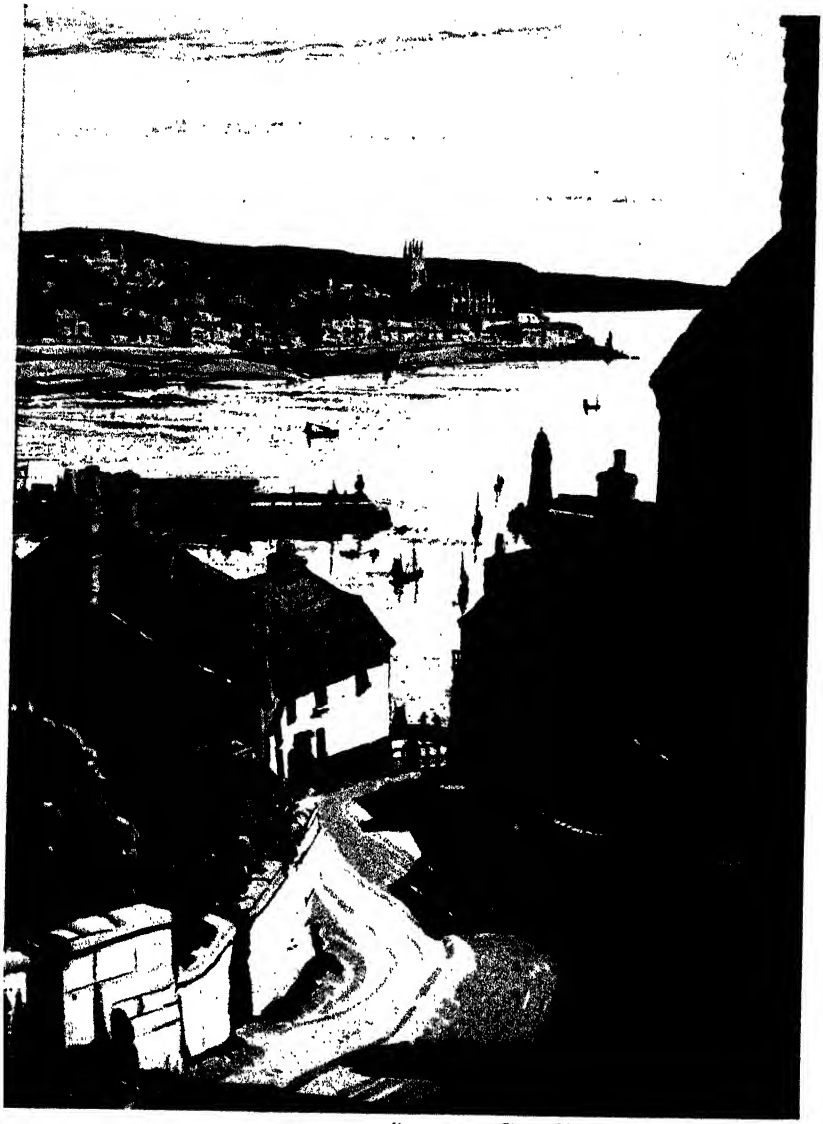
THE GOLDEN HIND GEOGRAPHIES
SECOND SERIES BOOK ONE

THE BRITISH HOMELAND

by LEONARD BROOKS, M.A.
and ROBERT FINCH



By courtesy of Claude Muncaster and British Railways

A VIEW OF PENZANCE FROM NEWLYN.

[*Frontispiece*

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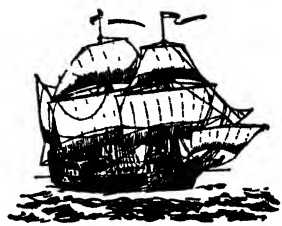

WITH 127 ILLUSTRATIONS IN THE TEXT
AND FOUR COLOURED PLATES

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PREFACE

This book is the first of a series designed for use by pupils from eleven to sixteen years of age. The series provides an alternative course to that given in the Columbus Senior Geographies by the same authors. The books are largely descriptive, but simple geographical ideas and principles are carefully taught, and great care has been taken in the selection of illustrations and coloured plates. Academic and formal methods of treatment have been rejected and extensive use has been made of material which brings before the pupils real experiences of the life and work of the people of the areas described. Two examples of local geography are included in this first book in the hope that all pupils using it will devote reasonable time to the gaining of first-hand knowledge of the geography of the area in which they live. The authors are greatly indebted to Mr. R. J. Whiteman, formerly Headmaster of Hexton School, and to the late Miss M. E. Cooke for much of the material used in Chapters 2 and 3.

The study of the pictures and maps, and the working of the exercises at the end of each chapter, should be regarded as an important part of the course. The book may be used as the basis of class lessons, or to supplement a course of lessons designed by the teacher, or in classes where individual or private study or group methods are followed.

L. B.
R. F.

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LIST OF COLOURED PLATES

LIST OF OTHER ILLUSTRATIONS

CHAPTER 1.

READING MAPS

One of the most important things in studying geography is to learn how to read maps. If we cannot read maps we shall make little progress in our geography lessons, because it will be very difficult for us to picture how other countries and parts of our own country which are unknown to us really appear. The symbols on the map, the geographer's shorthand, are there to be read like a book. When we are able to take a map and in our imagination see the country it represents come to life, as it were, then we can read a map. When we can do this we shall have no difficulty in finding our way about, either in town or country.

SCALE

We know already that the size of a map is by no means a guide to the size of the country or district it represents. A clever map maker could put a map of the world on a piece of paper the size of a postage stamp; but we should perhaps need a magnifying glass to read it! We have all seen, too, a plan or map of part of our town on a very large sheet, showing such small things as lamp-posts and pillar-boxes; yet that part of the town is only a very tiny part of our country, and a tinier part still of the continent we live in. On every good map there is always something that tells us exactly how big the region represented on it really is; and that is the *scale* (see maps on pages 16 and 19). Using the scale, we can find how far it is from one place to another, or the area of any part

of the map. The first thing to do with a new map is to find out to what scale it is drawn.

The second thing to find out is which is north; and, of course, if we know this, it is easy to find the other points of the compass. On many maps the compass points are indicated, but where they are not we assume that the top edge of the map is true north—looking to the North Pole of the earth. The compass, however, does not point to this Pole, but to the magnetic or compass pole, and that is why it is useful to have "compass north" marked on a map where we are using it outdoors and want to set our map correctly by our compass (see diagram). Have you ever thought, when studying a country or continent, that the best place for the map—but not the most convenient place—is not the wall, but the floor? On the floor the map can be so placed that north, south, east, and west on the map agree with these directions on the earth.

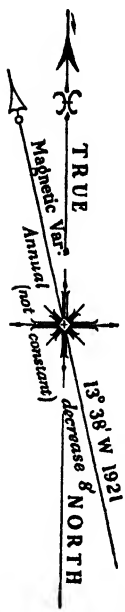


DIAGRAM TO SHOW COMPASS (MAGNETIC) NORTH AND TRUE NORTH.

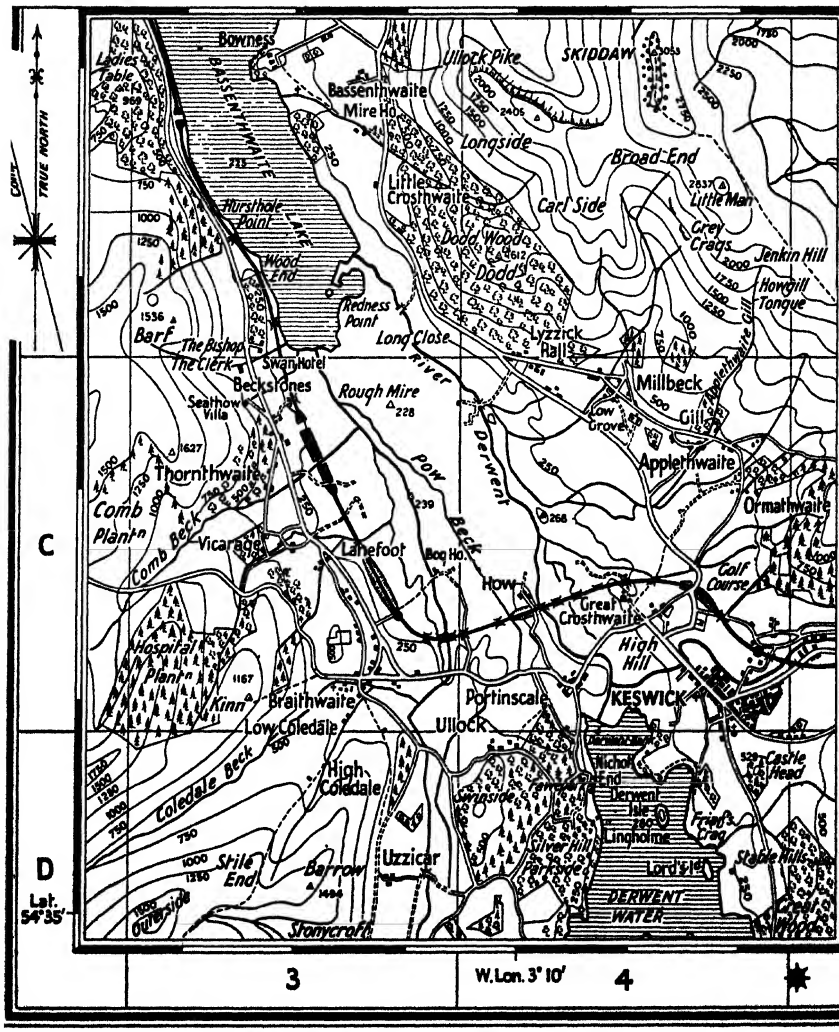
The third thing to discover about a new map is the method of showing the relief of the land; that is, which parts are high and which low; where slopes are steep and where they are gentle. It is important that we should read as quickly as possible what the general build of the country is like, where the highlands and lowlands are, and why the rivers, roads, and railways follow the routes they do; why towns are where they are; why men have made tunnels, or bridges, or embankments to carry roads and railways at certain spots.

The map maker usually shows the relief of the land by drawing *contour* lines, or lines of equal level. Thus, for example, he draws a line joining all points that are 100 feet above sea-level, another joining all points that are 200 feet high, and so on to the very highest land. When we understand them, these contours, or lines of equal level, each the same number of feet higher than the one next below it, give us a fairly accurate idea of the surface shapes of the country. The word "contour" means shape; contours give us at a glance the surface *shapes* as well as the *height* of the land. It is very important to try to visualise the shapes represented by contours.

Make a clay model of a high island on a flat board and put it in a sink or other water-container big enough. Let in water to a depth of an inch; then draw a line with a knitting needle all round your clay island at the water-level. Then admit more water till it is 2 inches deep, and draw another line at the water-level. Do this until you cannot repeat it without drowning your island altogether; then take it out. The lines you have scratched on your clay island are equal-level lines; they are *contours*.

Try it again with an island in which you have made, say, two valleys. Look at your contours and notice how they go up these valleys, making rough V-shapes. Now looking down directly on your contoured island, draw the contour lines on a sheet of paper as you see them. Notice again (1) the V-shapes of the valleys, and (2) the contours closer together where slopes are steeper, but more apart where the slopes are more gradual (see Exercise 4 on page 23).

In your coloured atlas maps, the border of each colour

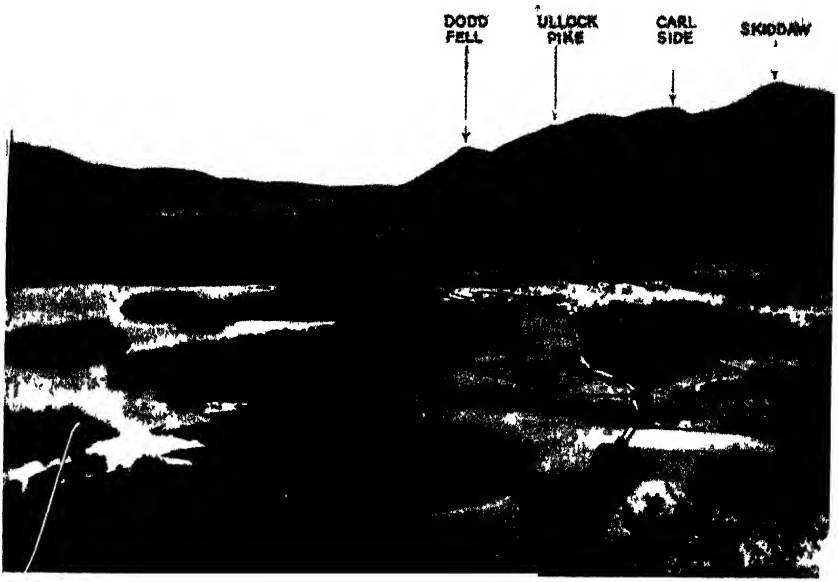


Scale of One Inch to One Statute Mile 63360

0 7 6 5 4 3 2 1 0 1 2 3 Miles

1000 0 1000 2000 3000 4000 5000 Yards

MAP OF THE KESWICK AREA.



Maysons, Keswick.

PHOTOGRAPH OF KESWICK AND DISTRICT

The star in the corner of the map on the opposite page shows the position of the camera which took this photograph.

is a contour line; the colour itself shows how much land is above a certain height but below another. The light brown, perhaps, begins at 600 feet; dark brown begins at 1,000 feet; the lower border of the light brown is the 600-foot contour, the upper border is the 1,000-foot contour; all land coloured light brown, therefore, is between 600 and 1,000 feet high. But you cannot say *exactly* how high it is *between* those contours—unless other contours are put in.

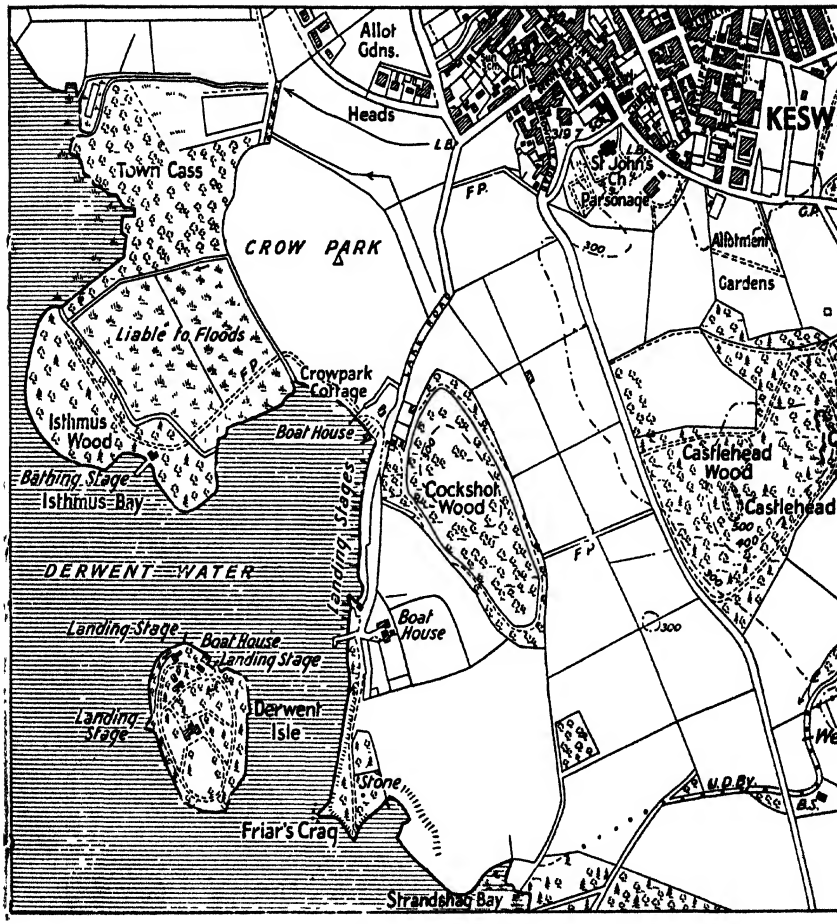
MAP READING

Now let us try a little map reading. The map on page 16 shows us a small part of the Lake District. Look at its *scale*. Now look at the contours very care-

fully: they are 250 feet apart, for each is 250 feet lower than the one next above it. Compare the map with the picture on page 17. The view was taken from the neighbourhood of the place in the margin marked by a star. Find the features on the map and in the picture in this order; Bassenthwaite Lake; Derwentwater; the low ground between the lakes; the mountains in the north-east and the lowland bordering the eastern shores of Bassenthwaite; the highland rising steeply from the western shore of the lake; Keswick and the main road from the south. Having found these, discover how wooded areas are shown, where the steepest slopes are, how the contours show where there are river valleys, and how the various features along the railway, (bridges, stations, cuttings, etc.) are indicated.

Notice the figures and letters in the margins of the map. These are to help you to find places easily. For example, find Applethwaite (square 4C), Derwent Isle (4D), Bowness (3B), Coledale Beck (3D), and Grey Crags (4B).

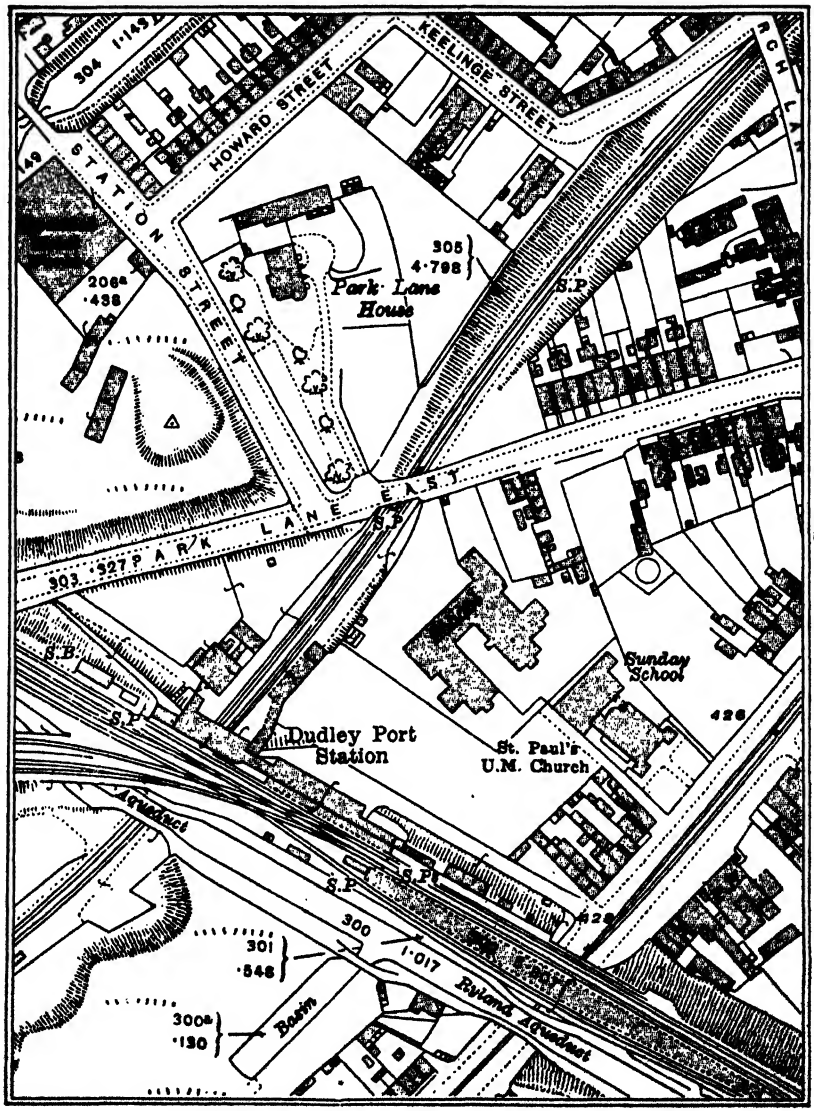
Now look at the map on page 19, which shows only a part of the region shown on page 16, although it is the same size. What is its scale? How much larger are things shown on this map than on the 1-inch map? Notice how much *more* can be shown on it. Examine the contours. On this map they are only 100 feet apart, but because this is the flatter land south of Keswick, there are only a few of them. Compare it with the picture on page 17 and pick out Castlehead Wood; the stream near it, also the house; Cockshot Wood; Isthmus Wood; Town Cass; Friar's Crag, Crowpark Cottage and boat house,



Reproduced from the Ordnance Survey Map, with the sanction of H.M. Stationery

PART OF THE 6-INCH MAP OF KESWICK.

and the footpath to Isthmus Bay. Why are the mountains seen in the picture *not* shown on this map ?



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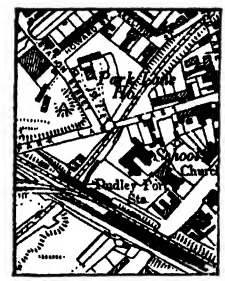
PART OF THE 25-INCH MAP OF DUDLEY PORT.

ORDNANCE MAPS

These two Keswick maps and most others used in books and atlases are drawn from official Government maps. Very accurate maps of every part of the British Isles have long been in use. They were made by skilful draughtsmen from very careful and scientific measurements taken by engineers and surveyors in the service of the Government, and belonging to what is generally known as the Ordnance Survey Department.

From these maps of the Ordnance Survey are made the town maps, tourist maps, cycling maps, and motor maps which are on sale in many bookshops. From such maps, too, most of the maps in our atlases have been made, although they do not show anything like so much of the detail as we find on Ordnance Survey maps.



Reproduced from the Ordnance Survey Map, with the sanction of the Controller of H.M. Stationery Office.

PART OF THE 6-INCH MAP OF DUDLEY PORT.

On the largest-scale Ordnance maps your school and its surroundings are clearly shown, and although such maps contain much that you cannot and need not, at present, understand, you can easily pick out, not only the school, but even your own home if it appears anywhere on the map sheet. A large-scale " town plan " is made to show things 1/500th of their actual size; its scale is 126·7 inches to the mile. On this all buildings and streets, and even back gardens, sewer-holes, and lamp-posts, are marked. If there is such a map in your school, see what you can find out from it.

Look at the map of part of Dudley Port in Staffordshire on page 20. Its scale is 25 inches to 1 mile, and it shows everything 1/2,500th of its actual size. Study this, too, and see what it shows.

Now look at the small map on page 21, which shows the same area. Why is it smaller? Look again, and notice that many things shown on the larger scale are not shown at all on the smaller scale; and that some things are shown in a different way in the larger scale, e.g. the railway. The smaller the scale, the greater the area that can be shown on the sheet, but the less detail.

Now work these exercises in order better to understand the 25-inch map: (*a*) measure the *lengths* of Park Lane East and the low-level railway and the *widths* of Park Lane East and the canal basin; (*b*) copy on a larger scale three different types of houses; (*c*) if you were in a train on the low-level line, what features on the map would you see? (*d*) check the area of the basin (about 130 acres); (*e*) arrange the roads, railways, and canals according to their heights, beginning with the highest.

We have now learned sufficient about maps in general to enable us to read all the maps you will study whilst reading this book. If you are wise, however, you will study the Ordnance maps, especially the 6-inch and the 1-inch sheets, of the district round your home or of some area which you visit frequently. For the best way of learning to read maps is to *use* them and to study the map with the area it represents lying in front of you.

QUESTIONS AND EXERCISES

1. What are Ordnance maps? Who make them? Where are they printed?

2. Find out all you can about the difference between compass north and true north.

3. Draw a map of your school, with its playground. Be sure to include a scale and a diagram to show the cardinal points. Why are these most important ?

4. What are contour lines ? Draw sketch maps to show how contours can be used to show (*a*) a hill with one slope steeper than the other, (*b*) a large island almost entirely occupied by a mountain with two peaks.

5. Draw a map of the area shown in the air photo on page 149. Be sure to use the Ordnance Survey method of representing the various features.

6. Draw a contoured map of an imaginary island on which there is buried treasure. Indicate the spot at which the discoverers of the treasure landed and the route they took to the hiding-place. Be sure to put in the cardinal points, to add a scale, and to use the symbols of the Ordnance Survey for the various features.

7. A new set of Ordnance maps uses what is called " The National Grid." If you buy your local sheet you will discover how the National Grid is used and why it is important.

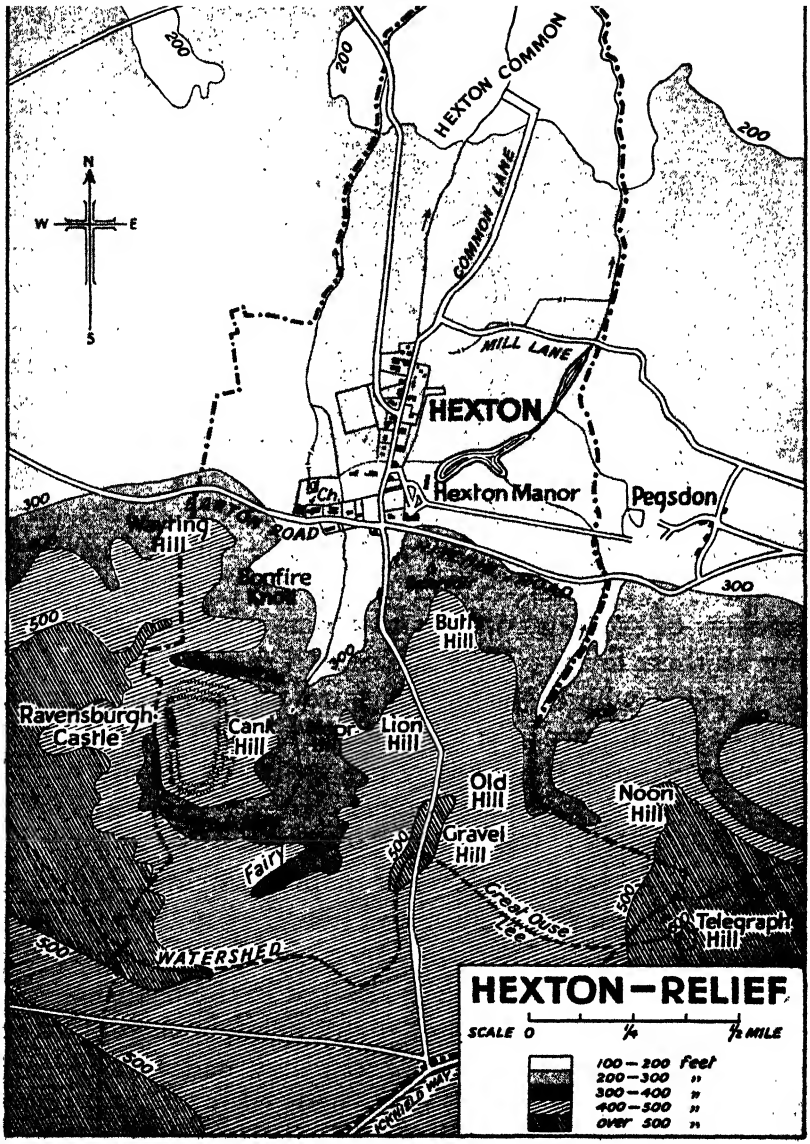
CHAPTER 2.

LOCAL GEOGRAPHY IN THE COUNTRY

A good map is a record of what people have done and are doing in the area it shows, as well as a guide that shows the way about. The map of your parish or district is a summary of its geography—it is geography in a sort of "shorthand" which can be read by all who understand maps. Which scale will be most useful in studying your part of Britain? The best, perhaps—at any rate to begin with—is the *6-inch sheet* of your parish or school district, on which things are shown 1/10,560th of their actual size.

A PARISH STUDY

Here is a short account of what the boys and girls in a Hertfordshire country school did to find out all about the geography of their parish, which lies on the steep north slope or scarp of the Chiltern Hills. After they had discovered its boundaries, its size and shape, and the names of the parishes on its borders, their first important task was to find out about its surface and drainage. Using tracing paper, they made maps, showing the contours and the streams. This showed them the high downlands in the south and the lowlands in the north, as well as the valleys; it gave them the "surface shapes" of their countryside. They were very puzzled by the way some of the rivers disappear for a time and why some valleys have no rivers in them. Perhaps the map on page 25 will also puzzle you! They went here and there to find out for themselves whether the map was true, as, of course, it proved to be; and it led



MAP TO SHOW THE POSITION OF HEXTON VILLAGE.

Latchmore, Hitchin.

HEXTON VILLAGE.

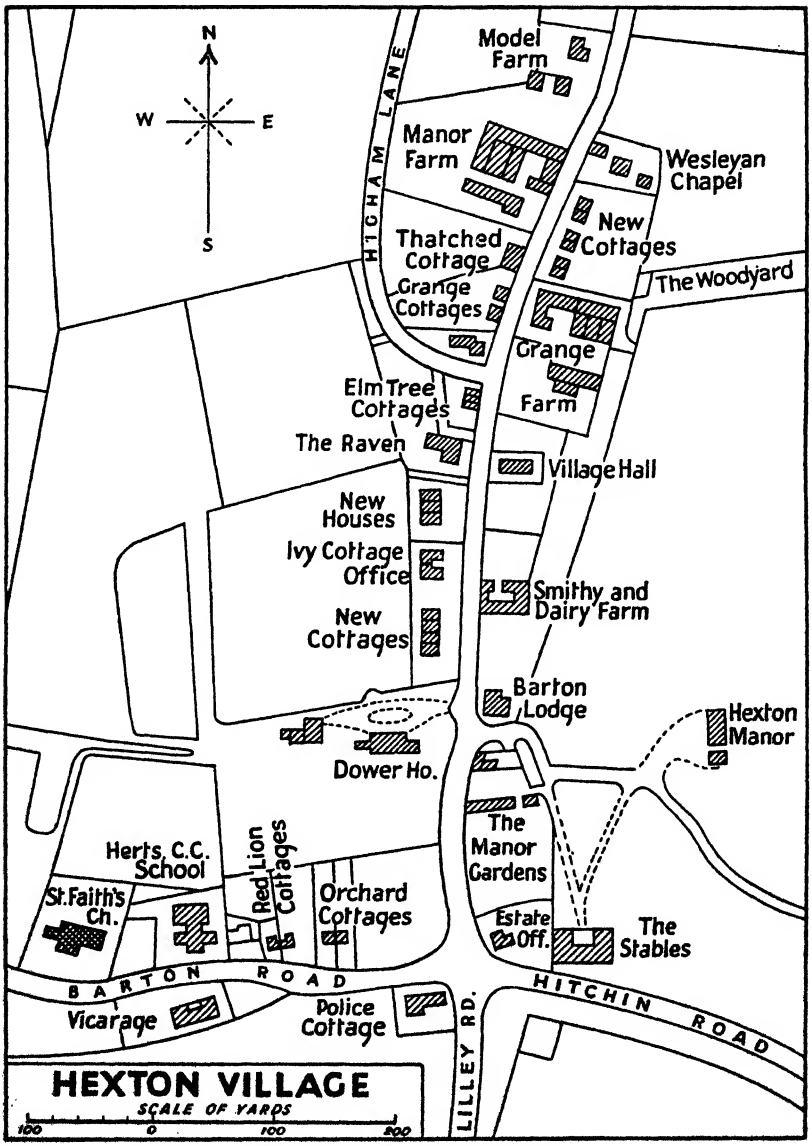
The photograph was taken looking across the cross-roads in the south of the village. Find the exact spot on the map of the village.

them to put in the roads and field paths on their map, so that they could see how both roads and paths followed the easiest way across the country, and how their village was linked up with outside areas. Some boys and girls made maps to show only the village, the roads and the houses (see the map on page 27); others made tracings of contours only; and others made maps showing all these facts. They discovered that the village lay at a place where springs of pure water gave a good supply for all purposes; and one or two boys made a map of the village to show where the wells and pumps were.

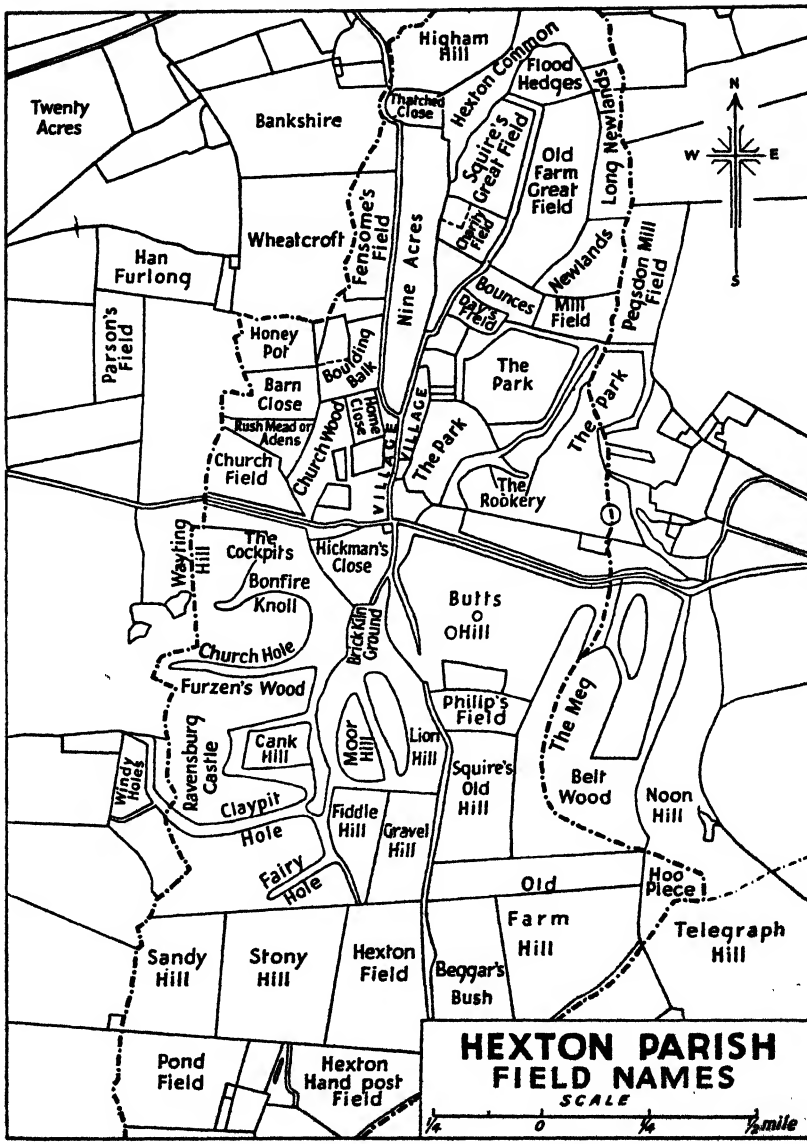
WHAT GROWS IN THE FIELDS?

They soon became clever at making tracings from the 6-inch sheet for themselves, and now they made a tracing showing all the parish *fields* which are clearly marked on the Ordnance maps. They also put in the farm-houses.

They knew the names of many fields, and found out the others by asking. Presently they had a field-map with all the names of the fields marked on it; and since there were several woods and plantations, they marked



MAP OF HEXTON VILLAGE.



THE FIELDS OF HEXTON PARISH.

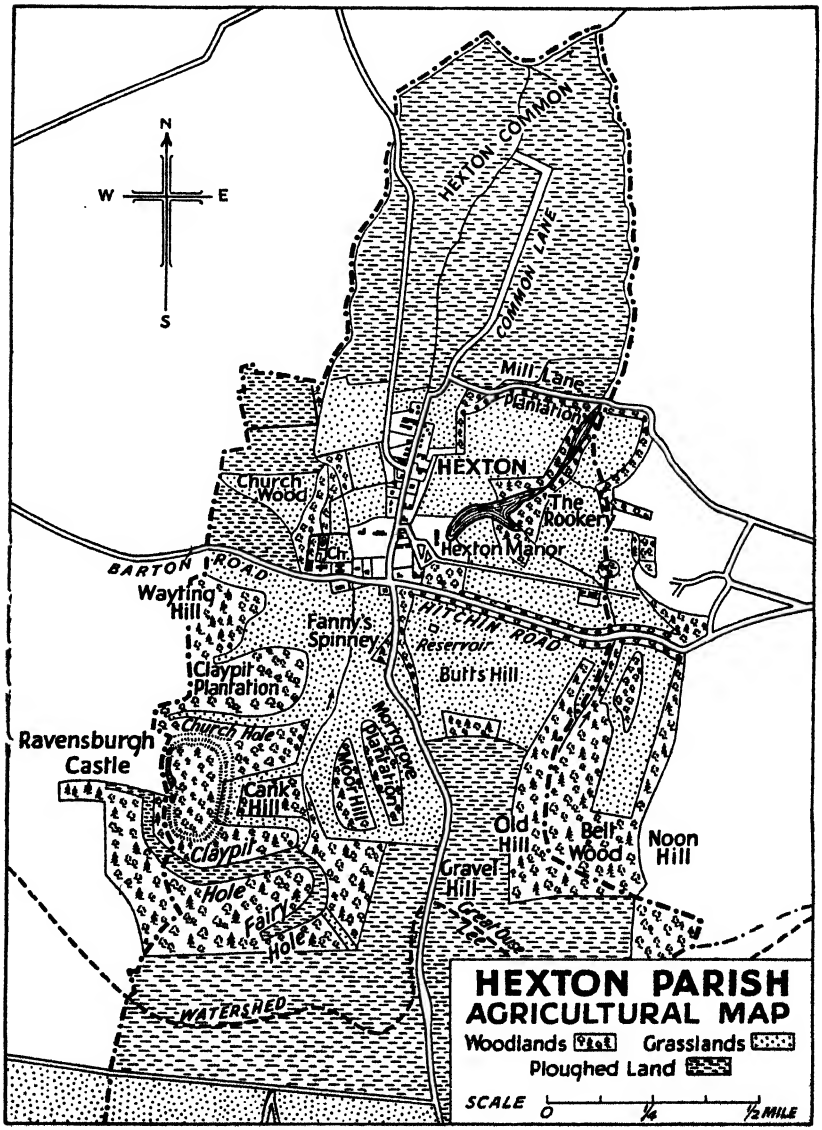
Try to account for the interesting names of some of the fields.

those also with their names. Some fields had queer names: Beggar's Bush, Bounces, Honey Pot; others were quite clear, like Twenty Acres and Pond Field, Parson's Field and Squire's Field (see the map on page 28). Later some children tried to discover why the fields were known by such names. Since a good deal of ground had to be covered, the work of finding out the names of the fields, and later what grew in them, was divided up among the boys and girls, those who had bicycles visiting parts farthest away, bringing back the information to be used by everybody.

The next job was to make a map showing how the parish land was used, and again a tracing of the fields was needed. Groups of pupils visited certain parts of the parish, taking with them a traced map of the fields on which they recorded what was growing in each of the fields in the part they visited. Each group brought back its information, and the teacher could then put on his map a letter or sign to show how each field was being used at that time. Boys and girls who wished could then make a copy of it on their tracings to add to the collection of parish maps they were marking.

Thus the children discovered where the ploughlands (arable lands) were, where the grasslands (pastures), and where the woodlands. Some pupils coloured their tracings brown for arable land, light green for pastures, and dark green for woodland (see the map on page 30).

The children found out, too, how the arable land was being used—grain in some fields, clover in others, root crops in others. Most boys and girls knew that farmers do not as a rule grow the same kind of crop in each field every year, but change it or even give the field a rest.



AGRICULTURAL MAP OF HEXTON PARISH.

Compare this map with that on page 25.

Keen youngsters who stayed at the school long enough made a new map of the parish agriculture for each of three years, and so found out what changes farmers made in the crops they grew. These regular changes are called " rotations." In one field, for example, the order was wheat in 1937, beans in 1936, oats in 1935, clover in 1934, and wheat again in 1933.

In school they had many talks about the way in which each important crop was growing and what became of it afterwards. Boys and girls were expected to tell all they knew, either because they came from farms or had discovered it by asking the farmers.

In the same way the school learnt how the pastures were used, what kinds of animals were grazed on them, and how the animals themselves yielded products used by the village or sent away to other parts of the country. Many children had been to the neighbouring market town and could tell what prices animals and farm produce fetched there when sold.

TREES, FLOWERS, BIRDS, BEASTS AND OTHER THINGS

Another interesting job was to make lists of flowers and trees, birds and animals, found in the parish; some boys and girls went farther than this: they collected specimens of flowers and leaves, pressed them in brown-paper books, writing beneath each specimen its name and where and when it was found. Collections of birds' eggs were forbidden. Some made maps to show where certain trees or flowers were most abundant. They discovered that certain trees were used for certain purposes, and made notes accordingly; and that each season

—even winter—had its show of special flowers. They learnt much about the habits of rabbits and hares, foxes and badgers, rats and field-mice, and about birds, some of which stayed all the year, and some only part of the year.

HOW PEOPLE LIVE

A very important matter was to learn how people got their living in the district.

A large number of people got a living on the land as farmers, labourers, cowmen, horsemen, ploughmen, etc., some drove steam ploughs or motor tractors, and knew enough about them to put them right if they broke down

Other men were gamekeepers, gardeners, or chauffeurs; some worked in the local lime kilns or brickworks; others were builders, carpenters, bricklayers, road-menders, engineers, or shopkeepers. Many girls went every day to a large town by bus to work in the hat and other factories there, or in the shops, coming home each evening.

Another interesting piece of work was to find out how the village got its water supply. Boys and girls working together, and using a large-scale map of the village, were able to show on it those homes which used wells, those which used springs or pumps, and those which got water by pipes from the big reservoir on the hill. On the same map they put E against houses and shops using electric light, and O against those using oil lamps; there was no gas in the village.

The village shop and the Post Office kept a good stock of groceries and other things; but on certain days people visited the village from neighbouring places to bring

such things as new bread, fresh meat, paraffin oil, and coal. Boys and girls made lists of these visiting traders, putting down their names, the goods they brought, and the days on which they came to the village. Milk, of course, came from the farms close by, but had to be fetched by customers.

In this way village children discovered a great deal about the geography of their parish—and a great deal about parish history too. Above all, they learnt two very important things: (1) how to read and use a map, so that they could not only find their way about in an area that is new to them, but also could tell before they went what the new region would be like; (2) how the life and work of people are related to the geography of the area in which they live.

These are extremely important lessons for all who wish to become good geographers.

