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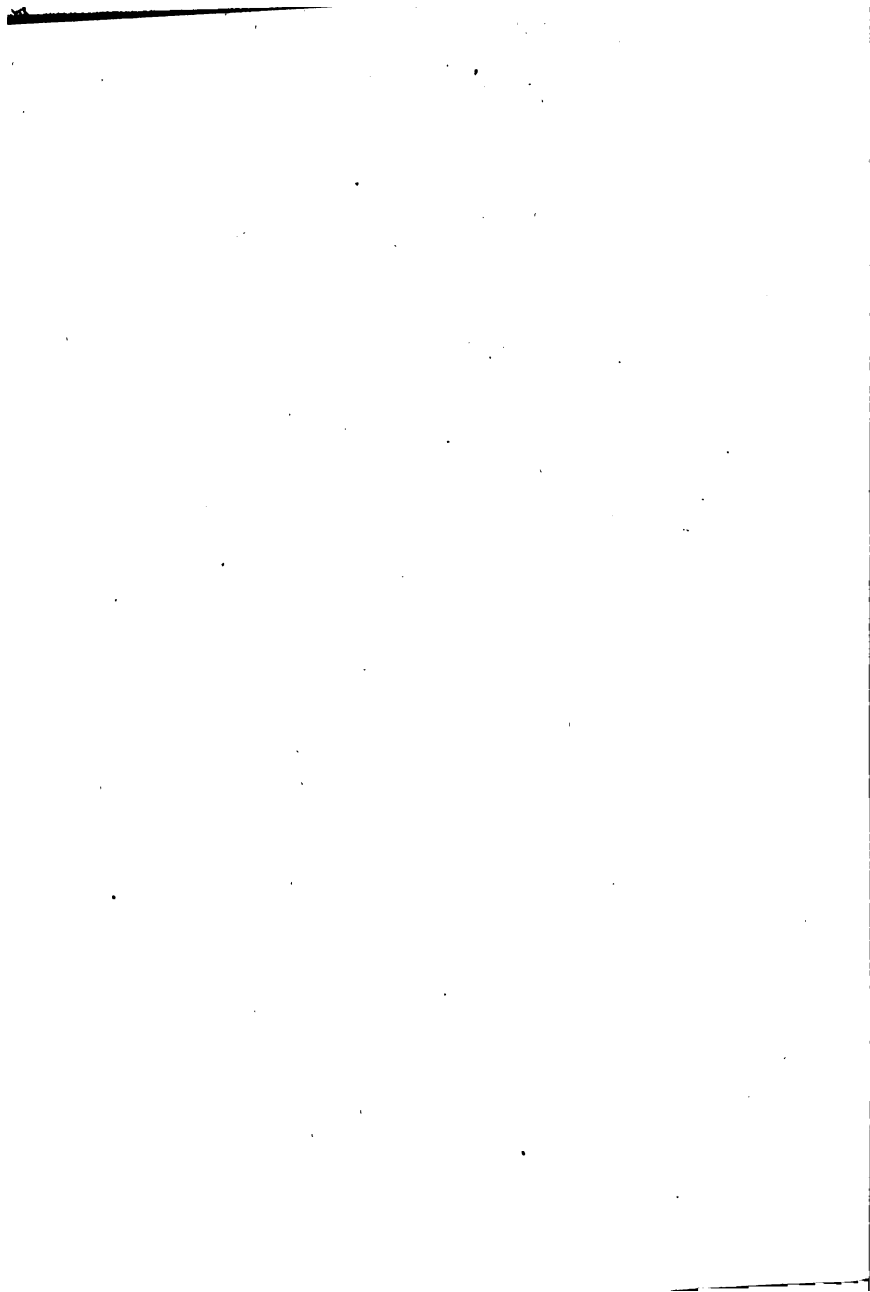
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THE BRITISH ISLES

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M.A., F.R.G.S.

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PREFACE

IN this Series I have tried to embody the experience of a teacher and of an examiner. This experience has led me to several conclusions, which will, I believe, be confirmed by most practical teachers who are interested in Geography as a subject of real educational value :—

1. That maps in text-books cannot generally be used directly with the text, as it is impracticable to have the book open in more than one place at a time ; but that their presence in books has led to a regrettable neglect of the Atlas.
2. That an excessive variety of type and other mechanical devices for classification confuse the average pupil.
3. That most text-books contain much which would be better learned from the Atlas, or which is only an unnecessary tax on the memory.

Consequently, this Series contains no maps and little variety of type ; and I have intentionally avoided mentioning, *e.g.* exact heights, distances or sizes, small industries, and unimportant places. Wherever any definite comparisons are made, they are intended only for reference, and not to be learnt.

L. W. L.

NOTE TO SIXTH EDITION.

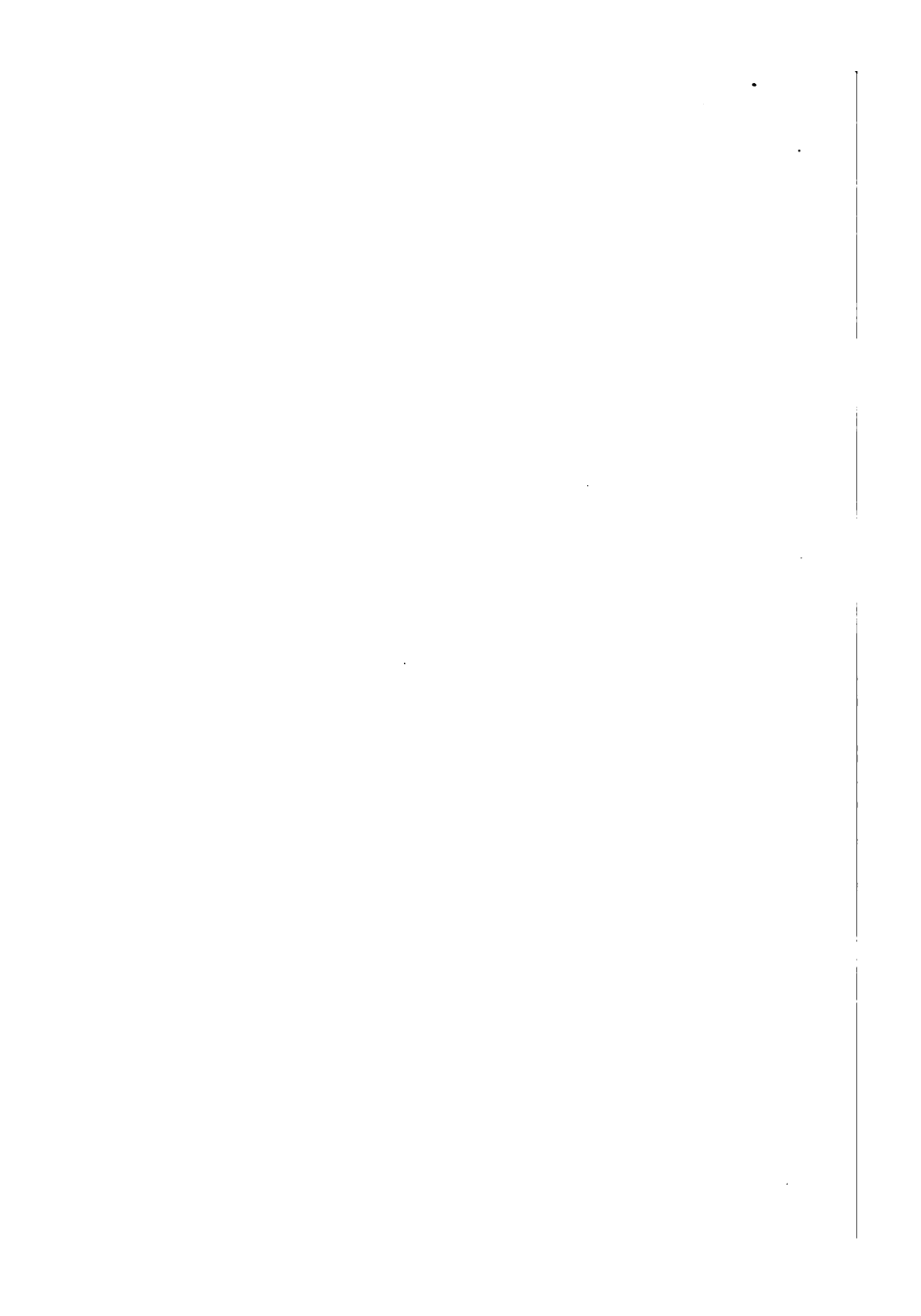
In this edition the paging is identically, and the text is substantially, the same as in the Fifth Edition; but a number of small additions have been made, and statistics have been brought into line with results published last year.

L. W. L.

Sept. 3rd, 1906.

