CHAPTER I

THE POSITION OF THE BRITISH ISLES

The British Isles are situated off the extreme western coasts of Europe. In former times this situation was unfavourable for trade. When the commerce of the world was carried on chiefly between the countries bordering the Mediterranean Sea, Britain was obviously quite outside the main streams of trade. It was at the edge of the world, and what little trade it had was hampered by such a position. But nowadays its situation with regard to the other great countries of the world is one of its most important assets. The commercial centre of gravity has shifted from the Mediterranean Sea to the Atlantic Ocean. The world’s greatest trade route is between the English Channel and the United States, and the British Isles have plainly the finest situation in Europe for Atlantic trading.

The “world position,” too, of the British Isles is remarkable. In classical times, as we have said, the British Isles were at the edge of the world. Now when all the land of the globe is known, it is seen that our country is very nearly at the centre of the land hemisphere\(^1\), that is, the

\(^1\) Authorities differ as to the exact position of the centre of the land hemisphere. Thus Gregory (Structural Geography) places it at London, Penck (Morphologie der Erdoberfläche) places it south-west of Paris; and De Lapparent (Géographie Physique) places it at Berlin.
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half of the globe that contains more land than any other hemisphere that may be selected.

The British Isles are well placed, too, with regard to the chief countries of the Continent of Europe. They lie close to the mainland, only a few hours' travel dividing them from Germany, France, Holland, and Belgium, and are therefore able to share in the trade that is continually going on between all the important countries of Europe. It is true that Britain is not so well situated in this respect as Germany, for the latter touches most of the richest countries in Europe; but still Britain's position is better than most. Then Britain has the advantage over all the other countries of Europe in being surrounded by the sea. There is therefore no necessity for a huge standing army, and so more of the inhabitants are left free for peaceful, industrial pursuits which add to the wealth of the country. Notice, too, the point at which England approaches the Continent most closely. It is just where the Celtic and Teutonic races of Europe meet, and these two streams of influences have mingled intimately both in the blood and in the civilization of the British race, with the good results that follow all judicious "crossing." Remember, too, the great geographical truth that an island home tends to produce a vigorous civilization. Thus influences, both of blood and culture, in other words, heredity and environment, have helped to produce a self-reliant, enterprising race.

The geographical position of Britain involves other advantages. The climate is not so mild and genial as to put a premium on laziness, nor on the other hand is it so severe as to prevent out-door work in any season. As we shall see later on, the winters are exceptionally mild considering the latitude, and inland navigation is seldom impeded by ice, as it is on the Continent. Again, the British coasts abound in good harbours, and no part of the
Fig. 1. The British Isles and the Surrounding Seas.
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country is very far from a seaport. The country, too, is rich in minerals, and particularly in the most important of all minerals, namely, coal. Coal is the basis of the industrial wealth of to-day, and no other country in Europe equals Britain in the quantity or the quality of its coal output.

Turning now from the general aspect of the situation of Britain let us consider next some of the more important details regarding the relation of these islands to the neighbouring seas and lands. The seas around the British Isles are shallow. The submarine slopes of Europe towards

![Fig. 2. The Continental Shelf. The contour-lines (drawn at intervals of 100 fathoms) show the sudden descent at the western edge of the Shelf.](image)

the west are very gentle at first. This gentle slope is maintained for some distance to the west of Ireland before the sea-floor plunges more steeply to the depths of the Atlantic Ocean. The submarine area between the shores of the Continent and the steeper slope of the sea-floor is called the Continental Shelf. The British Isles therefore rise from a Continental Shelf. Quite the most striking way of realising this sudden steepening of gradient is by applying our knowledge of contour-lines to the interpretation of the slopes of the sea-floor. Look at Fig. 2 which shows the
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bed of the ocean contoured at intervals of 100 fathoms. Notice just west of the 100 fathom line how the contour lines are crowded together showing that the steepness of the sea-floor there suddenly increases. It should be remembered that when we say the slope west of the 100 fathom line is steep, we mean steep compared with the slope of the Continental Shelf. In reality the steepest part of the slope is about 1 in 18, that is, roughly equivalent to a gradient at which an ordinary cyclist would dismount and walk his bicycle uphill, but which could be surmounted by a strong rider. The slope of the Continental Shelf could not be perceived by the unaided eye. In section the slope of the sea-floor west of the British Isles is seen in Fig. 3.