QUESTIONS AND EXERCISES

1. In a map showing woodland and forest, how could you show which parts had conifers (like firs and larches), which had deciduous trees (broad-leaved trees like oaks and elms), and which had both conifers and deciduous trees ?

2. Discover from your 6-inch sheet how the following are shown : windmills ; churches ; ancient buildings ; parish boundaries ; marshes ; orchards. Make a sketch for each.

3. Explain why your 1-inch map shows much more ground but less detail than your 6-inch sheet, although it is about the same size.

4. Make a large sketch-map to show where the people live and how they get a living in the area in which you live. Now make other maps which help to explain the facts shown in your first map.

CHAPTER 3.

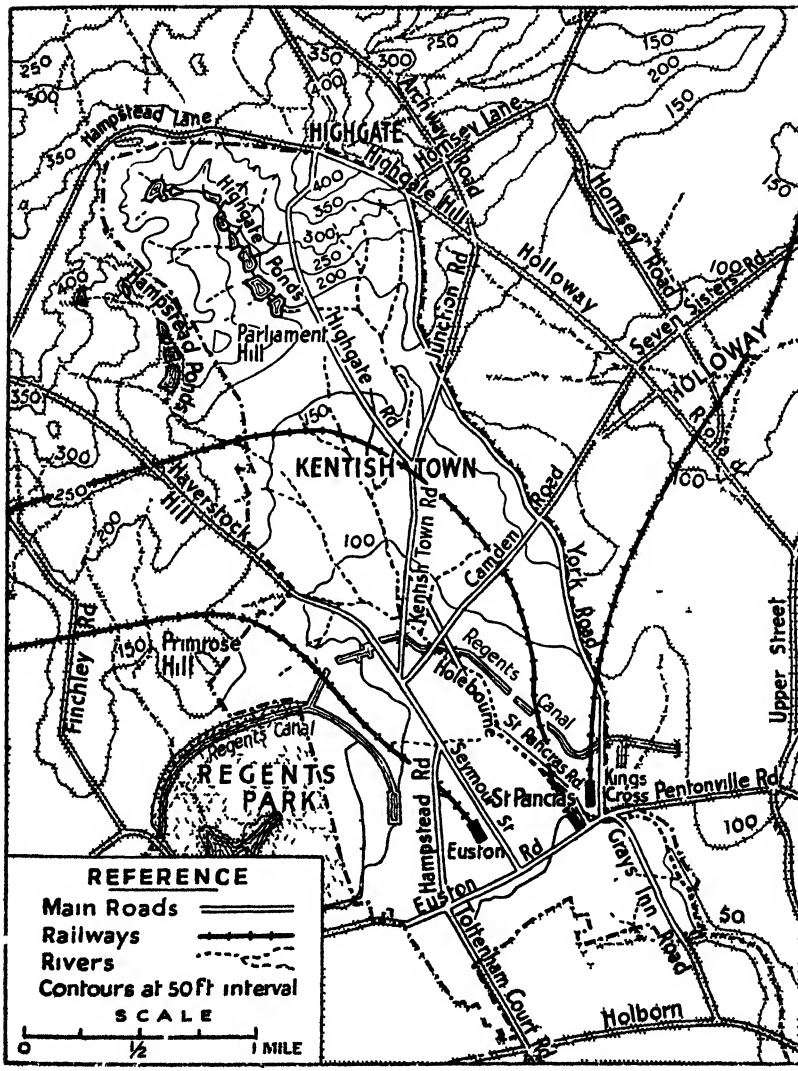
LOCAL GEOGRAPHY IN THE TOWN

Boys and girls in large towns generally know best that part of their town containing their school and home. On the 25-inch Ordnance map (see map on page 20) they are able to see how the streets are arranged, where important buildings are, and the position and even the shape of their school and home. If the 6-inch map including the area is examined, school and home will be found together with much more of the surroundings than can be shown on a 25-inch sheet of the same size.

If the town is a very large one, more than one 6-inch sheet will be necessary to show all of it; and soon the 1-inch map is needed. This helps one to see more clearly where the high land is and where the low; where the parks and open spaces are and the best ways to reach them; how roads and railways serve the district; and other important things in local geography.

A TOWN STUDY

Let us see what girls in a large school in North London did to discover all they could about St. Pancras, the London borough in which they lived. In the junior school they had learned a good deal about the school neighbourhood; now they wanted to learn more. First they traced from the 6-inch sheets the contours of the area including St. Pancras, although it is not always easy to follow them among so many streets and buildings. Their teacher helped them by going over the contours with red ink, so that tracings could more easily be made.



MAP OF THE BOROUGH OF ST PANCRAS

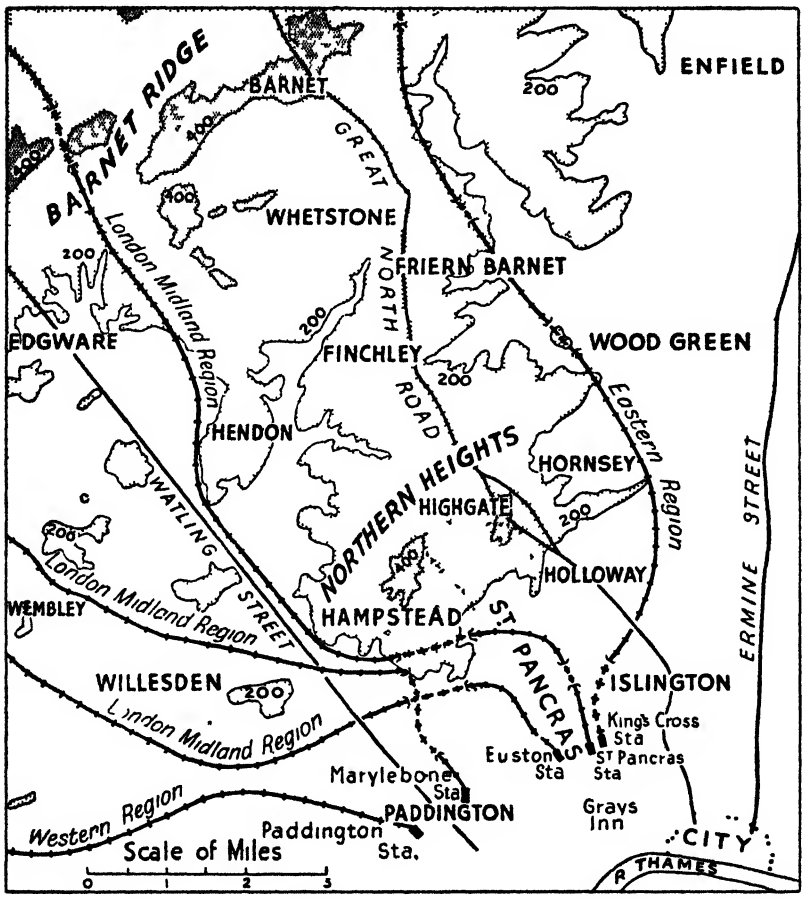
Notice that the borough, which is the unshaded part of the map, has part of Hampstead Heath and Regent's Park.

Some children, indeed, who were not quite so clever as the rest, used contour maps ready made on a hectograph or cyclostyle. On these contour maps they marked the routes followed (*a*) by the railways, (*b*) by the chief roads. The map on page 35 shows the kind of map they made. The original map is much bigger.

They were now able to see the ground-shape (or surface relief) of their district and could easily pick out on the map parts where roads were steeper, because at such points the contours were closer together. They found out the heights above sea-level of Parliament Hill, of Primrose Hill, of Highgate Hill, and of Hampstead Heath. They discovered where the local rivers used to be and inserted them on their maps. One group used the contours to make a relief model of the area.

Attention was now turned to the 1-inch sheet, and the girls discovered where their main roads and railways entered and left the borough, where they came from and where they led. Maps of roads and railways were made, one group making a map to show the relation of St. Pancras to the old roads and the modern railways. In St. Pancras, with its famous stations, St. Pancras, Euston, and King's Cross, railways and railway and transport workers are exceedingly important.

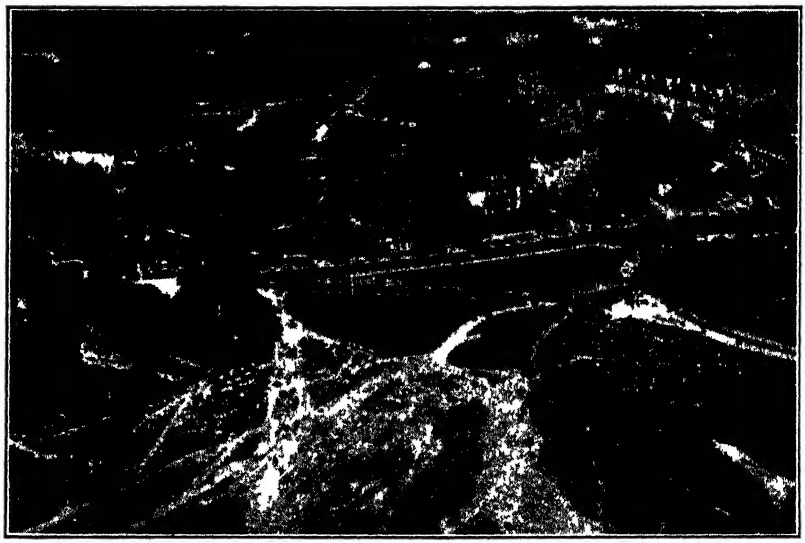
Some girls made special maps: one group prepared a map to show the parks and open spaces (including Hampstead Heath and such places as football grounds and playing fields) of their district, marking the position of their school, and showing the roads leading to the parks and open spaces, putting in a scale so that distances



MAP OF THE NORTHERN HEIGHTS OF LONDON

Notice (i) the position of St Pancras, and its importance in railway communications, (ii) how the railways avoid the heights of Hampstead and Highgate

could easily be found. Even many Londoners do not know that St. Pancras has a big share of Hampstead Heath! Another group made a bus and tramway map, making use of the guides issued by the London Transport Board, as well as their Ordnance maps. Another



Aerofilms

AIR VIEW OF PART OF HAMPSTEAD HEATH

This part of the Heath belongs to Hampstead The flagstaff and pond in the centre of the picture are just off the map on page 35, but the pond in the top left hand corner is indicated Can you find it?

group showed where the streams, reservoirs, and chief waterworks were, putting in as many as they could of the wells that determined the early settlement of the borough. These maps were compared with geologists' maps showing how the area was made up of caps of sand and gravel, or heavy London clay, and that springs and river sources were found at the edges of sandy areas.

The class did even more than this. On fine summer afternoons, maps in hand, they visited Hampstead Heath, and from good viewpoints, such as Parliament Hill, they identified prominent features on the Ordnance maps and the maps they had made, and thus read their maps with the area represented spread out before them like a carpet.

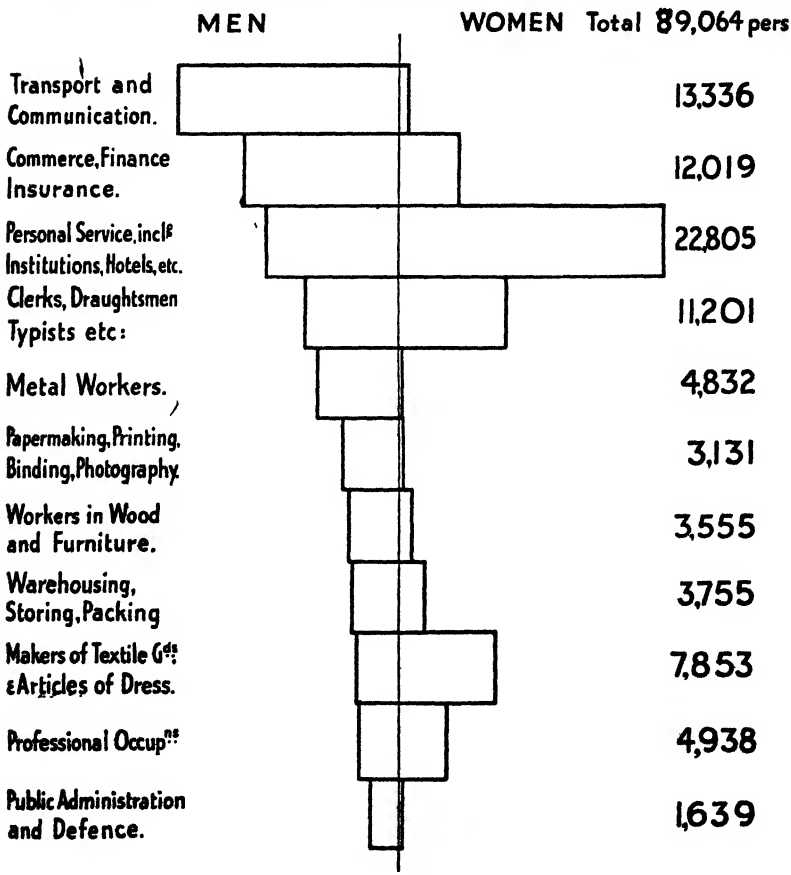
HOW PEOPLE LIVE

Even more interesting was the job of finding out the chief kinds of work done in the neighbourhood. At first it seemed dull, for many of the people in this part of North London go to the City daily and return in the evening—they are professional people, clerks, typists, and office and warehouse workers of many kinds. The presence of the big stations, with their hotels and great warehouses and goods-yards, accounted for the principal occupations in the borough.

Then someone thought of the works and factories—the big pianoforte and cigarette factories first! The problem now was to find out what works and factories there were in the borough. Certain of them were quickly discovered and set down on paper, for there were girls who lived near them or passed them on the way to school, and there were others who knew people who worked in them. The list grew for a time—then stopped, until the girls were told to hunt for others in the borough *directory*, a large book giving the names and addresses of all people living in the borough, with special sections for traders and manufacturers of all kinds. They also obtained the figures for the last census, which gave an accurate classification of the various types of employment. From these figures they made the diagram which is reproduced on page 40.

When the list was complete, it was easy to see from it which were the chief kinds of thing made, and where the factories were. On outline maps the positions of the chief factories could now be marked, and each marked factory had its own special sign or colour-spot—one for

St PANCRAS CENSUS 1931



N.B. Diagram accounts for 73% of "occupied" persons in the Borough

DIAGRAM TO SHOW THE CHIEF OCCUPATIONS OF THE MEN AND WOMEN OF ST. PANCRAS.

pianos, another for tobacco and cigarettes, another for transport headquarters round the stations, and so forth. Most interesting of all were the visits made by children to neighbouring factories to see how the goods were made, to learn where the raw materials came from, and to hear what became of the finished products.

SOME SPECIAL STUDIES

It is a good thing to find out all you can about your chief local industries, especially in towns famous for one or two industries in particular. In this case, where many industries are concerned, one or two were chosen for study in school because the girls had visited the factories. One thing they did was to study the different kinds of woods used in the pianoforte and furniture factories, and in new houses that were being built. They had talks about these woods and the parts of the world whence they came, the different people who got them for us out of their forests, and the ways by which the timber was brought to London.

Then there was London itself—the most wonderful city in the world, full of so many interesting things that one would need several lives to find time to see them all. In talks about local shops and the goods sold in them, the children soon found out that the Port of London and the great London markets were places to see if they wanted to understand how their shops got the goods they sold. Arrangements were made to visit *Covent Garden*, the fruit, flower, and vegetable market, *Billingsgate*, the fish market, and *Smithfield*, the meat market, to get some idea of what they were like. But at Covent Garden and

Fox Photos

A SCENE IN SMITHFIELD MEAT MARKET

Notice that the men who carry meat must wear overalls

Billingsgate the main business was all over long before the children got there, for it is chiefly done before breakfast! As for the Port of London, they joined the steamer which ran a special trip every Wednesday in summer, through or past the most important docks.

Perhaps you see why it is so important for these young Londoners and the country children we read of in Chapter 2 to study the area in which they live. In geography we have to learn about so many places and things we can never hope to visit ourselves, and so, in order to understand them better, it is helpful to gain experience in the study of the area in which we live and of which we have first-hand knowledge.

QUESTIONS AND EXERCISES

In most town schools the map work of the kind described in this chapter can be done, and the usual daily records of temperatures and of wind and weather can also be kept.

Some individual or group exercises that might be done in your school are :

(*a*) A study of the physical features of your area by means of Ordnance Survey maps.

(*b*) A study of local industries.

(*c*) Your local shops and the market. What is sold there: how it got there : whence it came and by what routes.

(*d*) Your water supply. Where are the reservoirs ? The waterworks ? What is done to the water before it comes to you ?

(*e*) How your town is supplied with power, light and heat.

(*f*) If there is a very important road junction where several roads meet, make a study of the types of traffic meeting there. Where are the vehicles chiefly coming from ; where are they going ; what are they carrying ?

Never forget that most things worth remembering can be shown on maps, for maps are the shorthand records of geography.

CHAPTER 4.

BRITAIN AND HER PEOPLE

Over fifty millions of people live in the British Isles—English, Welsh, Scots and Irish, who form the British people. If we look at a population map we can see *where* they live: in some parts millions of people are crowded together, and in others they are widely scattered. Why should there be very many people in some parts and very few in others? Study the maps on pages 46 and 47.

Part of the answer to this question is given by the physical map of the British Isles. The mountain lands are high, bleak, and rainy; the soil is thin and gritty, except in the valleys, and on the heights there is no soil at all. In such areas people find it hard to make a living: they cannot grow much, they find it hard to get about, and the weather, except in summer, is uncomfortable. The blank spaces on the population map are nearly all high lands, where life is too hard for many people to live. Those who have their homes there must be hardy and independent, for they must rear, or grow, or make most of the things they need.

Notice how these thinly peopled highlands stand out in the physical map. In Great Britain, the largest island, there is a great belt of uplands dividing the Lowlands of Scotland from the English lowlands: the Southern Uplands of Scotland, the Pennines and the Lake District of England belong to this central upland belt.

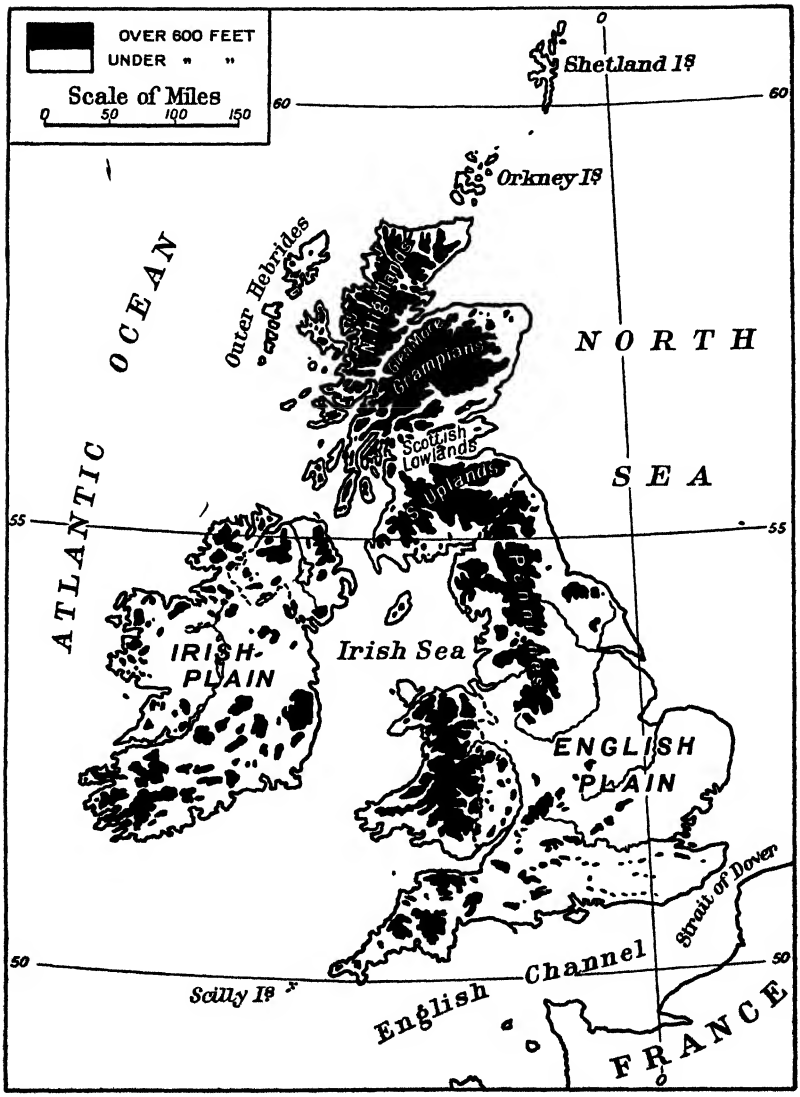
In Scotland, north of the Lowlands, is a still higher and bleaker region, known as the Scottish Highlands, where even fewer people live than in the Southern Uplands. Most of Wales, too, is mountain land, with very few

people, except in the south, where three-quarters of all the people live. Cornwall and Devon are largely upland too, but have rather more people than the other upland regions we have mentioned; they are, however, by no means thickly peopled. The population map of Ireland, too, shows up the Irish Highlands as white spaces where people are few.

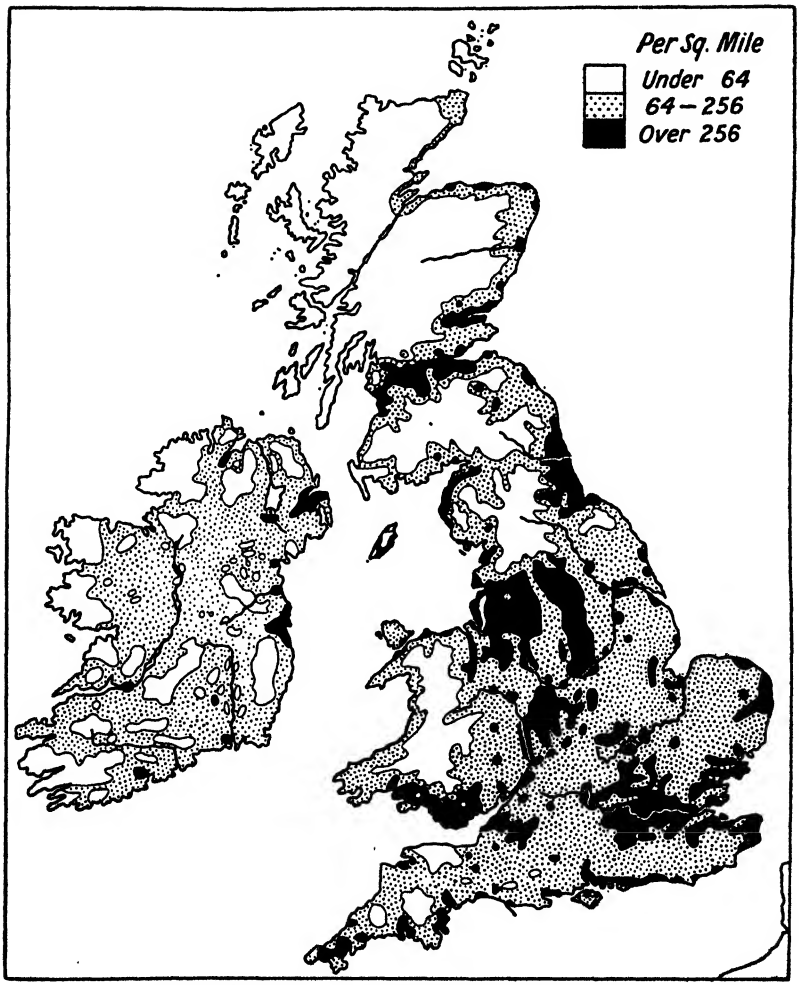
Most British people live in the lowlands, where there is good soil for the plough and rich grasses for animals; where the climate is better suited to human beings, and where roads and railways can most easily be made. In the English lowlands live more than three-quarters of all the people in Britain; the soil is fertile, the climate is not wet and cold like that of the highlands of the north and west, and there is much more sunshine. In the Scottish Lowlands live nearly nine-tenths of all the people in Scotland. But parts of the plain of central Ireland are thinly peopled because it is too boggy.

TOWNSFOLK AND COUNTRYFOLK

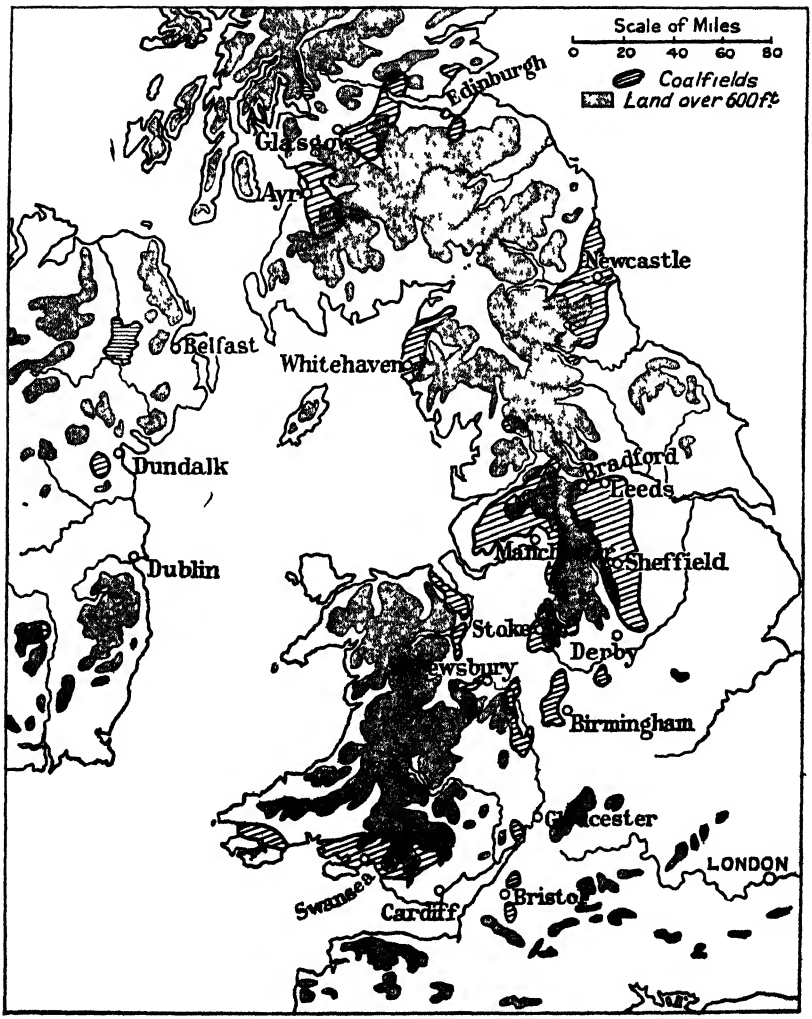
The physical map, however, does not explain everything; for we find that certain parts of the lowlands are much more densely peopled than others. There are groups or clusters of great towns, some of which have grown so much in recent years that they have become one monster human settlement. The city of *Stoke*, six towns in one, is a good example of this; *Greater London*, with its eight millions of people in its city, its boroughs, and suburbs, is bigger still. There are other great town clusters around *Birmingham*; in south-east Lancashire, in the *Manchester* region; in the *Leeds-Bradford* region of the West Riding of Yorkshire; and around *Newcastle*.



PHYSICAL MAP OF THE BRITISH ISLES.



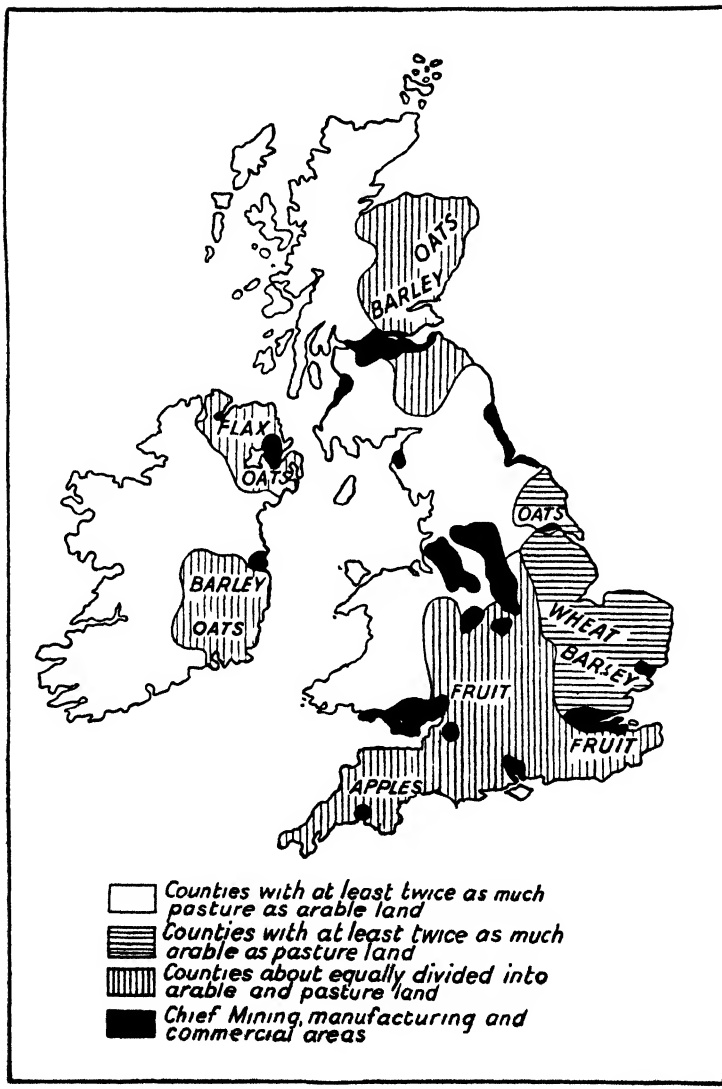
POPULATION MAP OF THE BRITISH ISLES.



MAP OF THE COALFIELDS OF THE BRITISH ISLES.

Compare this with the population map on page 47.

There is another coalfield in Kent, not shown on this map. Find out what you can about it.



FARMING MAP OF THE BRITISH ISLES.
The map also shows the chief mining and manufacturing areas.

Aerofilms

VIEW OVER PART OF PRESTON

This picture shows the crowded conditions in this Lancashire cotton manufacturing town. Now look at the picture on the opposite page

In Scotland there is a town cluster around *Glasgow.* On this page there is an air view of a northern industrial town.

The truth is, that a very large number of British people are townsfolk, most of whom get a living by making and selling things, or by keeping shops, running trams, trains, and buses, or by providing education, amusements, houses, churches, medical attention, or in other ways serving those who do. Only 855,000 people were employed in agriculture in Great Britain in 1949. It is the way people get a living which helps to decide whether they dwell crowded together in towns or spread out over the countryside in hamlets, villages, and small country

Aerofilms

HIGH HALDEN, KENT

Here we see some of England's countryside in an agricultural area in Kent.

towns. Farmers must have land to plough and land for their animals; they need more room than manufacturers, and are not so crowded together as workers in mills and factories, who must be near their work. You can see this for yourself if you examine the photographs on this and the previous page.

Why do mills and factories tend to concentrate in certain areas?

Most of the manufacturing industries still depend in some way or other upon *coal*, and they stay where they grew up—on or near the coalfields, although many new factory areas have arisen in other parts of Britain, as we shall see. Look at the map of the coalfields, and then at the

population map, and see how many very densely peopled regions are where coal is found. For although the petrol engine, the oil engine, and electricity are being more and more used in Britain, " coal is still king "—for coal still runs most of the British factories, railways, and ships.

THE GIFTS OF THE EARTH

Everything we have or use in our daily lives comes from the earth, which is our home—most things from the lands, but some things from the seas. Our food, our clothes, our homes, and all they contain are the gifts of the earth—some from our own land, the rest from lands beyond the seas. But we have to work to get them: Nature provides some of them for us ready for use, but the rest we must help to get and prepare for ourselves, or earn money to buy them.

The big businesses of getting and preparing the gifts of the earth are known as industries. Our four main groups of industries are manufacturing, farming, mining, and fishing: each of these industry-groups is divided into several industries, the chief of which we shall read about in this book.

First we shall study *fishermen*, the workers who gather in the harvest of the sea; then *farmers*, the workers who rear animals and reap the harvests of the land; next *miners* and *quarrymen*, who get out the treasures of the earth; and then *workers in shipyards, mills, and factories*, who use the gifts of earth got by fishermen, farmers, miners, and quarrymen in manufacturing the many things we use in our daily lives. Lastly, we shall read

about the *transport workers*, who carry us and our goods by land, water, and air.

When we speak of "workers," it is important for us to remember that anybody who earns his living is a "worker," no matter whether he earns it by his muscles or his brains, or both. The draughtsmen in the drawing office of a big shipyard, who draft out the plans of a big new ship, are just as much "workers" as the riveters who toil at putting the great steel beams and plates together; the clerk in the ticket office is just as much a "worker" as the fireman on the engine or the platelayer on the line; the head of a big business who plans out everything is a "worker" just as much as those who carry out what he has planned.

QUESTIONS AND EXERCISES

1. Make a list of workers employed in any *two* of the following :

A dairy farm ; a motor works ; a large general store ; a school ; a railway station.

2. Give reasons why the islands of the Outer Hebrides are not as densely peopled as the Isle of Wight, *or* the Isle of Man, *or* the Channel Isles.

3. Examine the photograph on page 179, then state in writing (*a*) why the area does not support many people, (*b*) its value to the people of Britain.

4. Write down three important conclusions that you can come to after comparing the four maps in this chapter.

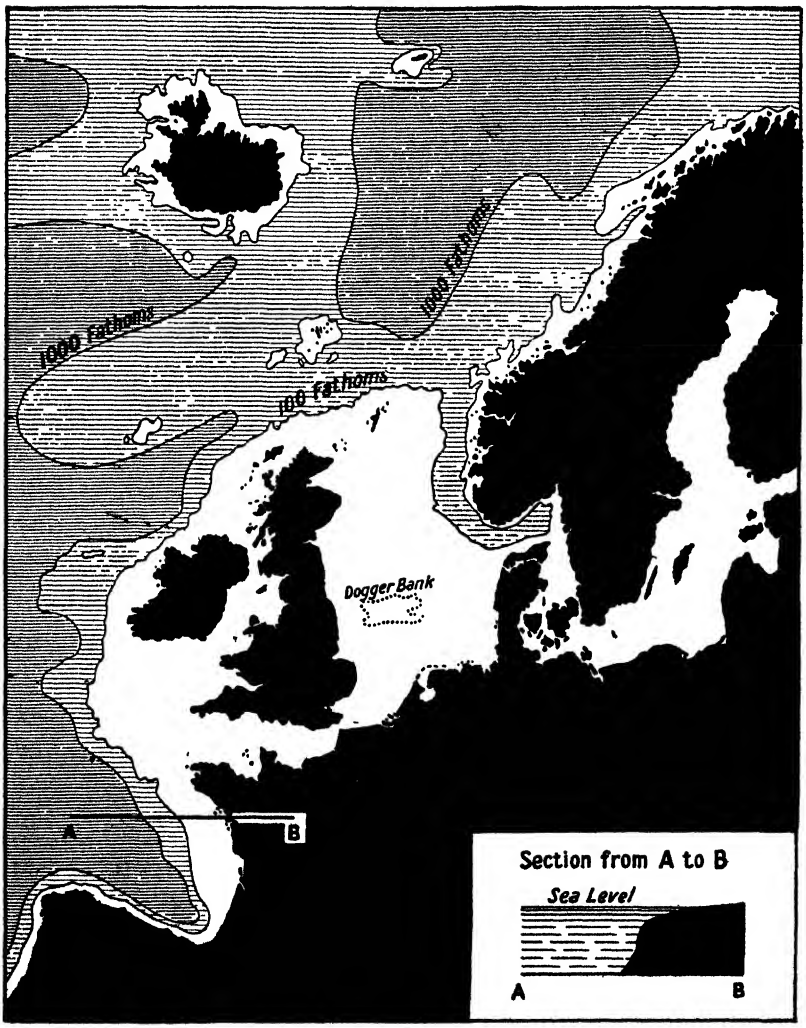
Chapter 5.

SEA HARVEST: FISHING IN THE NARROW SEAS

The map on page 55 shows that the British Isles rise from a broad undersea platform known as a "continental shelf," which is really an extension of Western Europe beneath the Atlantic. Its limits are best indicated by the 100-fathom line; the 1,000-fathom line is not far outside it, showing a steep descent; beyond this the descent is even steeper to depths greater still. It is in the shallow or fairly shallow seas of the continental shelf where most fish are found; for there they find abundant food and places for laying their eggs.

About a million tons of fish are landed every year at British fishing ports, great and small. In 1949 the year's catch, of all sorts, was worth over £40,000,000. This enormous sum was earned by trawlers, drifters, and other craft, including the smaller boats used by the "longshoremen," who go out a little way to sea and come home again in a few hours, or dredge or set traps for shellfish.

In 1935 about 57,000 fishermen were employed in the fishing vessels, of which 4,520 were sailing boats and 9,433 were driven by steam or motor. Notice that power-driven craft are more than twice as numerous as sailing craft, which are becoming less and less used. Power craft can reach fishing grounds quickly and surely, and, what is more important still, they can hurry their catch at high speed to the fish market.



MAP OF THE CONTINENTAL SHELF OF WESTERN EUROPE.

Identify the continental shelf on the section in the corner of the map and state why the steepness of the slope of the sea-bed is exaggerated in the diagram ; note the shallowness of the sea around Britain and also of the Baltic. Where is the sea shallowest in the area shown on the map ?

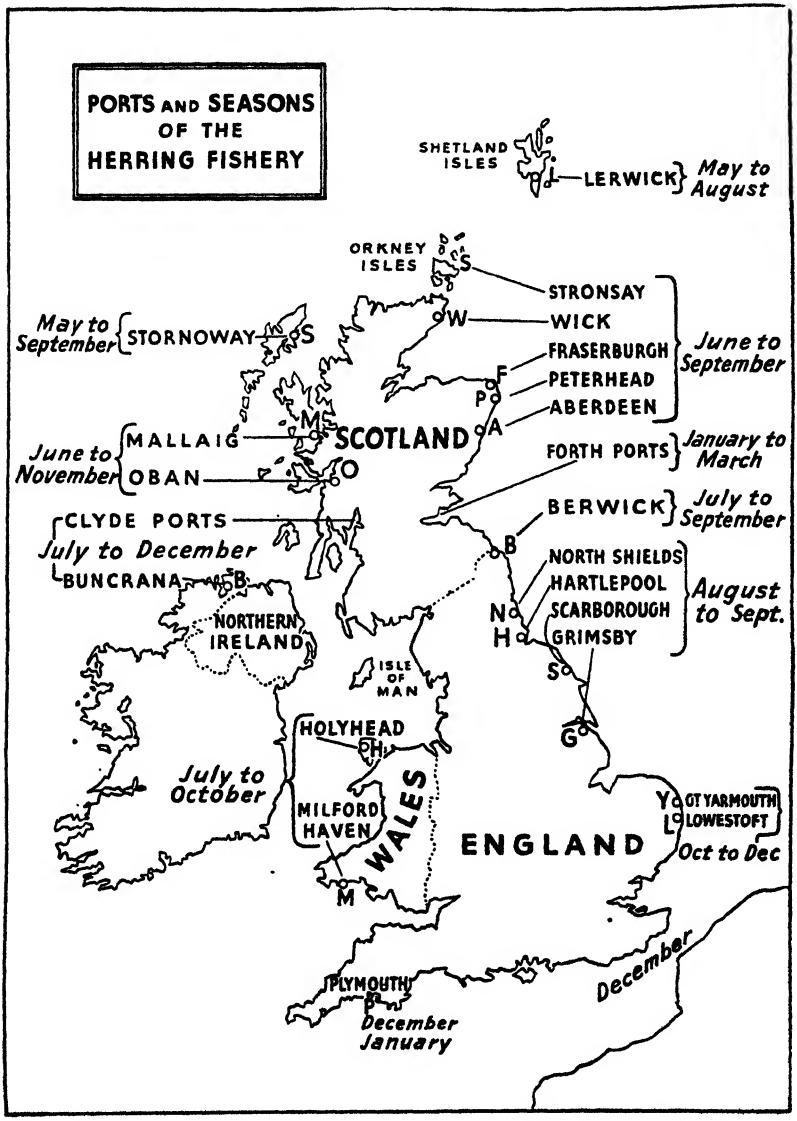
HERRING DRIFTERS

The herring fishery is the most important of all carried on in the "Narrow Seas" which surround Britain. Two thousand millions of them are caught in a year if the fishing is fairly good. In weight alone, herring come second only to cod, which form the heaviest catch of all fish landed at British ports.

Herring swim in vast shoals—sometimes 8 or 9 miles long and 4 or 5 miles broad. They keep deep during the day, but swim nearer the surface at night, which is therefore the best time to catch them in large numbers.

For catching herring, drift-nets are generally used—nets joined in series two or three miles long, hanging like an invisible curtain or wall of mesh 13 feet deep, held up by floats and kept down by leaden weights on the bottom ropes (see picture on page 61). The "fleet" of nets is attached by a warp to the bow of the ship; ship and nets drift with the tide (nets are always "shot" *across* the tide), giving time for the herrings to be caught. Because of this, the vessels used for this purpose are known as "drifters." Many of them nowadays are driven by Diesel engines.

The different herring "families" collect at certain times of the year and "go on a holiday trip to coastal waters," arriving at certain points along British shores at times well known to fishermen. The map on page 57 shows this very clearly. Although herring are caught in all these places at the times mentioned, the really big catches are made (1) in early summer off the north and north-east of Scotland, and (2) in October and November off East Anglia—the most important of all. It is in East Anglia, therefore, that we find the chief herring



MAP OF THE CHIEF HERRING PORTS OF BRITAIN.

The map also shows the time of the year when herrings are caught in different parts of the British Seas.

ports of Britain—Yarmouth and Lowestoft, where drifters congregate from many ports, Scottish and English, and where an army of " fisher-lassies " comes from Scotland and the North to deal with the catch. " Scottish lassies can ' gip ' herring at the rate of 45 to 60 a minute, and grade them at the same time."