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BRITISH ISLES.

Chapter 1. Introductory.

1. The British Isles are, for their size, the most important area on the face of the earth.

- (1) They have a smaller area than any other Great Power in the world.
- (2) They have a larger and—with the exception of China—a more populous empire than any other Power in the world.

2. The reasons for this extraordinary contrast are mainly the position, climate, and structure of the islands.

- (1) The position has saved them from continual invasion, invited civilisation, and sheltered refugees; and it now commands the trade of the world.
- (2) The climate is free from extremes of temperature, guarantees abundance of rain, and helps to improve the soil.
- (3) The geological structure supplies a naturally fertile soil and abundance of minerals, especially coal and iron, i.e. fuel and machinery.

3. These advantages have made Britain the greatest naval power in the world, and enabled her to maintain a large population (41,600,000) in spite of her tiny size.

- (1) The excess of this population, however, over the natural means of subsistence at home, led to the colonisation of a world-wide empire.

SURROUNDINGS AND SURFACE

Chapter 2. General Surroundings.

1. As the British Isles lie on the eastern edge of the Atlantic, between 50° and 60° N., they have special advantages.

- (1) The latitude implies a temperate climate except where height interferes, and the insular position further protects them from extremes and from sudden changes of temperature.
- (2) This eastern edge is the one towards which the S.W. Anti-Trade winds blow off the warm Gulf 'Drift'; and this guarantees abundance of rain, especially along the west coast.

2. This position is also practically the centre of the land of the world.

- (1) More than 40 out of the 53 million square miles of land on the surface of the earth are north of the Equator, and England is about half way between the extreme east of Asia and the extreme west of America.

3. Proximity to Europe is better than contact would have been.

- (1) The islands are near enough to Europe to benefit by intercourse with it, and far enough away from it to be free from its wars and pestilences—no small advantage, especially in the Middle Ages.

4. The coast is extremely long in proportion to the area.

- (1) The average proportion of coast to area in Europe is 1 mile to 200 square miles, and Europe has a much higher proportion than any other continent; but the proportion in the British Isles is 1 to less than 20.

5. The cause of this is, of course, the number of large openings, especially in the west, which break up the coast into a succession of bold headlands and deep bays.

- (1) The headlands represent the harder rock. For instance, Land's End, Carnsore Point, and Buchan Ness are granite; Flamborough Head and Beachy Head are hard chalk; Cape Clear and Kinsale Head are hard sandstone; Great Orme's Head and Portland Bill are hard limestone. But occasionally a promontory is made of tide-driven shingle, as Dungeness and Spurn Head.
- (2) The bays represent the softer rock, and the deepest bays are found naturally where the fiercest waves and winds beat on the softest rock, *i.e.* along the exposed parts of the west coast.

6. The results of this very large proportion of coast are most beneficial.

- (1) The interior of the country is within very easy reach of both the commercial and the climatic advantages of the sea. For instance, no place in the whole country is 70 miles from sea.
- (2) There are numerous harbours, some of which are very large and very safe; and this makes transport of goods easy and cheap.
- (3) Further, the best harbours are most conveniently near together *vis-à-vis* — the Clyde and the Forth, the Mersey and the Humber, the Severn and the Thames.

7. The surrounding seas are very shallow, which is the cause of the enormous fishing industry, and which protects the islands from the influence of the *deep* Arctic currents.

- (1) If the bed of the sea were raised 300 feet, all the 5000 islands, except the Outer Hebrides, would be again joined to the mainland of Europe. Cf. p. 5.

- (2) The great fishing centre of the Dogger Bank is nowhere more than 100 feet below the surface of the sea.
- (3) The shallowness of the sea, and the shape and direction of the great estuaries, cause the tides to be very high, especially on the exposed west coast; and this is of immense advantage to commerce. The height varies from an average 6 feet at Yarmouth to an extreme of about 40 feet at Cardiff. Cf. p. 29.

N.B.—Thus the inhabitants have every inducement to engage in various sea industries, *e.g.* fishing, such as lead on to ocean traffic.

Chapter 3. General Surface.

1. The area of the British Isles is about 121,000 square miles; but, except Great Britain and Ireland, the 5000 islands are very small.

- (1) Compared with some other countries of Europe, this area is insignificant, being not much more than half the size of France or Germany.
- (2) Compared with other parts of the British Empire, it seems still smaller; India is 11, Australia is 25, and Canada is 30 times as large.
- (3) Great Britain alone has an area of about 88,000 square miles, of which nearly 30,000 belong to Scotland, and nearly 7500 belong to Wales.

2. The political division of the kingdom into four areas under different names is not altogether artificial.

- (1) Besides being a separate island, Ireland is quite unlike Great Britain, being a large, low plain, enclosed by a rim of mountains.
- (2) Great Britain, like Egypt and Italy, was too long in proportion to its breadth to be easily governed, in olden times, from a single centre.
- (3) The physical obstacles of the Cheviot Hills and Solway Moss helped to give a separate political existence to Scotland, as, for a long time, the Cambrian Mountains did to Wales.

3. The physical features of the country are similar to those of the adjacent mainland, of which the islands once formed part.

- (1) The chalk cliffs of Kent reappear in the chalk cliffs of Calais, as the granite peninsula of Cornwall does in the granite peninsula of Brittany.
- (2) The Fens correspond to Holland. Indeed, the Lincolnshire Fens are actually called 'Holland.'
- (3) The lochs of Scotland are similar in appearance and origin to the Fiords of Norway.
- (4) The Grampians are an extension of the old Scandinavian system.
- (5) The native plants and animals are the same as those on the opposite side of the submerged plain of the shallow North Sea and English Channel.

4. The country may be roughly divided into five areas.

- (1) North-west of a line from Dumbarton to Aberdeen, Scotland is mountainous and comparatively barren.
- (2) South-east of the same line, there is an expanse of fertile lowland and upland.
- (3) North-west of a line from Exeter to Berwick lie all the English and Welsh mountains.
- (4) South-east of the same line are the fertile lowlands and uplands of England.
- (5) Ireland is a marshy, saucer-like plain.

5. There is, therefore, no continuous mountain system throughout Great Britain, and there is no true mountain chain; but there is more or less continuous highland along the west, which expands towards the north.

- (1) The absence of mountains in the south and east, and the fertility of the lowlands, encouraged invaders, who sometimes brought civilisation.

- (2) The presence of mountains in the west and north, and the barrenness of the highlands, were a great protection to the invaded natives.

N.B.—The mountains have been partly pushed up from below by terrestrial convulsion, and partly weathered into their present forms.

6. The general water-parting, therefore, runs along the west, *i.e.* the wet, side of the country.

- (1) This accounts for the heavy rainfall of the west, the length of the eastward rivers, and the easy communication with the continent.
- (2) It also accounts for the fact that the west is mainly famous for mining, manufactures, and cattle, while the east is mainly famous for agriculture and sheep.

N.B.—Thus, Devonshire, Somersetshire, and Gloucestershire are famous for milk products; Leicestershire, Lincolnshire, and Yorkshire, for wool. The Mersey and the Clyde basins are famous for mining and manufactures; while those of the Thames, the Trent, and the Tay are famous for grain (*cf.* Burton beer, Reading biscuits, and Strathmore whisky).

- (3) The country is too narrow, however, to be really dry anywhere; and this accounts for the suitability of inland towns, like Rochdale and Bradford, for spinning and weaving. *Cf.* p. 26.

7. The soil is naturally fertile except in the marshy and mountainous districts, and is abundantly supplied with coal and iron.

- (1) The constant rain and the numerous rivers have covered the lower areas, *i.e.* those most suitable for cultivation, with a good depth of soil.
- (2) Scotland and Wales have a large proportion of mountain and moor, and Ireland has a considerable proportion of marsh and bog.
- (3) The coal and iron are generally found close together, along with limestone (for flux), and near navigable water, which greatly increases their value.

CLIMATE.

Chapter 4. Climate.

1. The size of the United Kingdom is so small, and its surface is so low, that there cannot be any great variety of climate.

- (1) As the country extends through less than 9° of latitude (600 miles), the variety which does exist must be due to some other cause than distance from the equator.
- (2) Ben Nevis is only 4400 feet high, *i.e.* not half the height of Mt. Etna, and not much more than a quarter the height of Mt. Blanc.
- (3) There are, however, distinct varieties of climate due mainly to moisture, wind, and slight differences of height.

2. The word *climate* means 'slope,' and the slope has great effect on what we call climate.

- (1) The heat of the sun's rays varies with the angle at which they fall upon the earth, a direct or perpendicular ray being warmer than an indirect or sloping one, because it passes through less atmosphere, and because it is more concentrated.

