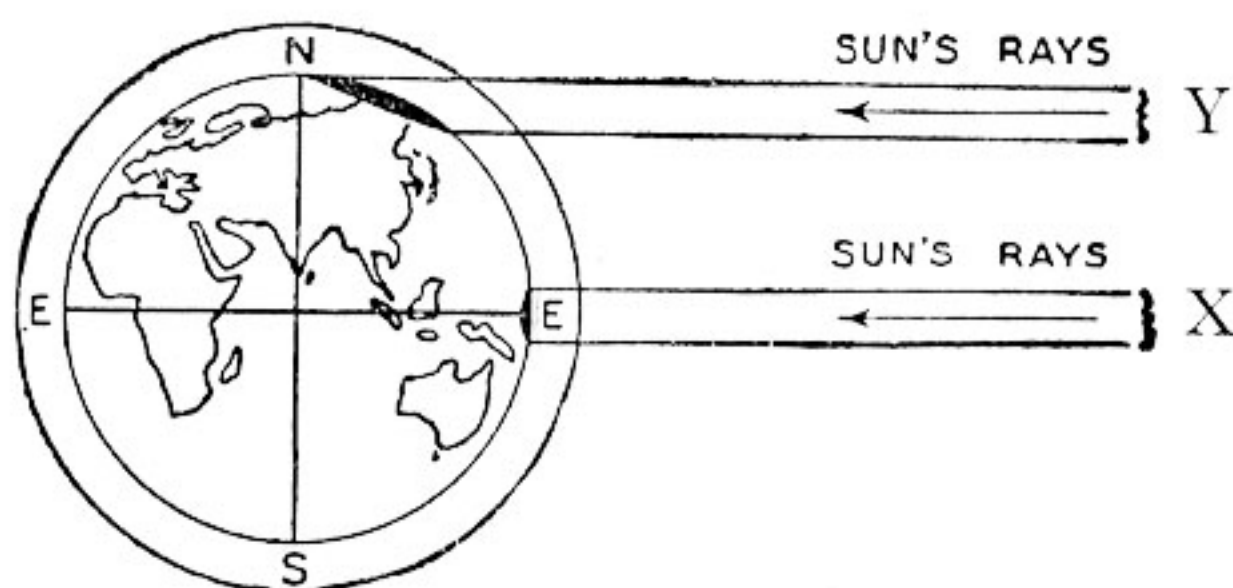


FIG. 77.—Sun's rays falling on the Equator and the North Pole.

true. In this diagram, two sun's rays of equal width are shown. They have been labelled X and Y. Let us take the ray X. This enters the atmosphere and travels to the area marked E on the earth's surface. Now let us take ray Y. This ray enters the atmosphere and travels to the area near N on the earth's surface. You will see that ray Y has had to

pass through a greater thickness of atmosphere than ray X. You will also see that ray Y has to cover a larger area on the earth's surface than ray X. So now you understand why it is always very hot at places on the equator. Hot air can hold a great deal more moisture than cold air. It is just like a thirsty boy and drinks in every bit of moisture it can. Hot air also rises and when it gets into the upper atmosphere where it is much cooler than on the ground, the water condenses and clouds are formed and rain falls. This type of rainfall is called 'convictional' rainfall and is always caused by great heat.