![Diagram](image)

Fig. 3. Section across the Continental Shelf and Scotland. The section is drawn along the line AB in Fig. 2.

If we consider the Continental Shelf to be bordered by the 100 fathom line, we see that the seaward margin of the submarine platform keeps well to the west of the British Isles, being from 20 to 80 miles west of Ireland, and about 60 miles west of the Outer Hebrides. North of Scotland it swings round the outside of the Shetland Isles, and then one would expect it to keep north-east to the Norwegian coast. At this point, however, the Shelf is trenched by the remarkable submarine valley called the Norwegian Depression (see Fig. 1). This long and deep channel keeps close to the Norwegian coast, and swinging round to the north is continued into the heart of Scandinavia by the Christiania Fiord and the valley of Lake Miosen.
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Most of the North Sea is exceedingly shallow. Many parts of the Dogger Bank, more than a hundred miles from land, are only ten to twenty fathoms deep. Indeed the depth of the North Sea is no greater in proportion than the thickness of a sheet of notepaper is compared with its area. The Irish Sea is also shallow. This sea, however, is crossed from north to south by a submarine valley that can be traced continuously through the North Channel, across the Irish Sea west of the Isle of Man, and southward along the middle of St George's Channel. A somewhat similar submarine valley is found farther north between the Outer and the Inner Hebrides.

The shallowness of the seas round the British Isles is important in two ways. In deep water the height of the tidal wave is insignificant. In mid-ocean high tide means only a rise of two or three feet. When the tide comes in over a continental shelf, however, the rise is very considerable. For example, in the Bristol Channel there is sometimes a difference of forty feet between high and low tide. It is therefore the shallowness of the seas round our coasts that gives us the high tides that are so useful in cleansing our shores, in filling our docks, in scouring our channels, in floating barges in and out our estuaries, and in bringing our great ships safely to port in deep water. Again, fish congregate and feed mainly in shallow water and over submarine banks. The banks of the North Sea are among the most valuable fishing grounds in the world, and many thousands of British fishermen obtain a livelihood from them.

The tidal wave that impinges on the British Isles comes from the south-west. Near Ireland it divides into three streams. One flows up the English Channel, another into the Irish Sea by St George's Channel, and the third keeps west of Ireland and flows round the north of the British Isles. The last named tidal wave moves fastest, and
entering the North Sea from the north it has reached the estuary of the Thames before meeting the tide through the English Channel. This is a fact of economic importance, for the meeting of the two tidal waves results in exceptionally high tides in the estuary of the Thames.

If the level of the sea round our shores were to sink 200 feet, England would be joined to the Continent. The English Channel and the North Sea south of the Dogger Bank would become dry land. The Irish Sea would become a great plain trenched north and south by a long inlet of the sea occupying the submarine valley referred to above. It is practically certain that the British Isles once formed a part of the Continent. The earliest men who inhabited Britain reached the country before the English Channel was formed. Many different lines of evidence point to this conclusion. The chalk cliffs of France have every appearance of having been once continuous with the chalk cliffs of England; the Fen district corresponds with the low-lying parts of Holland; northern Scotland is identical in structure with Norway. Again, the animals of England and the Continent are almost the same, although England has fewer kinds than the Continent, and Ireland still fewer; as if the animals of the Continent had not all had time to migrate to England and Ireland before the formation of the Irish Sea and the English Channel. For example, the famous naturalist, Alfred Russel Wallace, tells us that Germany has 90 species of mammals, Great Britain has 40, and Ireland has 22. Similarly Belgium has 22 species of reptiles and amphibia, Great Britain has 13, and Ireland has 4. The same story of a former extension of the land is told by dredgings from the North Sea. Off the east of Scotland there is a submarine bank from which shells are obtained of a kind that belonged to animals that live only at sea level. From the Dogger Bank have been dredged many bones of the mammoth, the rhinoceros, the
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reindeer, and other land animals, showing that the North Sea was once dry land. We may conclude, therefore, with reasonable certainty, that the British Isles once formed part of the Continent, and that primitive man once hunted his prey where now the billows of the sea roll far from any land.