The herring are unloaded on the quays, to be sold by auction " under bell and hammer." Some are sold as fresh herring; some go off to the sheds to be smoked into bloaters or kippers; some go to local canneries to fill tins of " herring with tomatoes " or be made into fish paste or other foods; and a very large number are swiftly cleaned by the fisher-lassies and salted down in barrels for export to countries in Europe which need fish, but do not catch enough of their own.

Tons of fresh herring are put with ice into boxes and rushed off by special fish trains to the markets of great towns in densely peopled parts of Britain. In any of these big towns you can buy herring caught the night before. (Don't pick those with " red eyes " !)

The following table shows the countries to which over 2,000 barrels of East Anglian pickled herring were sent in the year 1936.

Where Sent.	No. of Barrels.
Germany	192,346
Free Port of Danzig	104,874
Poland	46,779
Lithuania	40,241
Latvia	23,427
Russia	10,000
Holland	4,511
Palestine	2,931

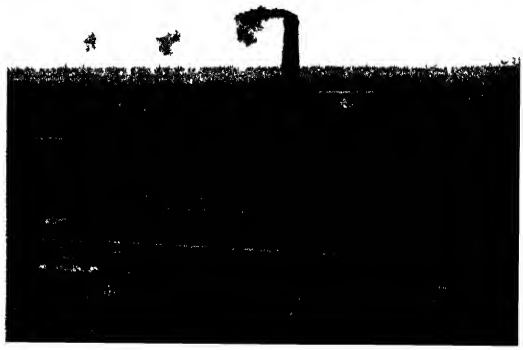
Since the war of 1939–1945 the exports of herrings to Europe have declined.

THE HERRING INDUSTRY

Here herrings are being landed in baskets at Yarmouth. The letters B.C.K. on the drifter's side stand for Buckie, her port in Scotland. Drifters and trawlers from many ports may be seen at Yarmouth during the season.

The fish go straight to these Scottish girls, who cut open and clean, grade, and pack them with salt in barrels. What work is done by the men? These girls come southwards with the fish, and during the season work at several ports.

In these Yarmouth fish factories fish are cured and smoked, some are canned or made into fish-pastes and other foods, and some may be used for the manufacture of fertilisers.



SPRATS, MACKEREL, AND PILCHARDS

Other " surface swimmers " are sprats, mackerel, and pilchards, which at certain times of the year swarm in monster shoals, much as the herring do.

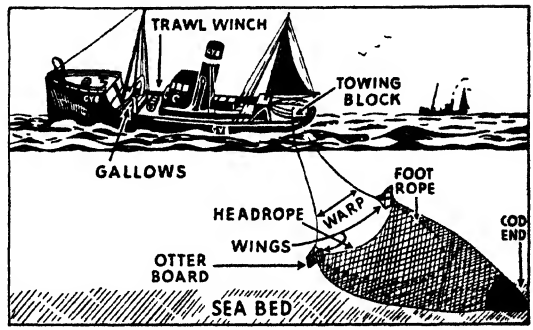
Sprats, like herring, are chiefly North Sea fish. They invade the coastal waters of Suffolk and Essex in uncountable battalions, often penetrating up the Thames estuary to Southend-on-Sea. " Longshore " fishermen working in small boats catch millions in their fine oiled drift-nets; and anchored fishing-smacks lie in wait for sprats, with their gaping " stow nets," into which the swift tides sweep the unlucky sprats. Sprats are marketed fresh or dried. Millions are now canned at home factories, in Colchester and Yarmouth for example.

Mackerel are specially important in the English Channel and the Bristol Channel. *Pilchards*, once very important, are much scarcer than they used to be; their shoaling grounds were chiefly round the Cornish coasts, where numbers of small ports almost depended upon them; nowadays they rely more upon herring and mackerel or go after flatfish in the Channel. In the Cornish harbour of St. Ives you can see the herring fleet—mostly motor-vessels; at Newlyn you may see Breton crab-boats from France side by side with Cornish ones.

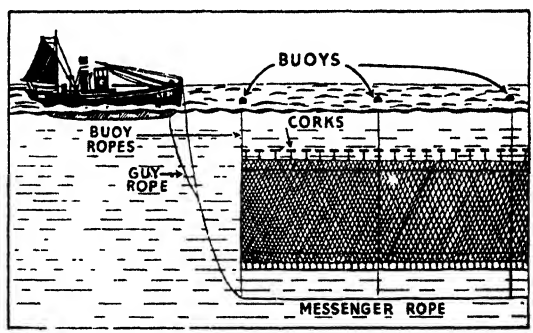
The coasts of Cornwall and Devon are indented with numbers of coves and inlets, each of which has its fishing town or village. It is not surprising that the fishermen of this part of Britain are renowned for their skill and daring, and make fine sailormen. The " sea-dogs of Devon " and the " men of Cornwall " have more than once played an important part in the defence of the British Homeland.

THREE IMPORTANT WAYS OF FISHING

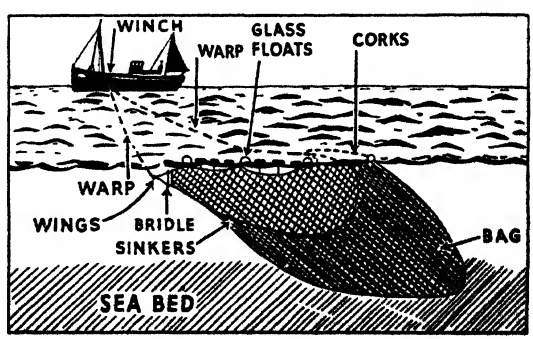
1. TRAWLING.—This Grimsby trawler has her trawl down and is steaming slowly ahead. Otter boards keep the wide mouth of the trawl open; the foot rope armed with huge bobbins drags on the sea bed.



2. DRIFTING—for herring. This Lowestoft drifter has her "fleet" of nets. With nets attached to her bow, foremast down, and mizzen-sail set to keep her steady, the vessel drifts—nets and all—with the tide.



3. SEINING.—This Scottish seiner is a Diesel-engined craft, and has no funnel like the others. The seine is a kind of purse-trawl used in shallower water, chiefly in summer time.



SHELLFISH

Around British shores there are many valuable shellfish, some of which, like oysters and mussels, love muddy creeks or muddy shallows; others, like cockles, prefer sandy beds in which they can rest in safety a few inches below the sand until the cockler comes at low tide to rake them out and carry them off to be cooked in his cockle-shed on shore; others, like crabs and lobsters, thrive best in coves with rocky beds that provide both food and shelter for them.

Fine *oysters* are dredged near Colchester in the Colne estuary, and off Whitstable in Kent; *mussels* are "cultivated" in beds at Wells, and other places on the north Norfolk coast; *whelks and winkles* are gathered in millions at small fisheries along East Anglian and other shores. *Shrimps* and *prawns* are caught wherever there is shallow water over sands—the Wash is noted for them; *lobsters* are particularly important along the rocky shores of Cornwall, of the Orkneys, and of the Outer Hebrides; and fine *crabs* are caught off the coasts of Yorkshire, Durham, and Northumberland.

QUESTIONS AND EXERCISES

1. Find out all you can about the food eaten by fish.

2. On the sides and funnels of herring drifters are letters which tell from which port they come. At Yarmouth on October 15th, 1937, were seen the drifters *Chestnut* YH, *Hallmark* BCK, *Fairhaven* FR, *Celosia* BF, and *Ephratah* PD. From which port did each come, and where is it? Examine the photograph on page 59.

3. Explain why, at certain times of the year, steamers from the Continent bring to Yarmouth and Lowestoft a great deal of salt, and much material for boxes and barrels.

4. What can you learn from the following tables for the season 1936–1937 about *sprats*?

Ports.	Thousands of cwt.	Ports.	Thousands of cwt.
Lowestoft	5	Deal	12
Southwold	3	Folkestone	5
Aldeburgh	6	Torquay	1
Brightlingsea	64	Brixham	2
Southend-on-Sea	3	Dartmouth	11

5. What canned fish seen in our shops come from other lands? What British fish are canned in home canneries, and where?

6. How are "radar" and "asdic" useful to modern fishermen?

Chapter 6.

SEA HARVEST: FISHING IN DISTANT WATERS

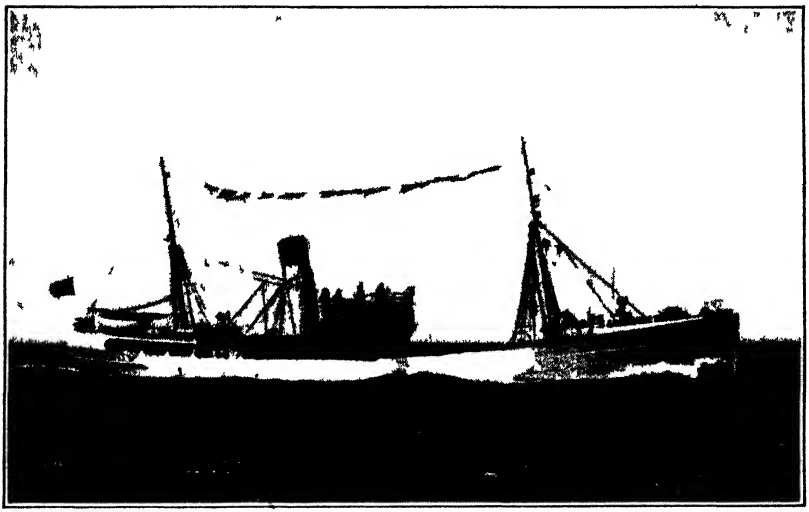
The steam trawler *Gypsy*, of Hull, home from Iceland waters, is deserted by her skipper and crew, who are away making the most of their brief thirty-six hours' leave; she is in the hands of the shore gang. Cleaners wash the fish holds, leaving them gleaming white, and scrub down decks; engineers overhaul the powerful engines that drive her at 12 knots through heavy seas, and see that all instruments are in working order.

Now *Gypsy* is being nudged carefully out of the hundreds of trawlers at the fish dock—three deep in places—and taken up to the coal shutes, which send some 80 or 90 tons of Newcastle coal roaring into her bunkers. After washing off the grimy coal-dust, men take her next to the ice-berths by the ice factory, where crushed ice is poured down a chute until she has her usual 70 tons. It will soon harden into a solid lump, which the men will have to break up with picks as they want it to cover the fish and keep them fresh all the way home.

Food and stores are taken aboard. The shore gang goes home. The night watchman takes charge, and below a lonely fireman sets about the job of raising steam; for early to-morrow the crew come aboard and *Gypsy* leaves for sea.

DEEP-SEA TRAWLING

Gypsy, like hundreds of her companions at the fish dock, is a deep-sea trawler, strongly built for battling with



Kinovia

THE TRAWLER *KING SOL*

One of the fastest trawlers in existence It is equipped with electric log, direction finder, wireless apparatus and echometer (p 67)

the giant seas of northern waters, and powerfully engined to give her the speed she needs for bringing her catch swiftly home. She is about 130 feet long, with high bows to help her to ride the Arctic gales in safety, and a big sloping foredeck, where most of the fishing, cleaning, and packing are done; high above amidships rises the wheel-house, where are the hand and the steam steering wheels. Below the wheel-house are the Skipper's quarters: chart-room, 10 feet square, with bunk, settee and table, a lobby and bathroom.

Towards the stern below deck are the men's quarters and tiny mess-room. Just in front are the engine-room, boiler-room and coal bunkers, which as the coal is used up on the outward trip may be cleaned out to carry fish if the main hold is already filled. There is also a special

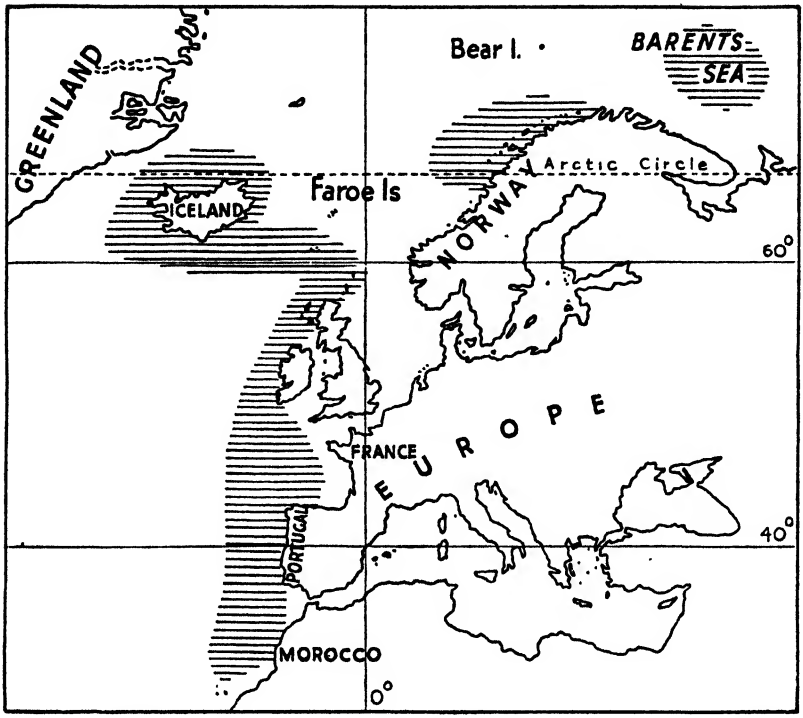
"plant" for getting rich fish-oil out of the livers of fish. On deck is the trawling gear: there is only a 4-foot way on either side of the engine-room casing, so one has to be careful while at work in rough weather.

Gypsy has electric light throughout; fishing and other work can be carried on at night under the bright glare of her floodlights. She carries wireless, and has both wireless telegraph and telephone, so that her skipper can talk to other trawlers and to her home port if it is within range. She has also an echo depth-sounding machine, by means of which her navigator can tell almost at once what depth the sea is beneath her—an important matter, for some fish are found only at certain depths.

THREE WEEKS' "HARD"

Down the yellow waters of the Humber steams *Gypsy*—one of a procession of deep-sea trawlers which are putting to sea. By noon the Spurn lightship has been passed, and she is making north for Flamborough Head, now and then overtaking other trawlers, all bound like herself for the Pentland Firth, the rough strait between the Orkneys and northern Scotland, where she must steam at full speed if the tide and wind prove awkward—even to get through at a snail's pace.

Gypsy is lucky; the dreaded strait is passed, and she steers for the Faroe Isles. The two engineers and two firemen take turns, six hours at a time without a break for the whole three weeks; the crew are divided into "watches"—the mate's watch taking from one o'clock to five, the bos'n's from five to nine, and the third hand's nine to one. Breakfast is at seven, dinner at noon, tea



MAP OF THE FISHING GROUNDS VISITED BY BRITISH FISHING-VESSELS.

at six; but hot tea is always ready in the galley. But when fishing starts, meals fit in where they can.

From the Faroes, *Gypsy* turns towards the east shores of Iceland; all gear is overlooked and the trawl got ready for "shooting." Fog and a long, heavy swell are encountered; then wind and "thick weather"; but *Gypsy* steams on to her sea harvest. Bare, steep rocks, with black highlands towering inland, are her welcome to the shores of Iceland. She is over one of the "lucky spots" known to her skipper. To make sure he presses the knob of the echo sounder; there is a noise like the solemn tick of

a grandfather clock, and on the scale of fathoms a spot of light appears, giving the depth—70 fathoms.

"Lower away!" says the skipper. The huge net bag of the trawl, 70 feet long and 8 or 9 feet high, is kept open on the sea bed by big wooden "gates," or otter boards, forced apart by the pressure of the water as the trawler drags them at $2\frac{1}{2}$ knots. The bottom is held on the sea floor by bobbins—yard-wide wheels of wood shod with iron; and glass floats in scores hold up the top edge. Strong steel ropes tow the trawl, which is always "shot" on the windward side of the vessel not far from the stern, to prevent it fouling the propeller.

After three hours or so, the trawl is hauled in by steam winches until the "cod-end" of the net, bloated with a living mass of white, green, scarlet, and black, appears a little astern. The forepart of the net is got in, then the "belly" by using long S-shaped hooks to reach and hold its heaving meshes; and now, at last, the "cod-end" is caught in a loop of rope fastened to the tackle that hoists it inboard, with sea water gushing from it in a flood. The mate pops underneath this monster net bag, pulls a cord at its end, and jumps quickly aside to avoid the avalanche of fish, seaweed, shells, "jellies," stones and other things that fill the cod-end after a trawl. The whole mass falls into two of the "pounds" on the deck; there are six of these compartments, made by setting up movable boards in steel sockets.

Flapping and gasping amongst the sea rubbish are monster cod, over 25 lb. in weight, "sprag" or middle-sized cod, many codling, a few haddock and halibut, several big black coalfish that will find a last home in the fried-fish shops, catfish, and dogfish like miniature sharks,

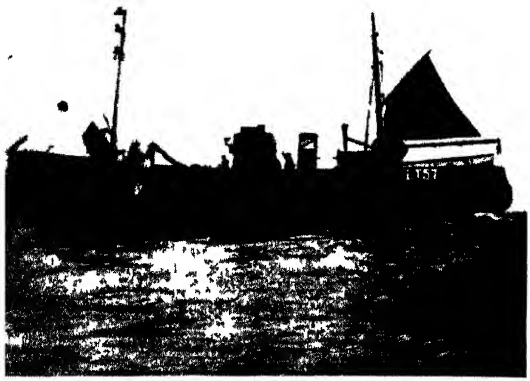
with sharp teeth, green eyes, and spotted sides as rough as sandpaper. More numerous than any other are the scarlet sea-bass, or "soldiers," whose great spiny fins make them dangerous to handle without gloves; these are shovelled back with the rubbish into the sea, for the market for them is worse than poor at Hull.

All "hands" who can be spared set to work gutting the fish. Dressed in oil-skin "frocks," sea-boots, gloves, and caps, and armed with keen knives, the men make short work of it, heaving cleaned fish across to be washed, shot below, and packed in finely chopped ice. Then the trawl is made ready for another shoot, and at last, bone-weary, muscle-tired, and eyes red-rimmed with salt and fatigue, the men go below for a spell. Eat and sleep and haul again; clean and stow; shoot again! So it goes on, sometimes for days on end. Trawling is work indeed!

At last, a "full ship," *Gypsy* stows her trawling gear and turns south for home. Long before she rounds the Spurn to go up the Humber, she has telephoned her owners, who know exactly what she has caught, and make provision to receive it. Other messages are sent to wives and friends, so that the crew of *Gypsy* can make the most of their thirty-six hours' ashore after their "three weeks' hard labour."

Trawlermen get a regular wage of about two pounds a week. In addition, they receive a share of the "liver money" from the sale of the oil made from fish livers, and also a share in the profits of the catch, which brings their money up to about four pounds a week—not a great deal, considering the hardship and dangers of their jobs.

These "deep-sea fishermen" of Hull, Grimsby, Fleetwood, Aberdeen, and other big fishing ports in



PICTURES OF TRAWLING

1. The Diesel-engined trawler *Eta* of Lowestoft. The men are hauling in the trawl. Notice the "otter board" (on the men's left) used to keep mouth of net open (see also page 61). The photograph was taken at sea.

2. Getting the "cod-end" aboard by means of tackle from the foremast. Notice the "cod-end" bulging with fish. The rest of the trawl left to itself for a time. The mizzen-sail is set to keep the ship steady. The two "otter boards" of the trawl are clearly seen.

3. Opening the "cod-end" to let an avalanche of fish and marine rubbish fall into the "pound" on deck. These will soon be sorted, cleaned, and packed in ice below deck. There they remain until port is reached.

their sturdy craft venture far in their search for fine fish for British tables. Their vessels are still chiefly steam driven, but the number of powerful trawlers run by Diesel engines is increasing. They reap the harvest of the sea from the White Sea to Iceland and from Iceland to north-west Africa (see map on page 67).

From the White Sea they get giant plaice and cod ; from the Barents Sea in the Arctic they get cod, haddock, and plaice; from Iceland waters, cod, haddock, halibut, and coalfish (saithe); from the seas west of Scotland, cod, haddock, hake, saithe, and skate; from west of Ireland waters, hake and conger eels, ling and skate, and other fine fish, and from the Bay of Biscay and the seas west of Portugal and Morocco, hake, skate, rays, and soles.

But although they are often called "deep-sea" fishermen, because they venture far from home, they do not, and cannot, catch fish like these in the very deep ocean. Their trawling is done chiefly at depths of under 250 fathoms (1,500 feet)—for trawls cannot be used in very deep seas. Nor can they be used when the bed of the sea is very irregular.

QUESTIONS AND EXERCISES

1. Name six kinds of fish caught by trawling. Describe two and say how they should be prepared for the table.
2. Explain the following : 12 knots ; watches on board ship ; bunkers ; Diesel engines ; seventy fathoms.
3. Find out when and why the passage of the Pentland Firth is most difficult. Draw a sketch-map to show exactly where it is.
4. Make a map to show the outward and homeward voyages of the *Gypsy*.
5. In what way have wireless telegraphy and broadcasting been great boons to fishermen ?

CHAPTER 7.

FARMERS AND THE LAND

The British Isles are formed of many different kinds of rocks; some very old and hard, others younger and softer. Some of the rocks, such as granite, were formed ages ago by cooling from a molten state, but many of them were laid down as deposits in prehistoric seas and lakes, forming thick layers, which hardened under the enormous pressure of later deposits that collected on top of them (see map on inside cover at the end of this book).

The "layered" or *stratified* rocks became folded or even broken in places, as a result of changes in the earth's crust, so that rocks which were once buried beneath layers of others now come to the surface. Others, especially the most recent ones, have not changed in this way. Special maps, called geological maps, have been made to show what rocks underlie the soil in the British Isles; for many soils result from the break-up of rock under the influence of heat and cold, wind and rain, and running water. The sheets of ice which in ancient days covered Britain north of the Thames ground much of the rock surfaces into fine "rock-flour," which was left behind when the glaciers melted. In East Anglia, for example, there are thick deposits of this "rock-flour," called *boulder-clay*, which provides excellent soil for the fine wheat for which this part of Britain is famous.

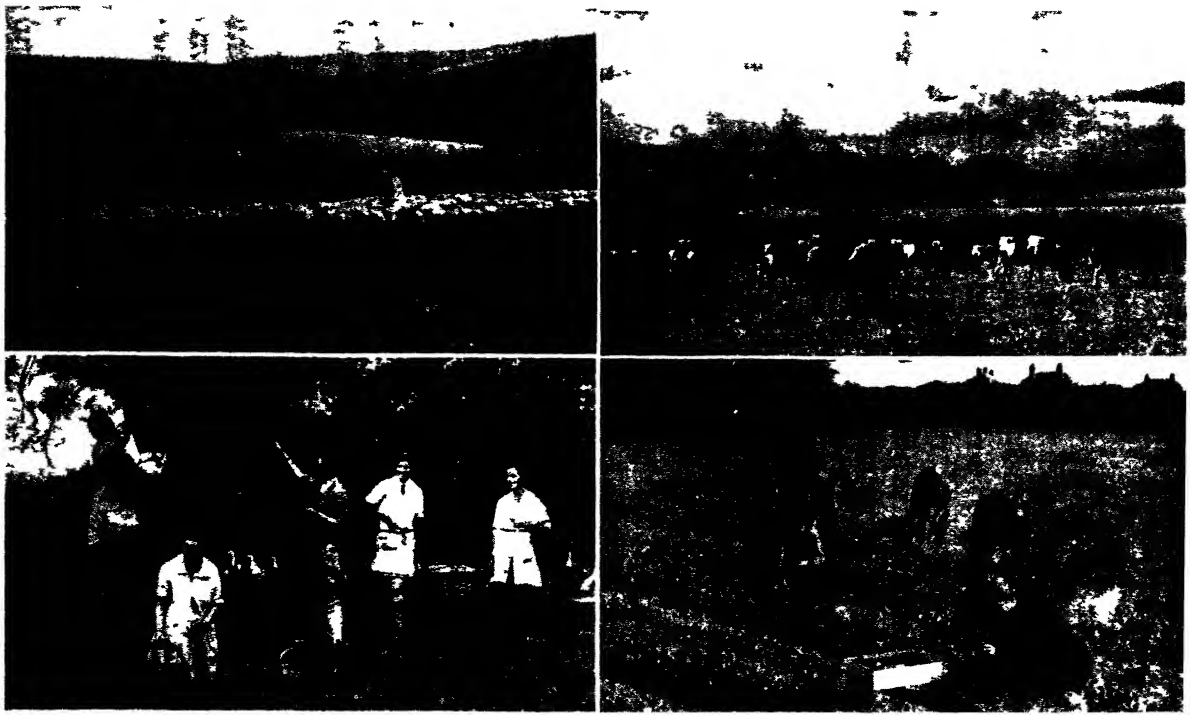
The geological map shows the many different kinds of rocks that come to the surface in Britain, producing many kinds of soils, on which many different

things can be grown. Old, hard rocks resisted the weathering, or "wearing down," by sun and frost, rain and snow, wind and running water, and remained standing as the mountain lands of Scotland, Wales, northern England, and the moors of Devon and Cornwall, or as the detached masses of mountains we see in Ireland. The finer materials worn from them were carried down by streams to be deposited as rich mixed soil (alluvium) in the lower valleys. Other materials worn from the hills and the lowlands were carried off by streams to be deposited in the same way. This weathering is still going on, and the newest lands in Britain are near the mouths of large rivers which have brought down the fine silt and mud that make land in time. We see, therefore, that some soils are not made from the rocks which lie under them, but of materials brought long distances by ice and running water—or even by the wind.

Perhaps we can understand, too, *why* there are so many different kinds of scenery in Britain. Hard, old rocks, resistant to the weather, stand out as mountain land, carved, perhaps, into deep valleys by streams; where hard, old rocks come to the sea, the coast stands up in cliff-precipices, fretted by the sea into a thousand inlets and sea-caves. Softer and younger rocks form the rolling hill country of south-eastern England—the Cotswolds, the North York moors, and the chalk Downlands. Very young and very soft rocks form the lowlands and mud flats of East Anglia.

THE USE OF THE LAND

How are these different kinds of lands used, especially by the farmer?



Photos (Above) Photochrom (Below) Sport and General Press Agency *Photos (Above) Mustograph Agency (Below) Fox Photos Ltd.*

TYPES OF FARMING IN BRITAIN

1. Sheep farming on the Sussex Downs
2. Gathering fruit on a Kent fruit farm
3. A herd of Friesian cows grazing
4. Growing violets and strawberries under glass in Hampshire.

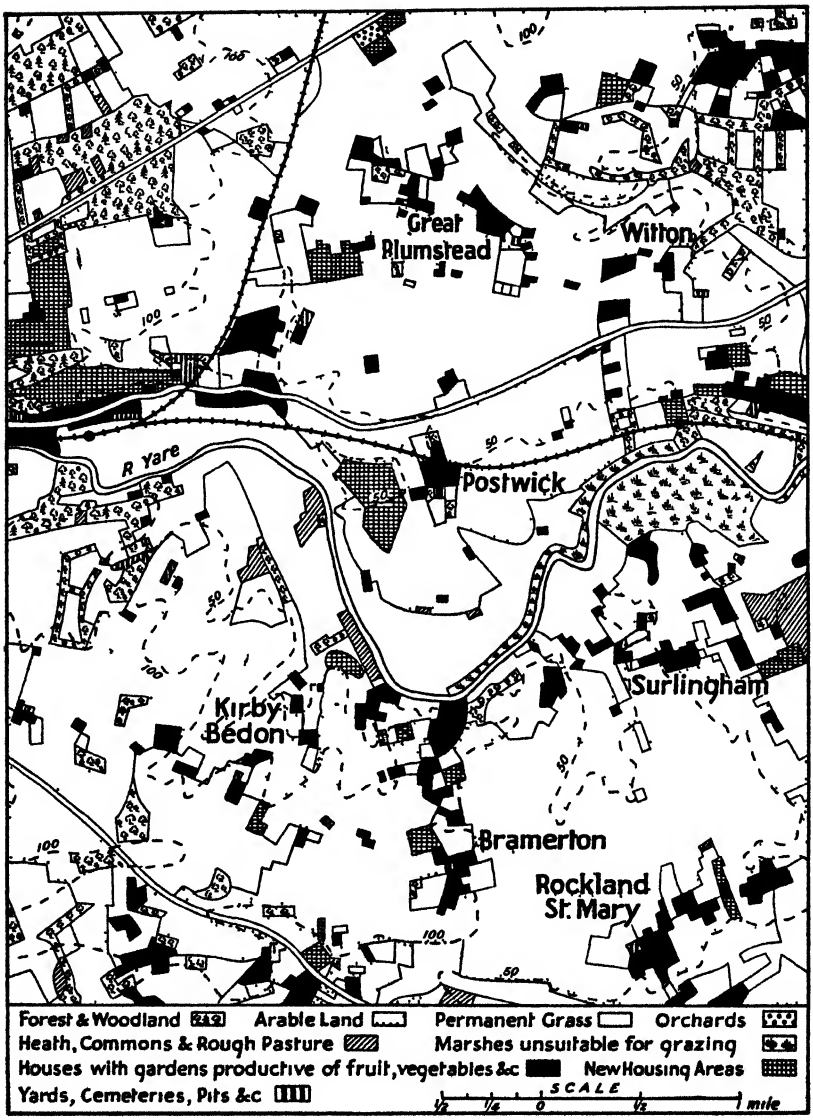
The mountain lands are chiefly used for grazing sheep, and perhaps hardy cattle, such as we may see in the Scottish highlands. Sheep can stand the bleak cold weather of the hills and do not mind the wet, if the water runs off quickly so that they do not have to stand about in it. The limestone hills of England and the chalk Downlands are also good for sheep.

Cattle used for dairy purposes and cattle that are to be fattened for meat thrive best on the wetter lowlands, and in some parts of the drier lowlands too, where along the river valleys there are luscious meadow grasses for them to eat.

But grain, roots, fruit, and garden stuff can be grown in large quantities only in the lowlands, where the soil is good and where farmers can use machinery to help them. Market gardeners need rich alluvial soil, and like to be near large towns, to which their produce (which easily spoils) can be quickly sent and easily sold. Nursery gardeners, too, like to be near towns, where they find ready sale for their flowers, young plants and trees.

Generally speaking, we may say that the English lowlands of the south-east are the most important farmlands; the Scottish lowlands and the richer, drier lowlands of Ireland are good too. The highlands are the homes of sheep rearers and some cattle rearers. The chief cattle lands are in the Irish Plain and in the moister parts of the English lowlands, especially in the Midlands and the west.

Special maps have been prepared to show how the land is being used in England, Wales, and Scotland. The map on page 76 is a part of the Norwich sheet.



MAP TO SHOW HOW THE LAND IN A PART OF NORFOLK IS USED BY MAN

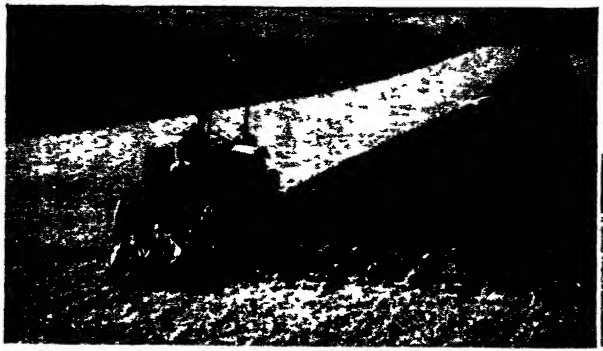
This map is based on the Land Utilisation Map, by permission of the Director of the Land Utilisation Survey of Britain, and with the sanction of the Controller of H M. Stationery Office.

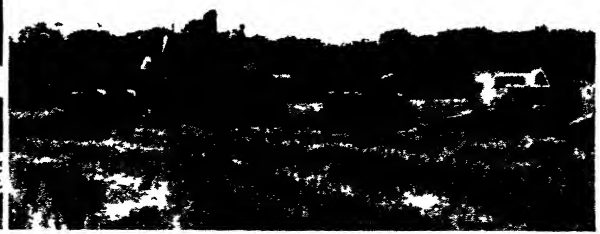
FARMERS

British farmers are of great importance to British people; for although Britain is only a small land, " it still produces from its own soil more value in crops and stock than any of the Dominions except Canada," and agriculture is still Britain's greatest industry and " the third largest employer in the country."

Farmers are of many kinds. Some are stock breeders, raising sheep, cattle, and horses; others are engaged in agriculture on the ploughlands, growing grain, roots, and fodder crops; others are fruit farmers, or market gardeners, or nurserymen, or poultry-keepers, or bee-keepers. Many farmers go in for mixed farming, having part of their land for sheep and cattle, part for field crops; an orchard too, perhaps, and they keep poultry as well. Every farmer aims at making the best use of his land. If it is very good for wheat, he grows more wheat than anything else; if it is excellent for fruit, he plants orchards or hops; if it has much good pasture, he rears cattle and horses; if it is too hilly for any of these things, he rears sheep.

Nowadays the farmer uses machinery much more than in the past, and farm-hands have to be up-to-date in order to know how to use the wonderful machines that have been invented, and to repair them if they go wrong. Farmers must know a great deal about the lives and ways of their animals; about the diseases which attack plants and animals, and how to cure them; about different soils, and how to make them yield more by treating them with chemical and other manures. Farmers and land workers of to-day, in fact, have to be





Photos : (Above) Mustograph Agency. (Below) " The Times " *Photos by " The Times."*

FARMING SCENES IN GREAT BRITAIN.

1. Autumn ploughing by tractor in Somerset.
2. Harvesting west of Mevagissey, Cornwall.
3. Haymaking near Oxford.
4. Combined cutting and threshing machine and a baling machine to deal with straw discharged by combine harvesters.

engineers and scientists of a sort, as well as tillers of the soil and shepherds and herdsmen.

Besides getting food and other things from the land, farmers do a great deal to keep Britain beautiful. They are builders and preservers rather than destroyers. Unlike the miner, who takes from the earth what can never be there again, and leaves behind him waste, dirt, and ugliness, the farmer puts back into the ground the nourishment his crops have taken, so that year after year his fields are beautiful with rich harvests. The farmer trims his hedges and cleans his ditches; he cares for the woodland trees, and helps to preserve the beauty of the English countryside.

CHANGES IN FARMING

Britain's farming lands "have been shrinking since 1921 at the rate of 31,000 acres a year," and chiefly in south-eastern England. The growth of big towns is partly responsible for this: notice, for example, how London has grown in that time! The ease and cheapness with which British people can get foodstuffs from overseas have made it more and more difficult to grow things at a price that will enable the farmer to get a living. So difficult has his position become that the Government has had to find ways in which he can be helped and encouraged. Under the Minister of Agriculture various "Boards" (or Committees) have been formed to assist farmers by trying to ensure them a fair price for their crops and animals, by stopping waste, by stamping out disease in plants and animals, and by protecting them as far as they can from foreign competition. Among such Boards is the Milk Marketing

Board, which controls the price of milk; other Boards deal with potatoes, or pigs, or bacon, or hops; and for the farm worker there is the Agricultural Wages Board, which controls wages and hours of work all over the country.

QUESTIONS AND EXERCISES

1. *Wheat* is chiefly grown in eastern England, especially in Cambridgeshire, Huntingdonshire, Hertfordshire, Buckinghamshire, South Lincolnshire and the Fens, Suffolk, Norfolk, and Essex. *Barley*, used for feeding dairy cattle and other animals, and also for making malt for beer, is grown largely in the same area. Make a map of Britain to show where most wheat and barley are grown.

2. Although milk is produced in almost every county in the British Isles, the chief regions are: Cheshire, Staffordshire, Derbyshire, Lancashire, Somerset, Wiltshire, Dorset, West Sussex, and south-western Scotland. Make a map to show Britain's chief milk-producing areas.

3. The Minister of Agriculture, in a speech made on October 28th, 1937, is reported to have said that between 1924 and 1933 the poultry population of England and Wales rose from 31 millions to 61 millions; that in 1924 the average man ate 120 eggs a year, half of them British, but in 1934 he ate 150 eggs, and two-thirds of them were British. In 1949 British poultry numbered over 95,499,000.

Where are the chief poultry lands of Britain? From what other countries do eggs come to Britain in large quantities?

4. Make a Land Utilisation map of *either* the area in which you live or an area which you are able to visit.

5. What can you learn from the photographs on pages 74 and 78 about the kind of rock of which each area is composed?

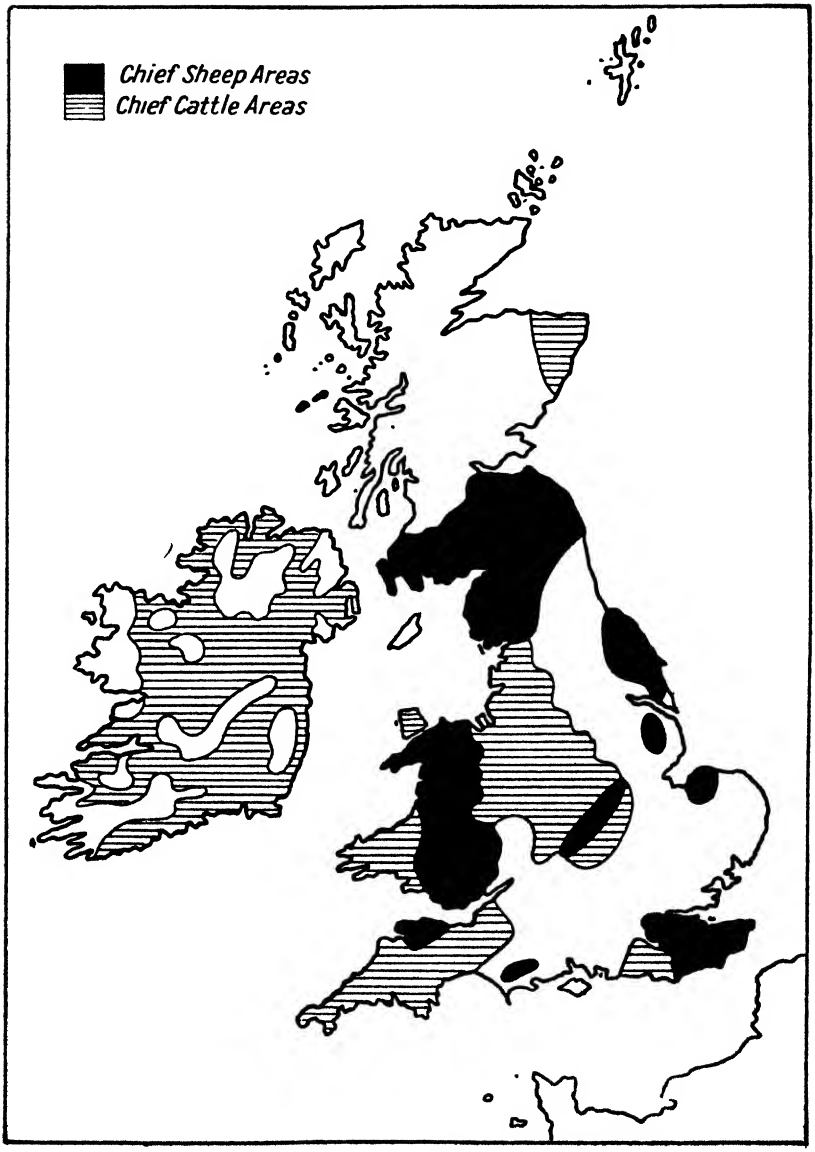
Chapter 8.

SHEEP FARMING

Sheep have always been the most important animals of the British pastures. In the Middle Ages they were reared chiefly for their wool, which was sent to Flanders to be made there into cloth; nowadays they are famous for their meat, although they have excellent wool as well.

In Britain there are over 19½ million sheep—twice as many as all other farm animals put together, and three times the number of cattle. One reason for this is that sheep will thrive where cattle and other animals cannot; they are naturally the animals of the moors and hillsides, and their small mouths enable them to crop the short wiry grass, such as is found on the chalk hills of the Downland country of south-east England. Cattle like longer grasses: have you noticed how a cow gathers in a mouthful of juicy meadow grass *with its tongue* before biting it off? Sheep will do well almost anywhere, except in places where water lies about a long time, making the ground too moist for them and giving them foot disease and other complaints. Foot-rot is one disease to which sheep are very prone, if reared where conditions underfoot are too damp.

You may see sheep feeding almost anywhere in Britain, except on high or barren spots without greenstuff of any kind and in low-lying waterlogged places. Even Londoners see them for a time grazing in the very heart of their great city—in Hyde Park. But sheep in very large numbers are found chiefly in the hilly and mountainous parts of the British Isles, as we



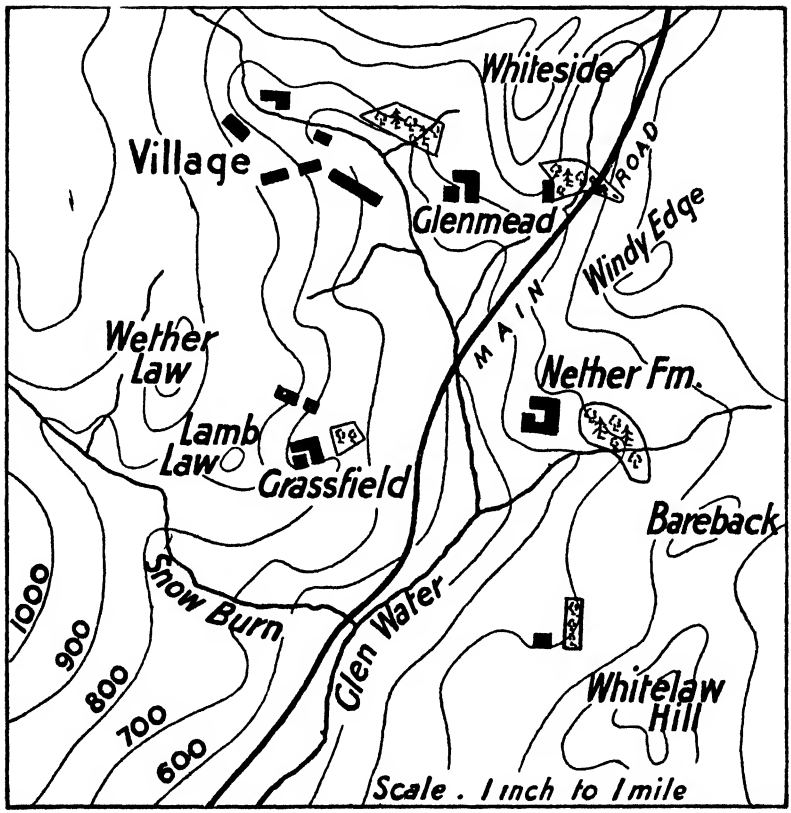
MAP TO SHOW THE CHIEF SHEEP- AND CATTLE-REARING AREAS IN GREAT BRITAIN.

can see clearly from the map on page 82. One of the places which have a large sheep-population is the upland country which lies between the lowlands of Scotland and the lowlands of northern England. It includes the Southern Uplands of Scotland, and the Pennines and the Lake District of England. Let us see what sheep farming is like in the Cheviot Hills, which are in the middle of this block of upland, and form part of the boundary between England and Scotland.