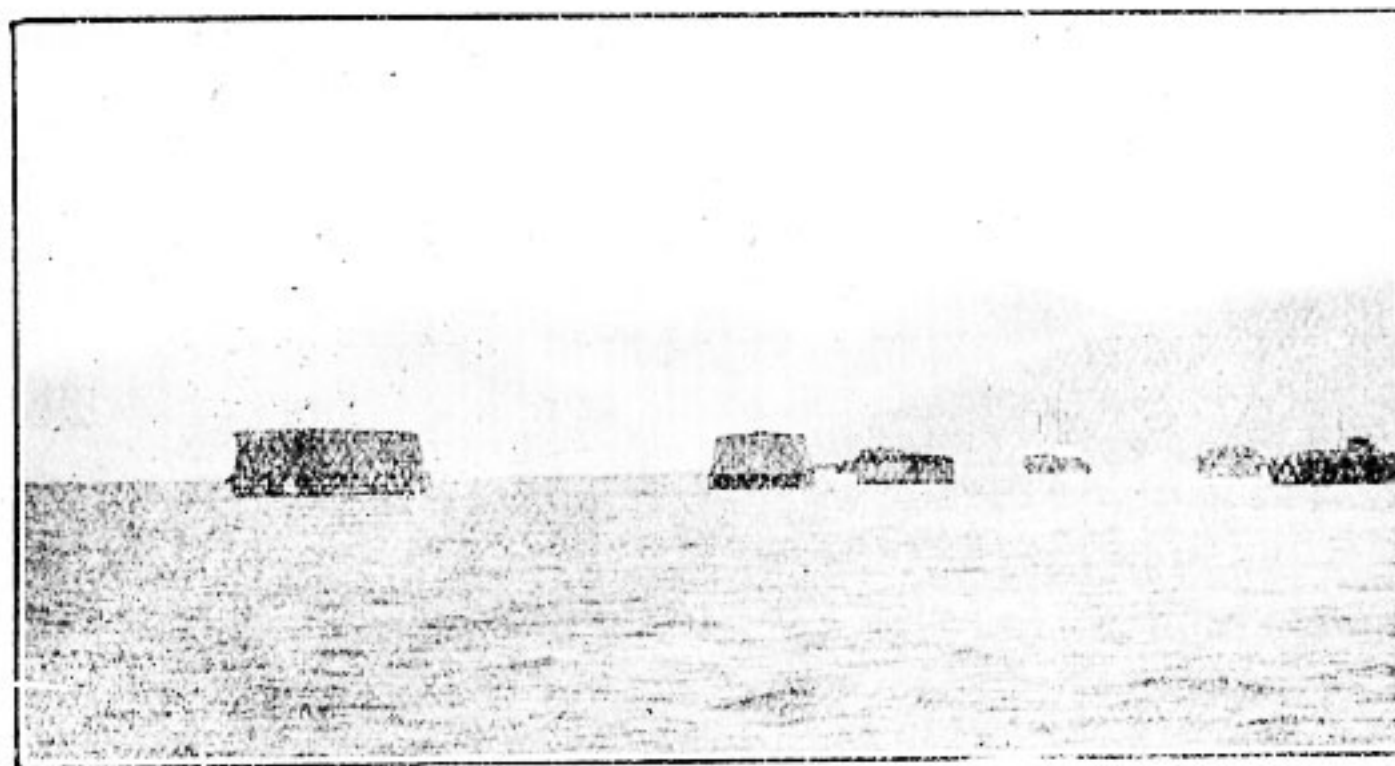
The Amazon basin is very low-lying and very hot. It is shut in on the west by the lofty Andes and all the winds blowing into it come from the Atlantic Ocean. They are very wet winds and, when they reach the land, which is warmer than the sea, they become so much hotter that the air rises and we find a convictional rainfall all over the basin. The rainfall of the Congo basin was convictional also. In this hot steamy atmosphere, dense forests grow. Tall trees, whose wood is very hard, grow to tremendous heights. Rope-like creepers cling to their branches, and many brilliant-coloured birds are seen flying about on the tree tops. Monkeys climb from tree to tree and make their homes

among the creepers. The only way of travelling in this region, where it is almost impossible to cut a road, is by the river, with its many 'tributaries' or sidestreams. The river is so large and so deep that big ocean liners can sail upstream as far as Manaus, a thousand miles from the sea. The people living in this region live almost entirely in small villages on the banks of the river. They belong to the same race as the North American Indians, or Redskins. They are very poor and not very strong, for the forest is full of insects which infect them with all types of fevers. In fact, there are very few people living in the region at all. They fish for their food in the rivers and some of them make a living by tapping the wild rubber trees. There used to be many of these rubber trees growing wild in the forests but, instead of tapping them properly to get the rubber, the Indians cut down the trees and destroyed them. They have never made any large plantations, and so the supply of rubber has become less and less plentiful. The country of Brazil, of which the Amazon basin is a part, was conquered by the Portuguese who came from Europe. They were white people and could not live easily in such a bad climate. At first, they tried to make the Indians work, but the Indians were a very lazy and weak people and soon ran away into the jungle. So the white people had to

leave them alone, and have never been able to open up the country. The largest town is *Manaos*, and this is a collecting centre of the district.

16. The cattlemen of the Llanos and the town dwellers on the plateau

In South America, there are stretches of tall, coarse grass in the basin of the Orinoco River,



[Photo : L. D. Stamp.]

FIG. 78.—Cattle boats from the Llanos.

which are called llanos. Not many people live here, but there are some who keep many cattle. Sometimes they sell the cattle to traders, and they are sent down the river on curious flat boats such as you see in the picture. Some day this may become a rich and important land.

The plateau region here is the thickly populated part of this country. *Caracas*, the capital of Venezuela, is in this region. *La Guayra* is the port and it is connected with the capital by railway. Sugar and coffee are the exports.