Not only were the English Channel and the North Sea dry land, but the British Isles once extended much farther to the west. It is very important to realise this clearly, for, as we shall see later, many of the most puzzling features of British geography are explained by the fact that this country once extended farther to the west. The waves of the Atlantic Ocean toss their crests over part of sunken Britain. At present it will suffice to mention one feature of the geography of Britain that is directly connected with the sunkenness of the western part of a continent more extensive in former times than now. Look at the west coast of Scotland. What a remarkably broken and indented outline is presented by this coast! How numerous, too, are the islands of the west coast! Then look at the east coast and note the contrast. It is sometimes said that the indented western coast has been produced by the vigorous breakers of the Atlantic, but this is an absurd explanation. Wave action could never produce these long, narrow, deep fiords. This broken coast line is probably a result of the fracturing of land that once existed far to the north-west, but has now sunk beneath the sea.

Let us sum up now the main points of this chapter. The destinies of Britain have been shaped in no small measure by its situation as an island group, just to the west of that part of the Continent where diverse streams of culture meet. Favourable position is further aided by good climate, many harbours, and rich natural resources. The islands rise from a continental shelf that west of Britain slopes more rapidly to oceanic depths. This fact, too, is
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shown to involve favourable results to the inhabitants of this country. Many reasons force us to the conclusion that Britain was once part of the Continent of Europe from which it has been sundered by a sinking of the land or a rising of the sea. The British Isles once extended much farther to the west, but the land was fractured, and much of it sank beneath the waves. The foundering of part of a former land probably took place before Britain was inhabited by human beings, but palaeolithic man lived in this country before the separation of the British Isles from the Continent.

CHAPTER II

THE BUILD OF THE BRITISH ISLES

FROM any good orographical map a great deal of information can be obtained without the use of any book whatever. It is advisable first of all to obtain familiarity with the scale of the map by making a few measurements. For example, find the distance between Duncansby Head and Land's End, between London and Carlisle, between Dover and Calais, between Fishguard and Rosslare, between Holyhead and Dublin, between Stranraer and Larne. Find the width of Scotland at its broadest and at its narrowest parts. By using transparent squared paper an estimate may be made of the area, say, of Ireland. It is somewhat less than 33,000 square miles. The United Kingdom is one of the smallest of the great powers of the world. It is a little more than half the size of Germany, and only one twenty-fifth part of the size of the United States.

Now note the meaning of the colour scale adopted for
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the map, and then verify the following account of the con-
figuration of the country. In Great Britain there is a strong
contrast between north-west and south-east. Imagine a
line drawn from Newcastle through Leeds, Sheffield, Derby,
the Severn estuary, and Exeter. South-east of that line
Great Britain is a land of plains. What hills there are,
are low. North-west of the line is a mountainous country
with intervening valleys. The contrast is fundamental. It
is not confined merely to a matter of height above sea-level,
but has a basis in rock structure, and finds an expression
in the vegetation, the industries, and the very nature of the
people.

In Great Britain there are three great mountain masses
and a number of smaller ones. The first mountain mass
forms roughly the northern half of Scotland, and is called
the Highlands. The Scottish Highlands are divided into
two parts by the long, straight, and narrow valley of Glen
More. On one side are the North-West Highlands, on the
south-east of Glen More are the Grampian Highlands.
The Highlands are divided from the next hill mass by the
Central Lowlands of Scotland. South of the Central Low-
lands are the Southern Uplands which stretch completely
across Scotland from north-east to south-west. This hilly
region extends across the border into England, and is con-
tinuous with the Pennine Uplands which stretch to the
southward for 150 miles. The Lake District Mountains
must be considered as forming part of this mountain mass,
for they are attached to the Pennines by a neck that is
nowhere much less than 1000 feet in height. The third
mountainous area comprises most of Wales. In the south-
western peninsula of England there are several hilly areas
of considerable extent, although not to be compared with
those just mentioned.

The hilly regions described above are all situated north
or west of the line from Newcastle to Exeter. South-east