N.B.—This accounts for the care taken to give nurseries and convalescent homes a southern aspect, and for the best fruit being grown on southward slopes, *e.g.* the strawberries of Perthshire or the pears of Herefordshire.

3. Height, of course, affects temperature very much, whatever the slope.

- (1) Snowdon and Ben Nevis, as their names imply, are high enough to be snow-capped and icy-cold; and snow lies for many months on much lower hills, *e.g.* Ben Lomond and Helvellyn.
- (2) The vegetation on the Carse o' Gowrie is very different from that on the Sidlaw Hills behind it; so, the hop gardens of Herefordshire are overlooked by the bleak moorland of the Brecknock Beacon.

4. Mountain heights provide shelter for the valleys and plains below them.

- (1) The Pennine Range shelters the Lancashire plain from the cold east winds, and cuts off the Yorkshire plain from the mild west winds.
- (2) Hastings is distinctly warmer than St. Leonards, and Conway than Llandudno, because in each case one is, and the other is not, protected by a cliff from the east wind.
- (3) Dolgelly has twice as much rain as Shrewsbury, because the intervening fifty miles is filled up with the heights of the Berwyn Mountains.

5. As water changes temperature more slowly than land, it tends to raise temperature in winter and lower it in summer.

- (1) Glasgow is both much warmer in winter and much cooler in summer than Moscow, which is in the same latitude.
- (2) The average difference in temperature between summer and winter is less than 30° in London, but more than 60° in Irkutsk.

6. Consequently, water prevents sudden changes of temperature either from day to night or from one season to another.

- (1) Spring and autumn come very gradually in Edinburgh, but very suddenly at Moscow.
- (2) On the Central Plain of England the air becomes chilly directly after sunset; at sea-side places, *e.g.* Cromer or Aberystwith, the change from day temperature to night temperature is very slow.
- (3) In winter, Berlin is nearly 10° colder than London, and Orenburg is nearly 20° colder than Berlin; in summer, Berlin is about 3° warmer than London, and Orenburg is about 6° warmer than Berlin.

7. As the sea is the source of all rain, and as

the rain is distributed by winds, the rainfall varies with distance from the sea and the direction of the regular winds.

- (1) For instance, the regular S.W. Anti-Trades blow directly up the Severn valley, leaving annually about 50 inches of rain near Newport, about 35 inches near Chepstow, and about 27 near Tewkesbury.
- (2) As there are no regular winds blowing to the east coast, the rainfall there is much lighter than in the west; for instance, Galway has more than 50, Skye more than 100, and Cumberland 150 inches, while Edinburgh and Dublin have only 30, and London has only 25.
- (3) In the broadest part of the country, *i.e.* in the latitude of Lowestoft, where the east winds are driest, and the level is lowest, the average rainfall is even less than 25 inches.

8. The heavy rainfall in the west is due, however, not only to the prevailing S.W. winds, but also to the warmth of the sea.

- (1) The rotation of the earth and the S.W. winds deflect warm surface water from the Tropics as a S.W. Drift towards the British Isles, and a stream of this warm water flows directly up our west coast.
- (2) This saves Scotland from having a climate like that of Labrador or Kamchatka, and gives the south-west of Ireland a winter temperature as high as that of Central Italy.
- (3) The slight range of temperature enables work to be carried on out of doors all the year round, and the high relative humidity is as advantageous for spinning as it is for stock-rearing.

9. Those parts of the country where the annual range of temperature is smallest, have also the greatest percentage of sunshine.

- (1) The sea-coast has more sunshine than the interior. For instance, Aberdeen has annually 100 hours of sunshine more than Kingussie ; Lowestoft has about 100 more than Ely, 200 more than Peterborough, and 300 more than Leicester ; Ventnor has about 100 more than Southampton, 200 more than Guildford, 300 more than Reading, and 400 more than Burton.
- (2) The amount of sunshine increases with exposure to the S.W. For instance, the Cornish peninsula is much the sunniest part of the whole kingdom ; the Isle of Man has as much sunshine as Brighton or Margate ; and, thanks to the lie of the Severn valley, Rugby and Stratford-on-Avon have far more than Oxford and London.
- (3) The least sunshine is, of course, where there are most clouds, *i.e.* on the mountains or in the path of cyclones, *e.g.* the north-west corner of Ireland or the Orkney Islands.

10. The main causes which determine the climate of the United Kingdom, therefore, are :

- (1) As the islands are small and comparatively low, heat and moisture are distributed more or less evenly over the whole country.
- (2) The 'marine' exposure of the west makes it milder and moister than the east, and the dryness of the 'continental' exposure gives the east rather greater extremes.
- (3) Height and slope are much more important than latitude. The difference between the summer temperature of the extreme south and the extreme north of Great Britain is only 10°, while that between Fort Augustus and the top of Ben Nevis is 16°.
- (4) The insular position and the S.W. Drift save the country from all extremes of temperature, ice-bound harbours being entirely unknown.
- (5) The regular winds are S.W. Anti-Trade winds, which are as useful to trade as to climate.

PRODUCTIONS.

Chapter 5. Vegetation.

1. The vegetation, of course, depends on the soil and the climate; and it may be roughly classified under three heads:

- (1) Grass-lands.
- (2) Ordinary plough-lands.
- (3) Forests and fruits.

2. Two-thirds of the whole usable area of the country is under grass, permanently or otherwise.

- (1) More than a quarter of the area in Great Britain is under clover and other sown grasses; in Ireland it is nearly all permanent pasture, and Great Britain has altogether about 10 times as much grass-land as Ireland.
- (2) On this area Great Britain feeds about 1,500,000 horses, 7,000,000 cattle, and 25,000,000 sheep; Ireland feeds 500,000 horses, 4,500,000 cattle, and 4,500,000 sheep.
- (3) For our huge city population the milk supply is miserably deficient. Holland, which is only one-tenth the size of the United Kingdom, has about 4,000,000 more cows; more than a quarter of our milk supply is used for making butter and cheese; hundreds of gallons go bad every day, because the poor cannot afford the price demanded for it; and a large proportion of the milk which is sold in poor districts is profusely watered, especially in London.

3. The plough-lands are divided mainly between grain, roots, and 'vegetables.'

- (1) About 7,000,000 acres are down in grain, more than half of which is oats; while barley usually occupies just over, and wheat under, 1,500,000 acres.

N.B.—The British wheat area in 1905 increased by 421,000 acres.

- (2) The chief roots are turnips and potatoes; Great Britain has about 2,000,000 acres of turnips and 500,000 acres of potatoes, while Ireland has about 300,000 acres of turnips and 700,000 acres of potatoes.
- (3) Garden vegetables are grown in large quantities round all the big towns, especially London; and Great Britain has also about 250,000 acres of 'field' beans, and a similar area under peas.

N.B.—The Scilly Isles grow early vegetables for the London market.

4. The grain-area has been steadily decreasing since the repeal of the Corn Laws, mainly owing to foreign competition.

- (1) Wheat is now practically confined to the dry eastern plain, especially to the clay lands of the Thames and the Wash basins.
- (2) Barley is mainly confined to the mixed clay-and-chalk lands of the English Midlands and to the river valleys of eastern Scotland, especially along the Trent and the Tay (cf. Burton beer and Strathmore whisky).
- (3) Oats can flourish in a much damper climate, and are, therefore, grown widely over Ireland and Scotland.

N.B.—Lincoln is the most important county for all three grains.

5. The area under 'green crops' has also decreased, but not to the same extent as that under grain.

- (1) Potatoes are still the most valuable of all the Irish crops, and are largely grown in Yorkshire, Lincolnshire, and the Scotch lowlands.
- (2) Turnips are essentially a Scotch crop, Banffshire producing the finest crops in the country; but Norfolk and Suffolk also produce considerable quantities.
- (3) Peas, beans, and hops are essentially English crops—the two former not being very important outside Lincolnshire and Suffolk, while the hops are largely confined to Kent and Surrey in the east, and to Worcestershire and Herefordshire in the West. Essex grows all three.

6. The area under forest has also decreased enormously, but not recently.

- (1) Only about 6 per cent. of the country is still under forest, much the largest areas being the 400 square miles of the New Forest and the 150 square miles of the Dean Forest.
- (2) The most famous of the old forests, *e.g.* Sherwood, Epping, and the Weald, have practically disappeared, owing mainly to the use of wood for smelting iron in former days, but partly also to the growth of population. Cf. p. 65.
- (3) The chief commercial woods are oak and beech, which are found mainly on the lower and more fertile parts of England and Ireland; elm and ash are also important, and in the far north the soil and the climate favour the birch and the Scotch fir.