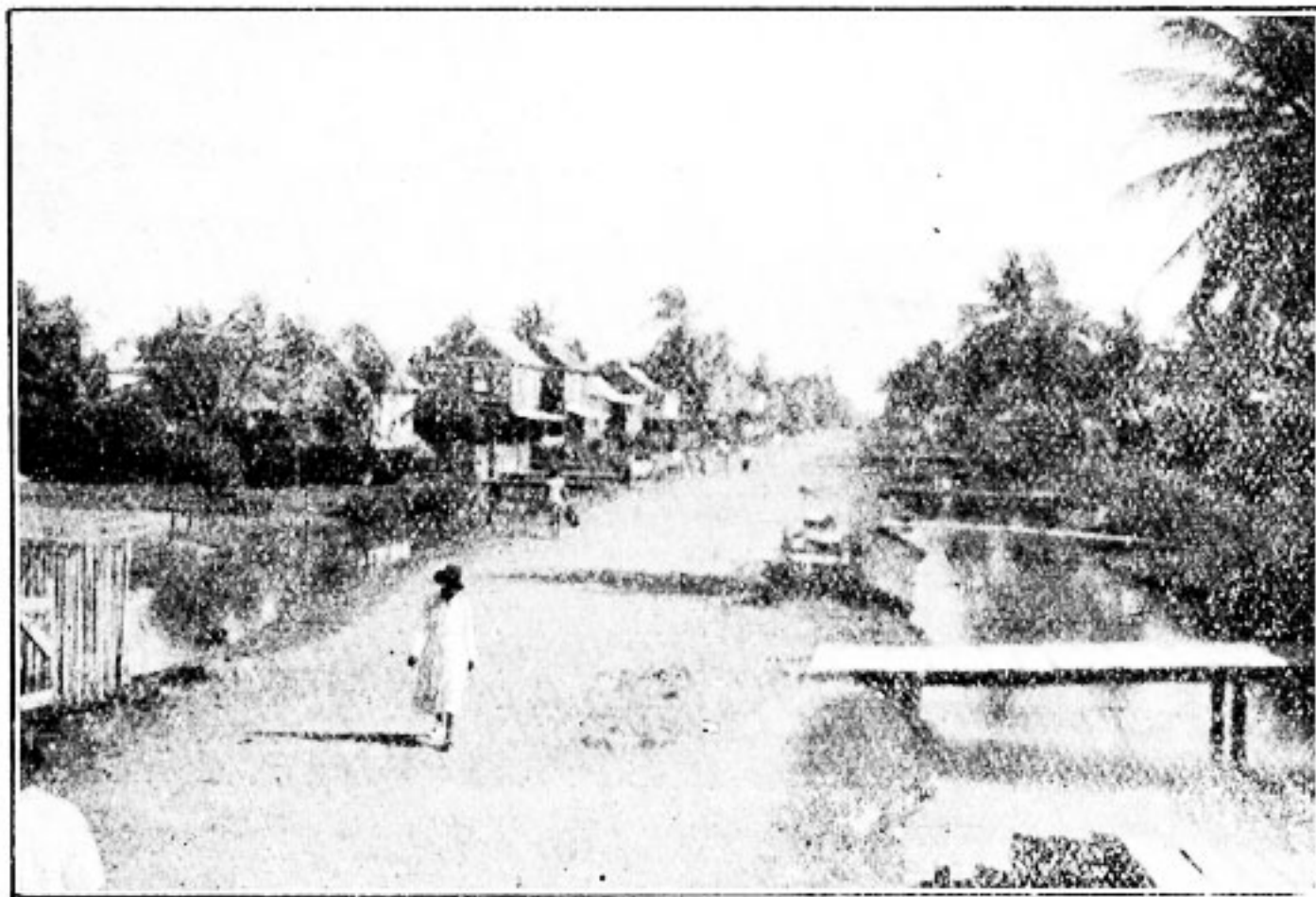
17. The Guianas and Trinidad

The Guianas are divided politically into three parts. In the west lies British Guiana, in the centre lies French Guiana and in the east lies Dutch Guiana.

Taking the region as a whole geographically, we find a coastal plain in the north, rising fairly abruptly to a plateau region in the south.