A SHEEP FARM AMONG THE CHEVIOTS

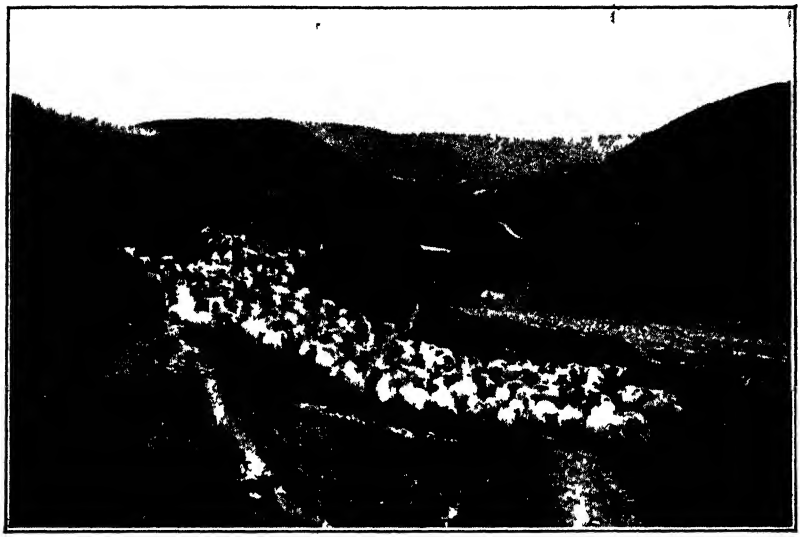
From one of the rounded hill-tops you can look for miles across a sea of others just like it to where the Cheviot—" a great dome of granite with a bog on top deep enough to sink a man "—rears his head to nearly 3,000 feet, so that sailors can easily see him from the sea, although he is a good 25 miles inland from the coast. There are wide stretches of high moorland, heather-covered in places, broad slopes covered with patches of bracken, and few trees. In summer this is a pleasant place to wander in if you love the quiet of the hills, the fresh breezes, and the moving patterns of light and shade made by cloud and sunshine. You must know the paths, or have a good map with you, for swamp and bog-land occur in awkward places, and it is unwise to lose your way. But in winter bitter winds sweep the moors and the hill-tops, and deep snow fills the hollows and lies deep in the drifts.

The farm, like scores of others, lies snugly in a deep hollow, protected by its " wind-break," or screen of planted trees, from fierce north-easters; the stone farm-



MAP OF A SHEEP-FARMING DISTRICT IN THE BORDER COUNTIES.

house and its outbuildings are built low to offer little resistance to the winds, and their long steep roofs, almost touching the ground where the hill-side lifts steeply behind, are ideal for shedding winter snow. Around it are a few small fields, few level, in which the farmer grows his vegetables and his hardy rye or barley, potatoes or turnips. Many paths and sheep-tracks lead away from the farm buildings and up to the high moorland; the



A Brown & Co, Lanark

A SHEEP FARM IN THE UPPER TWEED VALLEY.
The sheep being brought in for clipping.

rough road to the village farther down the valley is the farmer's "way out to the world outside." Along this road go the sheep to market, and the farmer's people to shop. Up it comes the postman with the letters, the little car from the village store, and the doctor if he is needed.

Peat cut from the moor in summer and stacked handy to the farm-house kitchen for use in the cold winter is the chief fuel; for trees are scarce and coal is dear and hard to get.

The grazing grounds stretch away up and over the moors out of sight of the farm-house; stone "hedges" divide them from the lands of neighbouring farmers. On the highest ground the pasture is coarse herbage and

heather, whose green shoots form good sheep "feed"; here the farmer keeps his hardy Black-faces, which can stand the cold and thrive on such pasture. On better slopes lower down, where fine crisp grass grows among the bracken beds, he keeps his white-faced, hornless Cheviot sheep. In summer-time you may meet flocks of them up there, the shepherds accompanied by their wise and clever sheep dogs, who understand, not only every word, but every sign of their masters.

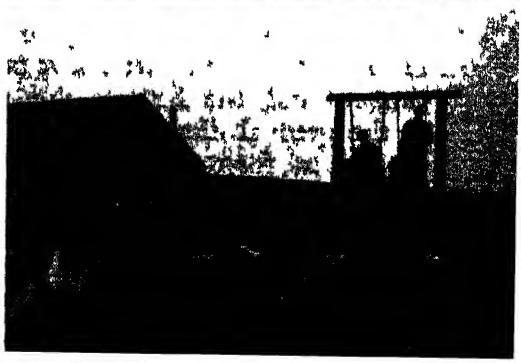
Hardy sheep remain up on the moors all winter, even in the snow, although they have now and then a little hay to eat when snow is deep. Weaker sheep are brought down in February to better pasture. In mid-April the lambs are born; in May the Cheviot lambs, and in early June the Black-face lambs, are marked with the farmer's mark. June and July are shearing months, and near the end of July sheep must be "dipped" to keep them free from insects (especially maggot flies, which are troublesome in August). Sheep for the butcher are picked out and sent down the road to the market in August, September, and October, and lambs are sold to lowland farmers in August for feeding and fattening during the winter on lowland grasses and turnips. Winter dipping is done in October, and the hardy sheep are all back on the moors for the winter. This upland farm, like many others, not only sends down sheep and lambs to the lowlands for meat, and fleeces of newly shorn wool to the woollen mills in the big towns; it also provides a steady supply of sturdy mountain-bred sheep to lowland sheep-farmers to improve their stock.

SHEEP-REARING SCENES

New-born lambs and their mothers. The mothers have to teach their babies quite a number of things! Nevertheless, new-born lambs are much more advanced than new-born cats or dogs.

Dipping sheep in the Southern Uplands in order to keep them free from troublesome insect pests. Where are the sheep actually dipped? What liquid is used? How frequently are they dipped?

Sheep shearing in the Southern Uplands. Describe what is taking place. How is this shearing different from that on a big sheep station in Australia? In what month does shearing take place?



OTHER FAMOUS BRITISH SHEEP LANDS

The English Lake District of Westmorland and Cumberland—" a land of mountain sheep, stone walls, grey crags, red bracken, and green grass "—rears the famous Herdwick sheep, which produce first-class mutton and wool, and are remarkable for their cleverness in steep places and their sturdy resistance to cold and wet. " A Herdwick ewe will scratch herself out of a snowdrift in which ewes of other breeds would wait patiently for death."

In many parts the landlords " let " flocks with the farms. The tenant farmer " rents " not only his farmhouse and land, and his pasture on the fells, but also his flock, which he is to manage and improve, and from which he is to earn a living. His wife gets milk from the cows and turns some of it into butter and cheese, eggs from her fowls, vegetables and small fruits from the garden. She can sell butter and eggs to pay for groceries and other necessary things, and so help her husband to reduce expense. The lambs soon increase the flock, with profit to the farmer. If the farmer gives up his farm, he must leave behind a flock of sound sheep as big as that which he found there when he first took over the land, or pay a sum equal to their value. In recent years many sheep farms in the Lake District have been bought for planting timber, and the farmers are not altogether pleased at the gradual disappearance of Herdwick sheep from these areas, for to them sheep are more important than trees.

Wales, whose mountain and hill pastures are very like those of the Lake District, has many sheep, famous

A SCENE ON THE SOUTH DOWNS

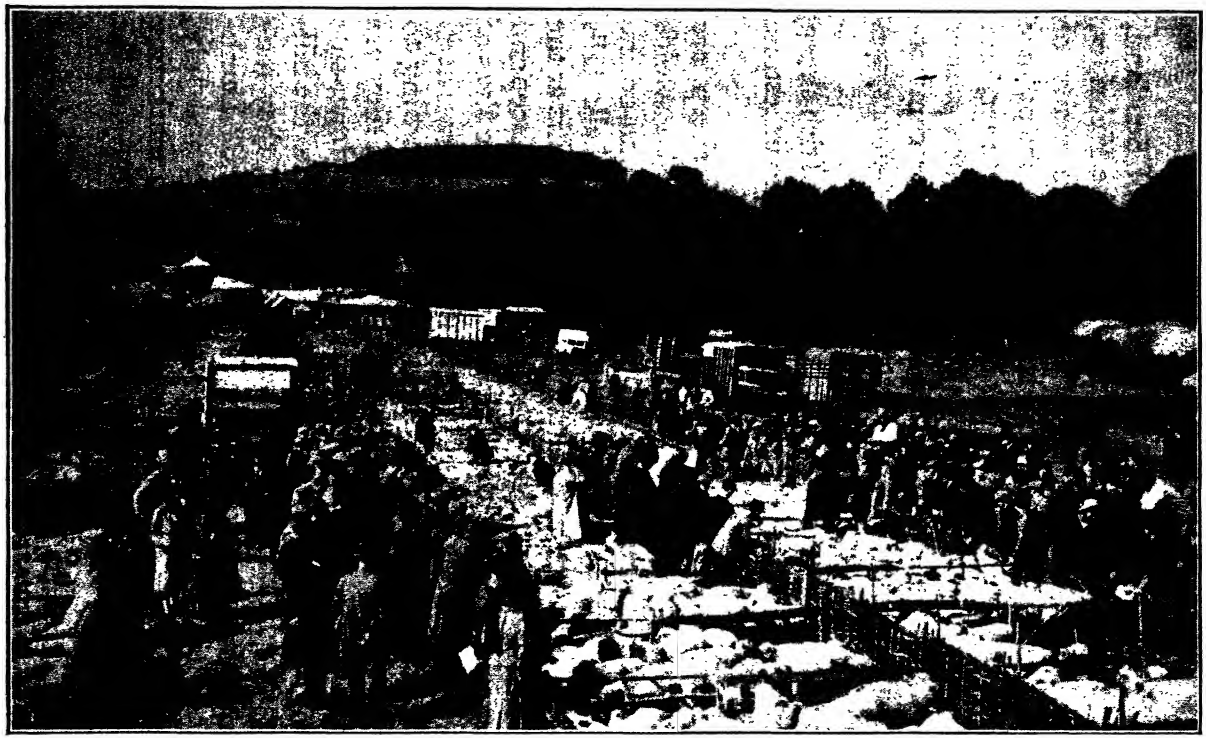
Notice (*a*) the steep escarpment, (*b*) the chalk pit, (*c*) the sheep

especially for their meat. The Highlands of Scotland, especially in the west and on the islands of the Hebrides, are also important sheep-rearing lands. In many of these bleak mountain sheep lands it is the custom to pasture the sheep on the higher slopes during the summer, and to bring them down to lowland pastures when winter comes—not only because it is safer and more comfortable for the sheep, but also because the upper pastures give enough " feed " only in summer.

Ireland has many more cattle than sheep. Irish sheep are commonest in the Wicklow Hills and in the limestone lands of Galway in the West.

In southern England large numbers of sheep are reared on the limestone hills that run from the Cotswolds across middle England to Humber and Tees, and on the English Downlands—the rounded grassy chalk hills which run from Salisbury Plain to their chalk cliffs at the sea's edge, e.g. Beachy Head, near Eastbourne. Sheep and sheep-rearing play a very important part in the lives of Downland country-folk. In the South Downs sheep graze on the open hillside during the day, returning to a field of clover near the farm for the night, if they are not driven into a " fold " of hurdles on the down-side instead. Early next morning the sheep go out to the hillside again. In the depth of winter, however, they may be kept for a time on one of the lower meadows. Lambing in spring, dipping and shearing in June and July, selling the wool, and in July to September marketing the sheep, keep the farmer and his shepherds busy all the year round.

In recent years, however, especially in Wiltshire and Hampshire, sheep and shepherds have disappeared from



"The Times."

FINDON FAIR.

The sheep have been gathered together and are being sold by auction. Where is Findon? Why are many sheep reared in that part of Britain?

many farms to make way for cattle and the dairymen, or for fields of grain, for hay fields, market gardening, and mixed farming.

For a very long time British sheep farmers have been unable to rear enough sheep to supply the many millions of British people with mutton and lamb, and the greedy woollen mills with the wool for garments that help to clothe them. Enormous quantities of frozen mutton and lamb, of wool and sheepskins, have therefore to be brought every year to British ports from the world's great sheep lands overseas to satisfy the needs of the people.

QUESTIONS AND EXERCISES

1. Find out from a book of reference how many sheep there were in Great Britain in 1950. If these could be equally divided among the population, how many would each man, woman, and child get?

2. Of what use are sheep (*a*) when alive, (*b*) when dead? Why does Britain import frozen mutton and lamb? From which parts of the British Commonwealth do they come?

3. Name two English, two Scottish, and two Welsh counties which rear large numbers of sheep. Draw a sketch-map to show where they are.

4. Draw a circle of 4 inches radius and divide it into twelve sectors of thirty degrees each. With the same centre, but a radius of $3\frac{1}{2}$ inches, draw a second circle. Write in the names of the months in the spaces between the two circles. Then try to complete the diagram by filling in the work of each month on a sheep farm.

Chapter 9.

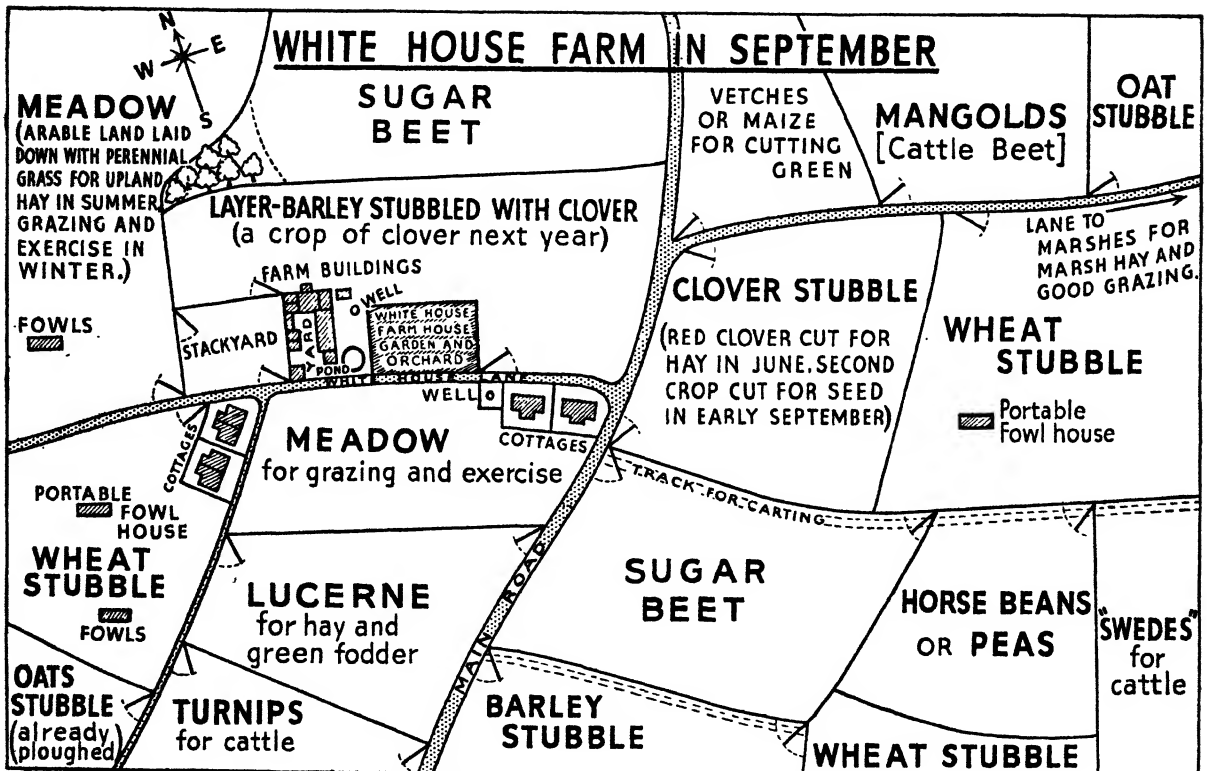
A MIXED FARM IN EAST ANGLIA

Now let us look at a farm near the borders of Norfolk and Suffolk, where the farmer has many interests—as indeed most farmers have—and does not rely upon one kind of farming for his living.

On page 93 is a rough sketch showing the general plan of White House Farm and several of its surrounding fields, in each of which is indicated what was there in the month of September. But next year the arrangement of crops will be different, because the farmer follows the "rotation" or change of crops usual in his part of the country. Examine the sketch carefully, and notice the points of the compass. The higher ground lies to the west of the main road; the ground slopes gradually from west to east where the marshes lie by the riverside.

It is clear that a big interest at this farm is *dairy farming*: we notice to the east rich meadow and marsh for summer pasture, to the west a large area of former ploughland—now laid down as permanent grass for hay in June and for cattle-grazing and exercise in winter—and to the south of White House Lane another large field for cows.

If we look at the crops in the fields, we see that many of them are growing cattle food—lucerne, mangolds, swedes, clover, turnips, and vetches or maize, that will be cut when green for use as summer fodder. Hay comes in summer from the "upland" meadow, and also from the marshes; but that has long been cut and stands as stacks in the stackyard in September.



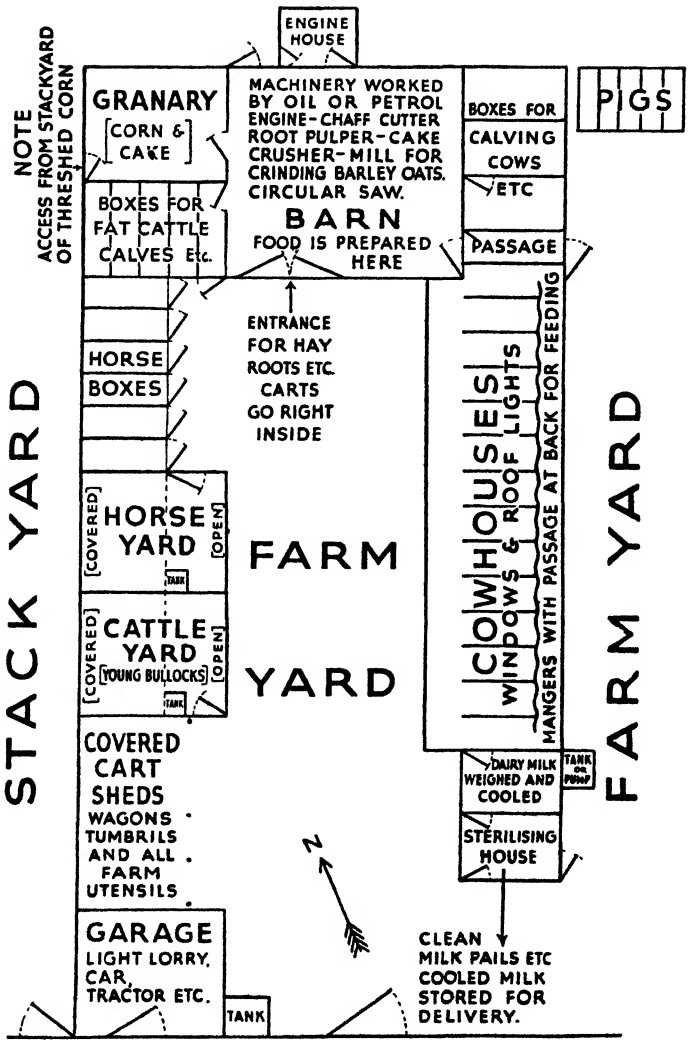
SKETCH-MAP OF PART OF WHITE HOUSE FARM.

THE FIELD CROPS

Now look at the other field crops: first the grain. As we should expect in East Anglia, the chief grains are wheat and barley, for eastern England is Britain's chief bread land, and barley for malting grows well there too. This part of England has excellent soil for wheat, and less rain and much more sunshine than anywhere else in the British Isles. Some oats are also grown on this farm for animal food; potatoes and more wheat are grown on fields not shown in the sketch.

Two large fields are devoted to sugar-beet, a crop that is becoming common in eastern England, for it is a good "money crop." In September the beet are not yet lifted, but in October the big sugar factory not far away will be clamouring for them, and lorry-loads of clean beet will be speeding to it along the main road. The farmer is paid so much per ton for his beet, and so much more according to the amount of sugar extracted from it. Beet may be large, but may not contain as much sugar as smaller stuff; "sugar content" is more important than weight, and depends in the main upon *sunshine*. The green tops of the sugar-beet are useful for feeding cattle; or they may be ploughed in as vegetable manure.

Oats have already been cut, and in one field the plough has been at work. Next year the farmer will put a root crop there. Wheat and barley have been reaped, and only the stubble is left. Notice how the farmer has put a portable fowl-house in the wheat stubble so that the hens can pick up the many stray grains; but *not* in the barley "layer," where already the green of young clover (sown with the barley) shows sturdily—fowls would pull this up.



SKETCH-PLAN OF WHITE HOUSE FARM BUILDINGS.

Besides the wheat and the barley—both "money crops" —there is the straw, which is stacked ready for use. The wheat straw is useful for thatching and for "bedding" animals, whose droppings turn it into valuable natural manure to enrich the land. The barley straw is cut up into chaff and mixed with other things to feed animals.

The lucerne has been cut *three* times already—it is a wonderful fodder crop—and may now be used for cattle grazing and exercise in winter.

The mangolds and swedes, in September showing up green, gold, and red, are pulled in October and stored in "clamps" for winter feed—the last of the farmer's harvest in the year. The fat red, green, and yellow roots are covered with straw, over which earth is put, leaving here and there naked straw for the roots to "breathe." The finished clamp looks like an indefinitely stretched Noah's Ark, its sloping sides as smooth as a bar of chocolate, with tufts of straw projecting at intervals. Potatoes, parsnips, carrots, and turnips are preserved in clamps like this. The turnips on this farm were planted late where another crop had failed; they grow quickly and are ready to pull in two months after sowing.

The horse-beans and peas are animal food; like clover, they prepare the land for a grain crop, because in their roots they store the nitrogen that is so necessary to wheat.

DAIRY FARMING

Look at the plan on page 95, which shows the general lay-out of the principal farm buildings. Notice how carefully everything has been planned, and particularly the amount of space given to cows and dairy work.

The cowman (and there are several on large farms)

DAIRY FARMING SCENES

THE COWSHED

This picture shows the front view of the cows. How are they kept in position? Note that they can eat and drink whilst being milked. Each cow has its own stall.

AUTOMATIC MILKING

Here we see milking in progress. No milkmaids are required. Why? Compare this picture with that on page 99. Notice how scrupulously clean the sheds are kept. This is, of course, extremely important.

SCIENTIFIC MILK-TESTING

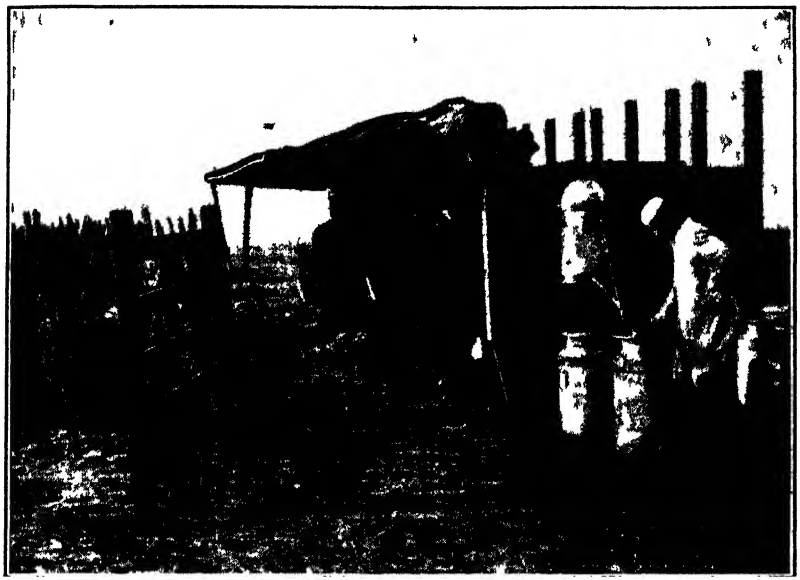
This is a view in the laboratory attached to the dairy. What kind of work is this young lady engaged in? Why is her work important to the farmer as well as the consumer?

Milk Marketing Board

lives in one of the farm cottages free, or pays a very small rent of a few shillings a week. Like the horseman, his hours are longer than those of other farm workers, and he must work seven days a week and be ready to stay up all night if a cow is ill or needs special attention. He knows every cow by name—Betsy, Beauty, Violet, etc., or in these days of "pictures," perhaps Greta, Merle, June, etc.—and every cow knows him. In summer he fetches the cows from the meadows by the river, where they have been all night, driving them *slowly* to the farm, letting them have a drink at the pond or in the cowhouse, where each has its own stall, "as clean as a new pin." Here the cows are milked; everything is kept scrupulously clean. The milk is weighed, and cooled in a milk cooler before going off on lorries to the railway station. The cows are now driven off to graze again; but the calves must be fed, and the cowhouse thoroughly cleaned down and fresh straw laid for the afternoon milking—for the cows are milked twice a day. Pails, cans, and everything used in milking are scoured and rinsed in clean cold water and scalded, ready for use again.

On very large dairy farms much of this work is done by machinery. There you may see great modern cowsheds big enough to hold 150 animals at a time, with a milking shed equipped with machines that milk the cows, weigh the milk, and "time" it, convey the milk to the dairy, release the milk to the cooler, cool it, test its temperature, and fill the milk churns or bottles with the perfectly pure and clean milk.

In winter the cows usually sleep in the cowhouse on White House Farm; in other farms they may sleep in



A J Hosier

COWS THAT NEVER COME HOME

For cows left to wander over miles of unfenced Downs, instead of being brought to the farm for milking, portable milking sheds, fitted with electric light and petrol engine driven milking machines, are taken to the herds

the covered yard. During the day they go out for grazing and exercise on the upland meadow, or other fields near the farm, for the marsh meadows are now too swampy and cows get dirty there. Grass is poor now, and the cows must have cattle cake, pulped roots, chopped hay, and other extra food in the field or in the cowhouse—the meadow in winter gives the cows exercise rather than food.

The cowman has now to feed the calves and "young stock," as well as bullocks being fattened for beef—all of which are "indoors" in winter in the yards or in stalls. Besides all this, he "lends a hand" with the pigs, numbers of which are reared on the farm. Pigs

Milk Marketing Board

BANDAGING CHESHIRE CHEESE

thrive on what would otherwise be waste—and so do poultry. We forgot to notice that this farmer has a large flock of Norfolk turkeys, many of which will be in fine condition for Christmas; just now they are gobbling and foraging round the stackyard, but soon they will be having special food—rejoicing, doubtless, at their good luck and knowing nothing of the future that is in store for them.

This connection of pigs and poultry with dairy farming is particularly well seen in Lancashire, a county which keeps more dairy cattle than any other except Yorkshire. Lancashire has by far the largest "poultry population" of all the counties in Britain, and the poultry business is more scientifically run there than anywhere else. Pigs are reared on a large scale too; years ago they were largely fed on the whey left after cheese-

making, but now that much less cheese is made because more milk is being drunk, the pigs are fed chiefly on other things than milk waste. Pigs and poultry are also important in the dairy farms of Eire.

Poultry farming, like market gardening, is also carried on nowadays as an industry independent of large farms, especially near big towns, where there is a constant demand for the products.

QUESTIONS AND EXERCISES

1. If you live in the country, make plans (like those on pages 93 and 95) of any farm you know.

2. Here is the year's work, month by month, on an Essex farm. Make a record like it for your own district.

Jan.—Hedging and ditching. Ploughing when weather permits.

Feb.—Ploughing, hedging, and ditching. Rolling and drilling (oats and spring wheat).

Mar.—As in February. Plant potatoes.

Apr.—Rake meadows with scarifier to get off rough loose grass. Drilling: mangolds and swedes (which cannot stand frost). Hoeing with horse hoe.

May.—Ploughing land to leave it bare for autumn planting (winter wheat and oats).

June.—Cut lucerne. Early haymaking. Pea picking.

July.—Haymaking. Beginning of harvest, oats first.

Aug.—Harvesting wheat, barley, potatoes. Beans last.

Sept.—Finish harvest. Ploughing stubble fields.

Oct.—Ploughing. Harvest mangolds and swedes and put in clamps. Sow winter oats.

Nov.—Sow winter oats, barley, wheat. Begin hedging and ditching.

Dec.—Hedging, ditching, ploughing. On wet days clean machinery, overhaul carts, mend harness.

3. Construct a diagram to show the work on the above Essex farm month by month (see Exercise 4, on page 91).

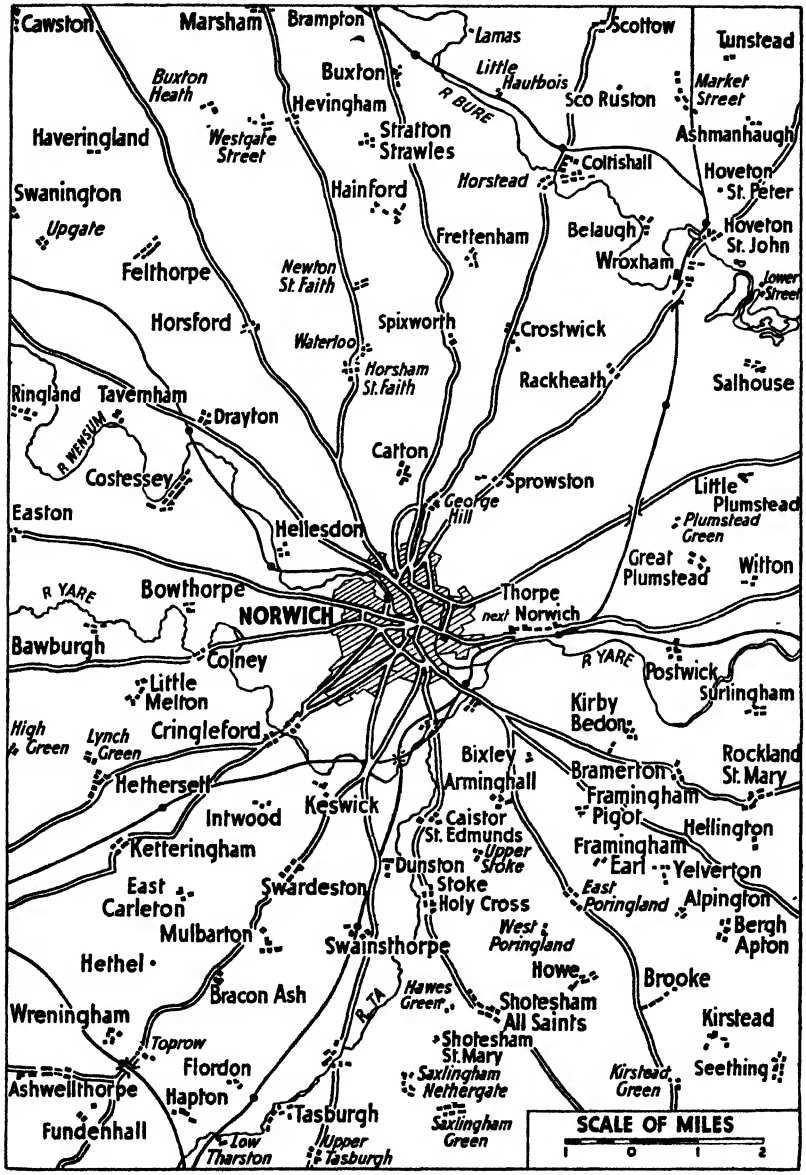
Chapter 10.

A MARKET TOWN

For centuries the chief centre of an English farming district has been its market town, where farmers and their families for miles around go to sell what they can spare of their farm products, to buy things which they cannot grow, make or produce on their own farms or in their villages, and to find the amusement and recreation which they cannot get at home.

Such market towns are situated at points where many roads meet, and are therefore easily reached by country-folk from surrounding farms and villages. Buyers and sellers meet there from town and country; some, indeed, may have come quite long distances, for traders and "cheapjacks" of all sorts travel from one market town to another. Each market town has its own special market day or days in the week. In a farming county there is not only the large market town but also several small ones, and markets are arranged, as far as possible, so as not to "clash" with one another.

We can see market towns in operation best, perhaps, in eastern England, which is, above all, a region of farms and farmers, of country villages and market towns. Let us choose the largest market town in eastern England—*Norwich*—and see what goes on there. This city is easy to reach from all parts of the farming country of eastern England, for thirteen or fourteen main roads lead to everywhere from its heart, like the spokes from the hub of a wheel (see the map on page 103). Lines of fast buses, which have changed



MAP OF NORWICH AND THE SURROUNDING AREA.

many things in the lives of country-folk in Norfolk, as, indeed, they have all over rural Britain, link the villages and lonely farms with the market and the city.

Norwich has three railway stations, one of which is for "goods" only. Of the others, Thorpe Station (see map on p. 111) is the more important. It is a passenger terminus from London. Nowadays, too, people in a hurry can *fly* there, for Norwich has its own airfield on the uplands north of the city.

We must go either on Saturday or Wednesday—the market days. If we want to know what is for sale, we can look at a copy of the *Eastern Daily Press*, and on its front page we shall find the announcements of the leading auctioneers who sell in Norwich Market, as well as advertisements of firms who show goods—especially farm machinery—needed by up-to-date farmers. Norwich has one of England's biggest *cattle* markets—in which are sold cattle, not only from the county of Norfolk and eastern England, but from the Midlands, Lancashire, Scotland, and even from Ireland. The latter are usually "store" cattle, brought over to be fattened for beef by Norfolk farmers. There are *sheep* too, and numbers of *pigs* of all sorts. Now we understand why we saw so many long trains of cattle trucks outside Norwich station, and why local passenger trains are so crowded on market days.

AT THE MARKET

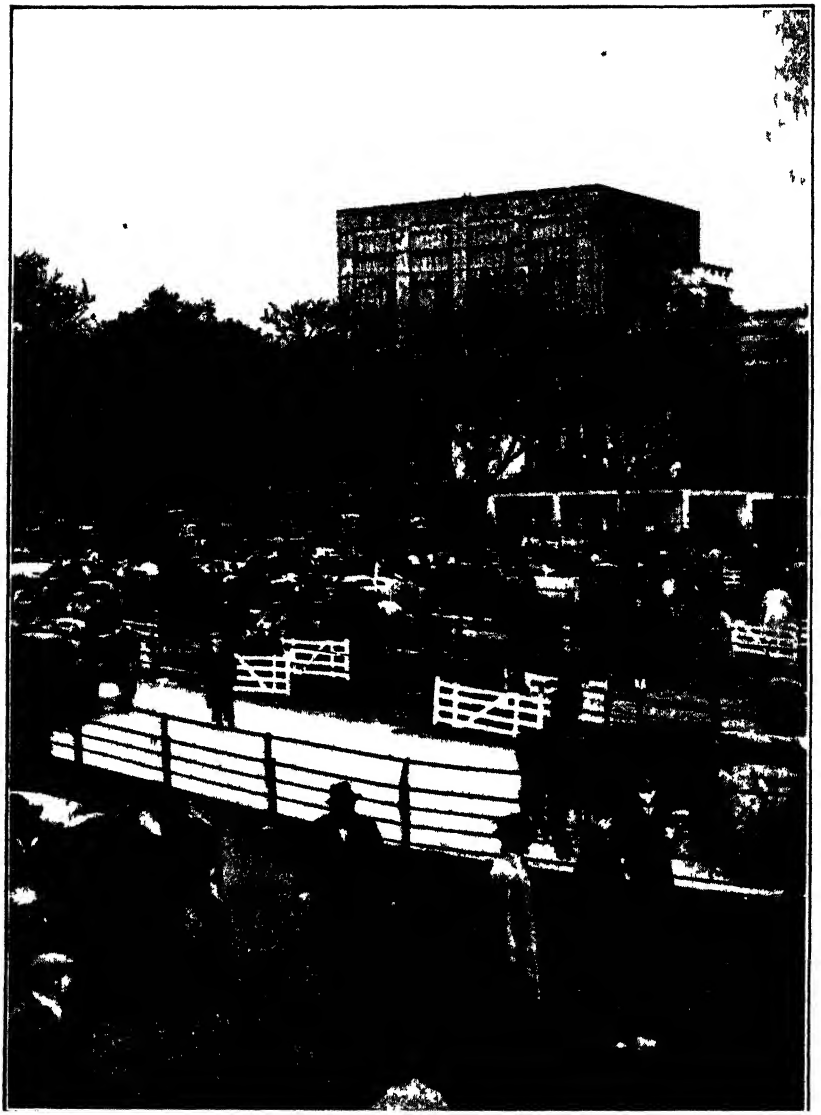
All roads seem to lead to the cattle market to-day: to find it we have only to follow one of the droves of cattle on the way there, or the big lorries with covered tops, containing fine beasts. In any case, the old Norman

castle stands there high on its mound and foursquare to the winds; it has stood overlooking the market for some nine hundred years, and is now an interesting museum.

Long before we reach the market we *hear* it: bleating sheep, lowing cattle, bawling calves, squealing pigs, barking dogs, and shouting drovers fill the air with busy noise. We turn down Crown Road between the G.P.O. and the Agricultural Hall and find ourselves with the market before us. Closely penned in their enclosures are sheep and lambs; beyond are pen after pen of cattle, with their drovers clad in thick boots, leggings, rough clothes, and neckcloths, armed with their usual sticks, and attended by intelligent and active dogs. Frightened cattle coming in make sudden leaps and darts for freedom; but the drover seems to know what their intentions are long before the animals can carry them out, and so does the dog—drover and dog, with surprising ease, keep the creatures in the way they should go.

In some pens and around them are groups of men deciding what they will buy when the auctioneer comes along with his clerk, or buying what they fancy before the auction begins. The stony paths between the sets of pens are now no place for strollers—we go on to the south-east corner, where are pens of very clean pink-and-white or smoky-black pigs, of all sizes, each marked on the back with its letter and number, and raising complaint with voices that range from piercing treble squeaks and squeals to bass grunts and roars. Buyers are here too, poking and prodding, bargaining and joking.

On the market edges are spaces for the new tractors,



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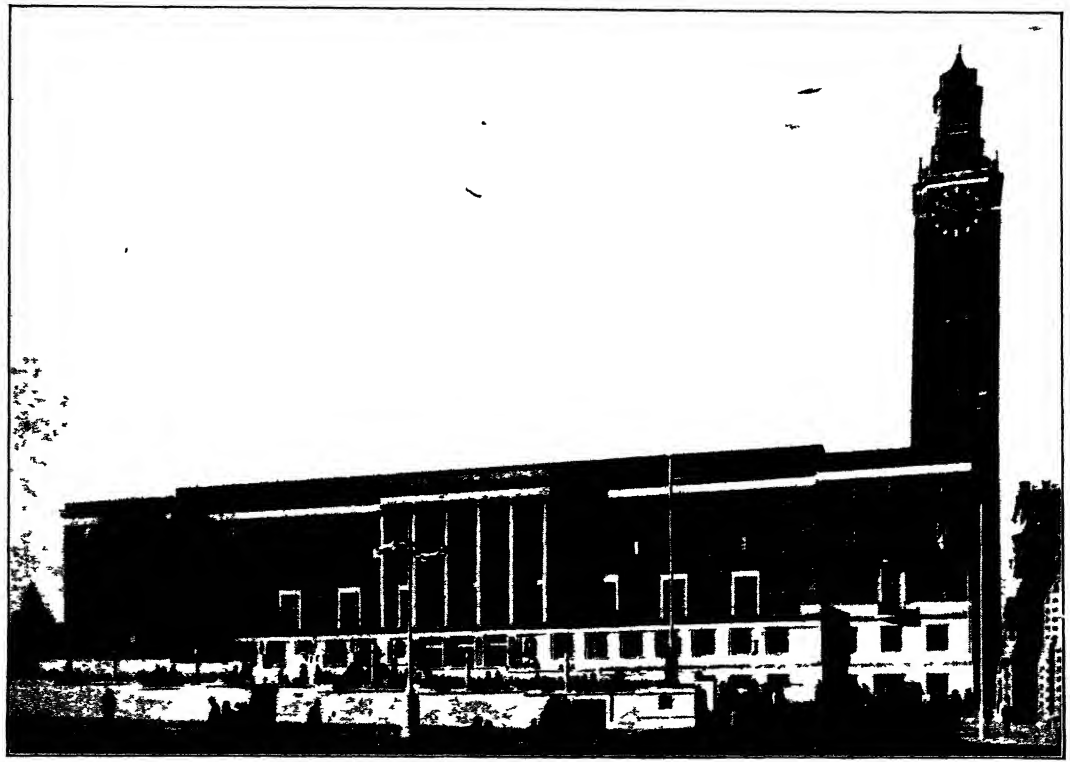
THE CATTLE MARKET, NORWICH

Find the cattle market and the Castle on the map on page 111.

binders, drills, and other modern machinery. Some of these seem to us very complicated. Around the market, especially on the south-east side, are the stores of merchants who sell farm implements—ropes, baskets, chains, harness, and hosts of other things interesting and useful to farmers. There are several hotels, many inns, restaurants, shops, and garages too; and in the south-west part, beneath the shadow of the Castle, is the parking-place for farmers' cars. Side streets are packed with more stores full of goods needed by farmers and their households, or attractive to farmers' wives and daughters. Main streets not far away are bright with fine shops, with "picture" and other theatres within easy reach.