7. The fruit is mainly apples, pears, plums, and cherries, and the various small berries.

- (1) The apples and pears come chiefly from the Severn Valley. Cf. Devonshire and Herefordshire cider and Worcestershire perry.
- (2) The cherries and plums come chiefly from Kent and the other "Home Counties."
- (3) The small berries come specially from the same district and from the Carse o' Gowrie—the former feeding the jam factories of London, and the latter feeding those of Dundee; but the most important, *e.g.* strawberries, flourish all over the country where they can get air and sunshine.

Chapter 6. Minerals.

1. As the British Isles are composed of a great variety of rock, they contain a great variety of mineral wealth; but the supply of coal and iron, *i.e.* fuel and

machinery, is so abundant that the other minerals have been comparatively ignored.

- (1) About $\frac{1}{2}$ of the 'metal' wealth of the country is in iron, and about $\frac{1}{4}$ of the 'non-metal' wealth is in coal, the total production of coal being about six times as valuable as that of iron.
- (2) Except in Ireland, these two minerals—the most important of all minerals—have three great advantages: they are found side by side, close to navigable water, and along with abundant supplies of limestone and gannister—the limestone for a 'flux' in smelting and for a 'base' in converting steel, and the gannister for an insoluble 'lining' to the converters.
- (3) The existence of coal, iron, and limestone in close proximity to one another forms the basis of manufactures and of transport both by land and by sea, and marks out the natural areas of manufacture. Thus, the three great coal-producing countries—the United Kingdom, the United States, and Germany—are also the chief producers of iron, and have the largest manufacturing and transport industries in the world.

2. The total coal production of the world is about 800,000,000 tons, of which in 1904 about 232,000,000 were produced by the United Kingdom, 320,000,000 by the United States, and 119,000,000 by Germany.

- (1) The United States is, therefore, our only serious rival; but its rivalry is most serious, because its seams are thicker, more concentrated, more recently opened, and much more easy to work than ours; and, consequently, the coal is much cheaper—1s. 1d. a ton cheaper in 1904.

3. Of the 232,000,000 tons produced in this country, about two-thirds was produced by England, and about one-sixth each by Scotland and Wales.

- (1) The production of the chief counties during the last few years has varied between 12 and 36 million tons apiece; in 1904 it stood:

Durham, -	36	Lancashire, 24	Staffordshire, -	13
Glamorgan, 30		Lanarkshire, 17	Northumberland, 12	
Yorkshire, 29		Derbyshire, 15	Monmouth, -	11

- (2) The export is mainly confined to a dozen towns, and distributed amongst a dozen countries,—the figures for 1904 being (in million tons).

Cardiff, -	- 15½	France, -	- 7
{ Newcastle, -	5	Italy, -	- 6½
{ South Shields, -	3½	Germany, -	- 6½
Newport, -	- 3½	Sweden, -	- 3½
Blyth, -	- 3	Spain, -	- 2½
Kirkcaldy, -	3	Russia, -	- 2½
Sunderland, -	2½	Denmark, -	2½
Swansea, -	2½	Egypt, -	2½
Hull, -	1½	Norway, -	1½
Glasgow, -	1½	Argentina, -	1½
Grangemouth, -	1	Holland, -	1
		Brazil, -	1

- (3) The Irish coal-fields are small, separate from the iron-fields, and far from the sea; and, owing to political troubles and want of capital, they have not been properly worked.

4. As the iron is found on the various coal-fields, it is put to various uses.

- (1) The 'coast' fields specialise in shipbuilding. Cf. the Newcastle coal and Cleveland iron, Whitehaven coal and Furness iron, Glasgow coal and Lanarkshire iron.
- (2) The 'inland' fields to which import of raw materials is easy, specialise in textile machinery—'cotton' machinery on the Lancashire coal- and iron-field, and 'woollen' machinery on the Yorkshire.
- (3) The 'inland' fields to which import of raw materials is not so easy, specialise in hardware; and their characteristic product is articles which demand a considerable amount of labour for a small amount of raw

material. Cf. the screws, pens, pins, nails, needles, watch springs, and bicycles of Birmingham.

5. Next to coal and iron, stone and slate are much the most valuable, the annual output being valued at about £10,000,000.

- (1) The most important stone products are various kinds of igneous rock and limestone, *e.g.* marble and granite—the marble mainly from Derby, Kilkenny, and Devon, and the granite from Leicester, Carnarvon, Aberdeen, and Cornwall. Of the ordinary building stone—the Kirkcudbright, the Portland, and the Bath kinds are the best.
- (2) Silica is found everywhere, but is not much used except where the addition of coal and salt have encouraged glass industries, *e.g.* at Newcastle, St. Helena, and Birmingham (*e.g.* in Smethwick).
- (3) The only good slates come from North Wales (Carnarvon and Merioneth), but inferior qualities are worked in Lancashire, Cornwall, Cumberland, Perthshire, Argyleshire, Tipperary, and Westmoreland.

6. Clay, salt, and tin are produced to the value of about £3,000,000 a year, the clay being much the most valuable.

- (1) Brick-clay is fortunately quite common, but the deposits in the Thames basin have been specially valuable in the extension of London; fire-clay comes mainly from Stourbridge; and china-clay was originally worked in 'the Potteries' district of the Trent basin, but is now taken there from the decayed granite of the Tamar basin.
- (2) The two great salt-fields are the 'Cheshire' and the 'Cleveland,' the valleys of the Weaver and the Wheelock being specially rich in the mineral; and the combination of salt and coal has given rise to great chemical industries, *e.g.* at Newcastle and St. Helena.
- (3) The tin also comes from Cornwall.

7. Oil-shale, lead, and zinc are also important, with a value in 1904 of £550,000, £200,000, and £137,000.

- (1) The shale is confined almost entirely to Linlithgow, where it supports the various 'paraffin' industries of Bathgate, and to Edinburgh.
- (2) The lead comes mainly from Flintshire, Derbyshire, the Isle of Man, the Lowther Hills, Durham, and Westmoreland.
- (3) The zinc comes mainly from Cumberland, the Isle of Man, Flintshire, Denbigh, and Cardigan.

Chapter 7. Fauna.

1. The British Isles are extremely well provided with domestic animals and fish.

- (1) The climate is exactly suited to pasture, especially in the western half of the kingdom.
- (2) The freedom from foreign invasion has encouraged continuous progress in agricultural science.
- (3) The character of the surrounding seas supplies abundance of food fishes at places which are most convenient both for the fishermen's homes and for large markets.

2. Sheep are found all over the country, but specially on the moors and downs of England and on the highland districts of Wales and Scotland.

- (1) The drier moors and downs produce the better wool, while the damper mountains produce the better mutton.
- (2) Thus, the three great woollen districts of Yorkshire, Gloucestershire, and Roxburghshire are overlooked by the downs which have given their names to the special 'Lincoln,' 'Cotswold,' and 'Cheviot' breeds of sheep.
- (3) The 'Blackfaced' mutton of Wales and Scotland is the best in the world, and is reared largely on a barren granite soil, while the wool is raised on chalk and limestone.

N.B.—Northumberland has the largest total number of sheep.

3. Cattle are most numerous in the lower and milder parts of the country, and their kind and use vary with the soil and climate.

- (1) The sandstone of Cheshire and Devonshire, and the mild climate of Jersey and Guernsey, produce the best cream and butter.

N.B.—Irish butter is equally good where it is made with equal care and cleanliness, as it is made in the 300 odd Co-operative Dairies.

- (2) The *lias* of Somersetshire, Gloucestershire, and Leicestershire produces the best cheese, especially round Cheddar and Melton Mowbray, cf. *Stilton* (p. 48).
- (3) The valleys of Aberdeenshire and Durham produce the best beef.

N.B.—The number of cattle on the Central Plain originally gave rise to the great leather industries, e.g. of Stafford, Leicester, and Northampton.

4. Horses are mainly used in this country for draught purposes, but a considerable number are bred for sport.

- (1) The finest cart-horses in the world are bred on the carboniferous limestone of Clydesdale and Yorkshire, where their services are most needed. Cf. the horses of the Kentucky limestone, U.S.A.
- (2) The best hunters are bred in Ireland, especially in the southern half.
- (3) The ponies of the Shetland Islands are as pretty as they are brave and strong.

5. Pigs and donkeys are most common in Ireland, where they abound everywhere; but pigs are also numerous in the Thames basin and East Anglia.

- (1) The best bacon is 'Wiltshire' and 'Berkshire,' and the best hams are 'Cumberland,' 'Westmorland,' and 'Belfast'; but the number of pigs is steadily decreasing.