The coastal plain.—The coastal plain has a hot tropical climate with rain all the year round. The natural vegetation is dense tropical forest, but much of the land has been cleared for crops. This region was originally settled by the Dutch, who brought their type of agricultural development with them. Holland is a very flat country, much of which is below sea level. The Dutch build big dams or 'dykes', as they are called, in their own country along the sea shore to keep out the sea. They drained the marshy land by a network of canals, which are used for barges in the summer and for skating on the ice in winter, for Holland

has very cold winters. The roads in Holland are built along the dykes well above the canals. When the Dutch came to Guiana, they were used to their own type of agriculture, so they settled down on this tropical coastal plain and began to plan their colony on the same lines as



[Photo : L. D. Stamp.]

FIG. 79.—A village near Georgetown (British Guiana).

in their own country in Europe. They were used to living near the sea, so for a long time they did not go far inland, but settled all along the coast. They built dykes just like the ones in Holland and drained the land by a series of canals. Even the bridges over the canals were made in the

same pattern as those in Holland. The town of *Georgetown*, or *Demerara*, is actually below sea level and is surrounded by a large high dyke. If you could visit the country outside Georgetown, you would see many canals and waterways, which are used for draining the land and for transporting



[Photo : L. D. Stamp.]

FIG. 80.—Cutting sugar-cane.

goods from one place to another by flat-bottomed barges. Fig. 79 shows you a picture of this countryside.

The chief crops grown in this coastal plain are sugar, rice and cacao. Sugar-cane you may have seen for yourselves in India. Fig. 80 shows you

a picture of this valuable crop growing. It is a reed-like plant which grows to the height of six or eight feet. The plant is cut down and taken to the sugar factory, where the juice or sap is crushed out of the stem by machinery. The liquid juice is then boiled in great vats and is strained several times and then crystallised. It is then done up in bags and exported to Great Britain and Europe. In some factories, the machinery is so modern that the sugar-cane goes in at one end and bags of sugar, sewn up ready for export, come out at the other, without the juice being touched by hand at all. Most of the rice is used locally. In this hot, steamy lowland, with its swampy soil, it is very easy to grow rice, but, so important is the sugar, that very little rice is exported.

The third crop, cacao, or cocoa, from which chocolate is made, comes from a tree. The cacao tree is a very delicate plant. It likes to grow in well-sheltered valleys, preferably near the sea. It does not like hot sunshine, but it likes plenty of heat and dampness. Other trees are usually planted in the cacao plantations to give shade to the cacao trees. Bananas are very often used for this purpose, as well as the higher 'Flame of the Forest' or, as it is

called there, the 'Madra del Cacao' which means the Mother of Cacao.

The cocoa comes from the little seeds inside the cocoa pods. These pods grow right against the stem of the trees and are very delicate and heavy. They have to be picked by hand and piled into great heaps. Fig. 81 shows you a picture of these pods growing.

They are then split open with a sharp knife, also by hand. The little beans are then taken out and dried. Then they are ready for export. Naturally, a cacao plantation needs a great deal of labour. In the early days of the Dutch settlement, there were very few people living