We pass down a side street and find ourselves in the old market square, with the ancient Guildhall at the north-eastern corner, and behind that the fine new City Hall (see picture on page 108). At the southern end rises the towered bulk of the old Church of St. Peter Mancroft. The square is filled with booths in neat rows, with alley-ways between. All sorts of goods are for sale; chief amongst all are the fruit, flower, and vegetable stalls, where piles of green and gold, scarlet and purple, tempt purchasers, and where twopence goes farther than it does anywhere else in Britain! Fishmongers and butchers, booksellers and ironmongers, cheapjacks and sellers of odds and ends—all have a place here.

When evening comes, the tide of people and animals begins to flow out of Norwich as it came in at early morning. Farmers' cars, buses, loaded or empty lorries, droves of cattle, flocks of sheep crowd the roads for a time. The market is shutting up, cleaners are already at



A E Coe & Sons, Norwich

THE CITY HALL, NORWICH.
In front is part of the market square, on the right a small portion of the Guildhall is visible.

work, and soon it will look as if no market day had happened for weeks. There is one place we have not seen, and that is the Corn Hall, where farmers take samples of their grain to show the buyers who come to purchase it. We find it in Exchange Street, not far north-west of the Castle. Besides the market and the shops, where people get money or spend it, there are also close by places where they can save it or invest it—branches of the chief banks and insurance companies, which are usually busiest on market days.

INDUSTRIES IN THE MARKET TOWNS

A market town of this size and importance surely has several industries: indeed, on our way to the market we have noticed more than one great rectangular building, with many windows and a tall chimney—without a doubt a factory of some sort. Besides, we have heard of Colman's Mustard and Caley's Chocolates, which have been famous in East Anglia and elsewhere for many years.

We can quickly find out what the chief industries are by consulting the city *directory*. Almost at once we discover at least a dozen important boot factories—more than enough to give Norwich a prominent place in Britain's boot-and-shoe industry. Next we find one or two large clothing factories; silk mills; big works that make agricultural implements, portable buildings, aircraft, or steelwork; tobacco factories; mustard works; makers of starch and " blue," cornflour, breakfast foods, mineral waters, and Christmas crackers; several large breweries, brickyards, and tileworks; and many smaller businesses. Most of these industries satisfy the needs of the city and the country round about.

Some of these industries, such as brewing, use up products of farms; others, like boots and shoes, mustard, and clothing, began by using local farm products, but nowadays depend chiefly on supplies from abroad; others must obtain their raw materials from outside the county, perhaps from overseas. The fact that Norwich is a port, easily reached from the sea by motor-vessels and coasting craft up its river, the Wensum, explains how the city can get not only some of its raw materials by water, but also its supplies of fuel and oil. For there are no coalfields in Norfolk; there is electricity, though, and, striding over the countryside, you can see the pylons and poles carrying the distributing wires of the "grid" serving this part of England, benefiting town and country, farmers and manufacturers everywhere.

Norwich port is connected also with the many waterways (including the famous "Broads"), and uses them by sending goods by wherry, barges, and small steam craft to many outlying towns and villages.

THE GROWTH OF A CITY

We can hardly leave this beautiful old city of Norwich without visiting the Cathedral, the Guildhall, the ancient houses and inns, the Strangers' Hall, and other famous buildings.

We might discover too, from our walks, our guide-book and our maps, that the first Norwich sprang up on the higher ground where the Castle was built on its mound within a great bend of the Wensum. We can

PART OF THE 6-INCH MAP OF NORWICH.

BARRACKS
Cow Tower (Remains of)
Great Hospital
St Helen's
BISHOPGATE
Pavilion
THE CLOSE
Cricket Ground
Upper Close
Lower Close
PALACE ST
WENSUM ST
STREET
PRINCE OF WALES ROAD
KING STREET
UPPER KING ST
CROWN ROAD
P.O.
BANK PLAIN
SYNAGOGUE ST
ST ANDREW ST
LONDON STREET
CASTLE MEADOW
ST GEORGE STREET
COLEGATE
DUKE ST
GENTLEMANS WALK
WESTWICK STREET
ST BENEDICT STREET
ST GILES STREET
ST STEPHEN ST
Goods Station

trace bits of the old city wall that ran from one side of the bend to the other, but included also some land to the north outside the bend. The Normans had to build their cathedral on lower ground inside the bend.

The time came when Norwich grew *outside* the old city walls. We can see that the streets are straighter and better planned outside the old wall-line than the crooked, confused, and often narrow streets of the old town (see map on page 111). We notice too that modern things, like the railway stations, the great military camp and the aerodrome, as well as the large works near Thorpe Station, are well outside the line of the old walls.

QUESTIONS AND EXERCISES

1. Norwich is within easy reach of the Norfolk Broads. What are they, and how were they formed? Why and when do many people go there? Collect some pictures of the Broads.

2. Norwich was one of the places where foreign weavers settled in the sixteenth and seventeenth centuries. What work did these weavers engage in? Worsted and Kersey are two villages near Norwich—do their names stand for anything else?

3. Many machine owners (themselves large farmers) let out machines to smaller farms. Why? What kinds of machines are let out?

4. In small towns of Norfolk and Suffolk are many foundries, small ironworks, breweries and sugar factories. Explain this. What are made at such places?

5. If you live in or near a market town, try to find out interesting facts about it. Map all the facts that lend themselves to this form of expression.

6. How many towns do you know of that, like Norwich, are cathedral cities with ancient markets and castles?

Chapter 11.

COAL

Coal is still our chief source of heat, light and power; it warms and lights our homes, it drives the machinery in mills and factories, and it runs most of our trains and ships. From coal we get the gas that we use in a hundred ways, and scores of other valuable products—coke, tar, beautiful dyes, benzol for motor spirit, and other things. Even the electricity which is becoming more and more used in Britain in these days comes from great power stations that are chiefly coal-driven; for although we use some of our water power for generating electricity, Britain is not like Norway, or Italy, or Switzerland, which get nearly all their electrical power from their waterfalls and swift rivers.

It is fortunate for Britain that she has much coal. Most of it can be mined, and most of it is near the sea, so that it can be sent away by water. Some coalfields, indeed, like the great South Wales coalfield and the Northumberland and Durham coalfields, actually stretch to the seashore. Nearly a million British workers get their living by coal-mining, or by doing work of some kind in getting, preparing and selling it, or sending it away.

COAL-MINING AND MINERS

Coal-mining, like most other British industries, has changed a great deal in recent years. Gone are the bad old days when young children worked long hours down there in the dark, pulling tubs or leading pit ponies, and when miners faced appalling dangers without proper

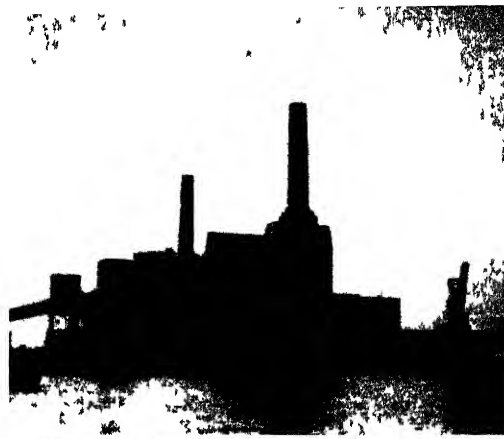
safeguards. The miner of to-day is generally a cheery soul, fond of the open air, proud of his home, keen on hard and vigorous sport, and a great lover of birds and animals. There are thousands of miners' homes to-day, well away from the grime of the pit, bright and cheerful, with gardens, and near open spaces where games can be played. But there are still backward mining areas where housing is bad and working conditions very unsatisfactory; in time, all this will be changed.

In every coal-mine strict rules must be kept to ensure the safety and welfare of the miners. The mine must be kept drained of water by powerful pumps to prevent flooding. It must be properly ventilated: a second shaft is sunk, smaller than the main shaft up and down which the " cages " go, to provide fresh air, and the bad air is sucked up from the mine by great fans and special machinery, to be replaced by good air from the " down-cast " shaft. Open lights of any kind are forbidden, because of the ever-present risk of gas explosions. Every mine must make provision against accidents of all kinds as far as possible.

To make mining safer and to provide better conditions for miners there is now a Miners' Welfare Fund, which is raised by taking a halfpenny a ton on all coal got from the pits. In 1949 the total amount of coal raised in British mines was 215,126,000 tons. If you find out what 215,126,000 halfpennies come to, you will know how much went to this fund in that year. Besides all this, clever scientists, under the direction of the Safety in Mines Research Board, are constantly working at problems of many kinds to make the work below ground safer and better.

USING COAL TO GENERATE ELECTRICITY

This magnificent building is the Battersea Power Station, which stands on the south bank of the Thames. Coal is brought by river and is automatically conveyed from the barges to the power house. How is this done?



This interior view of the Battersea Power Station shows the machinery which generates the electricity. What are these machines called? How is electricity stored?

This shows how electricity is usually carried from power houses to all parts of the surrounding country. Why is this method not practised in the case of Battersea?

Central Electricity Board

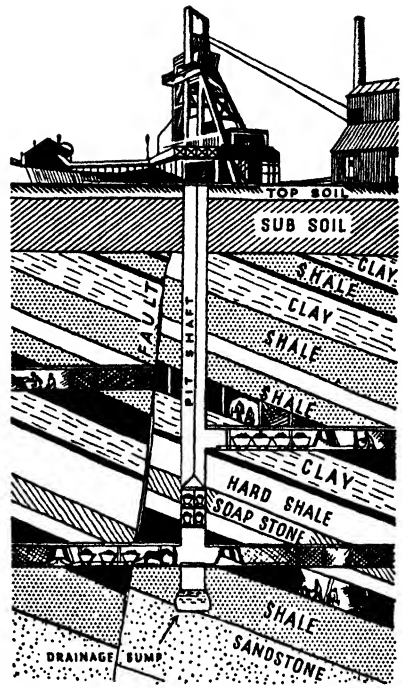
Let us see what a great modern colliery is like. We will choose one in south Yorkshire, not very far from Doncaster, where coal-mining is carried on by up-to-date methods.

WORK IN A COLLIERY

The colliery buildings cover much ground. Towering above the big block of miners' baths, the water tanks, sheds, and offices are the steel frames of the "head gear" supporting the big wheels, over which pass the steel cables of the cages that go up and down the pit shafts. Above all, the tall chimney of the boiler-room furnaces sends out a long plume of smoke. This mine makes its own electricity as well as using a great deal from the "grid" supply outside; and it employs steam power for the great pumps and for other machinery. The big "drum" in the engine-room that winds up the steel cable supporting the cages is as high as a house, and so perfectly does it work that it can drop loaded cages 2,850 feet to the bottom of the pit in forty seconds—yet land them there as gently as the settling of a fly.

The miners work in groups, called "shifts." As one "shift" finishes work, another begins. One of the two cages in the shaft brings up the tired miners, while its companion cage is dropping swiftly with other miners going to work. At the pit-head baths each man has two lockers, in one of which he keeps his dirty pit clothes and in the other the suit in which he comes and goes above ground. At the end of a shift he takes off his dirty clothes on one side of the bath, has his bath, and steps out on the other side to dress properly for going home. Between shifts the bath-house is cleaned and miners' pit clothes dried.

A miner going down takes with him one of the thousands of electric lamps that hang on hooks, all ready with glowing eyes in the big lamp-room. He wears heavy boots and a pair of shorts, for at the coal face the temperature is round about 80° F. and you do not need many clothes working in a place like that. With some forty other miners he steps into a descending cage, the steel doors clang to, a bell rings, and the cage drops swiftly to the bottom.



A SECTION THROUGH A COAL-MINE.

Anybody expecting to see a dirty, gloomy hole down there would be surprised to find that the bottom of this pit-shaft reminds him rather of a "tube" railway. Many railway lines meet there, coming from tunnels whose roofs are held up, not by wooden pit-props, but by steel frames. Long lines of tubs (or coal trucks), some full of coal and others empty, are moving along the rails under the electric lights. The miners, with their water-bottles and "snaps" (lunches), get into a little electric train, or cars something like those on switchback railways, and in less than half an hour are 2 miles away, at the "coal face"—a shining black seam of rich coal 7 or 8 feet high.

Miners do not use " picks " here. They work with " coal cutters " that are not unlike the drills used by road breakers, but very much lighter. In some mines mechanical coal cutters are used. With these they cut out the coal, which is put on a conveyor belt to carry it to the waiting " tubs " on the lines not far away. As each tub is filled it is " clipped " by a steel clip to the ever-moving steel cable that drags it off to the shaft bottom.

No pit ponies, no boys, are used in this work: most work in this mine is done by machinery, in which electricity and compressed air as well as steam play their part. Ten thousand tubs a day have to be moved backwards and forwards: the cages carry nearly five tons at a time—three tubs on the upper and three on the lower decks.

At the pit-head the loaded tubs glide first to the weighing machines, and then are caught up by monster hooks and overturned, so that the coal falls on to moving screens which get rid of dust and small stuff before the good coal passes along on a moving belt to pickers, who remove stone or rubbish as it goes by.

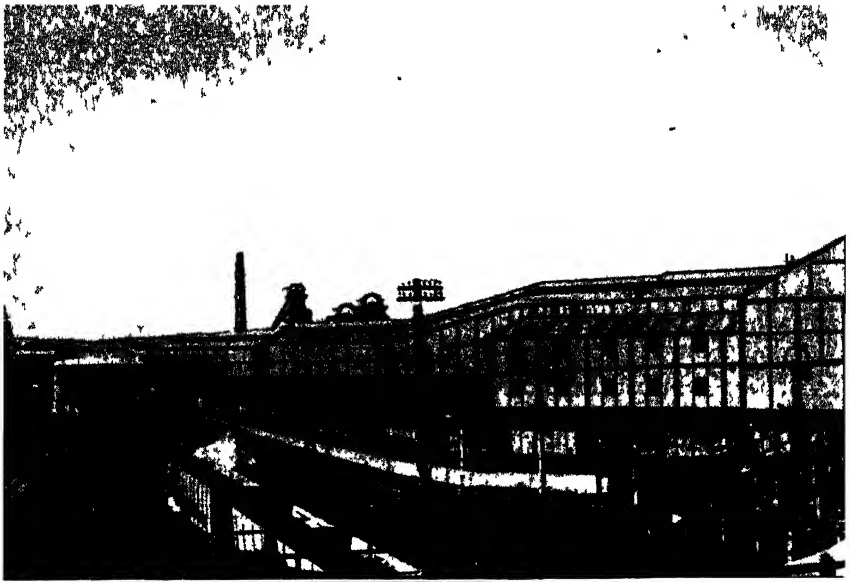
The coal is washed or dry cleaned, and then sorted by machinery into several sizes. It is then loaded into railway trucks, ready to go away to all parts of Britain. From the railway line you can see great ugly hill-like mounds or " dumps " of rubbish which has been taken from the coal and " shot " there by hoppers moving up and down on an endless chain. A colliery like this expects to get about 20,000 tons of coal every *week*, so we are not surprised to discover that its pit-head baths are built to serve about 2,000 men.

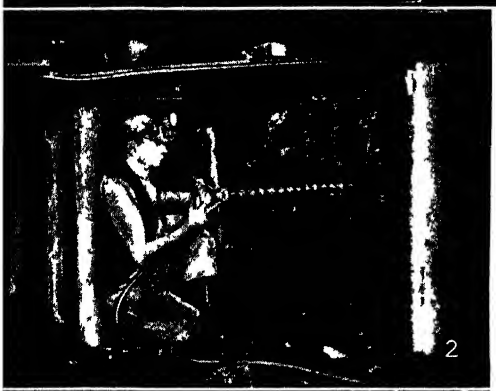
THE OLD AND THE NEW

Working conditions on some coalfields are still behind the times: miners toil below ground often in crouching positions that make work doubly hard; pit ponies still haul the tubs instead of electricity; and miners' homes are so small and uncomfortable that it is a marvel how their wives make them as bright and cheerful as they do. Contrast these conditions with those at the *Ashington* colliery on the great Northumberland and Durham coalfield—another very up-to-date concern.

"The yellow-tiled buildings, in their setting of green lawns and flower-beds . . . the great automatic electric winding machine, as yet the only one of its kind; the electrically driven conveyors speeding the hewn coal to the washing and screening plant, which mechanically sifts the stone from the coal and separates the latter in sized lots. . . . The galleries of the pit are brightly lit by electricity, where men now work in a standing position with an electric hewer. . . . Automatic machinery, workshops, and laboratories all play their part here before the coal reaches your cellar. . . . Around the colliery are green trees and hayfields unsmirched by grime or smoke. . . . Modern cottages, with hot running water and electric light, have been built by the colliery company for the miners' families. Playing fields and clubs are provided." This is as it should be.

Now let us study a few photographs of this modern Ashington colliery, taking special care to notice the use of labour-saving devices. Work underground is never pleasant, and it is right that every effort should be made to make machinery perform as much of the hard and difficult work as possible.





ASHINGTON

1. GENERAL VIEW OF THE PLA

The winding gear on coal reaches the surface. is picked, cleaned (both used), graded, and finally

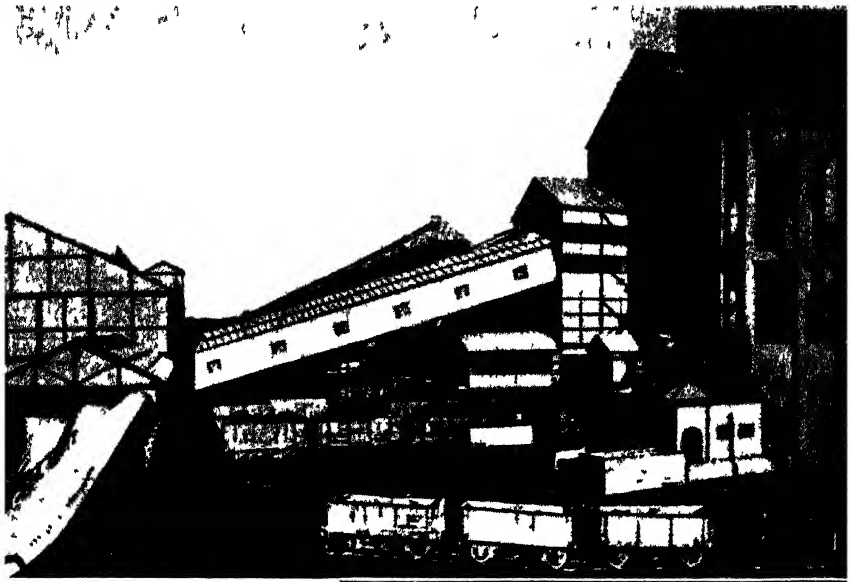
2. DRILLING

This electric drill makes deep holes in the coal for the explosive. Notice (*a*) the collier's lamp, (*b*) how the roof is supported.

3. LOADING THE CONVEYOR

The charge has been fired ; the loosened coal is loaded on a moving band or conveyor.

Photos by Ashi



COLLIERY.

LEANING AND GRADING

e left shows where the
these buildings the coal
t and dry processes are
led into railway trucks.

4. FROM CONVEYOR TO TRUCKS.

The conveyor delivers coal into tubs or trucks on the haulage road to the shaft.

5. PICKING BELTS.

At the surface, the tubs in turn deliver coal to moving belts; pickers take out stone and rubbish. Next, machines sort the coal into sizes.

Coal Co. Ltd.

THE CHIEF BRITISH COALFIELDS

Coal is by far Britain's most important mineral; about 220 millions of tons are mined every year, and its value is nine times that of all other British minerals put together. In spite of the rate at which British coal is being used up, scientists calculate that there is still left more than enough to last for the next five hundred years.

The map on page 48 shows the positions of the chief British coalfields, but do not make the mistake of supposing that the area covered by the coalfield on the map tells how important it is.

In *England* the coalfields lie chiefly (*a*) on the flanks of the Pennines and (*b*) in the Midlands. Smaller ones are in Somerset and in Kent (the newest of all). By far the most important is the great Yorkshire-Derbyshire-Nottinghamshire coalfield, extending from Leeds to Derby and Nottingham. In *Wales* the main area is the South Wales coalfield, which has several different kinds of coal and is about as large as the Yorkshire-Derbyshire-Nottinghamshire coalfield of England.

In *Scotland* the three coalfields lie in the Lowlands, where most Scots live to-day; they are the Ayr, the Lanark, and the Firth of Forth coalfields. The Lanark coalfield is the largest and most important of the three.

In *Ireland* there is very little coal, which largely explains why there are more farmers than manufacturers in the "Green Isle"—and more country-folk than towns-folk.

Look again at the population and coal maps and see how the densest populations occur as a rule on or near coalfields, which provide the power for factories and for

power stations from which the electricity can be led to manufacturing districts.

Later we shall see how certain of the coalfields have become famous for the manufacture of certain kinds of goods, and perhaps we may find some reasons why it is so. But in addition to its use in mills and factories, on trains and steamships, in gas works and dye works, coal gives power, light, and heat to millions of British homes; for this reason coal is perhaps the most important thing carried on British railways and on British coasting vessels.

Coal, once got, can never be replaced. Britain is fortunate in having so much of it that nobody need worry about the rate at which it is being used; but nowadays coal is being used in much more economical ways than it was formerly—in driving power stations, for example, which produce much more power, light, and heat than could be got from the coal required to run them (see the pictures on page 115). Perhaps before all the coal is used up other sources of power will have come into more general use. Can you name any?

QUESTIONS AND EXERCISES

1. Why is coal-mining "a robber industry"? Compare it with farming.

2. Explain why large cargoes of pit-props enter certain British ports every year. Whence have they come? At what ports are they chiefly delivered? For what purpose are they used?

3. Write an account of the way in which coal was formed. In it mention how we know that our coal must have been made in this way.

4. In what respects is it wasteful to have coal in open fires in houses, schools, etc.?

5. Find out all you can about the *Coal Board.*

Chapter 12.

OTHER MINES AND QUARRIES

Coal is so important to the people of Britain, that when miners are mentioned, we always think first of *coal* miners, and perhaps forget that there are British miners who earn their living by getting other useful things out of the earth.

The most important of these are the *iron* miners, who get out the ironstone or iron ore to feed the blast furnaces in steel and iron manufacturing regions, such as those at the mouth of the Tees at Middlesbrough; or in north Lincolnshire (Scunthorpe) and in Northamptonshire (Kettering, Wellingborough, and Corby); or in south Staffordshire (the "Black Country"), or in Cumberland; or in the Lowlands of Scotland, especially on the Lanark coalfield (see map, page 48).

The Cleveland District of north-east Yorkshire, near the mouth of the Tees, is Britain's most important iron and steel producer. The ironstone is got from the hillside by sinking short shafts, or by driving tunnels, called "drifts," into it. The ironstone is loosened by explosives, and brought out in trucks drawn by ponies, to be put on railway wagons for dispatch to the blast furnaces. Much foreign ore of good quality from Spain, Sweden, Algeria in north Africa, and even from India, as well as supplies from other British ore deposits, is used at the great iron and steel works of the Tees region.

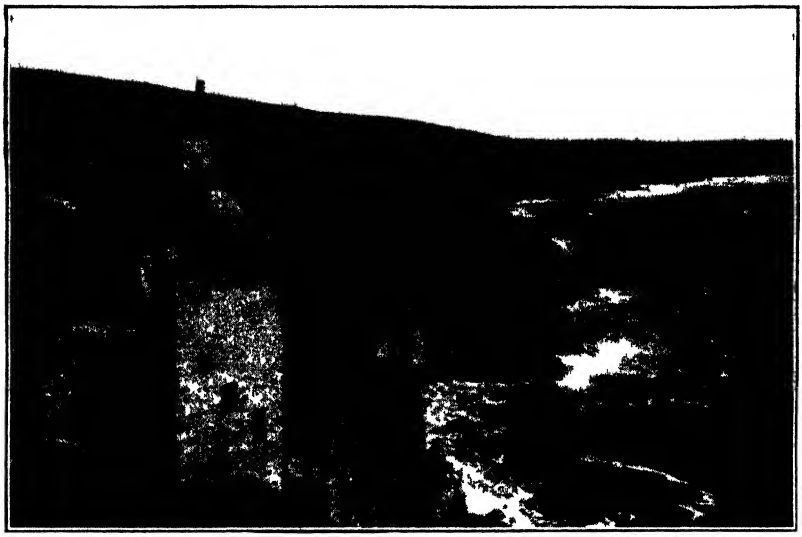
Those who have read Junior Book IV will remember the description of a blast furnace and how iron and steel are produced; the picture on page 135 will remind you of these processes.

IRONSTONE QUARRY AT CORBY, NORTHAMPTONSHIRE.
Describe the method of working the ironstone.

In north Lincolnshire the iron ore is got in a different way by the great open cuts or quarries (see photograph above). Giant mechanical "navvies," or diggers, remove the top soil and lift out the iron ore with their great "shovels" that take 5 to 10 tons at a bite, pouring their loads into waiting trucks. Coal to provide the coke necessary for the blast furnaces here must be brought chiefly from neighbouring coalfields.

There are British miners of tin, lead, and copper too, but the mines are nearly all small ones, and do not nowadays yield much metal. Most of the tin, lead, copper and other metals used in our works and factories has to be brought from overseas, because we have such poor supplies in our own country and need large quantities to use in our important manufactures.

In the days of the Ancient Britons, Cornwall and



Will F. Taylor.

OLD MINE BUILDINGS ALONG THE COAST AT TREWARAS HEAD, CORNWALL.

Devon were famous for tin, copper, and lead, and Phœnicians, Greeks, and Romans came on long voyages from their Mediterranean homes to fetch these metals; but there is very little left, although the old " workings " of these far-off times may still be seen.

Visitors to Cornwall will perhaps remember seeing the tall chimney-stacks and ruined engine-houses of abandoned mines (see photograph above). Some may have seen Cornish tin mines that are still at work, especially the important South Crofty mine, whose equipment is quite modern. The tin miners descend in cages 2,000 feet to the workings. They have no need for safety lamps: they can use ordinary lanterns, for there is no danger of explosive gas in tin mines. The mines are, however, very wet, and giant pumps must always be

at work; miners dress in " thick flannel shirts, trousers and coat of red-stained canvas, heavy boots, and skullcaps surmounted by a specially hardened felt hat " to guard heads against jagged roofs of the underground tunnels through which they pass.

Holes are bored by noisy rock-drills to receive the explosive charges that shatter the rock containing the tin ore, which, after all, may produce only 1 per cent. of pure tin after it has been crushed, washed, and " burnt " in revolving furnaces. Arsenic, a deadly poison, is contained in Cornish ore, and workers put veils over their heads and stuff cottonwool in their nostrils to protect themselves; but the arsenic can be collected for sale to be used for making chemicals for use in dipping sheep (see page 87).

QUARRYMEN

Miners work below ground, descending to their work down deep shafts and walking along the " galleries," or horizontal passages, leading to the places where the coal or other material is being got out. But there are many places where men are busy getting rock from great open pits or from wide cuttings in a hill-side. These are the *quarrymen* working in their quarries or open cuttings, where no shaft is necessary to enable them to reach the material they seek. Quarries of one kind or another are much commoner in Britain than mines. The sand-pit or the gravel-pit, from which men get out stuff for use in building, is really a kind of quarry, and so is the chalk-pit, from which farmers in some parts of south-eastern England get chalk to spread upon the heavy soil of the fields. There are some large chalk

THE LARGEST BRICK WORKS IN THE WORLD
These works, belonging to the London Brick Company, are situated in Bedfordshire.

quarries where chalk is obtained for making cement on a big scale—for example along the lower Thames and Medway valleys.

The wide, shallow pits dug by men in search of brick earth for use in their brickfields are really quarries too. The largest brickfields in Britain are those of the London Brick Company. Some are near Peterborough, in Northamptonshire; while at the Stewartby (Bedford) works of this company it is a common thing to turn out 9 million bricks a *week*.

But the most interesting of all quarries are those from which our building stones are got—the stones which go to make the finest buildings in our cities and towns, and the slates that form the roofs of many millions of our homes. These building stones are found chiefly in

those parts of Britain where hard, old rocks appear at the surface—usually among the highlands of the west and the north, where these rocks stand high because they are not so easily worn away by wind, weather, and water as the softer rocks which cover most of the south-eastern part of Britain.

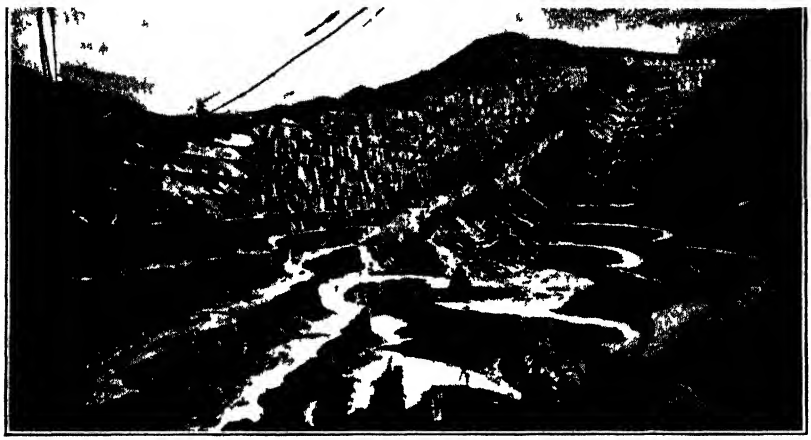
It is in Scotland, the Lake District, the Pennines, Wales, and in the peninsula of Cornwall and Devon that our important building stones are quarried.

LARGE LADIES, COUNTESSES, AND DUCHESSES

Slate is the commonest of our building stones : it forms the roofs of hundreds of our towns, of millions of our homes, because it is waterproof, splits readily into "leaves," and can easily be shaped. Roofing slates—blue, grey, and purple—come chiefly from the great slate quarries of north Wales. Green slates come from south Wales, the Lake District, and Ireland; blue-grey slates from Delabole, in Cornwall. They are prepared in several sizes, all of which have queer names. The chief are "Large Ladies," "Countesses," and "Duchesses."

Find on the map of Wales the highest mountain, *Snowdon*, not far from which are the biggest of the Welsh slate quarries. Then look for Bethesda and Llanberis, where two of the most important Welsh slate quarries are. At Bethesda you can look down into a monstrous open pit whose sides have been cut by the slate quarrymen into what look like giant steps—the whole reminding you of the great amphitheatres made by the Ancient Greeks and Romans.

The little railway at the bottom is used for carrying



THE PENRHYN SLATE QUARRY, NORTH WALES

Slates have been worked at Penrhyn since the days of Queen Elizabeth This quarry is 1,200 ft deep, a mile long, and gives employment to 2,000 men

the slate broken off by blasting to the finishing sheds, where the slate is split and "dressed" into "Large Ladies," "Countesses," and "Duchesses," or perhaps fashioned into slabs for billiard tables, cisterns, or other purposes. Welsh slates are sent all over England—by sea if possible, for they are heavy, and it is expensive to send them by rail.

At the London Docks you will find small craft unloading them, and a great warehouse, half of which is filled with them. Look again at the map of Wales and find the names of the little Welsh ports from which the slate is sent away.

SCOTTISH AND CORNISH GRANITE

One of the hardest and most beautiful of our building stones is granite, found among the hard, old rocks of

western and northern Britain. Granite was formed ages before the coming of the first men by the cooling of molten rock which had forced its way to the surface. Although, when freshly broken, it is very gritty and hard and rough, it takes a fine polish, and by means of cutting and splitting machines it can be fashioned into any shape.

Scottish granite, especially the grey granite of Aberdeen, is particularly famous for its hardness and its beauty. Not far from the " granite city " of Aberdeen, many of whose beautiful buildings are made of this stone, are the most important granite quarries in Britain.

Men bore into the hard rock with powerful drills, insert a blasting cartridge in the drill-hole, and then explode it, dislodging many tons of granite at a time. Sometimes the granite loosens up into gigantic blocks as big as a house and weighing over 2,000 tons each!

Such monster blocks have to be split up again before the granite can be used. In the yard you may see blocks of granite being cut and shaped by wonderful circular saws that slice through the hard stone like an ordinary saw cutting through wood. Not far away are working men finishing with hammers and chisels a great block roughly shaped by machinery.

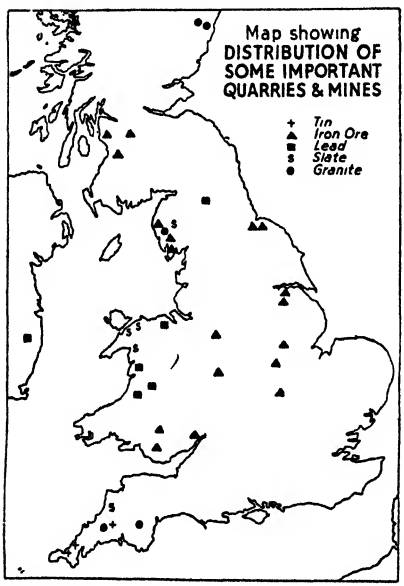
Cornish granite is so hard that it is used for building sea defences, breakwaters, and lighthouses, all of which must withstand the ceaseless battering of the waves. At some quarries you can see men fitting together the " keyed " stones that go to build a lighthouse, in order to make sure that each fits into its proper place.

Granites are used to make the kerbstones of pavements and the " setts " of stone-paved roads. Like other stone

from the old, hard rocks, granite is often broken into small pieces and used for road building.

BATHSTONE

Although a true quarry is an open cutting, it sometimes happens that men obtain the rock by working underground, as the miners do. Their workings are still called quarries, although they are really *mines* now.



THE CHIEF BRITISH QUARRIES AND MINES, OTHER THAN COAL.

The beautiful city of Bath in the West Country is largely built of greyish-yellow stone quarried from the neighbouring limestone hills and known to builders as Bathstone. This stone goes to all parts of England to be used in building. Many churches have the stone parts of their windows made of it, for this stone can be easily cut into any shape and will stand the weather.

The workers in the underground quarries near Bath find it much easier to break up and extract the stone than the quarrymen of Aberdeen do in their granite quarries, for the stone is already cracked and broken by nature into large blocks which only need loosening by hand-drills or sometimes merely by pickaxe and levers.

Although nowadays, thanks to roads and railways, canals, rivers and the sea, building materials of all kinds can be easily moved to any part of the country, it is interesting to notice how the older buildings of any part of Britain (as well as many of the modern ones) are made of materials belonging to the neighbourhood. We have mentioned the "granite city" of Aberdeen, and Bath built of stone quarried from its own hills. In the Lake District you find old farm-houses built of stone from the mountain-side, as you do in western and northern Scotland, where dwellings are often so like the hill-sides under which they nestle that they cannot easily be seen far off. In the far-off islands of the Outer Hebrides and in western Ireland you will find little houses whose walls are built of turf with roofs of heather or straw thatch. Don't you think it is very important that houses and other buildings should harmonise or "fit in" with the area in which they are placed?

QUESTIONS AND EXERCISES

1. In what parts of Britain do we find the following used for house-building? Name *one* region for each material: (*a*) granite; (*b*) turf; (*c*) flints; (*d*) brick; (*e*) Bathstone; (*f*) wood. Give reasons where you can, and try to illustrate your answers by a picture of each type.

2. Find out how granite, sandstone, chalk, slate and clay were formed.

3. Where in Britain are (*a*) copper; (*b*) lead; (*c*) salt obtained? Which of these must be supplemented by large supplies from overseas? From what countries?

4. Continue your collection of photographs in your picture book.

Chapter 13.

THE HEAVY INDUSTRIES

The " heavy " industries are those which use metals, especially iron and steel, as their raw materials.

In ancient times iron smelting and iron working were carried on chiefly in places where both iron ore and charcoal for smelting it could easily be got. The Weald of Kent and Sussex and the Forest of Dean in Gloucestershire, for example, had local ironstone, and forests from which charcoal could be made. But when coal began to take the place of charcoal for smelting, and especially when Abraham Darby began to smelt iron in blast furnaces using coke instead of coal, the iron industry moved to places where coal was abundant as well as iron, especially in the north of England, in the English Midlands and in south Wales. In our time the iron and steel industry has begun to move to places where there is abundance of rich iron ore, as in north Lincolnshire and Northamptonshire, coal being brought to the iron regions from the coalfields (see page 48).

IRON AND STEEL

Britain is fortunate in possessing large coal and iron supplies, and, thanks to her merchant fleets and her many ports, she can easily import supplies of rich iron ore from abroad. Iron and steel made from it are of great importance to a manufacturing nation, whose factories and means of transport depend chiefly upon steel. Modern factories are largely steel-frame buildings; from steel most of their machinery is made, and

Barrow Hæmatite Steel Co. Ltd.

A BLAST FURNACE.

Find out (*a*) how the coke, iron ore, and limestone get into the furnace, (*b*) where the molten iron ore leaves the furnace, (*c*) how it becomes "pig-iron."

steel enters largely into the construction of railways and ships. British iron and steel, and machines and other articles made from them, find ready sales abroad; and the money thus earned can be used to buy the foodstuffs and raw materials that are needed by a country whose people are so largely engaged in manufactures of many kinds.

The chief iron- and steel-producing region in Britain is that centred on *Middlesbrough*, on the south shore of the Tees estuary. The most important iron and steel company there has its own coal mines, its own ironstone mines and quarries, and its own limestone ; it has its own wharves on the estuary, which can be entered by large cargo steamers, and the railway lines and roads of its steel works and mills link up with those of the rest of Britain. Not far away are *Stockton*, the *Hartlepools* (ships), and *Darlington* (railway plant), all of which depend on iron and steel.

The great steel company mentioned in the last paragraph planned the magnificent new Sydney bridge and made the steel for it. Bush House and many other modern buildings in London, and in great cities all over the world, are steel-frame buildings of Middlesbrough steel; and so is the great pipe-line bringing water to Bombay from a lake 80 miles away in the Western Ghats of India.

Equal loads of coke, ironstone and limestone are put into the top of modern blast furnaces by machinery—coke is the fuel, the ironstone the raw material, and the limestone is there to help to collect impurities, which, as we have seen, float at the surface of the molten iron to be drawn off first as *slag*. The iron itself is tapped after-

wards, running off in a white-hot stream to cool as pig-iron in the moulds ready for it, or to fill crucibles, which are taken to the furnaces to have other things mixed with it to turn it into steel (see picture on page 135). Exactly what kind of steel it will be depends on what is mixed with the iron, for different jobs require different steels—some to stand wearing by friction (railway lines and tram lines), some to stand the strain of twisting (ships' propellers), and others to carry heavy weights (girders and steel pillars).

In making *coke* in great batteries of coke-ovens, other valuable products result—coal-gas, tar, creosote, benzol, naphtha, sulphate of ammonia, brilliant dyes, and so forth, the sale of which is of great importance in reducing the general expenses and increasing the profits of so big an undertaking. The *slag*, which long ago was waste and left in ugly heaps near iron works, is nowadays used for road-making, for the basic slag used in fields and gardens, and for firebricks.

This Middlesbrough iron and steel company produces pig-iron, and steel of many kinds—steel plates for ship-building; steel rails for railways and tramways; conductor rails for electric railways; steel wire for ships' hawsers and colliery ropes; steel fencing, and steel rods for putting in concrete buildings; and corrugated-iron sheets.

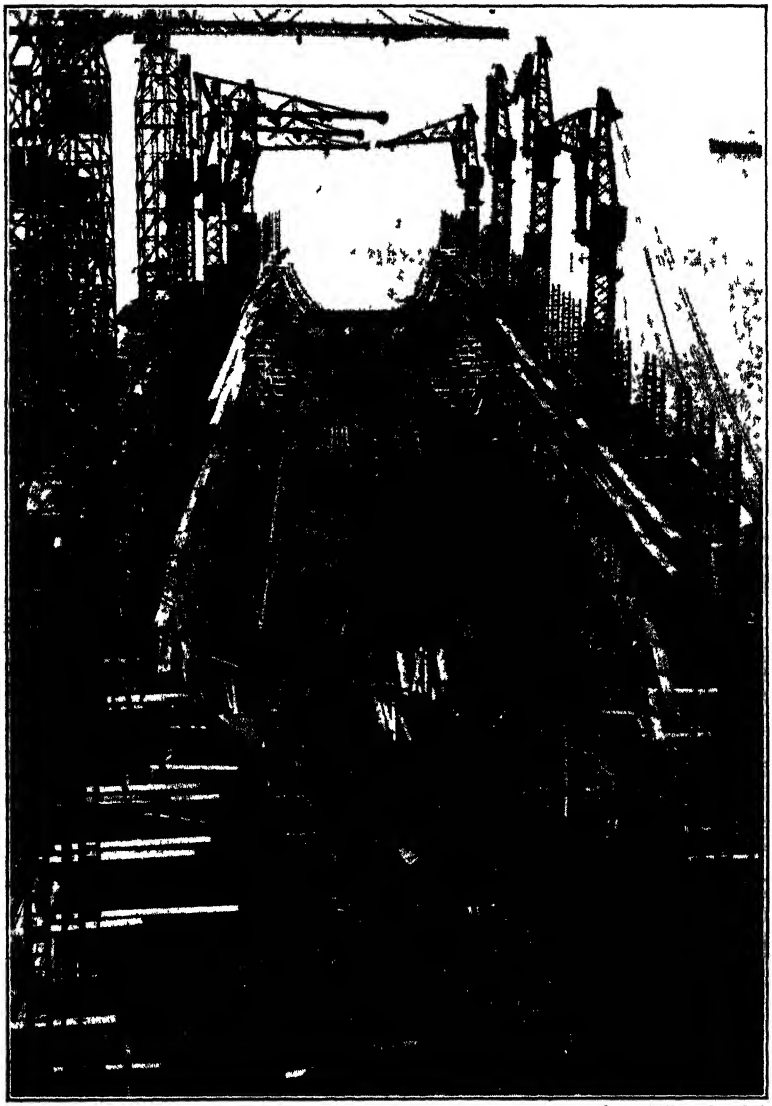
SHIPBUILDING

Most ships to-day are built of steel plates. The yards are at places where the necessary power, labour, and materials can be easily got together, and where there is smooth, sheltered, deep water for launching. Hence

we find the chief British shipyards (1) on the *Clyde* estuary, where they and the engineering works stretch practically from Glasgow to the Firth of Clyde; (2) on the *Tyne*, Wear, and Tees; (3) at *Belfast* in Northern Ireland; (4) at *Barrow in Furness* in north Lancashire; and (5) at *Birkenhead*, opposite Liverpool, on the Mersey. Find all these on a map of the British Isles. The largest ships can be built only in deep water-ways, as at Belfast, the Clyde, the Tyne, and Barrow.