6. The fisheries are the most important in Europe, and Billingsgate is the largest fish-market in the world.

- (1) The 'deep-sea' fisheries include the cod and flat fish of the Dogger Bank, the herring and haddock (cf. 'Loch Fyne' and 'Findon') of the Scotch waters, and the mackerel of the English Channel.
- (2) The 'shore' fisheries include the oysters of Whitstable and Colchester, the shrimps of the Wash, and the mussels of the Forth.
- (3) The 'river' fisheries are comparatively unimportant, except for the salmon of the Scotch and Irish rivers and of the Eden, the Severn, and the Tees.
- (4) Considerably more than half the total catch (£9,000,000 a year) comes from the North Sea, mainly through the Scotch ports of Wick and Peterhead, and the English ports of London, Grimsby, Hull, Lowestoft, and Yarmouth. Cf. Milford and Brixham.

N.B.—Haddock (English) and herring (Scotch) are the most important.

- (5) The east coast is well situated, too, for procuring ice (from Norway), salt, and barrels, the salt and barrels being especially necessary in connection with the Scotch herring fishery.
 - (6) Grimsby is the metropolis of the whole British fish trade, and possesses the same advantages over Hull that Harwich does over London: it is in purer water, nearer to the fishing banks, and more easily supplied with ice.
 - (7) The fishing industry is the only satisfactory school for a navy, whether royal or mercantile. The heroes of the Armada hailed from the pilchard and mackerel ports of the Cornish peninsula, as the greatest French sailors have hailed from the sardine ports of Brittany. Cf. Plymouth and Devonport with Lorient and Brest.
7. The wild animals of the country, which were originally very numerous, are now very few.

- (1) The only survivors that have any commercial value are deer and grouse, which are mainly confined to Scotland; but grouse are fairly abundant on the Pennine moors, and deer are still seen on Dartmoor.

ENGLAND AND WALES.

SURROUNDINGS.

Chapter 8. General Surroundings.

1. The coast, like that of the rest of the United Kingdom, is very long in proportion to the area of the country.

- (1) The direct distance from Berwick to the South Foreland is about 350 miles, that from the South Foreland to Land's End is about 325, and that from Land's End to the head of the Solway is 350 ; but the actual measurement of the coast-line extends to 2400 miles.

N.B.—The distance from the Solway to Berwick is about 80 miles.

2. As the general character of the coast depends on the relief and geological formation of the surface, and as the east and west sides of the country differ in both respects, there is considerable difference between the east and the west coasts.

- (1) The west coast consists of such hard old rocks that it has been able to withstand the fiercest storms and tides of the Atlantic.
- (2) The east coast consists of such soft new rocks that it has weathered away into a monotonous line of low shingle, which is continually changing even under the action of the slight North Sea tides ; it is broken only by the estuaries of rivers, and is protected by sandbanks, between which and the shore there is very safe anchorage, *e.g.* Yarmouth Roads and the Downs.
- (3) The south coast resembles both the other coasts—the west coast in its western portion, and the east coast in its eastern portion.

3. As the east coast is really formed by the natural sinking of the eastern plain into the sea, it is deficient in headlands, bays, and islands; and the shore waters are shallow and shoaly, with slight and regular tides.

- (1) Almost the only island of importance is Holy Island, the others being simply mud flats, e.g. Sheppey.
- (2) The only important headlands are the ends of the upland ranges which cross the country from S.W. to N.E.—Flamborough Head being the end of the main chalk range, and Hunstanton Point the place where it dips under the Wash.
- (3) As the northern rivers—the Tyne, Wear, and Tees—are so short, their estuaries are quite small; and the coast round the Wash has been silted up and made more or less useless for shipping by the wearing away of the Yorkshire and Lincolnshire coast. Cf. p. 48.

4. Owing to the larger area of the Thames and the Humber basins, their estuaries are very much larger; and their good waterway and their position give them special advantages.

- (1) The Humber is the only opening through a long line of coast uplands; it leads inward across a rich agricultural plain to the coal-fields of Yorkshire, Derbyshire, and Staffordshire, and leads outward across the great fishing centre of the Dogger Bank to the entrance of the Baltic Sea.
- (2) The Thames has no coal or iron of its own, but it has a rich plain and an enormous population behind it; it is navigable to the very heart of London by the largest vessels afloat; it opens directly on the great harbours of Rotterdam and Antwerp, and on the dense population of the European plain; and it commands the international waterway of the Dover Straits Cf. p. 24.

5. The character of the west coast between its bold headlands of slate and granite depends mainly on the rivers.

- (1) The chief headlands vary in height from 350 feet (Hartland Point) to over 700 (Holyhead)—St. Bees being about 470, and Great Orme's Head about 680.
- (2) Between the Cumbrian and the Cambrian mountains the sea has been able to gradually wash away the edge of the low Lancashire plain and silt up the rivers; but the character of that plain has made the rivers very useful considering their shortness.
- (3) The mountains round Cardigan Bay have resisted the inroads of the sea so successfully that the bay is practically useless for commerce, though there is a magnificent 'refuge' in the lonely fiord of Milford Haven.
- (4) The estuaries of the Solway and the Severn, on the other hand, owe their shape more to their rivers than to the sea; but the action of tide and storm has, of course, been much fiercer in the exposed Severn than in the sheltered Solway.
- (5) The importance of these west coast harbours depends mainly on the ever-increasing trade with North America, and on the easy access which they give to the great coal-fields of England and Wales.

6. The south coast reproduces the bold granite headlands and curved bays of the west coast between Portland Bill and Land's End, and the characteristics of the east coast between Portland Bill and the South Foreland.

- (1) Consequently, in the west there are magnificent harbours like Falmouth and Plymouth, while in the east there are only roadsteads like Dover and Folkestone.

N.B.—Falmouth, like Milford Haven, is very much out of the way.

- (2) In the centre of the coast the Itchen and the Test, like the Trent and the Ouse on the east coast, combine to form a splendid double estuary; and the natural protection of the Isle of Wight, and the position with regard to France, have made Portsmouth the chief naval arsenal of the kingdom.
- (3) The 'cross-channel' ports of Dover, Folkestone, and Newhaven owe their very large traffic in passengers and perishable goods merely to their nearness to the continent and the speed of their mail-boats.

Chapter 9. Ports (1).

1. The conditions of British trade make the harbours of unique importance with regard both to the production and to the distribution of goods.

- (1) Home industries depend absolutely on foreign products.
- (2) The population is so dense that the area under food crops is continually decreasing, and at least half its food must now be imported.
- (3) Many 'necessaries' both of food and of industry cannot be produced in the country at all, *e.g.* tea and cotton.

2. The production of commodities is, however, greatly encouraged by compensating advantages.

- (1) The climate allows continuous open-air work, and increases the natural fertility of the soil by precipitating (along with the regular rainfall) the carbonic acid, nitric acid, and ammonia of the atmosphere.
- (2) The presence of coal and iron in abundance, near together, along with limestone, is an immense advantage to manufactures, and originally was most helpful in giving Britain the start over the rest of the world in mechanical inventions.
- (3) The concentration of a dense and vigorous population within such narrow limits made it easy to organize industry and to 'divide' labour.

3. The distribution of commodities is also greatly encouraged by similar advantages.

- (1) The geographical position of an island country in the centre of the land of the world gives it cheap water-transport in all directions—a radius of 6000 miles including such widely different points as Bombay, Cape Town, Buenos Ayres, and San Francisco.
- (2) The number, character, and position of the harbours enable goods to be exported direct from almost any centre to any possible markets; for instance, Hull exports more cotton yarn to Europe than Liverpool does.
- (3) The absence of any very serious obstacle to internal communication allows the country to be covered with roads, railways, and canals, as well as with navigable rivers; for instance, England has nearly one mile of rail for every five square miles of area.

4. London, of course, stands at the head of all the harbours of the world, with a total population of nearly 6,000,000.

- (1) It has the largest foreign trade and the largest coasting trade of any harbour in the world; it receives more than one-third of the total imports of the country, and sends out nearly one-third of the exports; more than 50,000 vessels enter and clear every year, the largest branch of traffic being the Australian and East Indian.
- (2) It has two defects as a port: The channels up its estuary are not very good, and it has no coal or iron of its own. The latter want is handicapping its shipbuilding industry in these days of *steel* steamers.
- (3) It has, on the other hand, many merits, for collecting, producing, and distributing goods. Cf. p. 21.
- (4) The hops of Kent and the barley of the Eastern counties supply its breweries; the fruit of Kent and Surrey supplies its jam factories, and the wheat of the Thames

basin its biscuit factories ; and the " London clay " supplies bricks for the enormous number of new houses added to its area every year.

- (5) It is far enough from the west coast to have a dry, healthy climate, and it has supremely good communication inland in all directions to serve its political as well as its commercial needs. Cf. the names of the railways : *Great Northern, Midland, North-Western, Great Western, South-Western, South-Eastern, Great Eastern, Metropolitan, District*, etc.