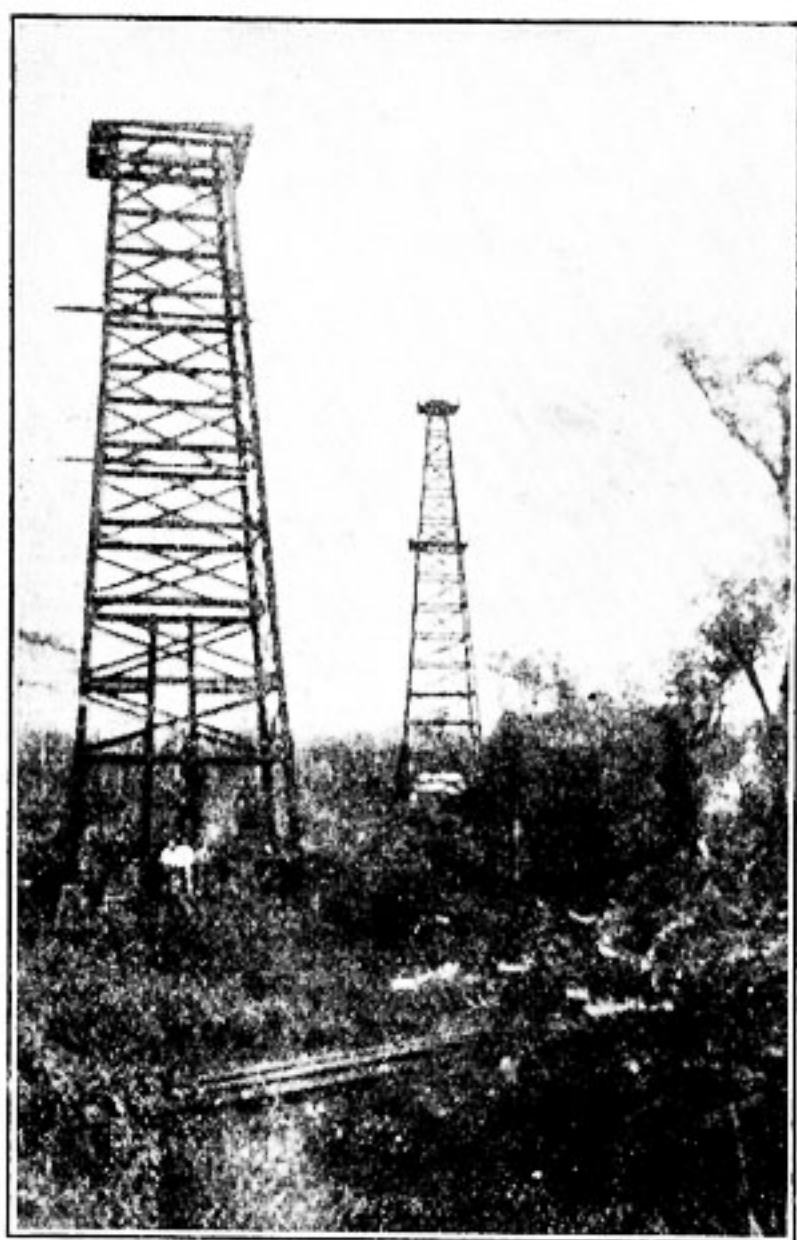


[Photo : L. D. Stamp.]

FIG. 81.—A cocoa pod on the tree.

in the Guianas. The climate was too hot for Europeans to work hard, and so they had to import labour from Africa. Many negroes from West Africa were brought over as slaves to work on the plantations. We shall have more to say about these people later on. Eventually, they were given their freedom from slavery but they

still work in the plantations. There are many East Indians as well in British Guiana, who have immigrated to the country in search of work. They usually live quite separate from the negroes, in their own villages, with their own customs and religion, and it is quite a common sight to see Hindu temples all over this region, for most of the immigrants came from Madras.



[Photo : L. D. Stamp.
FIG. 82.—Oil wells in Trinidad.