A great ship exists first in the mind of the architect who designs her for the special work she has to do. He puts down on paper what he has in his mind, making three sets of plans: one showing the general arrangement of the ship, another to show the shapes and sizes of the steelwork and other things to be used, and a third set to show plans of the ship broadside-on, its shape from above, and the body of the ship in section end-on. Skilled draughtsmen make working drawings of all the parts, to be used in the steel works and machine shops. In the "mould loft" of the shipyard the actual "lines" of the ship are chalked out on its black floor and moulds and templates of paper or wood made for the chief parts, so that everything may be exact.

Outside, the massive wooden keel-blocks are set up along the line chosen for laying the ship's keel, taking care that there is a gentle slope of about half an inch to a foot when the keel is in position, so that the vessel can easily be launched—always stern first, except when the ship is a small one, built on a narrow water-way, when she must be launched broadside-on.



Cunard White Star Ltd

THE NEW *MAURETANIA* IN COURSE OF CONSTRUCTION

In " reading " this picture make use of what is in this chapter Notice the tall movable cranes for lifting heavy materials

The keel in place, the great double bottom of the ship is pieced and riveted together; in it water will be carried; it is made up of many compartments, all connecting, and there are manholes in the floor plates, so that this great tank-like bottom can be examined, cleaned, or repaired. Now the great frames and beams are set up to form the skeleton of the ship, and soon this skeleton is clothed with steel plates, each cut to its proper size and shape and riveted together with rivets white-hot from portable furnaces. The noise is deafening—like a machine-gun battle; the "guns" used by the riveters (worked by hydraulic power or by compressed air) strike more than a thousand 95-lb. blows to the minute. After the riveters come the "caulkers," whose job it is to make all joints water-tight. The ship now really looks like a ship!

Meantime other workers are busy on the deck and inside of the ship. Carpenters, sawyers, plumbers, painters, brass-fitters, cabinet makers, blacksmiths, and hosts of other workers are playing their parts. Away in the engineering shops the boiler makers and engineers are preparing the ship's machinery and other things, ready to put in when she is prepared to receive it.

All this time the ship is dead—or at least asleep. Now comes the day of the launching, when she will suddenly spring to life, and when she will be given the name that she will bear proudly throughout her journeys over the world's oceans. The "launching ways" are greased with tallow and black soap, stout cradles are set up to keep her upright when the old supports are removed, and heavy chains are fastened to her to act as a drag, so that she shall not enter the water too suddenly. At

last the waiting crowd sees the bottle of wine crash on her bow, her name is loudly called—"I name this ship *Mauretania*; may God bless and keep all who sail in her!" Slowly at first, then faster and faster, she moves down the sliding ways, until she takes the water amid the cheers of the spectators.

She is towed to a convenient wharf to have put in her the boilers, engines, and the myriads of other things that make a modern ship. There is hardly a trade in Britain that has not had something to do for her, to make her ready for sea.

ENGINEERING

Engineering of one kind or another is widespread in Britain—even in agricultural districts engineers are at work making farm machinery, and in almost every town of importance there is a foundry of some sort. We can deal only with the big engineering industries.

Locomotives and railway "plant" (materials) are generally made at places chosen by British Railways as convenient, e.g. Swindon for the Western Region; Darlington for the North Eastern Region; Eastleigh and Ashford for the Southern Region; and Derby and Crewe for the London Midland Region. Other locomotive works are on or near the great coalfields, e.g. the North British Locomotive Co. between Glasgow and Kilmarnock; there are large works near Manchester; and others near Sheffield, Stafford and Bristol. Locomotives from these works are sent all over the world where trains run.

Motor-cars, first built at Coventry, are now manufactured at many centres. The *Black Country* has

Morris Motors

INTERIOR OF A MOTOR WORKS

What are chassis lines? What has still to be done to the cars in this chassis line?

several important motor-car works, especially in and near Wolverhampton and Birmingham; *Greater London*, too, has a large output—the A.E.C. build London's buses and other vehicles there—and at Dagenham, down the Essex side of the Thames, are the great Ford works; *south Lancashire*, especially in the Manchester region, is another important car-producer; and Cowley, near Oxford, can boast of the huge works that turn out over fifty thousand a year. Find out what " makes " of cars come from these places—and also from Derby, Bristol, Nottingham, Huddersfield and Luton.

ELECTRICAL ENGINEERING, ever increasing in importance since the power from the " grid " (or national network of supply) has become accessible to more and more homes and businesses, goes on in most towns where

machinery is made. The biggest works of all are at Manchester; other centres of note are Coventry, Rugby, Preston, Birmingham, Loughborough, and the London area.

CUTLERY AND TOOLS

The most skilful cutlers and the finest tool and instrument makers in the world are those of Sheffield and Rotherham in the Don Valley of southern Yorkshire. Here, long ago, local iron and coal, grindstones from the millstone grit of the Pennines, and power from the Don for turning them, made this valley a good place for making cutlery. The cutlers are still there, but apart from their native skill, conditions have changed; the iron must be brought from abroad, and electric or steam power does the heavy work instead of the Don. Heavy steel goods, like propellers and crankshafts, engines, and armour plating for warships; fine steel goods, like surgical instruments, scientific instruments, and tools for fine work and high speeds are now made at Sheffield, whose name stands for excellence all over the world.

QUESTIONS AND EXERCISES

1. Write down the names of six makes of British motor-car, and beside each name write that of the place where it was made.

2. The manufacture of *textile machinery* is an important branch of British engineering. Find out six centres engaged in this industry, and the kind of machinery made at each.

3. Find out all you can about the *tinplate* industry of south Wales—especially what it has to do with *steel*, and what the tin-plate is used for.

4. Birmingham is famous for boiler-tubes. What are these, and what is their purpose?

5. What raw materials are required to make steel? Describe the various processes in the making of steel and illustrate your account by diagrams, drawings and pictures.

CHAPTER 14.

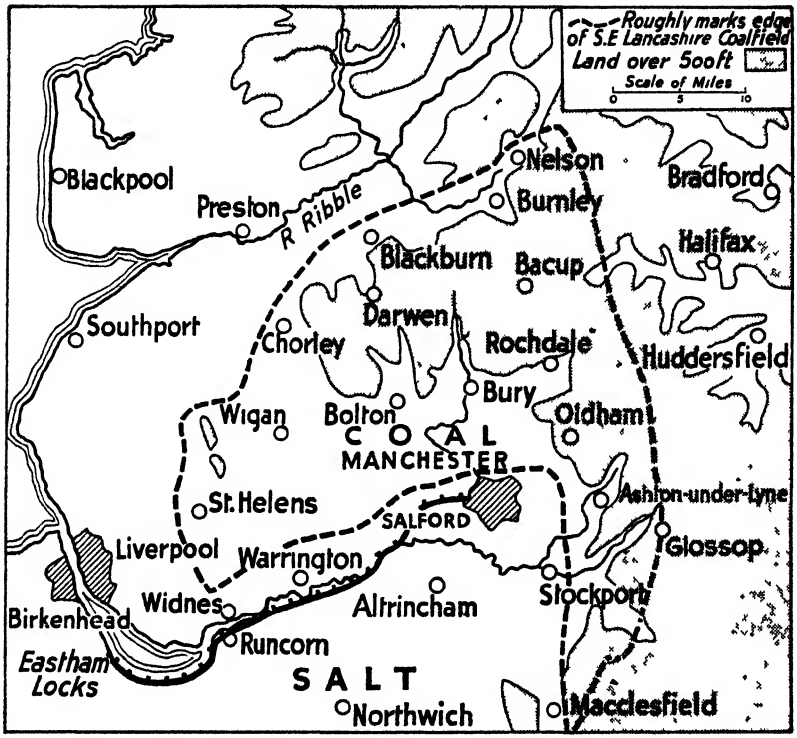
TEXTILES: COTTON

More than a million workers in Britain get their living in the textile industries—in the manufacture of stuffs and garments made by weaving or knitting threads or yarns of cotton, wool, linen, real silk, artificial silk (rayon), jute and other fibres. Cloth is made by weaving; stockings, vests, and other hosiery, football jerseys and sports costumes are made by knitting; both weaving and knitting, once done by hand, are now carried on in huge mills and factories by complicated machines, some driven by steam, others by electricity.

The two most important British texile industries are the *cotton* industry and the *woollen* industry, both of which have their chief homes in northern England on the flanks of the southern Pennines. Most of the *cotton* mills lie on the western side of the Pennines in southern Lancashire; most of the *woollen* mills are on the eastern side of the Pennines in the West Riding of Yorkshire; but there are cotton mills and woollen mills in both these important northern counties. *Manchester* is the business capital of the cotton industry; *Leeds* and *Bradford* are the leading centres of the woollen industry.

THE COTTON INDUSTRY

Making cotton goods consists of two big main jobs—(1) *spinning* the raw cotton into yarn (or thread), and (2) *weaving* the yarn into cotton cloth—each of which is done chiefly in certain Lancashire towns. Spinning goes on mainly in the spinning-*mills* of towns within the



MAP OF THE CHIEF COTTON TOWNS OF SOUTH LANCASHIRE.

triangle formed by Bolton, Oldham, and Manchester; weaving is done chiefly in the weaving-*sheds* of towns within the triangle formed by Preston, Burnley, and Bolton (see map above). But there are some towns which have both spinning-mills and weaving-sheds.

When the cotton has been spun and woven, much has to be done in preparing the cloth for sale; it has to be bleached, dyed, and printed, perhaps, with patterns. These jobs are the work of cotton finishers, who are busy in most of the cotton towns. Even when all these

workers have done their share, there is an army of people who are busy in selling the cloth and sending it away by land and sea to all parts of the world.

We must remember, however, that the cotton manufacturers must not only have abundance of raw cotton from overseas; they must also have machinery and power to drive it. Power comes from the coal of the Lancashire coalfields as well as from electricity. Lancashire has sixty thousand coal-miners, most of whom work in the pits near *Wigan*, *St. Helens* and *Leigh*; iron and steel for machinery are got from the blast furnaces and steel works of *Irlam* and district; the machinery itself is made at many of the cotton towns.

Chemicals needed in the " finishing " of cotton cloth are made in great factories like those at *Widnes* and *Runcorn*, near the Manchester Ship Canal; the salt which is used in the chemical works in preparing material used in the cotton industry is got from the salt beds of Cheshire—chiefly by pumping up the brine, from which the salt is obtained by evaporation.

Thus we see that in a great business like the cotton industry many trades and many different workers are concerned. Sailors and ships bring in raw cotton and take away the finished material—a job in which workers on roads and railways also play their part. Coal-miners and workers in power stations, iron miners, workers in iron and steel works, in engineering shops, provide machinery and power to run it. Workers in the spinning-mills and weaving-sheds make the cotton stuffs, and others in the finishing trades, using dyes and chemicals made in the chemical works supplied by the salt men of Cheshire, get it ready for sale.

Horrockses, Crewdson & Co Ltd.

SCENES IN A LANCASHIRE COTTON MILL.

1. A carding machine. 2. Mule spinning. 3. Making the warp. 4. A weaving shed.

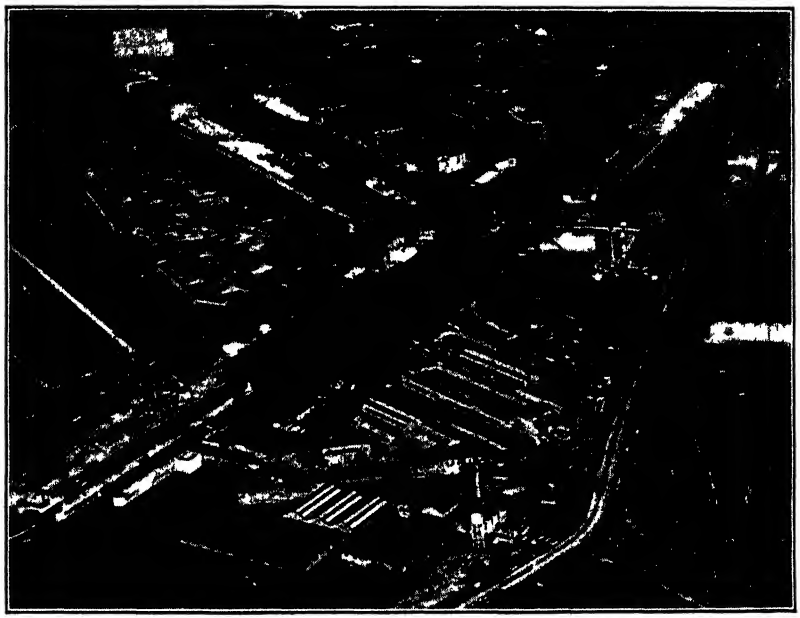
Find out what is taking place in each of these processes.

A VISIT TO A COTTON MILL

The spinning-mill is a monster rectangular building five or six stories high, with big windows all round each of its floors, to let in plenty of light. The weaving-sheds—low, glass-covered, one-story buildings—will be alongside if weaving is carried on in addition to spinning. The whole will stretch along the entire side of a street. Near one corner, but a little away from it, is the tall chimney from whose top pours the smoke which tells everybody that the mill is hard at work (see photograph on page 50). This is a modern mill, and each machine has its own electric motor, which is much better and much quieter than the old way of driving machines by belts from a huge turning shaft.

Most of the workers are Lancashire lassies, although some machines are still in the care of men or boys. These girls and women are so clever and quick at their work that they are wonderful to watch. They are smart too; the old days when mill-girls were content to go to the mill wearing clogs on their feet and shawls over their heads have almost or quite gone. At their work most of them wear neat overalls; and women and girls, men and boys, look very businesslike with bare arms and sleeves well turned up!

If you have not been inside a cotton mill before, you will become quite bewildered at the many different kinds of work going on, even if there is someone with you to explain everything. Immense floors filled with machinery so clever that you can almost imagine it thinking; the amazing skill of the workers going so quickly about their jobs; and the strange and, in the



Manchester Ship Canal Co

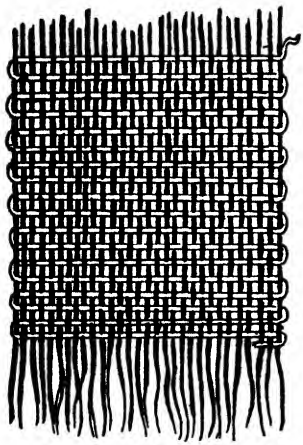
AIR VIEW OF PART OF THE SALFORD DOCKS

Ships bring raw cotton direct to these docks Find (*a*) the grain elevator at the head of one of the docks, and (*b*) the dry docks

weaving-sheds, the ear-splitting noises of swiftly running machines, leave you too dazed to say more than "Yes!" to everything your guide tells you. Roughly speaking, the following is what is going on in the mill.

Raw cotton, grown in the south-eastern United States, or in the Sudan and Egypt, or in India, Brazil, Peru, and the West Indies, comes in large bales by sea to Liverpool or up the Manchester Ship Canal to the docks of the Port of Manchester, which are really in Salford! There the bales are lifted out of the hold by powerful cranes, and sent in lorry loads to the spinning-mill. We visit first the rooms where they are broken

open and their contents mixed together before being cleaned of the many things which have got into the cotton during the picking and baling overseas. A scutching machine finishes the cleaning, and from its beaters and heavy rollers the cotton comes out in a broad, soft white roll. These rolls go to a carding machine, whose steel teeth straighten out tangles and set all the little fibres parallel, sending it forth in a flat, fleecy rope of cotton, called a *sliver*. In other machines the sliver is combed, twisted, and drawn out into fine threads—thin, smooth, and strong; then other machines twist it and draw it out still more into yarn, some very fine, some thicker. This is the process of spinning, and it is the normal dampness of the air in south-east Lancashire that is one reason for the establishment of the industry there. The threads are brittle and easily break, but there are fewer breaks to piece together when the air contains a certain amount of moisture than when it is dry.



THIS DIAGRAM ILLUSTRATES THE PROCESS OF WEAVING.
Which is the warp and which the weft ?

After being treated to make them strong and smooth, the yarns go either to form the "*warp*" or main thread running the whole length of the cloth, or the "*woof*" or "*weft*," which stretches across from side to side, over and under the threads of the warp. Warp and weft come together on the weaving machine or "*loom*."

The *warp* is wound on to large wooden rollers (warper's beams) to be put at the back of the loom in the weaving-shed; the *weft* is wound on to hundreds of " bobbins " or " cops " to be sent backwards and forwards, in shuttles, through the warp to make the cloth. Most of the weavers in this mill manage four looms each, but some mills are equipped with modern looms, which are so wonderful that they are almost automatic and need very little human aid or attention. In these mills a weaver can manage more than four.

Of course, the cloth is not ready for sale in shops when it leaves the weaving-sheds. It has to be bleached and finished, or dyed, or have patterns printed upon it. More often these processes are carried out in separate factories. This is the case in the factory we have visited.

LANCASHIRE HOLIDAY PLACES

Lancashire workers have many pleasant holiday spots in their own county, although many go far afield for a *change*. The seaside, with its magnificent sands, attracts large numbers, especially towns like Blackpool, Southport, and Morecambe; the Pennine Moors are ideal for hikers and all who love the breezy uplands and plenty of exercise; and the Lake District, the southern part of which is actually in Lancashire, offers beautiful scenery, walks and climbs, and sweet fresh air. The Isle of Man, 70 miles by sea from Liverpool by fast steamers that take only 3½ hours, or by air in one hour and ten minutes, is another favourite haunt of the Lancashire folk, and Douglas, its chief town, is crowded in summer. The north Wales sea coast is another favourite holiday place for Lancastrians.

Many Lancashire people like to go to seaside towns in eastern or southern England, where they can be sure of a good share of sunshine; for their own county has much less sunshine and much more cloud and rain, because it lies on the western side of the Pennines facing the prevailing wet westerly winds from the Atlantic Ocean. This moist air, as we have seen, has a business value for Lancashire cotton manufacturers. The heavy rainfall on the west Pennines too supplies an abundance of the soft water that is needed in bleaching and dyeing. This heavy rainfall is caused because as the air is forced to ascend on meeting the Pennine Uplift, it expands as elevation is increased. This expansion rapidly cools the air, and this in turn causes the moisture in the air to condense and fall as rain. This happens not only in Lancashire, but anywhere in the world wherever a moisture-laden air current is forced to ascend.

QUESTIONS AND EXERCISES

1. Draw a diagram to illustrate the last paragraph in this chapter. How does it help to explain the relationship between the map on page 46 and the diagram on page 200?

2. We cannot grow cotton in this country. Why is it, then, that south-east Lancashire has become the chief cotton-manufacturing area in the world?

3. What is cotton used for besides the making of cloth?

4. Write a connected account of the processes illustrated in the pictures on page 147.

5. Will Lancashire send more cotton goods to Canada than to India? Why? Where are Lancashire's chief markets?

6. Find out something about the history of the Lancashire cotton trade. Be sure to include the inventions of Kay, Hargreaves, Arkwright and Crompton.

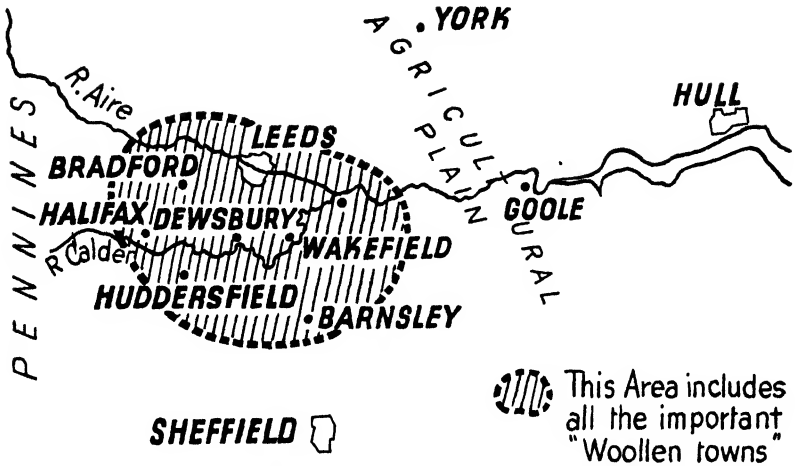
CHAPTER 15.

WOOLLENS AND OTHER TEXTILES

We have already seen that on both sides of the Pennines are busy towns, some of which thrust their streets of little stone houses up the valleys, and rear their factory chimneys within sight of the open Pennine Moors, drawing their drinking water from great reservoirs built up there among the rocks and bogs, the heather and the sheep pastures. For the Pennines "thrust themselves between the woollen mills of Yorkshire and the cotton mills of Lancashire," and mills of both kinds and both counties invade the south Pennine country itself.

The *woollen* industry is older than the cotton industry, for there have been wool weavers in Britain almost as long as there have been sheep. Lancashire folk were spinners and weavers of linen and wool long before they began to use the cotton which had to be brought from the cotton-growing lands beyond the seas.

Although weavers flourished in south-eastern England and the West Country long before the woollen trade became a big business in the North, the most important woollen industry is to-day in the West Riding of Yorkshire. It may have begun there because of the wool from Pennine sheep and of pure soft water from Pennine streams for scouring the wool and for other important processes of manufacture; their swift current supplied direct power to the old water mills as well. But it has become important chiefly because of the presence of rich coalfields, which provide the power needed to run the complicated machinery used in modern woollen mills and factories. Wool from Pennine sheep is not nearly



THE CHIEF WOOLLEN TOWNS OF THE WEST RIDING OF YORKSHIRE.

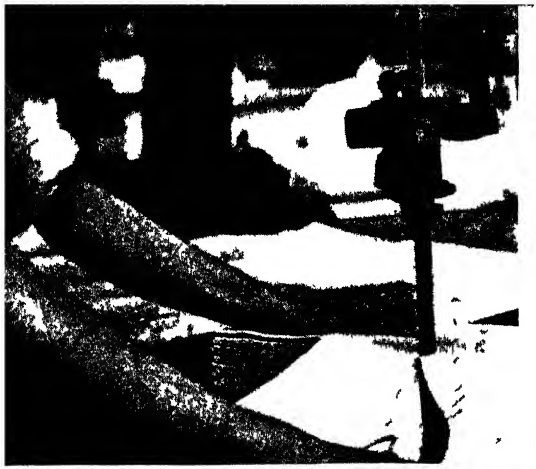
enough for these giants; they must be supplied chiefly from the wide natural grasslands of Australia, New Zealand, South Africa, Argentina and North America, through the great English sea-gates of London, Hull and Liverpool. Besides wool, other fibres from animals are used: *mohair* from Angora goats; *cashmere* from the goats of the Asiatic plateaus; *alpaca*, *llama*, and *vicuña* wool, from the high Andean plateaus; and *camels'* hair from Asia.

The woollen industry, which began long ago in the homes of the workers, who owned all the tools they used, is now housed in monster factories, many-storied, many-windowed, and filled with machines that turn out goods in vast quantities. Many wonderful inventions and the use of power from coal to drive machinery killed the little home industries and forced the workers into the factories built to contain the great new machines.

The woollen trade to-day is a twofold one—the manu-

facture and marketing of *woollens* and *worsted*. Woollens are made from wool of shorter "staple"(shorter fibres), and woollen yarn is not so strong as worsted yarn, which is spun from the longer "staple" of merino wool. There is not the division of the woollen industry, however, that we found in the cotton industry, where spinning is the business of certain towns and weaving of others: both sides of the woollen trade go on together in most of the principal towns. The map on page 154 shows the chief woollen towns of the West Riding of Yorkshire; of these *Bradford* is the leading city—"the metropolis of the worsted and woollen manufacture" and "the world's greatest wool market . . . whose largest factory, the Lister Mills (1871), cuts a more dominant figure in the landscape than any castle or palace yet made." *Leeds* is a great textile city, but also uses the finished cloth in its huge clothing business. *Halifax* is the great carpet centre, and is more interested in worsteds than in wools. *Dewsbury* and neighbouring towns make "shoddy" from stuff got from woolly rags and knitted goods when pulled to pieces.

Other woollen industries are those of (1) the West of England, especially at Stroud, Witney (blankets), Kidderminster (carpets), and Frome—all that remains of a great and flourishing industry of two hundred years ago; (2) the valleys of central Wales, where Welsh flannel is made; and (3) the Tweed Basin of the Scottish Border lands, where the famous "tweeds" and hosiery are manufactured. Harris Tweeds and other homespuns are made in the Hebrides and Highlands of north-western Scotland; but factory methods of manufacture and marketing are gradually taking the place of the old



MAKING SHIRTS

CUTTING OUT SHIRTS

Here you see the cutting out of shirts. The band knife is accurate to a hair's breadth, which is necessary if the garment is to fit.

MAKING CUFFS

Here a woman is operating a machine which makes the shirt cuffs. A strip of stout linen is laid across the future cuff in order to strengthen it. The machine closes and the cuff is turned neatly and exactly with the linen in place.

MAKING A SHIRT A MINUTE

Here is a moving belt on which the shirt is assembled as it passes from table to table. Each worker has some task to perform as the belt passes her table. Compare this moving belt with a somewhat similar device on

way of making homespun cloth in the homes of the workers.

THE HOSIERY TRADE

The British hosiery manufacture, next in importance after cottons and woollens, is carried on in many industrial towns, the chief of which are *Nottingham* and *Leicester*. Its raw materials are wool, cotton and silk (real and artificial), which arrive at the factory as yarns wound on carriers of various shapes and sizes, known as " cones," " cops " and " cheeses," from which they are rewound on the bobbins used on the machines. Silk (real) comes, however, in " hanks " for winding. The finished products of the hosiery trade are all kinds of underclothing, socks (" sox " to the trade), and stockings, sports clothes of all kinds, and knitted dresses, caps and costumes.

Hosiery is made by machines that *knit*—not by those which weave, as in the cotton and woollen industries. Cotton and silk hosiery is made chiefly in Nottingham and towns and villages close by; Leicester and its neighbourhood specialise in woollen knitwear.

Like many other large industrial concerns, the leading hosiery businesses pay great attention to the welfare and education of their workers. Each factory has its welfare and recreation committee. One great firm, whose name and badge or trade-mark are known all over the world, has magnificent sports fields, pavilions and swimming-pools; it runs winter evening classes in cookery, arts and crafts, millinery, and ambulance work. It has boys' clubs; provides lecture courses for grown-ups; and conducts special schools for beginners,

in which young people learn about their trade and the parts they can play in it. It has canteens that seat hundreds at a time for meals; hospitals and first-aid stations; and in London a large building that is home and club in one for its young men.

LINEN AND JUTE

Linen is made from the flax grown in Northern Ireland or imported from Belgium and other countries abroad. It is produced chiefly in the *Belfast* region of Northern Ireland, where the greatest linen industry of the world is carried on.

Eastern Scotland, especially at *Dunfermline* and *Dundee*, is another linen region; the yarn used comes from Belfast. *Manchester*, also, has linen mills.

Jute is a fibre from a tall, heat-and-moisture-loving plant grown in large quantities chiefly in the Ganges delta. It is used for many manufactures in Dundee, Kirkcaldy and other towns. The Dundee Chamber of Commerce gives a list of nearly a hundred different things made from jute, among which are sacks, cloths, carpets, cords and ropes, electric cable wrappings, nose-bags, tapestries, wall coverings, bacon wrappers, plaited soles for shoes, and linoleum and oilcloth backings.

Linoleum made from cork, linseed oil, gum and paint, and backed by strong hemp, is manufactured chiefly at Kirkcaldy, on the Firth of Forth; *oilcloth* is made chiefly at Lancaster.

SILK—REAL AND ARTIFICIAL; AND LACE

Silk weavers from Flanders and France fled to England to escape persecution in the sixteenth and seven-

A R Hogg, Belfast

SCENE IN A LINEN DAMASK MILL IN BELFAST.

What process is taking place? What differences are there between this scene and the picture on page 147, which shows the same process in a cotton mill?

teenth centuries, bringing their craft with them; they settled in various towns, which soon became centres of the silk industry—at Norwich and Colchester, at Canterbury and Coventry, and in London (Spitalfields), for example.

To-day the chief silk-manufacturing towns, using raw silk chiefly from Japan and China, Italy and France, are in Cheshire and Staffordshire, at Macclesfield, Congleton and Leek. Yorkshire's silk centre is Brighouse. East Anglia has silk mills at Norwich and other places; and the hosiery factories (see page 157) use silk largely.

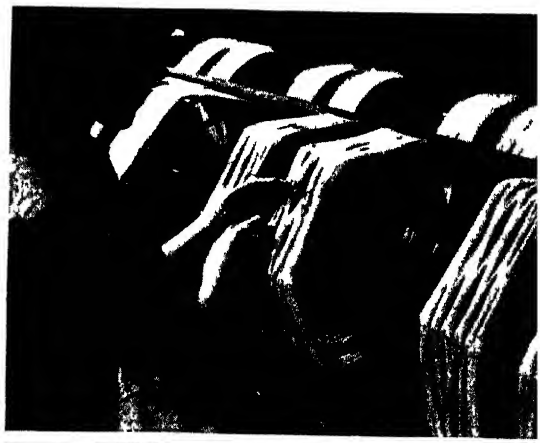
The Manufacture of artificial silk (or rayon) has now become a great industry. Much of it is made in the "real silk" towns, where the manufacturers, seeing the possibility of rayon proving a serious rival to real silk, promptly took it up; but many factories have been established in the textile towns of Britain, and also in places where no factories of the kind have been before. This new industry has been a boon to some of the Lancashire towns where cotton mills have closed. In the "cotton" towns rayon is frequently mixed with cotton, in the "woollen" towns with wool, while in the "hosiery" towns it is often mixed with the various fibres used in the knitting machines.

Rayon is made from wood pulp or from cotton; wonderful machines, aided by clever chemists, produce from wood or cotton a continuous, tough, pliant, glossy thread so much like real silk that sometimes only experts can tell the one from the other. Like real silk, it wears well, looks well, and can be readily washed and mended; it can be easily dyed, and it is often mixed with real silk, or cotton, or wool, to make new fabrics.

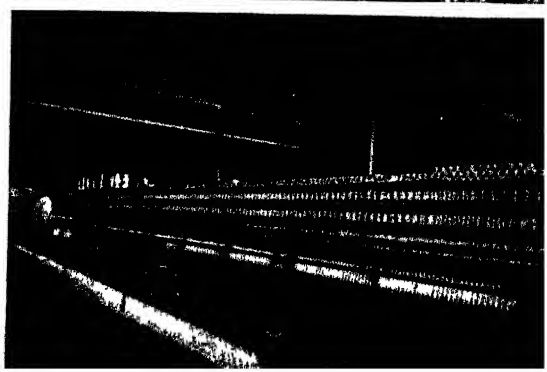
SCENES IN AN ARTIFICIAL SILK FACTORY.

Here we see stacks of wood pulp, the raw material, ready for steeping in chemicals which reduce it to a solution called *viscose*.

The viscose is forced through small holes, and a fine fibre is formed from each hole. These fibres are first spun into cakes and then are wound from the cakes into *hanks*, seen in this picture. The hank is the most convenient form for washing, bleaching, and dyeing.



This view shows that artificial silk can be spun into fine threads in the same machines as are used for cotton spinning (see page 147). Thus a new industry comes to the aid of Lancashire.



Courtaulds Ltd.

Lace, still a home industry in many parts of the West and in Ireland, is made in factories chiefly at Nottingham and neighbouring towns and villages. In Scotland, Ayrshire is the "lace county." Cotton is the chief raw material; linen is used in Irish lace.

QUESTIONS AND EXERCISES

1. The chief British flax-importing ports are Belfast, Dundee, Leith, London and Glasgow. What great linen towns will use this flax in their industry?

2. Make a list of all towns mentioned in this chapter and of their textile industries. Then, on an outline map of the British Isles, show where each town is situated, and indicate in some suitable way the industry carried on there.

3. From what British towns could you buy the following in large quantities direct from the factories: silk stockings; football jerseys; linoleum; blankets; flannel; lace curtains; calico; hessian for chair bottoms; white collars?

4. What is artificial silk? Mention as many materials as you can made either wholly or partly of it. How has the introduction of artificial silk been a great blessing to the older industrial areas?

5. What is *nylon*? For what purposes is this new material used?

6. *Orlon* is a new textile fibre made by squirting through fine holes a liquid that hardens into a fibre as it comes out. Find out all you can about it.

Chapter 16.

LONDON—THE METROPOLIS

London, the capital of the British Isles, and the heart of the British Commonwealth, is now, with its suburbs, the largest human settlement in the world. "Greater London"—London the city, the County of London and its outlying suburbs—is now the home of over nine millions of people. One-fifth of all the people in England and Wales dwell there.

In Book III of the Junior Golden Hind Geographies we read how London probably began as a small village on the gravel hill where to-day stands St. Paul's Cathedral; how the Romans made their walled town by the first London Bridge two thousand years ago; and how London and Westminster, where Edward the Confessor built his Abbey, grew together to make one great city, including also other land on both banks of the Thames as bridge after bridge was built. We read, too, how kings forsook the old capital of Winchester, and under the Normans made London their capital. London was easy to reach by water, and it faced the continent where kings in those days had wide lands and important interests.

Ever since Roman times, great main roads from all parts of Britain have met at London, and ships have come up the Thames to its port. London is still the greatest centre of communications by land and water in Britain; and to-day several important airports lie on its outskirts, making it a centre of British air-routes as well. Traders, bankers, lawyers, law-makers and shippers found it necessary and convenient to have their headquarters in the king's capital, particularly as it could so easily be

Aerofilms

AIR PHOTOGRAPH OF THE HEART OF LONDON

Name the bridges, and find out in which direction Westminster Bridge runs. Identify the Houses of Parliament, Westminster Abbey, County Hall, Horse Guards Parade, the Victoria Embankment, and the site of the 1951 Festival of Britain.

reached from all parts of the country as well as from foreign lands. Workers of all kinds found occupation there, living at first over the shops or other business places of their employers; then, as the city grew, moving into houses on its outskirts; and finally, as these districts became more and more part of the business town, going to live far out where London was gradually extending itself in all directions into the surrounding countryside.

To-day Greater London includes large parts of Essex and Kent, Middlesex and Surrey, and is growing outwards there at the rate of thousands of new houses a year. A new map made to-day is out-of-date to-morrow! It now takes an express train from any of the great London stations from fifteen to twenty minutes

to reach real open country with fields and farms, woods, and hedgerows and country villages.

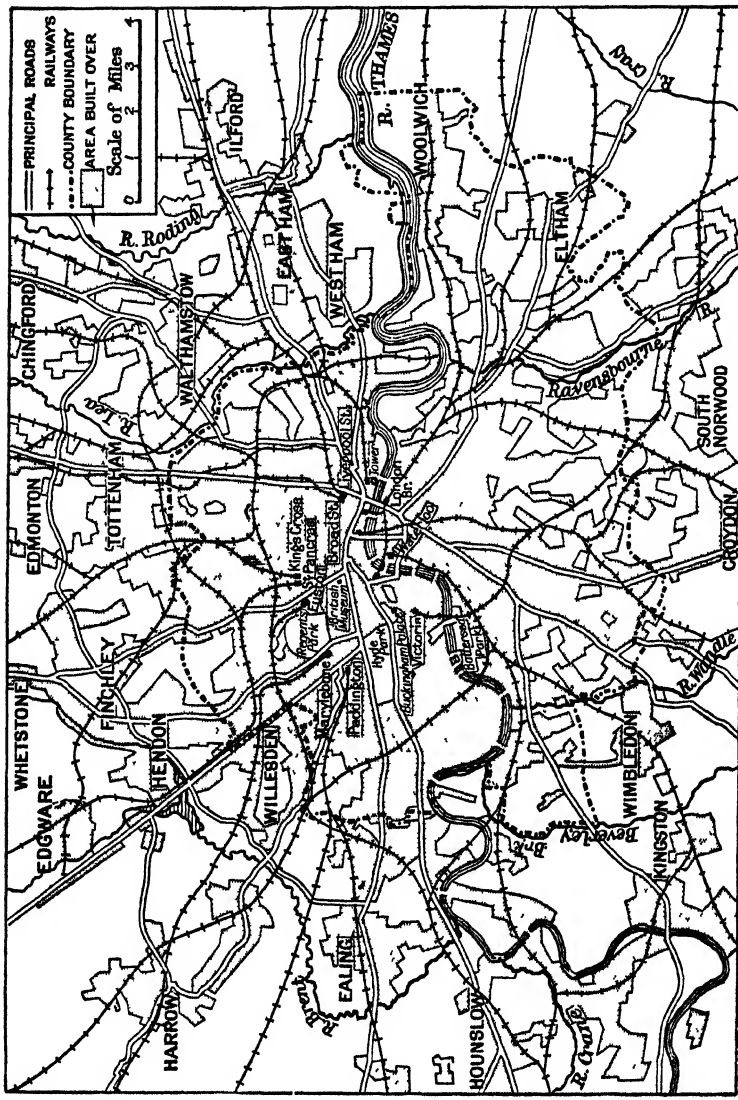
In London itself old houses are being demolished to make room for factories, offices and warehouses; slums are being pulled down and the people who lived in them being housed in large blocks of well-fitted flats; others displaced by these changes have been settled on great new housing estates in the outer suburbs, some of which have more people than many of our manufacturing towns in the provinces. Each year London seems to grow faster and faster. How will it all end?

Few of London's workers live in the City, and tens of thousands live outside the County of London. To bring them to and from their homes there is *London Transport*, which runs the underground railways, the buses and the trams. In London, too, each main line of British Railways has its principal station.

London Transport (formerly the London Passenger Transport Board) is owned by the British Transport Commission, as are also British railways, docks, inland waterways, road transport, and hotels owned by former transport companies. These nationalised businesses are now managed by five executives, of which the London Passenger Executive, running London Transport, is one. In 1948 its traffic ran 665 million miles, earning nearly £58,000,000. Its railways carried 650 million people; its trolleybuses and trams 1,210 million; its buses and coaches 2,745 million.

THE PORT OF LONDON

"London River," as sailors call the Thames, has done more than anything else to make London the greatest



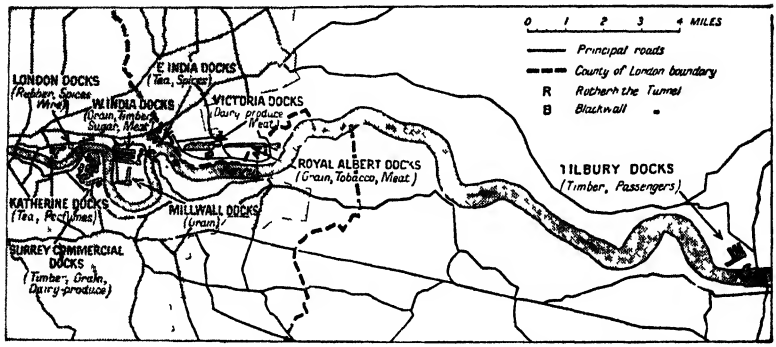
MAP OF THE LONDON AREA.

Note the portion within the area of the London County Council, and identify the area shown in the picture on page 164.

city in the world. Twice a day the sea tide flows up the Thames Estuary, creating deep-water conditions that enable large ships to reach the Port of London. Borne on the tidal current "dumb"-barges and lighters go up or down, with only a man or two to guide them with their great "sweeps" (oars)—for it is Father Thames who provides the motive power. Countless brown-sailed barges and motor craft crowd the water-ways and the wharves; and to the docks come ships from all parts of the world, flying the flags of many different sea-faring nations.

The Port of London includes the whole tidal part of the Thames from Teddington Lock to the Nore Light-ship—70 miles of tidal water-way. It is governed by the Port of London Authority, which arranges the dues and charges to be paid by ships and merchants using the Port, so that the expenditure involved in keeping the Port in good order and its equipment up to date can be met. The Port Authority maintain several large docks on each side of the river, hundreds of acres covered with warehouses and sheds, many miles of railway, large cold stores for frozen meat, enormous granaries for grain; they have regular river patrols, a wreck-raising service, a mooring service, and a river-purification service. But the Thames Police belong to the Metropolitan Police Services.

Because the Thames rises and falls some 20 feet from tide to tide, the construction of docks, in which the water is kept at a constant high-water level by huge locks, was necessary in order that ships might load or unload conveniently. But at Tilbury there is a great floating landing stage alongside which vessels can embark



MAP OF THE DOCKS OF THE PORT OF LONDON.

or disembark passengers at any state of the tide. Tilbury Docks, some 20 miles from London, are nearest the sea, and therefore are used by the largest ships; but railways and roads provide direct and speedy routes to the heart of London.

Farther upstream are still larger docks (see map above), the most important of which, perhaps, are the great Royal Victoria and Albert and King George V Docks —one huge dock, the largest in the world, divided into three main sections. It is equipped with long rows of cranes for lifting goods in and out of ships, with special gear for discharging meat or fruit or other cargoes, and with sheds and warehouses, railways and roads. This great dock is used by the principal shipping companies of Britain and the world: to it come frozen meat, wool, butter, cheese, fruit, wine and grain from Australia or New Zealand; chilled and frozen meat, dairy produce, mutton and lamb, grain and wool, coffee and fruit from South America; grain, wool, tobacco, and gold from Africa; grain, flour, tobacco and manufactured goods from North American Atlantic ports; rum, sugar, coffee

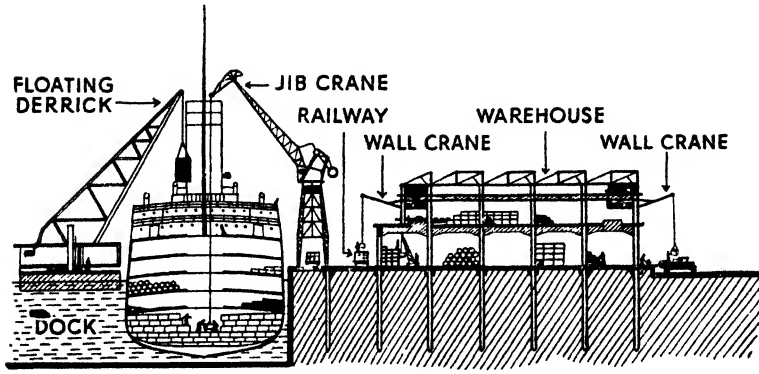


DIAGRAM OF A SHIP IN KING GEORGE V DOCK.
Examine this diagram carefully and describe what is taking place.

and fruit from the West Indies; grain, timber, fresh and canned fruit, and canned fish from Vancouver and other North American ports on the Pacific; silk and cotton goods, soya beans, bamboo, canned fish, hard woods, wax, vegetable oils, tea, rice and other things from China and Japan; and tea, rubber, spices, canes, pearl shell, gum, cocoa, coco-nuts, tobacco, hemp, jute and other cargoes from India and Malaya. This dock has also two flour mills and large cold stores for meat.