5. Liverpool comes next to London both in population (685,000) and in importance ; and, in the matter of foreign exports and registered tonnage, it even exceeds London.

- (1) It stands on a navigable river, with the rich Lancashire coal-field behind it, and it looks towards the New World, from which it draws its staple, cotton ; and, in connection with the enormous population behind it on the coal-field, it has come to largely monopolise the American grain and cattle trades and the Irish dairy trade.
- (2) It has the finest docks in the world, with nearly 40 miles of quay ; it receives about one-fourth of the total imports of the country, and sends out about one-third of the total exports ; and its only great drawback is the bar at the mouth of the Mersey.
- (3) The valley of the Weaver is rich in salt, and the salt and the coal have attracted to Liverpool a large trade in glass and chemicals, which is shared by St. Helens, Widnes, and Runcorn.

N.B.—The total value of its foreign trade is considerably more than £200,000,000 a year.

6. Manchester stands next to Liverpool in population (545,000), and has largely aided in the development of Liverpool ; but, as it has ranked as a port

only since the opening of the Ship Canal from Eastham in 1894, its importance is not due at all to its waterway.

- (1) It stands on a rich coal-field, with excellent communication by rail and canal in every direction ; it has the water-power of the Pennines behind it, and commands the most important passes across the range.
- (2) Its nearness to the coast and the character of the south-westerly winds make its climate very suitable for cotton-spinning, for the yarn will not stand high pressure in dry climates.

N.B.—In the drier climate of inland towns, *e.g.* Nottingham, textile work takes the form of hosiery, lace, etc., in which the yarn is not subjected to high tension.

- (3) As a great industrial centre, it manufactures machinery for cotton and for transport.

Chapter 10. Ports (2).

1. Bristol stands next in population (330,000), but it is very far behind Liverpool both in its tonnage and in the value of its foreign trade (more than £9,000,000). Indeed, its tonnage is quite insignificant, and at least a dozen other ports have a more valuable trade.

- (1) It has a coal-field and a navigable river, but the coal is very hard to work ; and the river has some very serious drawbacks, its only real advantage being the very high tides. Cf. p. 4.
- (2) It owes its importance to its old connection with America in the early days of colonisation, and it is trying to maintain its importance by developing its outport of Avonmouth, eight miles away. Cf. p. 64.
- (3) It still shares in some of the trades which in those days it monopolised, *e.g.* tobacco, cacao, and sugar ; and it has a considerable Irish trade, especially in provisions and dairy produce. Cf. p. 64.

2. Hull, with a population of 240,000, has a more valuable trade (nearly £50,000,000) than any other ports except London and Liverpool, and more tonnage than any others except London, Liverpool, Cardiff, and Newcastle.

- (1) It has no coal or iron, but it stands on the only navigable waterway between the Thames and the Tees, and is splendidly sheltered from the north-easterly storms.
- (2) It is directly opposite the Elbe and the Kiel Canal entrance to the Baltic, and it commands the richest fishing banks of the North Sea.
- (3) It has such an enormous population behind it, and such excellent communication inland, that it has become the commercial capital of Yorkshire.

N.B.—Leeds is the industrial capital, and York is the political and ecclesiastical capital.

3. Newcastle stands next in population (215,000), and has more tonnage than any other ports except London, Liverpool, and Cardiff; but the value of its foreign trade is comparatively small (over £12,000,000).

- (1) It stands on the most famous coal-field in the world, and close to the Cleveland iron- and salt-fields; and it has a much larger coasting and general trade than Cardiff, though the latter practically monopolises the export of 'smokeless' coal.
- (2) The coal and iron have given Newcastle its very important shipbuilding and engineering trades, which consume a considerable proportion of its mineral wealth; and the coal and the salt have attracted glass and chemical trades. Cf. Liverpool, p. 25.
- (3) The Tyne is exposed, and had a bad bar; but it has been much improved to meet modern needs, and Newcastle still exports more 'ordinary' coal than any other port in the world.

4. Portsmouth approaches Newcastle in population

(190,000); but, from the very nature of its importance, its trade is practically limited to the needs of the arsenal, ship-yards, and victualling yard.

- (1) It is too far from coal and iron to be a good commercial harbour, even if it had not an overpowering rival in Southampton, which is so much farther inland.
- (2) Like Southampton, however, it is sheltered by the Isle of Wight both from storm and from enemies; and, further, it is very strongly fortified, and large enough to accommodate the whole British Navy at once.
- (3) Being opposite our old enemy, France, and conveniently near to London, it has been made the great naval arsenal of the country.

5. Sunderland (146,000), like all coal-ports, has a considerable amount of registered tonnage, but the value of its foreign trade is not very great (£1,500,000).

- (1) Its importance is mainly due to its position at the mouth of the Wear, with the Durham coal-field behind it.
- (2) It is also well situated for importing fibres from the Baltic, and for sharing in the trade of Newcastle and Middlesborough.
- (3) It has, therefore, both shipbuilding and sail-cloth industries.

6. Cardiff comes next to Liverpool in the average annual tonnage of its foreign and colonial trade, though the value of that trade is scarcely £10,000,000, and its population at present is only 170,000.

- (1) It has made extraordinary progress within the last thirty years, and now exports more coal than any other port on the face of the earth.
- (2) It stands between the iron of Glamorganshire and the tin of Devon and Cornwall, which has given it the largest tin-plate industry in the world; and it has

direct communication up the Taff valley to the great iron centre of Merthyr-Tydfil.

- (3) The 'Severn' trade with the west coast of Africa includes palm oil, which is essential as a 'flux' in the tin-plate trade.
- (4) Its rapid progress is greatly due to the excellent quality of the anthracite coal, and to the high tides in the Severn (usually about 33 feet at Cardiff).
- (5) Its population has more than trebled itself since the Franco-Prussian War (1871).

7. The only other harbours with large populations are Southampton, Swansea, and Middlesborough; but several smaller towns have very important trade.

- (1) Southampton is mainly a mail and passenger port, doing nearly £20,000,000 worth of trade every year.
- (2) Swansea is the outlet for the copper, coal, and iron industries of the Tawe basin, and Middlesborough is the outlet for the Cleveland iron and salt industries.
- (3) Dover, Folkestone, Newhaven, and Harwich are practically outports for London, with a trade of from ten to twenty millions; Gateshead, Jarrow, and the Shields are practically suburbs of Newcastle, as Birkenhead* is of Liverpool and Salford is of Manchester; Hartlepool and Newport owe their importance to coal, and Great Grimsby has a larger fish trade than any other harbour in the country.

* The name of a town such as this is intended to include the place itself and all its suburbs, even though the latter may be distinct political units, e.g. 'Birkenhead' includes Wallasey, as 'Birmingham' includes Aston Manor, Smethwick, and Handsworth.

SURFACE

Chapter 11. Mountains.

1. As the Pennine Range is a succession of moors and hills varying generally from 1000 to 2000 feet, it does not present a very formidable obstacle to communication across the country; but it rises to considerably over 2000 feet in some places.

- (1) It is highest where it is farthest from the west coast, Mickle Fell rising to nearly 2600 feet, and Cross Fell to 2900.
- (2) On the other hand, it naturally comes nearest to the west coast where it is broadest; and in that part, Pen-y-gent, Ingleborough, and Whernside rise to a height of from 2300 to 2400 feet.
- (3) The scenery is wild, the soil barren, and the limestone full of caves; and, as the range runs due north and south, it is a considerable obstacle to the constant wet winds from the Atlantic.
- (4) In the south, where it is lowest and narrowest, vast beds of coal and iron have been upheaved on each side of the range.
- (5) The eastern beds, between the sheep pastures of the Yorkshire moors and the Lincolnshire downs, have become the seat of the woollen trade; the western beds, looking towards the great cotton area of America, have become the seat of the cotton trade.

2. As the Cumbrian group are joined to the Pennines by the high moorland of Shap Fell, communication north and south is not very easy; and the *London and North-Western Railway* has to climb the obstacle by means of the Lune and Eden valleys.

- (1) The group consists of a ring of peaks, radiating from Helvellyn, and rising to over 3000 feet in Scafell, Helvellyn, and Skiddaw.
- (2) As they are so much higher and nearer to the sea than the Pennines, they have a much heavier rainfall, which collects in lakes along the valleys, e.g. Windermere, Derwentwater, Ulleswater.
- (3) Their grandeur and their beauty are due, therefore, to causes which deprive them greatly of commercial importance.

N.B.—Their curious symmetry is due, not to their present geological structure, but to the 'dome' shape of the original mass out of which, by storm and stream, they have been weathered.

3. As the Cambrian Mountains are cut off by a continuation—in the Dee and the Severn valleys—of the strip of low ground which cuts off the Pennines from the sea, communication north and south is quite easy.