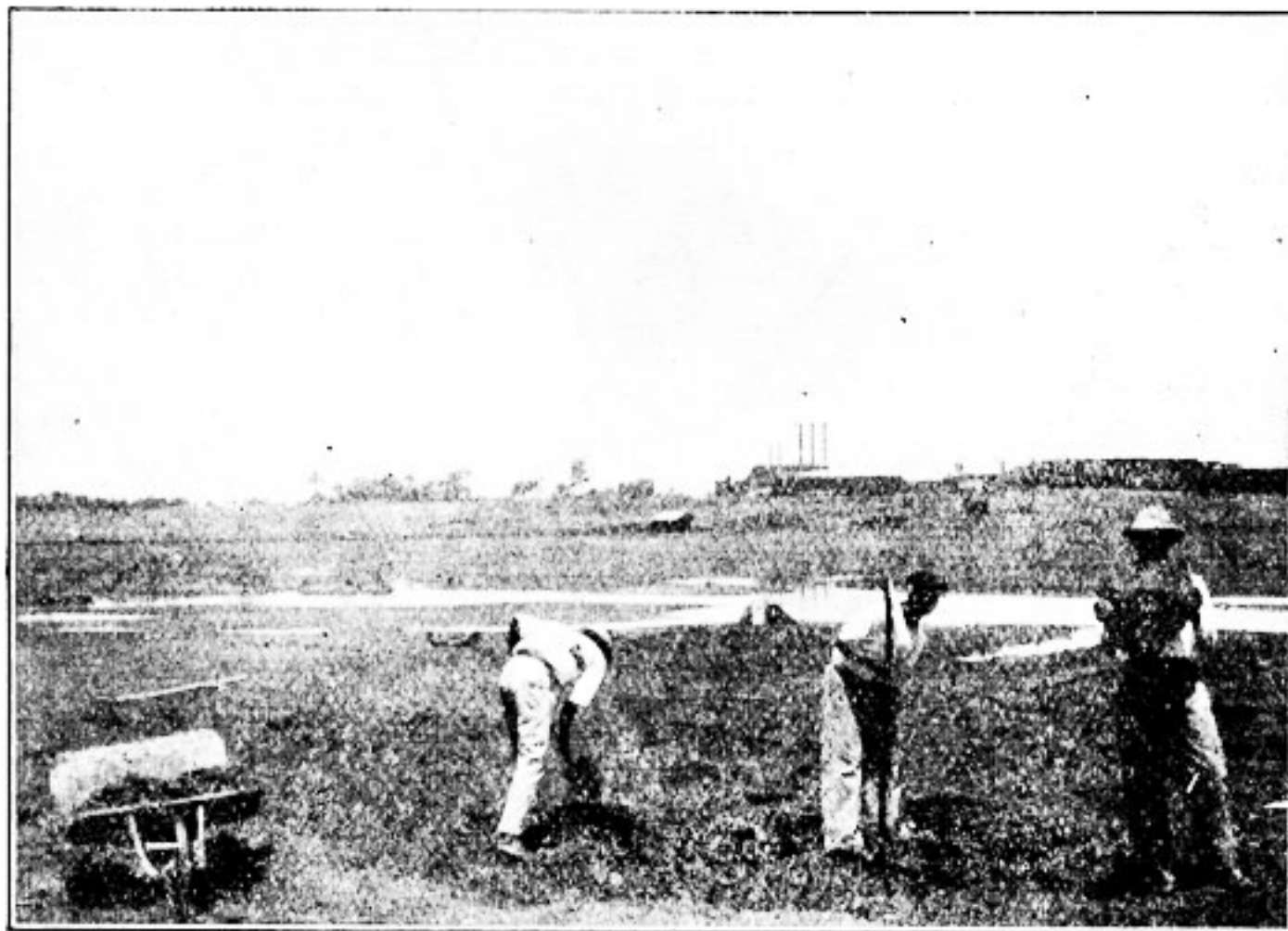
The plateau.—

The plateau is much drier than the coastal plain, but as yet it has not been very much developed. It is very sparsely inhabited, except for miners. The hard old rocks of the plateau produce gold and diamonds, which are also exported to Europe.

Trinidad.—

Trinidad, a British possession, is a small island lying off the mouth of the Orinoco River. Its climate is very similar to that of the coastlands of the

Guianas. Its chief importance is to be found in its rich oil-fields and, connected with oil, the great pitch lake. The oil-fields occur near the sea and the oil is sent down to the coast by pipelines. The oil is then exported in specially constructed ships to Europe. Fig. 82 shows you a picture



[Photo : L. D. Stamp.]

FIG. 83.—The Pitch lake, Trinidad.

of one oil-field. Near the oil-field is a very curious 'lake'. We think of lakes as a rule having water in them. This one is filled with pitch, or asphalt. The pitch is solid enough to walk on or even to drive a car on, but a heavy object standing on it in one place for

any length of time sinks into the pitch very slowly. The pitch is hot to touch, but not too hot to walk on. Men dig the pitch out of the lake and throw it into the trucks of a light railway which runs out on to the lake. They usually work at night, for the heat of the sun by day, beating down on the black pitch, is unbearable. The pitch is taken by the trucks to the factory on the shore of the lake, where it is put into barrels for export. This is very easy, for the lake is close to the sea and ships can come close to the shore at this point. It is exported to Great Britain in large quantities and is used for making a smooth surface to the roads in that country. The roads of Trinidad are excellent naturally, for the local asphalt is used in their construction. Fig. 83 shows a picture of this wonderful lake, which is the only one of its kind in the world.

Trinidad is a mountainous island and, in the sheltered valleys running up into the mountains, much cacao is grown. On the lower western side of the island, there is much sugar grown, while coconuts flourish along the sandy beaches of the south and east coasts.

The people living in the island are mostly descendants of West African slaves, but there are many East Indians and here again they live in

their own villages with the familiar Hindu temples. The original inhabitants were Carrib Indians, but there are very few of them left to-day.