From this we may, perhaps, get a general idea of the enormous traffic that goes on in the Port of London—for there are *seven* other large docks in addition to those already mentioned. We must remember too that from the Port goes out a great and steady stream of British products, especially manufactured goods from the cotton mills of Lancashire, the woollen mills of Yorkshire, the engineering works and the motor-car works.

All this export and import trade employs large numbers of people, not only at or near the docks, but

also in the thousands of offices concerned with the sale and dispatch of the goods, and in banks and insurance offices which carry on the money side of all this business.

THE FACTORIES OF LONDON

Not only is London the centre of government, law, banking, insurance and business: it is also the greatest manufacturing city in the world, producing a greater variety of goods than any other town in the British Isles. There is hardly a manufacture of importance that is not carried on somewhere in London or its outskirts.

For long East London has been noted for its huge clothing business; North and East London for their furniture factories and timber yards; South London for the breweries, potteries and glass works, and metal works by the river-side. Many other industries have sprung up in the suburbs and along the great main roads leading in and out of the County of London. Chemicals, musical instruments, wireless, foodstuffs of many kinds, patent medicines, metal windows, and numbers of other products—especially those likely to be readily purchased by Londoners—are manufactured.

Yet London has no coal and no raw materials save what can be brought to it from outside. But it has the great advantages of splendid communications with Britain and the rest of the world, of cheap water transport, of electrical power from several large power stations. Besides, Greater London alone has a market of over nine millions of people, with millions more not far away.

The London Basin has now become Britain's greatest film-producing area; several large film studios have their

Aerofilms.

AN INDUSTRIAL AREA ALONG THE NORTH CIRCULAR ROAD.

Note where the road goes under the main L.M.S. Railway and across the Edgware Road in Hendon. Find the position of this area on the map on page 166, and find out why the Edgware Road is so straight.

home there, e.g. at Elstree, Iver, Denham, Highbury, Islington, Shepherd's Bush and Beaconsfield.

FEEDING LONDON

We have seen some ways in which London is provided with foods of many kinds from lands overseas; to these supplies must be added the regular inpouring of meat and grain, fruit and vegetables, fish and dairy produce from the farms, fields, orchards, market gardens and fishing ports of Britain.

Every night while Londoners sleep, fast goods trains are speeding towards the Metropolis—the "Grimsby Fish," thundering south at 40 miles an hour; the

"Flying Pig," the crack goods train of the Western Region; the "Southampton Meat," bringing overseas beef and mutton in its special cars; the "Banana Special" from Avonmouth; and others with meat from Scotland, dairy produce, and milk from all points of the compass.

All these foodstuffs which pour into London daily from Britain and overseas are distributed chiefly from the great markets, whence shopkeepers and salesmen obtain their supplies. Meat is distributed from the Central Meat Markets at Smithfield; fish from Billingsgate; poultry from Leadenhall Market; fruit and vegetables from Covent Garden, from Stratford Market, from the Borough Market on the south side of the Thames, and from Spitalfields, where the London Fruit Exchange was opened in 1928 (see picture on page 42). London's chief potato, celery, green peas and rhubarb market is at King's Cross. The London Provision Exchange, at the southern end of London Bridge, deals with bacon and ham, butter and cheese; and so does Tooley Street, famous for canned goods and London's chief egg market, which has its London Egg Exchange.

The Baltic Exchange, which arranges for ships to carry goods to all parts of the world, is also the principal European grain market, and deals also in soya beans, groundnuts, cotton seed, and linseed; it deals with large purchases of grain, which are afterwards sold at the Corn Exchange and the London Corn Exchange, both in Mark Lane. In and near Mincing Lane are great sale rooms in which brokers deal with sugar, tea, coffee, cocoa, spices, drugs and other things.

The most important means of carrying foodstuffs from

the docks and railway stations to the markets and from the markets to the shops of all parts of Greater London is the motor-van or motor-lorry. At Smithfield butchers arrive with their vans at 4 or 5 a.m.; the busiest sale times at Billingsgate are between 6 and 8 a.m.; most of the day's supplies are at Covent Garden by 4 a.m., and selling commences almost at once. Only the "early birds"—or the very late ones—among Londoners ever see these markets in full swing.

QUESTIONS AND EXERCISES

1. Make a picture collection of famous historic buildings in London. Write under each a short description.

2. London's chief railway termini are at King's Cross, Euston, Fenchurch Street, St. Pancras, Marylebone, Paddington, Liverpool Street, London Bridge, Charing Cross, Victoria and Waterloo. Find out to what British railway Region each belongs. Find the position of each on the map on page 166.

3. Explain what is meant by (1) the City of London; (2) the County of London; (3) Greater London; (4) the London Boroughs. (London children should make a list of the London Boroughs.)

4. Make a list of London's famous parks, and show their position on a sketch-map. Where are the following: the Zoo, Greenwich Observatory, Kew Gardens, the Serpentine, Parliament Hill? Put these on your map too.

5. Make a special section of views of London in your picture book.

Chapter 17.

BRITISH HOLIDAYS

Holidays are important to everybody, especially to those who work hard all the rest of the year. Many large businesses now grant holidays on full pay to all their people, for they have discovered that this helps to make healthy, contented and happy workers. In some of our great industries whole towns go on holiday at a time.

Planning for the holidays is almost as good fun as having them, for we visit many spots in imagination before we finally decide what we are really going to do. In this chapter we look at some of the most popular holiday resorts in the British Isles. But before we do so, let us remember one or two important facts about the British climate; for bad weather may easily spoil a holiday, unless we go prepared for it—in which case "bad" weather may not be so bad for us after all!

Western parts of the British Isles, especially the highlands, are wetter than the eastern parts; south-east England, for example, has many hours more sunshine a year than Lancashire, and seaside towns on the eastern and south-eastern shores of Britain are likely to have much finer weather on the whole than those on western coasts (see diagram on page 200). The best months for visiting the Lake District or the Scottish Highlands are May, June, and September, when the weather is generally fairly settled.

Some people must take holidays in winter, or prefer to do so. They will be wise to go to southern or south-

western England, where winters are warmer than anywhere else in the British Isles. Devon and Cornwall, which reach farthest south, and form a peninsula much influenced by warmth from the Atlantic, are particularly good; and so is the Isle of Wight. Such resorts have many winter visitors, especially those who dread the fogs, the frost and the snow. But if they are hardy and energetic and love frost and snow and winter sport, they can go to the Pennines, the Lake District, and the Scottish Highlands and get all they wish for!

SEASIDE HOLIDAYS

So many British people are town-dwellers that they naturally wish to spend their holidays at the seaside or in the country; and because their children have their longest school holiday in summer, when the weather is warmest, they prefer summer holidays. This means that holiday places, especially at the seaside, are very crowded. Seaside towns must make special arrangements to house, feed, amuse, and care for the thousands of extra people who visit them in the summer season; railways and motor-coach companies, too, must provide additional transport. All this provides work for hundreds of thousands of people, many of whom, however, must find other jobs for the winter.

Running an up-to-date seaside town is a big business. Hotels and boarding-houses, restaurants and shops, coaches and trains, boats and steamers are usually provided by private persons or companies, but amusing the visitors is often a public business; for unless visitors

enjoy themselves they will not come and spend their money in the town. It is often the town which provides the pier, the bandstand and the bands, the gardens and parks, the swimming-baths and pools, the amusement park, the array of brilliant coloured lights at night, the concert parties, and open spaces for golf, tennis, cricket and other games. Among the most popular of such towns are *Blackpool*, on the Lancashire coast, *Southend-on-Sea*, one of the Londoners' playgrounds, *Yarmouth* on the east coast, famous for sunshine and fine sands, and *Brighton* on the south coast—" London-by-the-sea," where many people live and go to London every day to business.

Other favourite resorts on the east coast are Aberdeen, " the granite city," and St. Andrews, " the golf capital " and a university town of Scotland; Whitby, Scarborough, and Bridlington in Yorkshire; Skegness and Mablethorpe in Lincolnshire; Cromer, Southwold, Felixstowe, Walton and Clacton in East Anglia; and Margate, Ramsgate, and Deal in Kent.

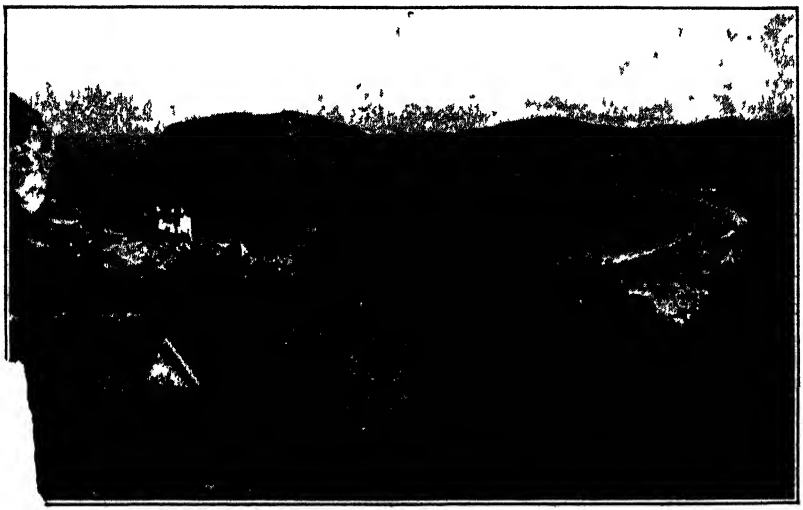
On the south coast are Folkestone, Hastings, Eastbourne, Worthing and Bognor; Shanklin and Ventnor in the Isle of Wight; Bournemouth, famous for its sands and pines, and Weymouth, a naval port and packet station for the Channel Isles; Torquay and other lovely places in Devon; and Looe, Falmouth and Penzance in Cornwall.

On the west coast are Newquay, Ilfracombe and many other spots in Cornwall and Devon; Tenby, Aberystwyth, Llandudno and Rhyl in Wales, where the delights of the seaside are accompanied by the charm of the mountains, rivers and lakes; Southport, the Isle of

Based on a photograph by Robert M. Adam.

WINTER IN GLEN AFFRIC, INVERNESS-SHIRE.

Notice (*a*) the lovely Loch Affric, (*b*) how conifers hold the snow.



Judges.

LLANDUDNO.

out the names of the two headlands at the extremities of the bay. Why do we frequently find beautiful bays between headlands?

n and Morecambe in northern England; and noon and Oban in western Scotland. From Glasgow mers take summer tourists to see the beautiful West- Isles, calling at the Isle of Staffa to see the famous gal's Cave and at Iona to see where Christianity first ne to Scotland, and passing through the Caledonian nal to the North Sea and the Firth of Forth for linburgh.

Ireland, too, has many seaside resorts. Portrush, in e north, is near the Giant's Causeway, which is formed f the same kind of strange basalt pillars that form the "organ pipes" of Fingal's Cave in Staffa. Many people prefer the quiet beauty of little places on the west coast, facing the Atlantic, and of the islands where summers are beautiful.

Will F. Taylor.

THE LAKES OF KILLARNEY FROM QUEEN'S VIEW.
Find the Lakes in your atlas

COUNTRY HOLIDAYS

The British Isles, although they are not large, offer a great variety of country holidays to tired townsfolk.

Those who prefer the mountains and the moorlands go to Wales, the Lake District, the Pennines, and the Yorkshire Moors in England; to the Highlands of Scotland, where there is some of the finest mountain and lake scenery in the world; or to the wild mountain and lake country of Connemara in western Ireland, and to other Irish highlands, such as the mountains of Donegal, the Mourne Mountains, or the Wicklow Hills, or to the lovely lake-land of Killarney among the high mountains of Kerry in the south-west.

The English Lake District, at its best in May and June,

G P Abraham Ltd., Keswick

A TYPICAL SCENE IN THE ENGLISH LAKE DISTRICT

The picture was taken from Honister Crag. Find this in your atlas, and identify the three lakes

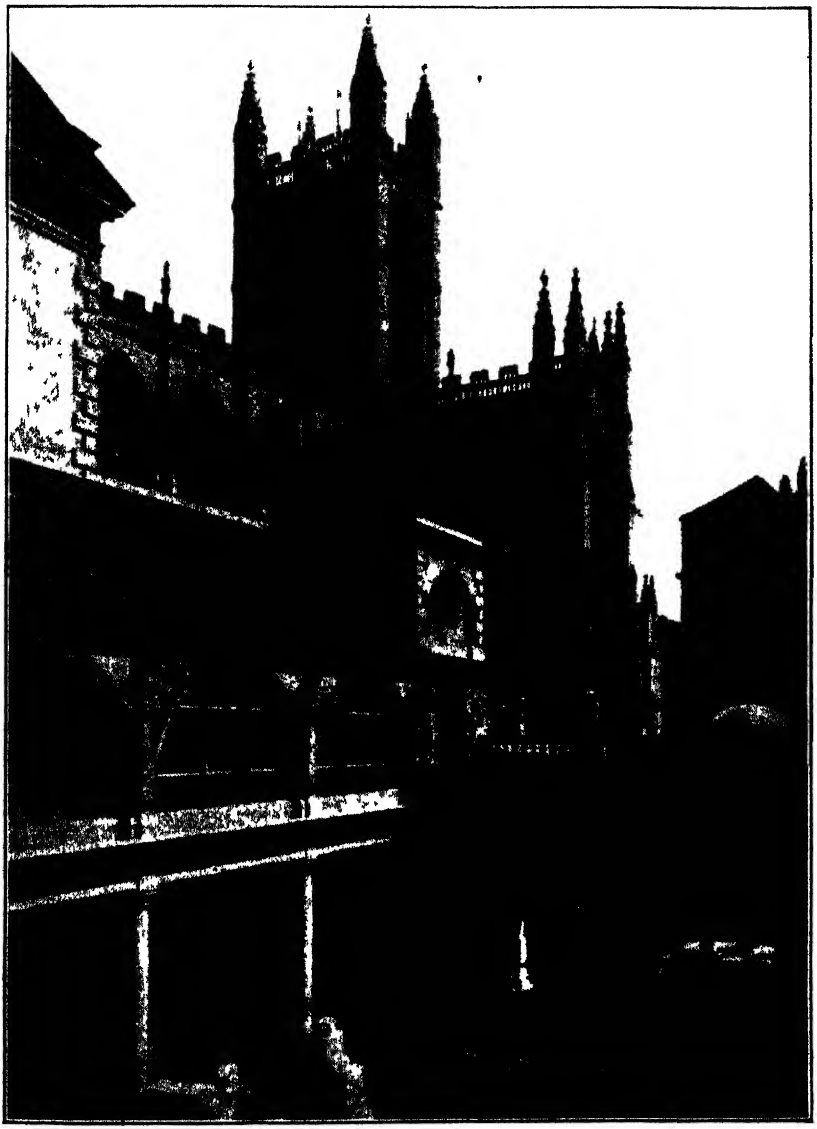
is very beautiful. A famous American writer says of it: "Never have I found a district so limited in space which contains so much beauty and so much variety in scenery as your Lake District. It is something truly marvellous." The mountains rise so steeply from their deep valleys that they seem higher than they really are; they are clothed with ferns and mosses, heather and grasses, and their lakes are often overhung with trees—all offering a wonderful feast of colour that changes with the seasons. Notice from the map how the lakes radiate

from the high central knot of Scafell like the spokes of a wheel; Windermere is the largest. The key towns to this natural wonderland are Kendal in the south-east and Keswick in the north.

Other holiday-makers prefer the gentle slopes and open country of the English Downlands, or the beach woods of the Chilterns, or the lovely valleys of the Cotswolds, or the wide freedom of southern moors, like Dartmoor and Exmoor. The Norfolk Broads—large lake-like expansions of the sluggish rivers, caused by the accumulation of mudbanks and sandbanks near their mouths—provide safe boating, fishing, sailing and swimming to large numbers of summer visitors, who can hire motor-boats, yachts or wherries as floating homes, moving from one spot to another along the network of water-ways. Yarmouth and Lowestoft are the sea-gates to the Broads; Norwich is the land-key.

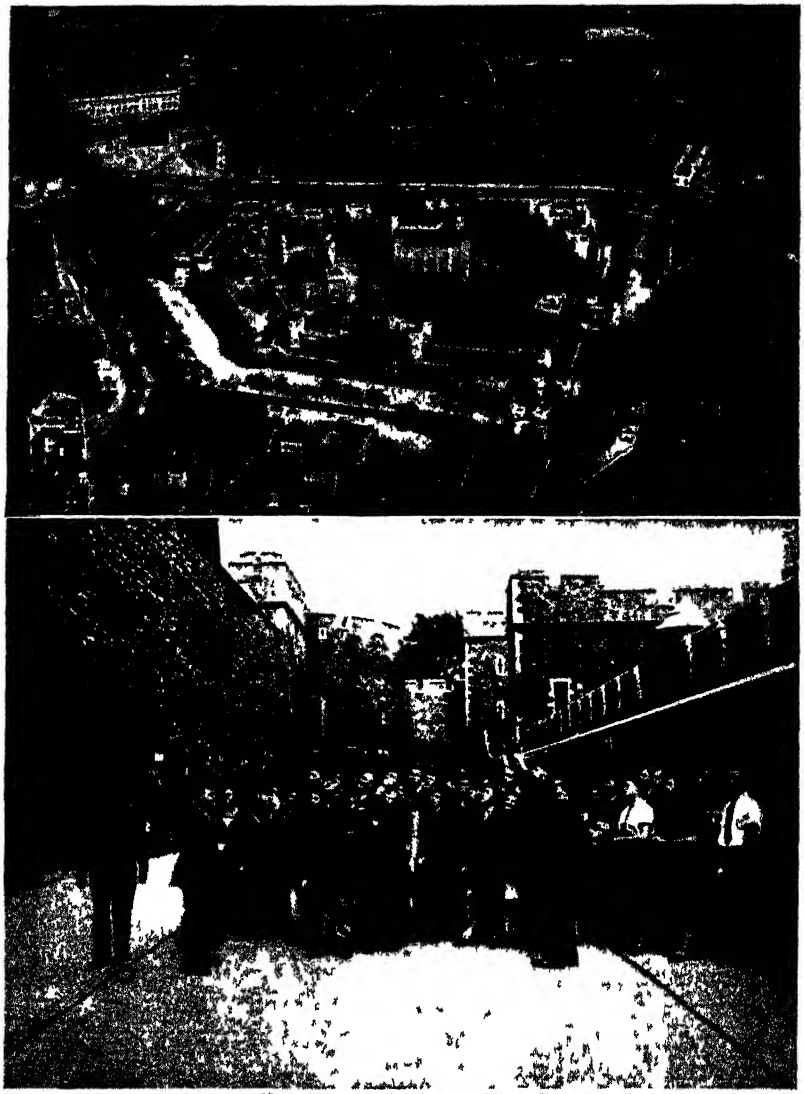
HOLIDAYS AND HEALTH

Britain is fortunate in possessing places which not only are beautiful and health-giving in themselves, but also have healing springs gushing forth to cure the ills of mankind. Some are good for rheumatism and similar ills; others for the skin; others for digestive troubles—and so forth. Doctors advise patients which place is likely to suit them best. Such towns are known as *spas* or inland watering-places; at all of them there are special arrangements (including medical attention) for "taking the waters," either by drinking them regularly or by bathing in them; and for housing, feeding, and amusing guests. Good examples of such *spas* are Harrogate at the foot of the Pennines in Yorkshire; Buxton and Mat-



Will F. Taylor.

THE ROMAN BATH AND THE ABBEY BATH.



Photos (Above) Aerofilms (Below) Sport and General Press Agency

1. THE TOWER OF LONDON FROM THE AIR

2. A VISIT TO THE TOWER.

Visitors to the Tower are shown around by a beefeater Find the position of the Tower on the map on page 166

lock in the famous Peak District of Derbyshire; Leamington in Warwickshire; Malvern at the foot of the beautiful Malvern Hills and Droitwich in Worcestershire; Cheltenham at the foot of the Cotswolds in Gloucestershire, and Bath in Somerset.

Bath is perhaps the most famous of them all, for the Romans long ago discovered the value of the healing springs and built the Roman city of Aqua Solis ("Water of the Sun") there. The remains of the Roman baths may still be seen (see page 181). The springs are very hot and gush up from considerable depths; the "Pump Room" is the resort of thousands who come to drink the healing waters and take "the cure" under the direction of skilled doctors. Wales has its healing springs too, notably at Llandrindod Wells and Builth Wells.

TOWN HOLIDAYS

Countryfolk, and many townsfolk too, like to spend their holidays in towns, especially those which have historic buildings and ancient customs, as well as the special opportunities for amusement, interest, and education found in most large cities.

Everybody wishes, for instance, to visit London—if only to see the Houses of Parliament and Westminster Abbey, the Tower of London and St. Paul's Cathedral, Buckingham Palace and the National Gallery; or to ride in the wonderful red buses and tube trains; to see the Zoo, and the many museums, the parks, the ancient churches, or the London Markets and the Docks.

England has many beautiful cathedral cities, full of interesting old buildings: Canterbury and Winchester, Norwich and Lincoln, York and Durham, are among

the chief of them. Other holiday people go to see the Roman Wall in the Tyne valley of Northumberland; or the old Roman walls of Chester; or the mysterious stone circles of Stonehenge and Avebury; or the old castles of places like Warwick and Kenilworth, Rochester and Harlech. Some are attracted by Stratford-on-Avon and the Shakespeare country; or by Abbotsford and the Tweed valley, where lived Sir Walter Scott.

Nowadays many people go motoring for their holidays and, thanks to the great network of roads (see map, page 193), they can arrange tours which will enable them to visit many of the interesting places we have mentioned, and to see the real beauty of Britain and the glories of the open countryside.

QUESTIONS AND EXERCISES

1. Plan a motor tour, from any starting-point you choose, which would enable you to see in a fortnight's holiday a cathedral city, a castle town, mountain scenery and the seaside. Draw a sketch-map to show exactly where you would go.

2. Make a map to show all the holiday places mentioned in this chapter. Add a note describing any one you have visited or read about.

3. Suppose you were offered a free fortnight's holiday in August. Make a list of holiday places within £1 return fare from your town or village ; say which of these you would choose, and why ; and draw a sketch-map to show how you would prefer to go there.

4. Which British holiday centres are most convenient for the workers and their families of London, Birmingham, Manchester, Leeds, Glasgow, Bristol ?

5. Where in Britain would you go for mountains and lakes, or bracing moorlands and fine stretches of sand, convenient with regard to spending a few days of the holiday in France or Belgium or the Isle of Man ?

Chapter 18.

WAYS ABOUT THE BRITISH ISLES

Although geography has always had much influence on the lives of people in Britain, as in other lands, men have not always been content to let geography have its own way; they have *made* a good deal of geography of their own!

Men have drained swamps and turned them into fertile fields, as in the Fenlands; they have cleared forests and made farms there; they have made harbours where Nature had provided none, like Dover Harbour; and where Nature has not afforded a necessary sea-way, they have cut one, as in the case of the Manchester Ship Canal. Dissatisfied with natural inland waterways, men have straightened rivers or cut canals to meet their needs. Above all, men have made roads and railways where they wanted them; they followed natural routes, such as valleys and mountain passes, where they could; but very often they made a route for themselves by boring tunnels or making cuttings in hilly places; by constructing bridges across rivers, lakes and arms of the sea; by filling up swamps to make firm ground, or by raising embankments to carry roads or railways easily and safely over hollows and low ground and keep them as level as possible.

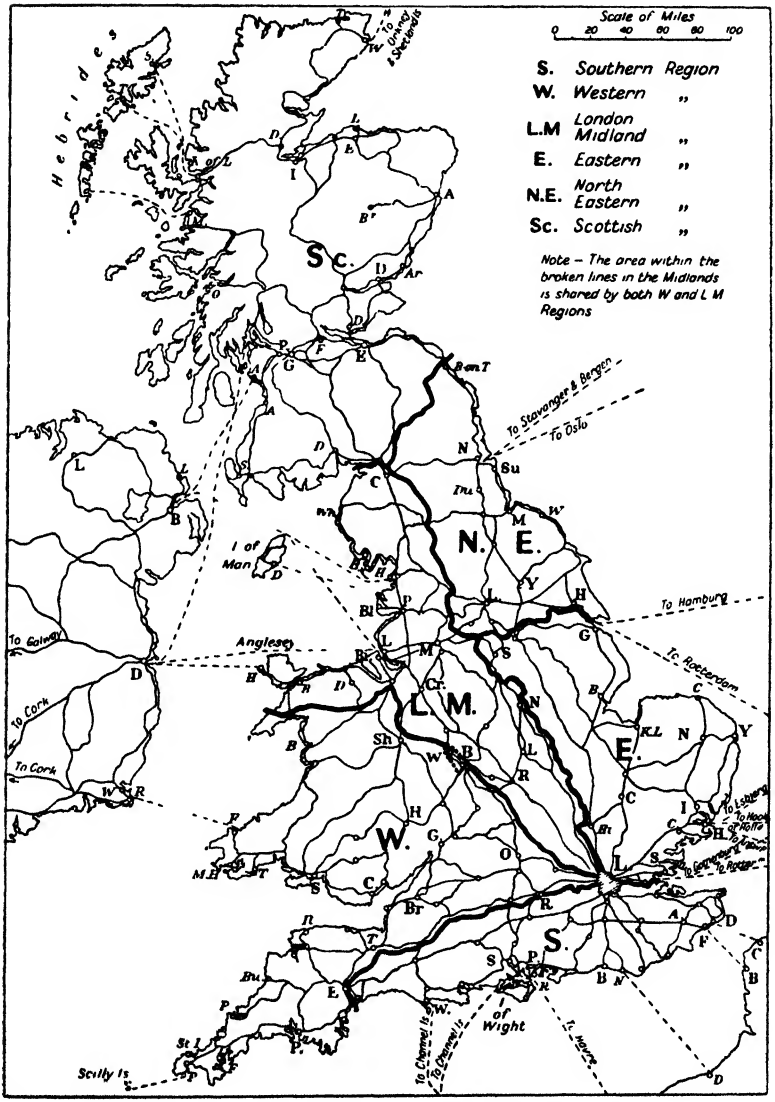
The urgent need for getting about themselves or for taking goods from place to place has perhaps given rise to more man-made geography than anything else. When men and animals carried themselves and their burdens on their own legs, tracks and footpaths were good enough; but when they began to move in large

numbers and use carts, carriages and coaches, they had to provide roads. When they found out that the best way to move heavy goods cheaply was by water, they constructed canals; and as soon as they discovered the power of steam and invented locomotives, they built railways. In our day, with the invention and common use of the petrol engine and the motor-car, the roads have become once more of great importance, and fine new motor roads are being made in various parts of the country. Road transport is now a serious rival of transport by rail; but at present the railways still carry most goods and passengers.

BRITISH RAILWAYS

The Transport Act of 1947 nationalised the railways and reorganised the existing four systems into six regions as follows:

1. *The London Midland Region*, corresponding to the former L.M.S., with headquarters at Euston station.
2. *The Western Region*, corresponding to the former G.W.R., with headquarters at Paddington station.
3. *The Southern Region*, corresponding to the former S.R., with headquarters at Waterloo station.
4. *The Eastern Region* (the southern part of the former L.N.E.R.), with headquarters at Liverpool Street station.
5. *The North Eastern Region* (the area formerly served by the L.N.E.R. between Doncaster and Berwick), with headquarters at York station.
6. *The Scottish Region* (the former Scottish area served by the old L.M.S. and L.N.E.R.), with headquarters at Glasgow station.



THE MAIN REGIONS OF BRITISH RAILWAYS.

All of these railway systems have their special ferry ports whence railway steamers and others start for the Continent of Europe or for Ireland and the Isle of Man; for it is important for many British people to have quick and easy transport of this kind.

The London Midland Region, which has its London termini at Euston and St. Pancras, serves nearly all the chief manufacturing regions of Britain—the industrial Midlands (" Black Country " and the Potteries), the cotton district of Lancashire, the woollen and steel regions of the West Riding of Yorkshire, and the busy Lowlands of Scotland, all regions of very dense population. It also provides transport to and from the important ports of London, Liverpool, Manchester and Bristol. It serves important crossings from Great Britain to Ireland, and provides routes leading to the Scottish Highlands and to steamers sailing to the chief islands of the Hebrides.

For tourists and holiday-makers this Region provides a quick and easy way to the Welsh mountain land, the Lake District, the Pennine and Yorkshire Moors, the Highlands of Scotland, the beauty-spots of Ireland, as well as to numerous seaside towns.

The Eastern and the North Eastern Regions (London termini: King's Cross, Liverpool Street, and Marylebone) provide the east coast route to the North—the easiest of the ways from London to Edinburgh, Aberdeen, and Inverness. This main route passes through the rich farmlands and manufacturing districts of the east Midlands, mid-Yorkshire, the iron and steel region of the Tees, the Northumberland and Durham coalfield, and the eastern Lowlands of Scotland. Its branch lines

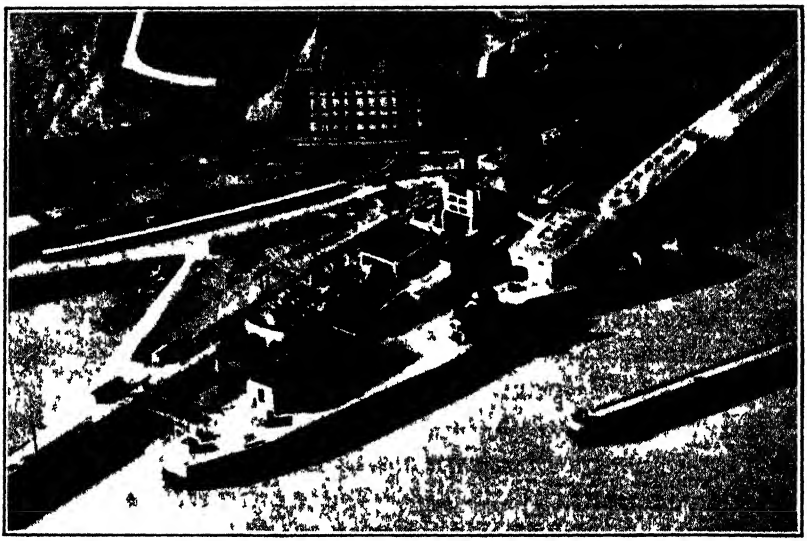
serve the cotton and woollen and steel industries of the North.

Besides this, these Regions provide the main system serving the wheat lands of eastern England; the fruit, potato, bulb, celery and potato farms of the Fenlands; and the fishing ports of Yarmouth, Lowestoft, Grimsby and Hull. It leads to the ports of Harwich, Immingham and Hull, Newcastle and Middlesbrough, Dundee and Aberdeen, and provides the chief ferry routes to Scandinavia, Denmark and the Baltic, Germany, Holland and Belgium.

To the holiday-maker these Regions offer the choice of a long string of pleasant seaside towns, from Southend to Aberdeen; they also serve the Yorkshire Moors and the Pennines, the Norfolk Broads and the Highlands of Scotland. They rightly boast that they serve "the sunshine side" of Britain—the part which has most sunshine and least cloud and rain.

The Western Region (London terminus: Paddington) is the main highway to the West Country, to Wales and the Lakes of Killarney in southern Ireland. It serves the busy districts on both sides of the Bristol Channel; the farmers of Somerset, Devon and Cornwall, and the seaside towns of the south-western peninsula. It has routes, too, through the "Black Country" and north Wales; it serves the ports of Liverpool and Birkenhead, Bristol (with Avonmouth), and Plymouth; and its main line to south Wales passes through the famous Severn Tunnel.

The Southern Region (London termini: Victoria, Waterloo, Charing Cross, and London Bridge) covers most of southern and south-eastern England, linking



British Railways

DOVER TRAIN-FERRY DOCK.
Find out how the train is able to run on to the ship.

up the Channel ports and many popular seaside towns, as well as the Isle of Wight, with London and the rest of Britain. Large stretches of the main line as well as of the London suburban lines are now electrified. It has the distinction of running the only train ferry for passengers from Britain to the Continent, although the Harwich-Zeebrugge train ferry for goods traffic has been in operation for many years, whilst its trains reach the important port of Southampton, whence liners set out for the Americas and for South Africa.

The Scottish Region of British Railways serves the whole of Scotland by the Scottish sections of the old L.M.S. and L.N.E.R. It provides rail transport across the Southern uplands to the busy Central Lowlands and the Highlands, and to the Scottish ports of Glasgow,

Leith, Dundee and Aberdeen.

Since all the Regions are served by British Railways, " through " trains can be run from London termini to all important centres in Great Britain.

Irish Railways focus chiefly on the two capitals, Dublin and Belfast, both of which are in daily sea communication with ports in Great Britain by English, Scottish, and Irish passenger and mail steamers.

In *Northern Ireland* the Midland Railway serves the northern part, running to Londonderry; the Great Northern provides the chief railway route for places south of Belfast.

In the *Irish Republic* the Midland Great Western Railway provides for the northern regions, serving the ports of Galway and other points on the Atlantic; and the Great Southern and Western handles traffic for southern and south-western regions, serving the ports of Limerick and Cork, Waterford and Wexford. At Cobh (formerly Queenstown), the outport of Cork, the water is deep enough to permit liners to or from America to call.

ROADS

The enormous increase of traffic on the roads of Britain, particularly motor vehicles, has given rise to so many problems that they have now become the charge of the Road Transport Executive. This Executive provides not only for the improvement of old roads and for the construction of new ones, but also for the safety of road-passengers and the general public. It is most important that all road users should obey the rules which have been framed for the safety and welfare of all. You know yourself how careful you have to be in

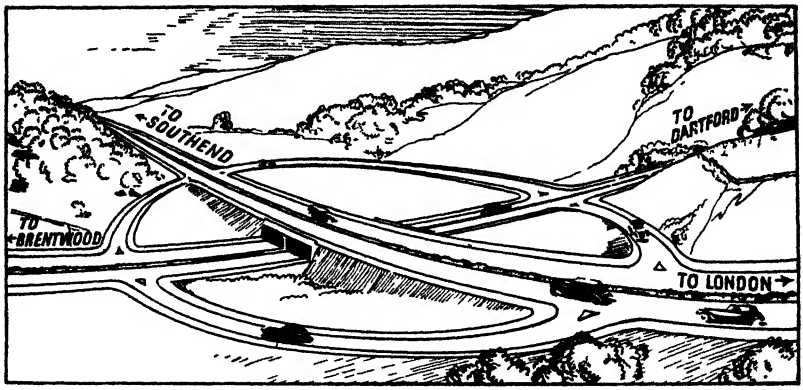


DIAGRAM OF A SUGGESTED MAIN ROAD CROSSING

Examine the details of this crossing. Do you think it should make the roads safer ?

going to and from school.

Some idea of the use of the roads may be gained from the following huge figures for 1949: Total number of motor vehicles 4,051,000, of which 625,000 were motor-cycles, 834,000 motor goods vehicles, and 2,104,000 private cars. A famous motorist says that within the next two or three years the numbers will reach a round five million vehicles, for all of which accommodation will have to be found on the highways. One high authority has suggested the separation of fast traffic from the rest by the making of special " fast roads " on which only fast traffic shall run—not to be used by horses, cyclists, walkers, dogs, cattle, and slow or inexperienced drivers. This is already coming into practice. The above sketch is a new type of road-junction planned by the surveyor to the Essex County Council.

More remarkable even than the great increase in transport of goods by road has been the spread of a wide net of coach routes throughout Britain, along which fast and

THE COACH CONNECTIONS OF LONDON COASTAL COACHES LTD.

Would you prefer to travel from London to Edinburgh by coach or by train? What considerations would help you to decide?

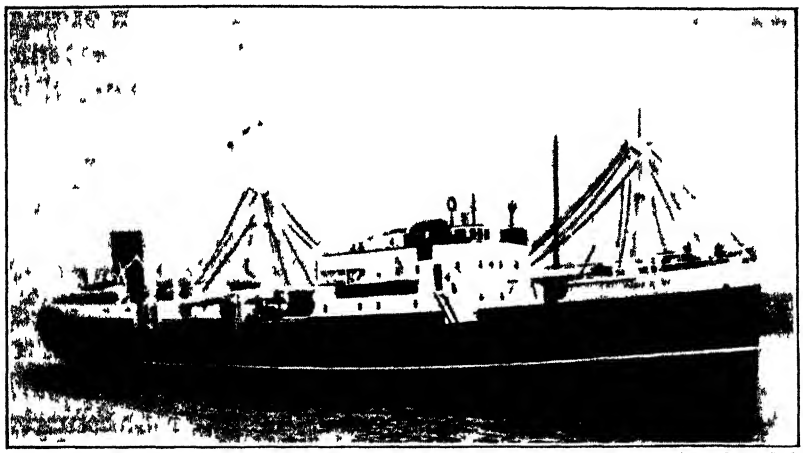
thoroughly comfortable motor-coaches run to a time-table with the regularity of trains, stopping at regular " stops " on the way. There is no town of any size in Britain which cannot be reached by motor-coach; many of the main coach lines run all the year round, by night as well as day, and extra services are provided for the heavy holiday traffic in the summer months.

Most of the British main coach lines have associated under London Coastal Coaches Ltd., whose headquarters are at the great Victoria Coach Station in London, whence coaches depart for all parts of Britain. The company issues regular time-tables—fifty-four of them !—serving 1,500 towns, some on great main roads, others on routes linking up outlying towns and villages with the cities and main highways (see map on page 193).

AIRWAYS

British people have taken to the air in a remarkable fashion, and in addition to the big London airports of Heath Row and Northolt, almost every large town has an aerodrome or landing-field close by, for flying, like motoring, has become a sport for those who can afford it. British Railways, too, now run air services between important centres on their routes, so that people to whom time is money, or others with urgent business, may reach their destinations as quickly as possible.

At London airports you may see " planes " from France, Holland, Switzerland and other countries as well as those of the British Overseas Air Corporation and British European Airways, which fly to the chief parts of the Commonwealth, to North America, to Europe and to South America. So busy and wonder-



Coast Lines Ltd

THE COASTAL LINER *PACIFIC COAST*

This is a vessel of 1,600 tons. What does this mean? What considerations would decide whether (*a*) passengers, (*b*) goods went from London to Glasgow by sea, by train, by road, or by air?

ful are the airports that it is now one of the sights of Greater London to watch the machines coming and going.

SHIPS

Ships carry goods and passengers to all ports on British coasts. British coastal trade is carried on, not only in a swarm of small motor-craft, steamers, and sailing vessels, but also in fairly large and well-found steamships, many of which have good accommodation for passengers. For example, Coast Lines Ltd. offer summer voyages round the British Isles, as well as pleasant and comfortable passage from port to port.

CANALS

The British Isles have many canals, most of which were cut in the eighteenth and nineteenth centuries and used

a great deal until the railways came to rob them of their traffic. Many of them gradually fell into decay—some, indeed, into disuse—but some remained, proving their value to the parts they served.

In recent years the canals have had more attention and certain of them have been widened, deepened, and straightened. The Grand Union system, providing a water-way from London through the "Black Country" to the Mersey and Liverpool, is a good example. The use of motor-tugs and motor-barges, too, has led to increased traffic. Canals are most numerous in the Midlands, and the chief of them lead to the four estuaries of Mersey and Humber, Severn and Thames.

British ship canals have been cut (1) between Manchester and Liverpool; (2) on the lower Severn to avoid the many bends; and (3) through the Highlands, by way of the rivers and lochs of Glen More.

QUESTIONS AND EXERCISES

1. By means of a Bradshaw or A.B.C. railway time-table find out the distance in miles and hours between London and Edinburgh, Dublin and Cork, London and Glasgow, London and Penzance, London and Birmingham.

2. What do you known about (*a*) "cruises" by railway, (*b*) caravan holidays by rail, (*c*) modern methods of road safety (include drawings of important signs), (*d*) facilities for air transport in Britain?

3. Compare the journey from London to Paris (*a*) by air, (*b*) by ferry train, as regards (i) time taken, (ii) cost, (iii) comfort.

4. How are the following brought to London: (*a*) fish from Grimsby, (*b*) flowers from the Scilly Isles, (*c*) vegetables from the Home Counties?

Chapter 19.

THE COUNTRIES AND REGIONS OF BRITAIN

It is now necessary for us to look at the British Isles as a whole, bearing in mind what we have already learnt about the various types of homelands and how the people live and work.

The five thousand British Isles rise from a broad undersea extension of western Europe, whose edge is the 100-fathom line. Of these the two largest are Great Britain (England, Wales, and Scotland), and Ireland (Northern Ireland and Eire); and, as we saw in Chapter 4, by far the greatest number of people live in England, where there is the greatest amount of plough-land, and where the largest and most important coalfields and manufactures have been developed.

The British Isles lie mainly between 50° and 60° N.—in latitudes where the climate is temperate and rarely too hot or too cold for work and play. In these latitudes the westerly winds prevail, bringing warmth in winter and cool airs in summer; British ports are open all the year round—not sealed by ice, like those of Canada in the same latitude on the other side of the Atlantic. The British Isles lie opposite and near the most important trading countries of Europe, and also opposite those of North America, which, however, are some 2,000 miles away across the North Atlantic. Because the British are an island people, they early took to the sea and mastered it, using it as a defence and as a highway that leads to every seaboard country in the world.