- (1) The isolated mountains of Carnarvon resemble those of Cumberland in their poverty of soil, their excessive rainfall, their lakes, their height, etc.—Snowdon and the Carneddls being even a few hundred feet higher than Scafell and Helvellyn.
- (2) The Berwyn and Plinlimmon ranges, like the mass of the Pennines, are more continuous, and run more or less north and south; and Arran Mowddwy and Cader Idris are about the same height as Cross Fell, though their greater exposure makes them bleaker and more barren.
- (3) The southern system of the Black Mountains and the Brecknock Beacons, like the southern part of the Pennines, contains coal and iron.

4. The third group of old rocks is in Devon and Cornwall, and is also cut off from the newer rocks by a continuation—in the Parret and the Tone

valleys—of the same low strip which cuts off the Cambrian and the Cumbrian Mountains.

- (1) Like the other two groups, it is steep on the west side, and slopes gradually down to the east; and, like them, it is wild and barren.
- (2) Unlike them, it is highest in the centre, where Dartmoor rises to 2000 feet in High Willhayes, and it has no heights and no lakes.
- (3) It has much more bog and much less mineral wealth than the Welsh group, but much less rain and more wealth than the Cumbrian group—the wealth being chiefly in tin, granite, and porcelain clay (decayed granite).

5. The Cheviot Hills belong more to Scotland than to England.

- (1) Their chief peaks are nearly as high as those of the Pennine Range, from which they are separated by the low strip that gives easy railway communication between Carlisle and Newcastle.
- (2) The range itself and the Solway Moss, in the days before the latter was drained, were a great obstacle to communication between England and Scotland; and railway communication still goes mainly *via* the two historic strongholds of Carlisle and Berwick.
- (3) The soil and climate of the grassy slopes and moors suit the small short-woolled sheep which takes its name from the district.

Chapter 12. Uplands and Plains.

1. As the west of the country has its four mountain systems, so the east has its four upland systems, or lines of undulating hills.

- (1) All four converge on Salisbury Plain; and, in the days when Central England was a waste of forest and marsh, they formed the highways to Stonehenge.

- (2) The northernmost range is formed of Oölitic limestone; the other three are of chalk, and, therefore, rich in flint, and suitable for pasture.
- (3) Natural wealth in the earliest times often meant a bed of flint (for weapons), and pastoral pursuits were safer than agricultural; and thus this chalk formation was the natural site for the early centres of 'civilisation'—Stonehenge, Salisbury, Winchester, Windsor, St. Albans, etc.

2. The Oölitic—or granular limestone—range is known by various names in different parts, *e.g.* Cotswolds, Edge Hill, Rockingham Forest, Lincoln Edge, North York Moors, Cleveland Hills, etc.

- (1) This range divides the manufacturing from the agricultural districts of England. In the former, local deposits of minerals amongst barren moors favoured the concentration of people in isolated centres; in the latter, where there is practically no mineral wealth, the population is more or less evenly spread over the agricultural land.
- (2) Throughout its whole length the range follows the universal slope of the country, rising on the west side in an abrupt edge or 'escarpment,' and falling gently on the east; and it is this escarpment which gives so much beauty to the eastern banks of the Ouse, the Trent, the Avon, and the Severn.
- (3) As it is highest towards the two extremities, rising to 1100 feet in the Cotswolds and 1500 feet in the Yorkshire moors, it unites two pastoral districts across the agricultural district of the Trent basin.

3. The northernmost of the Chalk ranges resembles the Oölitic range in position, form, and direction, and is also known by various names, *e.g.* Dorset Heights, Marlborough Downs, White Horse Hill, Chilterns, East Anglian Heights, Lincoln Wolds, etc.

- (1) Throughout its whole length it, too, follows the general slope of the country, rising in an escarpment on the west and falling gradually to the east; but it is distinctly lower than the oölitic range, nowhere rising to 1000 feet.
- (2) The two 'Down' ranges are spurs of the same formation, but they have not the same escarpment.
- (3) All three have the flat-topped ridges and monotonous curves characteristic of chalk scenery.

4. By far the largest plain in the country is the great horse-shoe of low land which encloses the southern part of the Pennines.

- (1) As it is formed of the valleys of the rivers which flow from that range, it is well provided with both soil and water.
- (2) It is divided by these valleys into three main parts—the Eastern Plain or Plain of York or Valley of the Ouse, the Central Plain or Valley of the Trent, and the Western Plain or Valley of the Mersey.
- (3) The great rainfall west of the Pennines causes the preponderance of cattle pasture in the west, especially in Cheshire.

5. There are two other plains of importance, both really starting in the historic Vale of White Horse.

- (1) One is the wedge of low land that stretches along the valley of the Great Ouse into the Fens, and the other is the Thames valley.
- (2) As both have large areas of clay, abundance of sunshine, and light rainfall, they produce excellent wheat.
- (3) Clay (for household utensils) ranked next to flint in importance among the early inhabitants of the country; and thus, below the 'flint' centres of Windsor and St. Albans, sprang up the 'clay' centres of London and Colchester.

Chapter 13. Rivers.

1. As the main water-parting naturally follows the line of the main mountain system, it lies much nearer to the west coast than to the east; and thus it passes through three typical areas.

- (1) For 200 miles it runs along the crest of the Pennines, amongst grouse moors, sheep pastures, and stone quarries.
- (2) In the south-west it runs for a similar distance along the downs and moors from the Cotswolds to Land's End.
- (3) Between these two extremes it crosses the fertile plain of Central England.
- (4) The nearness of the watershed to the west coast guarantees a constant and abundant rainfall, and the undulating surface of the country favours the collection of this rainfall in rivers.
- (5) There is a minor water-parting along the south of the country, which is the watershed for the streams that fall into the English Channel.

2. The fact of the main water-parting being so much nearer to the west than to the east coast is reflected in the river system.

- (1) By far the greatest number of rivers flow to the east; and even of those which do not empty eastward, the most important, i.e. the Severn, Wye, Dee, and Usk, flow eastward for more than half their course.
- (2) The eastward rivers are, except for the Severn and the Wye, much the longest; and, therefore, we may expect them to be the most useful for navigation and the least liable to floods. For instance, the Yorkshire Ouse, the Great Ouse, and the Trent, are all fully 150 miles long, and the Thames is 215.
- (3) The eastward rivers have much the largest basins. For instance, the Humber basin alone embraces an area

of about 10,000 square miles, i.e. nearly as large as Belgium.

- (4) As the eastward rivers flow over the softer rock, they carry down more alluvium to enrich the land through which they flow; and, as they empty into the shallower sea, the alluvium often collects in such masses as to seriously impede their entrances.

3. The Tyne, the Wear, and the Tees all start close together on the drier side of the Pennines, and all reach the sea within from 70 to 80 miles.

- (1) Consequently they cannot have any great volume, or be navigable for any great distance.
- (2) All three, therefore, must owe their importance to the bed of mineral wealth through which they empty.
- (3) The Tyne empties through the very centre, and the Wear along the south, of the Newcastle coal-field, while the Tees empties along the north of the Cleveland iron- and salt-field.

4. The Humber, as we have seen, is the only opening along that part of the coast, and leads across the middle of a rich plain up to the minerals of the Pennine slopes.

- (1) The Aire stretches along the north and busiest part of the coal-field, while the Don cuts through its central and narrowest part.
- (2) The rivers of the Ouse basin are more valuable for manufacturing and irrigating purposes than for transport, while the greater size and length of the Trent make it equally useful for all three purposes.
- (3) The Ouse basin collects the agriculture of the Yorkshire plain and the manufactures of the Yorkshire coal-field; the Trent basin collects the agriculture of the Midland plain and the manufactures of the Stafford and Derby coal-fields.
- (4) The head of navigation for sea-going vessels is at Goole

and Gainsborough respectively, and barges can ascend very much farther—on the Trent as far as Burton.

- (5) The valleys of the Aire and the Calder give canal communication between Lancashire and Yorkshire, while the Upper Trent canals form part of the "Grand Trunk" system between the Mersey and the Thames.

5. As the Great Ouse rises on the low Chiltern Hills, and is 150 miles in length, its course is so slow that it is navigable for a great distance—to Bedford.

- (1) Its two serious defects are that it empties into the dreary, useless, unhealthy Wash, and that its basin has no mineral wealth.

6. Like the Great Ouse, the Thames rises at a very low elevation (about 300 feet above the sea), and yet is very long; consequently it ought to afford special advantages for navigation.