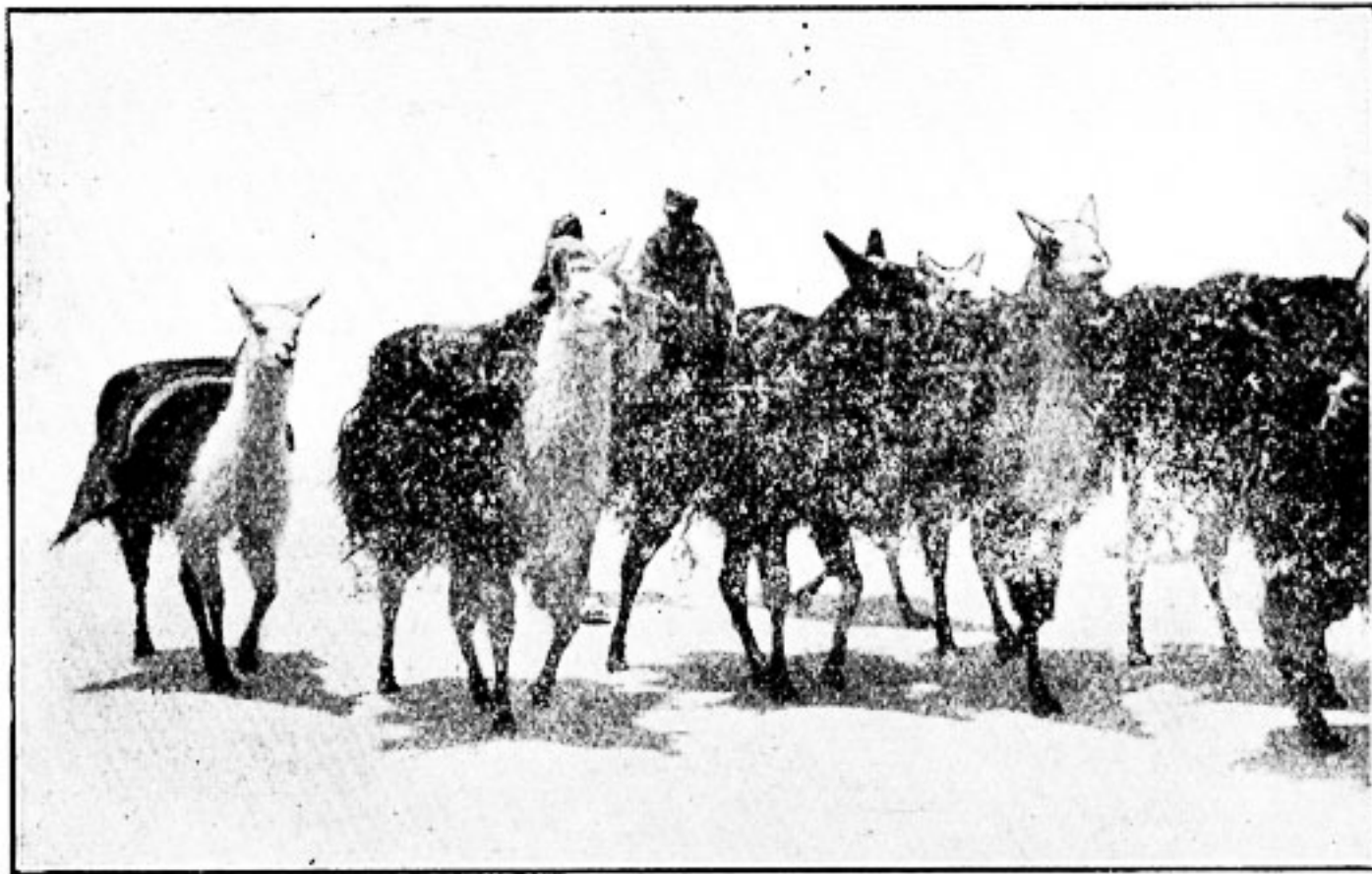
18. The Lands of the High Andes

I want you once more to turn to the map of South America, Fig. 74. Look at that great mountain range, which runs all the way down the west coast. You will see that from the equator southwards there is a plateau which becomes fairly broad at the point where the coastline turns south-east and then south again. The countries of Peru, Bolivia and Northern Chile have a considerable amount of their territory situated on this high plateau. In Bolivia the *Plano Alto*, as it is called, is about 14,000 feet above sea level and it is here that most of the people live.

This great altitude alters the climate considerably. The coastlands of this region are desert, as we discovered before, for the rain-bearing winds from the east cannot cross the high Andean Range. The coastlands, too, are very hot, and so people can only live there where irrigation is possible. In Peru, this is possible and the richest part of the country is the coastal plain round *Lima*, the capital.

Leaving the coastal plain, we cross the coast ranges, where there is little or no vegetation, and

then ascend the main climb on to the Plano Alto. As we reach the plateau, more and more grass appears and we find small villages of farmers. There are very few trees, however, and wood is extremely scarce and coal unknown. So fuel is difficult to obtain and very dear to buy. The farmers grow crops of peas and beans, a little



[Photo : L. D. Stamp.]

FIG. 84.—Llamas.

grain, and they keep flocks of sheep and goats. The beast of burden in this country is the llama which is a native of the Andes. It is very sure-footed and strong, and can carry heavy loads over the difficult tracks among the mountains, for there are very few roads. Fig. 84 shows you a picture of some of these animals.