RELIEF AND DRAINAGE

The highest regions lie to the north and west of Great Britain; and in broken masses round the Irish plain, especially in the north and south. In Great Britain a broad central upland (made up of the Pennine backbone, the Lake District, and the Southern Uplands of Scotland) lies across its middle. *North* of this central upland are the Lowlands of Scotland, beyond which rise the Scottish Highlands, cut in two by the deep trench of Glen More, and fringed on the west especially by many rocky islands—the Inner and the Outer Hebrides. *South* of the central upland is the English Plain, with ridges of hills running chiefly from south-east to north-west across its southern half, and with the high Welsh Mountains (Cambrian Mountains) forming a great block of highland to the west.

Great Britain's longest rivers, with the exception of the Severn, flow from west to east generally, entering the North Sea by wide estuaries that invite sea traffic—the Firths of Tay and Forth, the estuaries of the Tees, Humber, Wash and Thames. On the south the important estuary of Southampton Water and the drowned estuaries of Plymouth Sound and Falmouth Harbour have important ports, but are the outlets of quite unimportant rivers. Western sea-gates are the Bristol Channel, the huge estuary of the Severn and other streams, with its ports of Cardiff, Newport, Avonmouth and Bristol; the Mersey, on which stands the great port of Liverpool, and from which the Manchester Ship Canal takes vessels to the Port of Manchester; and the Clyde, on which stands Glasgow, Scotland's largest city and port.

In Ireland the Shannon, with its many lakes, the longest river in the British Isles, flows through the thinly peopled central plain to its long estuary facing the west, with the port of Limerick at its head, and the important Trans-atlantic seaplane base of Foynes farther down. Belfast, capital and port of Northern Ireland, is on its Lough, which is the deep, drowned estuary of the little River Lagan. The great square Lough Neagh, the largest lake in the British Isles, is drained by the quite unimportant River Bann.

CLIMATES AND CROPS

The prevailing westerlies deposit most of their moisture on the western and north-western highlands of the British Isles (see diagram on page 200), making the western regions much wetter than those of the east. Driest Britain is in the south-east; wettest Britain is chiefly in north Wales, the Lake District and the Western Highlands of Scotland.

Eastern Britain, farthest away from the Atlantic, and less influenced, therefore, by its warmth in winter and its coolness in summer, has the coldest winters and the warmest and sunniest summer.

All this has its effects upon the use of the plough-land by the farmers. The drier and sunnier eastern England provides most of the home-grown wheat—for *wheat* must have sunshine; and so must sugar-beet. *Oats*, however, are the chief grain in eastern Scotland and Ireland; *barley*, too, grows there, but the barley needed for malting requires more sun, and is therefore grown mostly in East Anglia. The chief British fruitlands are in Kent, the Fenlands, the Vale of Evesham, Herefordshire and

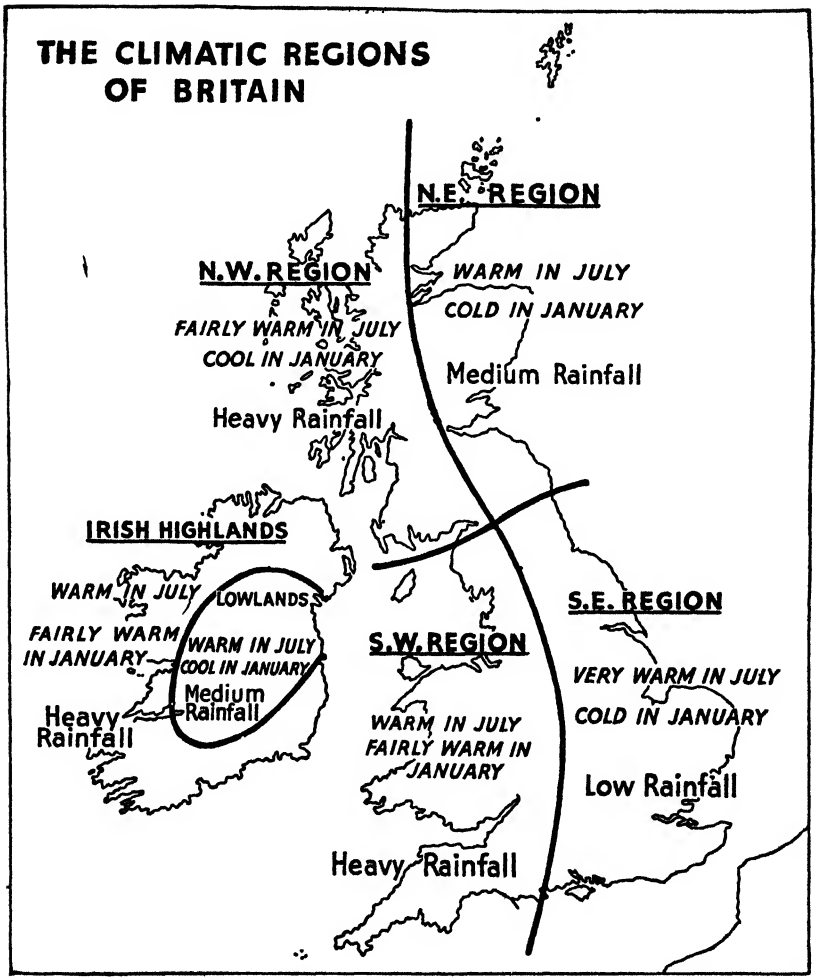


DIAGRAM OF THE CLIMATIC REGIONS OF BRITAIN

Devon (apples), where soil and climate favour them. *Potatoes*, grown almost everywhere for local use, are produced in England on a large scale in the fine rich soils of the Fenlands, of the Lancashire Plain, of south

Durham; and of the London Basin, where many people live. In Scotland, the potato fields of the Lowlands are most important; in Ireland, where potatoes enter more largely into the daily food of the people, they are grown wherever the soil is deep and rich enough. England and Wales grow more; but there are vastly more people there.

Climate helps to decide also the use of the pastures. The chief sheep and cattle lands have already been mentioned (Chapter 8). The moist climate and green pastures of Ireland have made the "Green Isle" a great dairy-farming country whose chief business is the production and sale of milk and cream, butter and cheese, eggs and poultry, bacon and ham, and of "store" cattle and fine horses. As in the chief dairy regions of Great Britain, the milk is sent to central creameries, and the pigs to bacon factories, thus assuring farmers of steady sales and prices.

Study carefully the map on page 200, which shows that the British Isles, small though they are, have slightly different climates in different regions. In January the temperature falls as we go *eastwards*, but in July as we go *northwards*; while the higher western areas have more rainfall than the lower eastern areas.

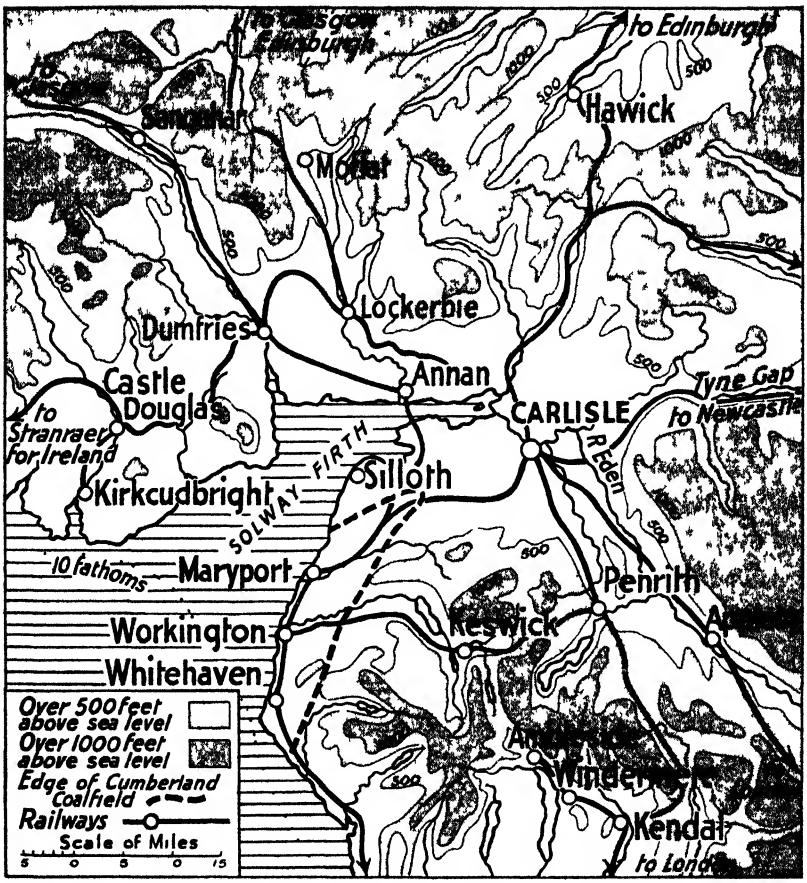
THE HOMELANDS OF ENGLAND

The British Isles contain a number of "little homelands," in which people get their living in ways suited to their region—ways perhaps somewhat different from the rest. All these form one homeland in which all work for the good of all.

In *northern England* most people live in the great clusters of towns upon the coalfields, each of which is particularly famous for one industry, but carries on many others. The Northumberland and Durham coalfield, whose chief centre is Newcastle, supports the shipbuilding, iron and steel works, and chemical works along the lower Tyne. The Tees iron and steel industry of Middlesbrough, Stockton and Darlington depends upon it too. The Yorkshire coalfield, whose chief sea-gate is the port of Hull, supports the great woollen industries of the West Riding, where Leeds, Bradford, Huddersfield, Halifax and many other towns are engaged in this business; and also the cutlery and steel industries of Sheffield and Rotherham.

On the Lancashire coalfield is the chief cotton industry (see map, page 145), with Liverpool and Manchester as its sea-gates and Manchester as its chief business centre. The Cumberland coalfield is smaller, but has iron and steel works; its chief centres are Whitehaven and Maryport (see map opposite). Northern farmers rear sheep on the highlands and cattle on the lowlands; they grow many crops, especially potatoes, market-garden produce, and grain. The Vale of York and the plain of Lancashire and Cheshire are the chief arable lands.

The English Midlands lying within the Humber-Mersey-Severn triangle, famous for cattle and dairy farms, orchards and pastures, also has its chief town clusters on the coalfields. Here we find the "Potteries," of the North Staffordshire coalfield, where the City of Stoke (six towns in one) is chiefly engaged in the production of earthenware of all kinds, from huge drain-pipes and sinks to the most delicate of porcelain. The "Black



MAP TO SHOW RELIEF, ROUTES, AND COALFIELDS OF THE WESTERN BORDERLAND

Note the importance of the site of Carlisle as a route centre

Country " of the south Staffordshire coalfield has many towns engaged in metal work of all kinds. Birmingham is the largest town. The smaller Warwick and Leicester coalfields support the electrical trades of Rugby, the motor works of Coventry, and the hosiery and boot

trades of Leicester. Nottingham, another hosiery town, and Derby, famous for railway plant, china, and silk, are on the southern end of the great Yorkshire, Derbyshire and Nottinghamshire coalfield.

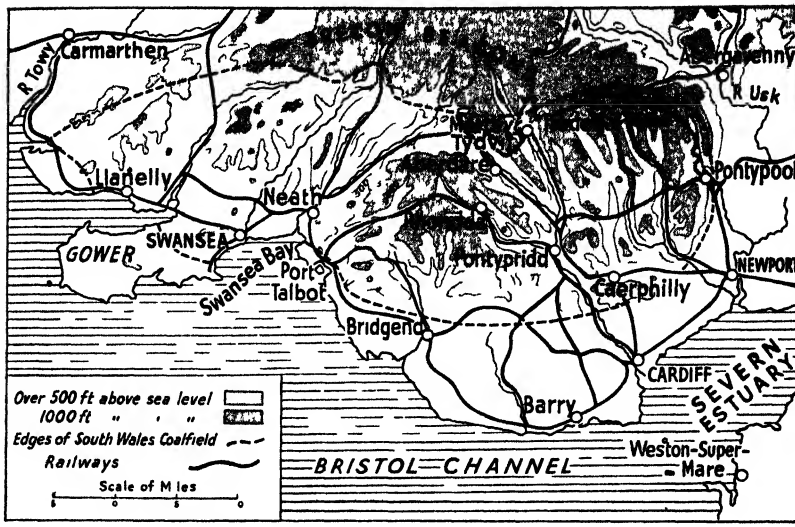
Eastern England is chiefly a land of farms, villages and market towns, where broad plough-lands produce wheat, barley, root crops and fodder crops, and where the larger towns—Norwich, Ipswich, Colchester, Bedford, Huntingdon, Northampton, Grantham and Lincoln—manufacture agricultural machinery, farm implements, clothing and other goods needed by a farming population.

The two most famous and most ancient British universities are at Oxford and Cambridge, both in the centre of rich farming regions and both market towns.

Southern England contains the hop gardens and orchards of Kent, Sussex and Hampshire, the downland pastures of the North and South Downs and the Hampshire Downs. In the Wealden plough-lands of Kent and Sussex many different crops are grown, and dairy cattle are pastured on the rich meadows.

In this part of England are the cathedral cities of Salisbury, Canterbury, Winchester and Chichester; the military camps of Maidstone, Aldershot, Salisbury Plain and Winchester; and the naval harbours of Chatham, Sheerness, Dover and Portsmouth. To it belongs the Isle of Wight, famous for sunshine and mild winter climate, and a long string of favourite watering-places from Bournemouth to Brighton, Brighton to Margate.

South-western England, whose largest towns are Plymouth, the naval harbour and liner port, and Torquay,



MAP OF THE SOUTH WALES COALFIELD

one of the most famous of seaside towns, is a land of farmers who rear dairy cattle and grow cider apples, early flowers, vegetables and bulbs; of fishermen who catch herring, mackerel, and pilchards; of miners who still work tin on a small scale, and of workers of kaolin or china clay who send it to the potteries of North Staffordshire.

WALES

The Principality of Wales, famous in song and story for the beauty of its scenery, and the home of liberty-loving people, many of whom still use Welsh as their everyday speech, has most of its people on the great South Wales coalfield. Cardiff is by far the largest town; it shares with Swansea and Newport the bulk of the coal export trade. South Wales makes tinplate for the world's canneries, manufactures iron and steel and

other metal goods of many kinds, repairs and builds ships, smelts metal and refines oil.

The rest of Wales is chiefly the home of farmers, whose chief business is sheep rearing on the hill slopes, or dairy farming in the valleys; but in the north, quarrymen are busy getting out the famous Welsh slate.

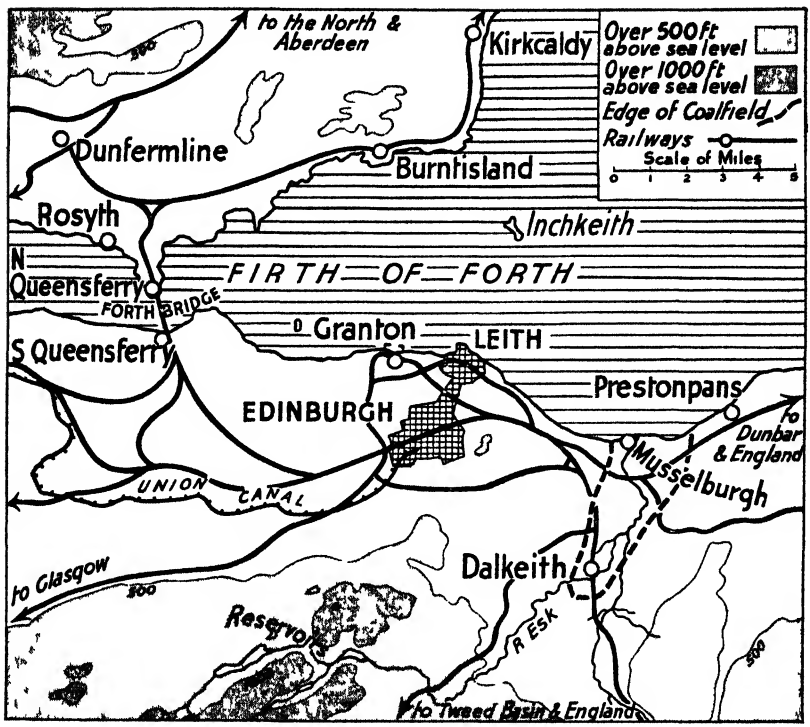
SCOTLAND

Scotland is divided into (1) the Highlands and Western Isles; (2) the Central Lowlands, where most Scots live to-day; and (3) the Southern Uplands.

The Highlands are the homes of crofters or small farmers, who rely on the produce of their small crofts, their sheep, and a cow or two; if they live near the sea they add to their tiny land harvest another from the sea. Large parts of the Highlands are the haunt of the wild deer and the grouse, and have fallen into the hands of wealthy folk, who use them solely for hunting, shooting and fishing. Aberdeen, at the eastern Highland border, is famous for its fishing and granite quarries. Inverness is another town near the eastern entrance to the Caledonian Canal.

The Lowlands, where the rich coalfields lie, and where there is the largest extent of good plough-land in the country, support nearly nine-tenths of the Scottish people. Glasgow, "builder of ships" and with many other industries, is by far the largest town; Edinburgh, the Scottish capital, is less than half as big. Dundee, Scotland's third city, is also within the Lowlands.

The Southern Uplands are chiefly the home of farmers and shepherds; but there is the woollen industry of



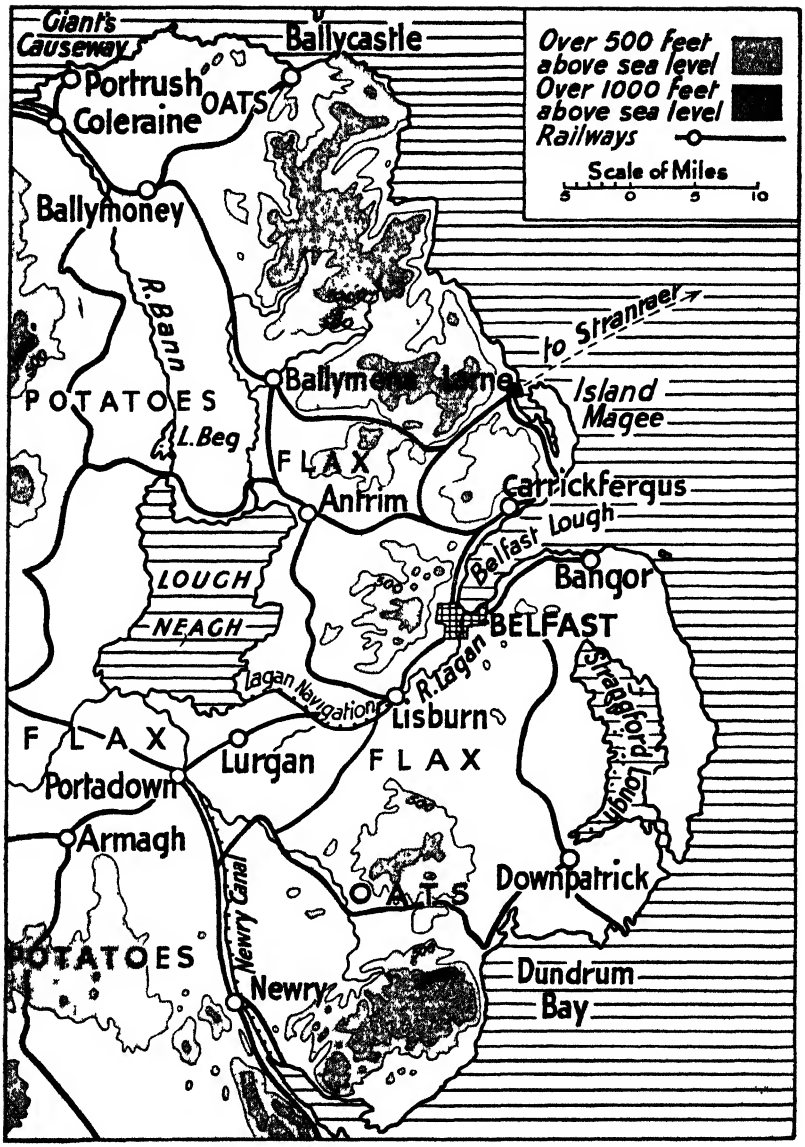
MAP OF EDINBURGH AND DISTRICT

Note the importance of the site of Edinburgh in regard to the control of routes

the basin of the Tweed, carried on at Hawick, Selkirk and other towns. Across the Southern Uplands go the main roads and railways linking the English Lowlands with the Scottish Lowlands.

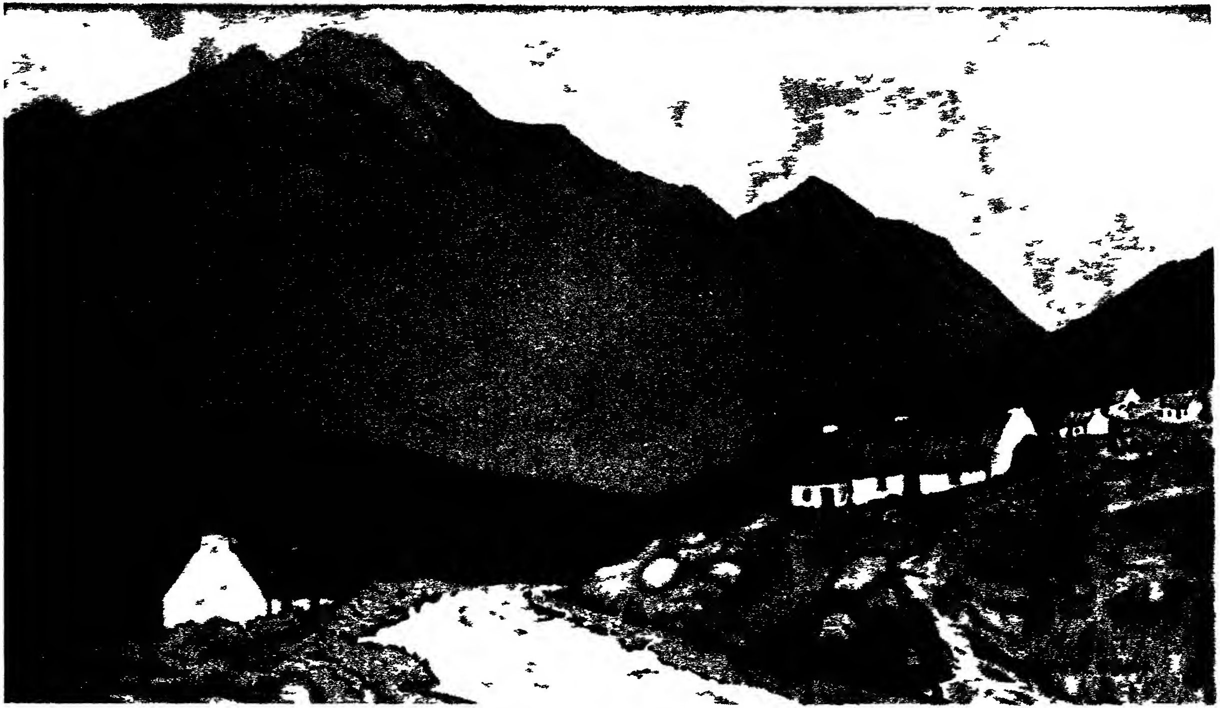
IRELAND

Ireland is divided into two countries—(1) *Northern Ireland* (capital, Belfast), which is part of the United Kingdom, and (2) *The Irish Republic* (capital, Dublin), which was separated from the United Kingdom by the



MAP OF NORTH-EASTERN IRELAND.

Note the position of Belfast.



B e las H r and Br tish Ra a

A SCENE IN CONNEMARA, IN THE NORTH-WEST OF COUNTY GALWAY
WITH CROAGH PATRICK MOUNTAIN IN BACKGROUND

Act of 1948.

The Irish Republic is a land of small market towns and villages, where farming is by far the most important occupation. Because of its moist climate, it has rich pastures, on which fine cattle and horses are reared. But dairy farming is its chief business. To help dairy farmers, great and small, many co-operative creameries have been established, to which farmers bring milk daily, receiving pay for the cream it contains and taking back the skimmed milk for home use or for feeding pigs.

Pig breeding is common too; and the bacon and ham factories do for the pig farmer what the creameries do for the dairy farmer; they provide a sure market for their produce at a fair price.

There are large "homestead" farms in the richer lands of County Meath, Tipperary and the south-east. Some wheat is grown, but the chief Irish grains are oats and barley. On all farms and in all villages the potato crop is of great importance. Like the Scottish crofters, the peasants of the western seaboard are often fishermen as well as farmers. Dublin, the capital, has breweries and distilleries, makes textiles, and produces motor-car bodies.

Northern Ireland, more densely peopled than the Irish Republic, has the most important linen industry in the world. Its chief centre is Belfast, which is also famous for its shipyards, its rope and cable works and its tobacco factories. Londonderry, in the north-west, uses Irish linen to make its fine shirts, collars and handkerchiefs.

QUESTIONS AND EXERCISES

1. Using your school reference atlas, make maps similar to

those in this chapter for (*a*) the English Lake District, (*b*) the Potteries, (*c*) the area around Dublin, (*d*) central Wales, (*e*) the Lowlands of Scotland.

2. How does the Government of the Irish Republic differ from that of Northern Ireland? Although the Irish Republic is independent and is not a member of the British Commonwealth, the citizens of each are not regarded as foreigners by the other. Why is this?

3. Give four examples of British towns which are important meeting-places of railways and roads. Draw sketch-maps to bring out the geographical factors which have made the towns important route centres.

4. Draw sketch-maps to illustrate the subject-matter of the following sections of this chapter, (*a*) Relief and Drainage, (*b*) Climate and Crops.

Chapter 20.

BRITAIN AND THE WORLD

There was a time when Britain could easily provide for the needs of her people, for her population was small and her needs were few and simple. Nowadays, however, Britain has a large population for so small a land; the people's needs have increased both in variety and quantity; instead of being chiefly countryfolk and farmers living on the produce of the land, they have become chiefly townsfolk engaged in manufactures and business who consume food and do not produce it.

As a result, Britain, like most great countries to-day, is unable to provide all she needs, but must buy very large quantities of foodstuffs and raw materials from abroad. But fortunately Britain produces far more manufactured goods than can be used at home, and has, therefore, large quantities of manufactured articles to sell to other lands which do not make such things for themselves. Many of these lands are, however, large producers of foodstuffs, or raw materials, or both.

TRADE

Britain and other countries in the world of to-day must *sell* what they produce in such large quantities that they have a great deal to spare, and must *buy* what they need, but cannot produce in sufficient quantities. They must carry on *trade*.

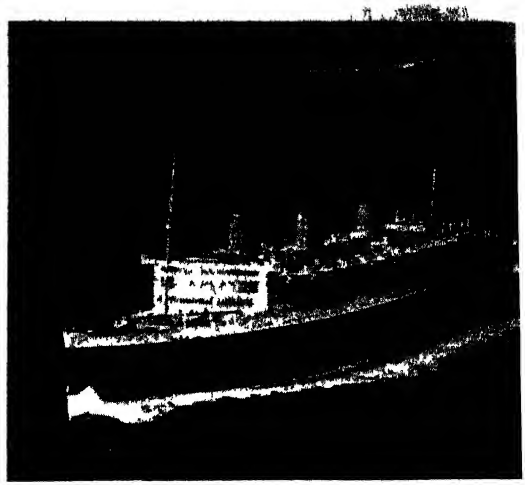
In ancient times people simply exchanged or bartered goods they could spare for goods they needed. In some parts of the world this is still done. But nowadays money comes in to help.

Britain sells manufactured goods (*exports*), and *with the money* thus obtained buys the foodstuffs and raw materials (*imports*) which she needs, but cannot produce for herself. Britain also *earns* money from foreign countries by carrying their goods in British ships, by lending money to help nations to open up mines, build railways and so forth. When we look at the money received for British exports, we find it much less than the sums we pay for imports. Unless we know that our imports are partly paid for by the money earned by services of one kind or another to other countries, we cannot understand how this can go on from year to year.

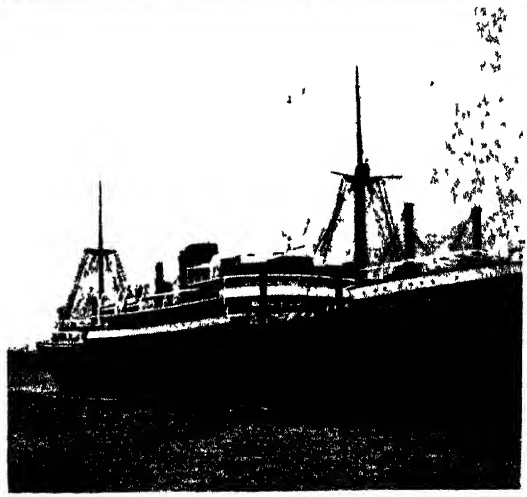
The world to-day is like a vast shop with many branches, each of which specialises in one or two particular kinds of goods. Countries which produce foodstuffs chiefly are generally buyers of manufactured goods of one kind or another; manufacturing countries are buyers of foodstuffs as well as of raw materials to keep the factories going. Each one of us is a customer in the "world shops"—even the schoolboy who buys a bar of chocolate or a new rubber on his way to school; for both chocolate and rubber are products of the hot lands, and cannot be made in England without the labour of Negro workers in the cocoa plantations of Gold Coast Colony, or of Tamil rubber-gatherers in the plantations of Malaya. We have only to think how many workers of different races in distant lands have helped to provide our breakfast, to realise how much we, and all other nations, depend on what we call "the outside world." It is *trade* that makes it possible; and fortunately it is so easy nowadays to carry goods by land, water and air all over the world that trade is world-wide.

TRANSPORT BY SEA.

Here we see the magnificent Cunard-White Star liner *Queen Mary*. This ship carries 2,000 passengers, as well as mails and cargo, across the Atlantic in less than 4 days.



This is a cargo liner. She is slower and much smaller than the *Queen Mary*. She follows a fixed route, and, although she carries some passengers, is more important for cargo.



This is the tramp steamer *Beckenham*. She does not follow a fixed route, and no passengers are carried. Tramp steamers are comparatively slow, but they carry a high percentage of British cargoes and are exceedingly important.

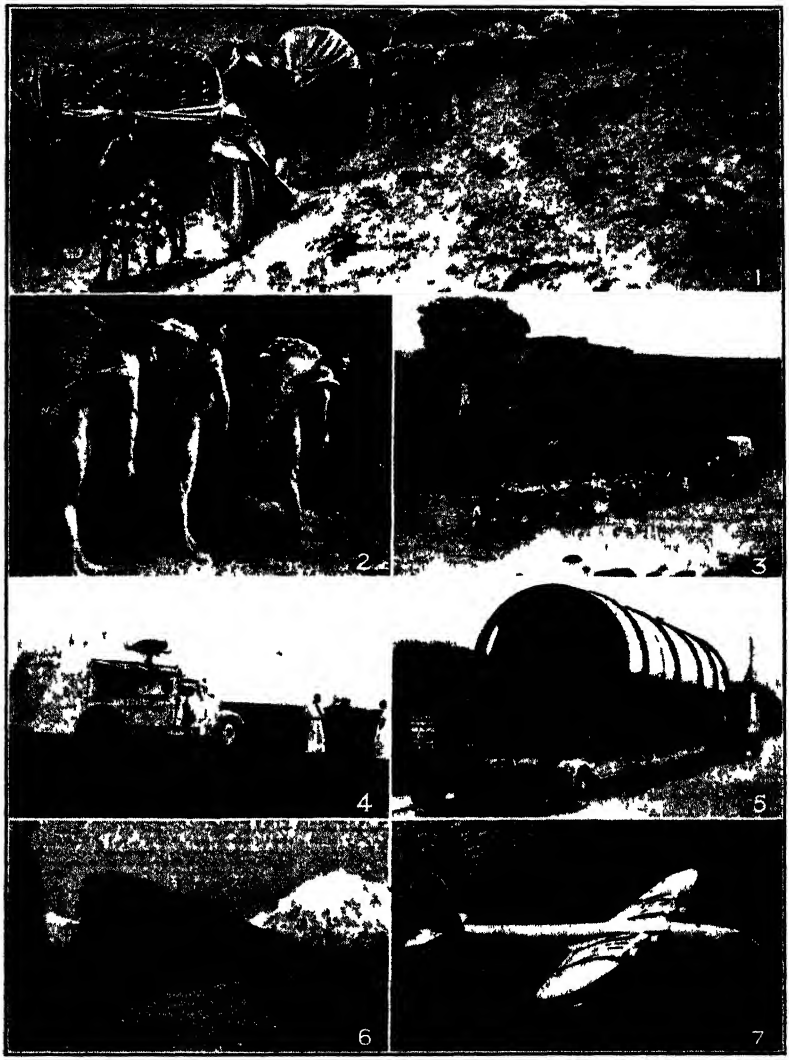
(Upper) "The Times"

BRITAIN AND THE BRITISH COMMONWEALTH OF NATIONS

Because Britain is the Motherland of the British Commonwealth of Nations, she is much less alone than any other country, for from the overseas self-governing dominions, from India and from the colonies, which are great markets for the purchase of British manufactures, she can buy a great deal of the foodstuffs she needs, as well as an enormous variety of raw materials—hides and skins, animal and vegetable fibres, rubber, oils, metals and other commodities, which are needed in her factories and mills. British Commonwealth traders "keep the money in the family" to a very large extent, although they do much business in buying and selling with the rest of the world.

The Dominion of Canada, for example, buys coal, hats, boots, cotton goods, earthenware, glassware, machinery, iron and steel, woollens, worsted, linens, jute goods and other things from Britain. Britain buys from Canada wheat and flour, cheese and canned fish, fruits, fresh, canned, or dried; skins and furs, metals, hides and other produce. The Commonwealth of Australia buys similar British manufactured goods and sells to Britain wheat and flour, butter and frozen meat, fruits of many kinds, wool and sheepskins, hides and leather, zinc, copper and lead.

Although the British Commonwealth could produce everything it needs, it does not try to do so. Britain and other parts of the Commonwealth trade largely with other parts of the world as well. Only about one-third of Britain's imports (chiefly foodstuffs and raw materials)



Photos by E N A , Mondsale, C P R , and Maryland National Guard.

PHOTOGRAPHS OF WORLD TRANSPORT.

1. A camel caravan in Algeria. 2 Indian porters in the Amazonian Forest. 3. Natal a farmer and his family on trek. 4. A Trans-Saharan omnibus. 5 Modern road transport. 6. A Canadian Pacific Railway train. 7. An Imperial Airways flying boat.

are at present Commonwealth products; and about half her exports (chiefly cottons, woollens, and machinery) go to British lands beyond the seas.

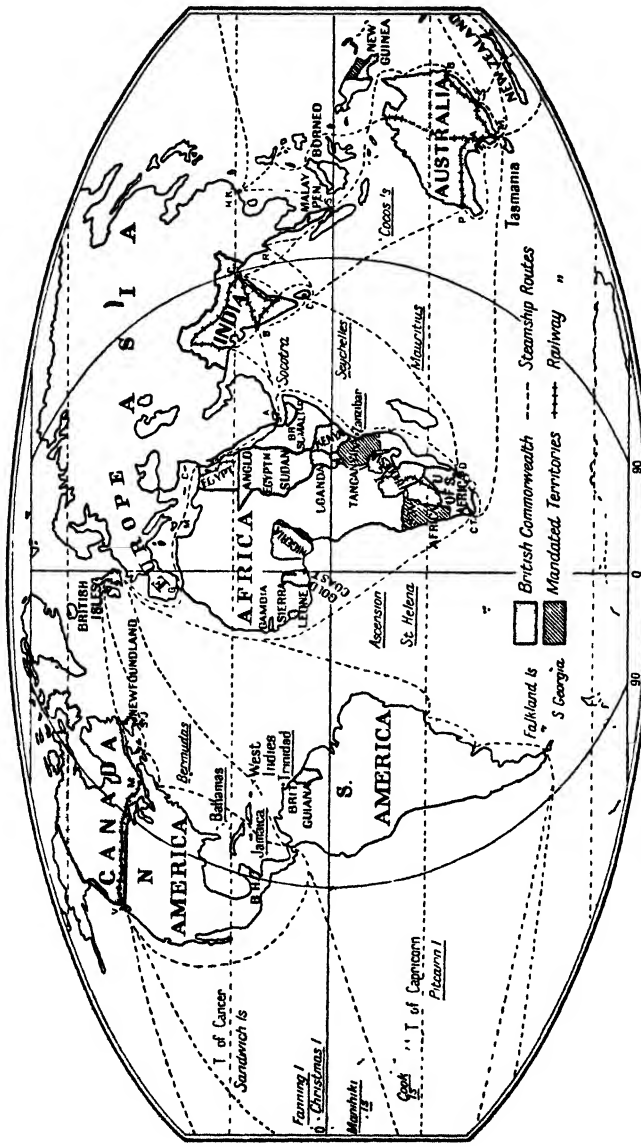
Britain is linked with the rest of the Commonwealth by the great sea-ways, all of which lead to the British ports (page 217). By sea Cape Town is less than fourteen days away; India fifteen days; Australia a month; New Zealand thirty-two days, and Canada a week. All ships, even fast liners, carry cargo, which actually pays better than passengers!

British Overseas Airways Corporation bring the Motherland within 12 hours of Canada; within 48 hours of South Africa; within 70 hours of Singapore; and within 3 days of Sydney, Australia. British Overseas Airways also fly from England to the chief cities of south-eastern South America within 3 days. These times will certainly be shortened as speeds of aircraft increase. British European Airways bring every capital in Europe within a day's flight.

Communication by cable, swift as it is, is now far outstripped by wireless and the wireless telephone; and the time will soon come when, by television, we shall be able to see as well as hear people in distant parts of the world talking to us. Every day messages, news, and entertainment are broadcast from England to all parts of the Commonwealth. The King can speak to the Commonwealth on Christmas Day, and hear Christmas greetings from his peoples throughout the world.

BRITAIN AND THE REST OF THE WORLD

Britain is in daily touch with the whole world, and carries on trade with every continent.



MAP OF BRITISH COMMONWEALTH AND EMPIRE SEA ROUTES.

Important trade goes on particularly with the *United States*, from which Britain purchases raw cotton, wheat and flour; bacon, hams and lard; oil, tobacco, machinery, copper and fruit. The United States is the most important customer for British goods outside the Commonwealth.

Argentina is another important country which sells Britain chiefly frozen, chilled or tinned meat, wheat and maize, wool and linseed, butter and hides; but she is not so important a customer for British goods as the United States.

In Asia, outside British Commonwealth lands, *China and Japan* (the world's greatest silk producers), Siam and the East Indies do much trade with Britain.

Britain carries on a great deal of business with countries on the continent of Europe, for she lies opposite the leading trading and manufacturing nations, with which she is connected by water and air, as well as by cable and wireless.

Although most of these continental countries are competitors with Britain for world trade, manufacturing, as they do, much the same kind of goods, they all buy British manufactures—some, indeed, in large quantities—and they all produce some foodstuffs or raw materials which Britain can import cheaply and quickly across the narrow seas.

Holland sends Britain great quantities of dairy produce, for example—and so do the Baltic countries. Soft woods from northern forests come to British ports from Scandinavia, Finland, Latvia and Russia, for building, for paper and rayon, and other purposes. French wines, flowers and manufactures; Swiss goods;

Italian wines, cheeses and fruits; Spanish oranges and olives and other fruits, copper, iron, and quicksilver, esparto grass for paper, and canned fish; Greek currants, sponges, olive-oil and tobacco; all are regular imports into Britain, together with goods from other European countries.

THE CHIEF BRITISH PORTS

Britain's overseas trade with the rest of the world is carried on by her merchant fleets, which use the many ports especially arranged for the loading and unloading, the sorting, and the dispatch of goods. Her inland trade goes by roads, railways and canals—all of which are connected with the docks at the ports, so that transport is easy, cheap and swift throughout the country.

The Port of London has been already described (page 167). To it come ships from every seaboard country in the world.

Liverpool, second in importance to London only, specialises in American and African trade, but docks vessels from all trading countries. It imports chiefly raw cotton, meat, wheat, rubber, fruit, wool and sugar; and exports cottons, woollens, iron and steel goods, machinery and earthenware.

Manchester has been made a port by the construction of the Manchester Ship Canal. Its trade resembles that of Liverpool.

Hull, the great Yorkshire sea-gate on the Humber, does much trade with Australia and the Baltic as well as with other lands, importing chiefly wheat and wool, butter and timber and oilseeds, and exporting much the same kinds of goods as Liverpool, and also coal.

Glasgow, on the Clyde, imports wheat and flour, meat and timber, iron and other metals, fruit and oil, especially from the Americas. Her exports are mainly cottons and woollens, linen goods, ships and machinery.

Southampton is a great passenger port, with liners sailing to South Africa, Canada, the United States, the West Indies and South America. It is also a port for the import of wool, meat, fruit, hides and skins, and other products, and the export of British manufactures.

Bristol (outport Avonmouth) trades much with the West Indies and the Americas in fruit (bananas especially), sugar, rum, tobacco and cocoa.

Belfast is the leading port of Northern Ireland; *Dublin*, of the Irish Republic; *Cardiff*, the Welsh port exporting coal, iron and steel, tinplate and machinery, and importing grain and timber, metals and ores, is more important, as a port, than Belfast and Dublin put together.

CONCLUSION

Thus to-day and every day Britain is in touch with the rest of the world. Our "home" is but a part of the great modern world, and our happiness and very existence are closely related to peoples whom we shall never see and of whom we may never hear. It is because of this that we must learn to think not of ourselves alone, but of all those unknown to us in this and other countries who help to provide us with the things we need. This is one of the chief things that our geography lessons should teach us.

QUESTIONS AND EXERCISES

1. Complete your picture book.

2. Which is better—for each country to produce the commodities for which it is naturally suited and to enter into world trade for other commodities, or for each country to do its best to become self-supporting and self-sufficient? Arrange a debate on this subject.

3. On a large outline map of the world indicate the areas which produce the leading imports of Great Britain. Make another map to show the countries to which the chief exports are sent. Try to make the maps as striking and realistic as possible.

4. Give as many reasons as you can why the British Isles are often described as "The Fortunate Isles."

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Items not found in this shortened index should be looked for under their appropriate chapter headings