It is very difficult for a stranger to live at this high altitude, for the atmospheric pressure is very much lower than it is at sea level. You will learn the exact meaning of 'atmospheric pressure' later, but at present we must content ourselves with the results it has upon a person used to low altitudes. When I visited *La Paz*, the capital of Bolivia, I found that it was impossible for me to walk up a flight of five or six stairs without panting for breath and without my heart beating wildly. After I had been there for a few hours, I became very ill with an attack of mountain sickness. I was so ill that I had to call in a doctor, who gave me some medicine to make me sleep. When I woke up I felt much better and was able to get out of bed and walk about, but I still panted with any exertion. Most strangers feel just the same as I did, but the natives, who have been born there and have lived there all their lives, are quite used to it. They often feel ill if they travel down to sea level. Some strangers to the country seem to get used to the altitude and can work there quite well, but even they become tired very quickly.

The natives of the region are descendants of a wonderful race of people called the Incas. When the Spaniards came to Peru and Bolivia in the sixteenth century, they found a very fine race



[Photo: L. D. Stamp.]

FIG. 85.—A street in La Paz, Bolivia.

of people there, whose civilization was based on a still more wonderful civilization, known as

the Pre-Inca. These Inca people built wonderful cities, the remains of which can still be seen to-day. The carvings on their temples rather resemble those of the Ancient Egyptians. To-day the only large city on the plateau is La Paz, the capital of Bolivia. Fig. 85 shows you a picture of La Paz.

The chief wealth of this region lies in its minerals. About eighty miles from La Paz is the largest tin mine in the world. The miners have burrowed into the mountain side, which is made almost entirely of tin ore, and every year thousands of tons of tin ore is produced. The tin is brought down to the coast by railway and sent to Europe and the United States of America by steamer. Tin is used for facing tins or cans, in which we buy fruit, chocolates or biscuits in India. These tins are really made of iron, with a coating of tin, as tin is a fairly rare and expensive metal. Bolivia also produces a great deal of silver. Silver usually occurs in conjunction with lead. The silver-lead ore is melted and the two metals are separated. The natives themselves use a great deal of silver for ornaments, but most of it is exported. For several years, Bolivia was at war with another country of South America, and many of the young men were killed. That fact and the

general depression all over the world have reduced the mineral exports of Bolivia considerably. It is still very difficult to obtain labour. Bolivia



FIG. 86.—Map of South America (Political).

has no coast line, so that all goods exported from that country must reach the west coast by railway, either through Peru or Northern Chile.

There is a fairly good railway system which runs from a port called *Mollendo* in Southern Peru up on to the plateau to Lake Titicaca and so on to La Paz. From La Paz it is also possible to reach the coast direct to *Arica* or, by going further south, via *Oruro* to *Antofagasta*. From all these ports, Mollendo, Arica and Antofagasta, tin and silver are exported.

19. Planters of Brazil

We have spoken before about the great Amazon lowlands, which are situated in the country called Brazil. We said that they were sparsely inhabited. Most of the people in Brazil live on the coast, south-east of the plateau area.

This coast has a tropical to subtropical climate. It is warm and moist for most of the year, with most of the rain falling in summer, when the South-East Trade winds are blowing strongly and beating directly on the coast,—that is, most of the rains fall in December, January, February and March, for it is south of the equator.

Look at Fig. 74 again. You will see the towns of *Santos* and *Rio de Janeiro* marked. These two towns are the chief ports of Brazil and both export a great deal of coffee. On the hillsides behind and between these two towns

lies one of the greatest coffee-producing regions in the world. The coffee is obtained from berries of the coffee trees. These trees need a fairly light and well-drained soil, with a moderate rainfall. They do not like heavy winds, but stand more wind than the cacao tree. The coffee trees are planted in plantations and after seven years they begin to bear fruit. The pretty white, wax-like flowers appear first and the berries after them. When these are ripe labourers spread large sheets of cotton beneath the tree and shake the berries down on to the ground. They are dried and exported, mainly to Europe and the United States of America.

As one goes northwards along this coast, one sees fields of sugar-cane and cotton. Both these commodities are exported from Brazil. Further north still, we should find cacao plantations as the rainfall becomes more general throughout the year and we reach the equatorial belt of calms. We shall find small plantations of rubber although that is not very important.

So Brazil, like so many of the 'new' countries, exports raw materials, such as coffee, sugar, cocoa and rubber, while she has to import manufactured goods, such as machinery, iron and steel goods, wheat, cotton goods and coal. There is no coal in the country, so that manufact