- (1) Its estuary gives sheltered navigation, with very regular tides, to the largest vessels for 50 miles—up to London Bridge; and the tide goes on for 20 miles farther—up to Teddington Lock. Cf. p. 53.
- (2) Barges can reach Lechlade, about 120 miles, in a straight line, from the Nore; and from there a canal gives easy communication with tidal water on the Severn.
- (3) The breadth of the river varies from about 6 miles at Sheerness to 1 mile at Gravesend, and to about 300 yards at London Bridge; and for the convenience of shipping there is a huge movable bridge at the Tower which can be raised 110 feet.
- (4) Its political importance in olden times may be gauged from the fact that it is a boundary to no less than nine counties, and that its headwaters are within nine miles of the Severn.
- (5) Its commercial importance in modern times may be gauged from the size of London (cf. p. 24), the port

of which practically extends from London bridge to Queenborough, and includes such places as Chatham, Gravesend, Tilbury, Woolwich, Greenwich.

N.B.—Like the Severn and the Mersey, the Thames has every possible convenience for cross-traffic, including tunnels.

7. The Severn is the longest river in the British Isles, its course from Plinlimmon to the sea being 240 miles.

- (1) As it drops on to the plain even before it leaves Wales, it is navigable for a great distance—for barges up to Welshpool; and the canal from Sharpness to Berkeley allows largish vessels to reach Gloucester.
- (2) As it has the highest tides in Europe, it gives access to the largest vessels even up an insignificant stream like the Lower Avon to Bristol. Cf. p. 4.
- (3) It empties through the largest and richest coal-field in Europe, and has very easy communication from it—*via* the valley of the Upper Avon—to the Trent valley and the great Central Plain. Cf. p. 64.
- (4) Its position naturally gives it a large trade with Ireland and the West Indies.

8. The Wye owes its importance mainly to the fertility of the sandstone and marl of the Herefordshire plain, which produces splendid fruit, but partly to its great beauty.

- (1) It also empties along the Forest of Dean coal-field.

9. The Mersey is essentially a 'Pennine' river, flowing at first through barren moors and then over a low plain.

- (1) The south portion of this plain is very fertile, and contains valuable salt-beds.
- (2) The north portion is crossed by a rich bed of coal.
- (3) Its position gives it an Irish and American trade. Cf. Liverpool and Manchester, p 25.

N.B.—It is much impeded by a shifting bar.

COUNTIES AND RIVER-BASINS.

Chapter 14. Tyne, Tees, and Eden.

1. Northumberland has an area of about 2000 squares miles.

- (1) In the olden times the natural ramparts of the Cheviots and Pennines were a protection to the Teutons against the Kelta, and the low land between the two ranges was protected by the Roman wall; but the isolation of the country, its bleak climate, and its poor soil, impeded its development.
- (2) The surface is divided into a low strip of arable land along the coast and a mass of moor and hill inland; the former produces excellent turnips and potatoes, while the moors feed sheep, and the Pennine valleys produce lead and zinc, *e.g.* at Allendale. Cf. p. 17.
- (3) The county owes its importance, however, entirely to its coal-field (*cf.* p. 27), which supports the iron, glass, chemical, and shipbuilding industries of the Tyne ports.
- (4) The political importance of Berwick in olden days may be gauged by the number of great battles fought along the Lower Tweed, *e.g.* Halidon Hill, Chevy Chase, Flodden; but it is noted now only for salmon and for the railway junction which marks the old line of march round the eastern end of the Cheviots.
- (5) The little market towns of Hexham, Alnwick, and Morpeth, stand at characteristic places for markets, *i.e.* at the confluence of two rivers in the interior of the county, or where a river is bridged on the line of march along the coast.

2. Durham, which is about 1000 square miles, also consists of a low eastern half and a high western

half, between which the 'Newcastle' coal-field crosses the county from north to south.

- (1) The moors feed sheep, and the hills produce lead, *e.g.* at Stanhope; the broad valley of the Wear feeds splendid 'short-horns'; and the plain of the Tees produces some of the flax which is used in the linen industry of Barnard Castle and Darlington (*cf.* p. 42).
- (2) The most important towns are, of course, along the navigable part of the rivers, where there is every facility for using the coal in iron, glass, chemical, sailcloth, and shipbuilding industries; Sunderland is much the largest, having a population of nearly 150,000, while Gateshead, S. Shields, Hartlepool, and Stockton vary from 110,000 down to 70,000. Port Clarence, with its salt works and exporting of coal, is really a suburb of Middlesborough.
- (3) Durham and Bishop Auckland are old farming centres. Durham rock was a suitable site for the castle and cathedral of a political capital, and Bishop Auckland was the natural market for the upper and the lower parts of the Wear valley; but Darlington, with its iron and coal industries, is much the most important inland town.

3. Cumberland (about 1500 square miles) is divided into three natural areas—the mountains of the south, the moors of the east, and the broad Solway plain.

- (1) The south contains the lakes, the old plumbago mines—which made Keswick famous for pencils—the coal mines which have developed the ports of Whitehaven, Workington, and Maryport, and the iron of Millom, Cleator, and Egremont.
- (2) The east is mainly devoted to sheep-farming, but lead and zinc are worked along the S. Tyne, *e.g.* at Alston.
- (3) The old towns were all in the fertile valley of the Eden; Penrith is mainly an agricultural centre, but it is also an important junction for Keswick and Cocker-mouth; the river-guarded rock of Carlisle was a fit

site for the castle and cathedral of a political capital, and railways converge on it now to round the Cheviots as military routes did in the days of Border wars.

4. Westmorland (about 800 square miles) is entirely hilly except for the little plain of the Kent, and is almost entirely given up to grazing—mainly sheep.

- (1) Kendal (14,000) is much the most important town, and still maintains the wool industry which once made it famous for 'Kendal green.'
- (2) Appleby is another political capital that grew up round a river-guarded, castle-crowned rock; and the old military route is now characteristically marked by the lines of the *Midland* and the *North-Eastern* railways.
- (3) Windermere and Ambleside are the chief 'lake' centres.

Chapter 15. Ribble, Mersey, and Yorkshire Ouse.

1. Yorkshire, though so very large (about 6000 square miles), is really a single county, being—except in the Ribble valley—practically the basin of the Ouse.

- (1) It may be divided into three areas—the wolds and moors of the east, the Pennine moors and mountains in the west, and the plain of York in the centre.
- (2) Except for Holderness and the Derwent valley (Vale of Pickering), which gives easy communication between York and Scarborough, the east is mainly pastoral; but the Cleveland iron- and salt-field has raised a very important industrial centre in Middlesborough, and the Humber traffic has raised a still more important commercial centre in Hull.

N.B.—Cleveland raises over two-fifths of the total output of British iron-ore.

- (3) On the bolder and more exposed part of the coast there are also several picturesque watering-places, *e.g.* Scarborough, Whitby, and Saltburn.

N.B.—The presence of jet at Whitby proves the existence of a pine forest in long past ages, jet being (like amber) a fossil gum.

- (4) As the plain of York is very fertile, it is dotted over with small agricultural towns, *e.g.* Northallerton, Thirsk, Ripon, Knaresboro', and Doncaster; and, as it is very flat, it has been a highway of communication ever since the time of the Romans.
- (5) York stands on this highway, in the very middle of the plain, at the limit of navigation on the Ouse—a fit site for a political and ecclesiastical capital; and this position makes it a very busy railway centre, but it has no industrial importance.

N.B.—The towns which command the approaches to this plain make large quantities of railway plant—Darlington and Doncaster specialising in 'rolling stock,' and Middlesborough and Sheffield in steel rails.

- (6) The abundance of coal, iron, and water between Sheffield and Settle has interspersed the Pennine sheep-pastures with a number of large industrial towns; Leeds, Bradford, Huddersfield, Halifax, Dewsbury, Batley, etc., are engaged in wool industries, Sheffield in iron and steel, Rotherham in brass, and Barnsley in linen. Wakefield is the natural centre of the coal-field.

N.B.—Sheffield owed its cutlery trade to its possession of abundance of splendid stone for grinding purposes.

- (7) The natural tendency of trade towards the Humber has developed a busy 'in-port' at Goole, which is the terminus of the Aire and Calder Canal; and the importance of the Pennine valleys for railway traffic has made Leeds, Skipton, Sheffield, Hellifield, and Northallerton very busy junctions. These valleys, especially Wharfedale and Niddsdale, are famous for their caves and their mineral springs, *e.g.* at Harrogate.

2. Lancashire (about 1900 square miles) is a typical 'Pennine' county, with a low plain along the coast and moors rising inland to the mountains; but the proportion of low land is larger than usual, and the moors descend more abruptly.

- (1) The Furness peninsula has in its slate hills all the characteristics of the Cumberland 'dale district,' to

which it geographically belongs; in its lower limestone formation, the possession of extremely good iron ore, so near to the Cumberland coal, has developed Barrow within the last fifty years into a town of 58,000 people, with a great reputation for shipbuilding and steel rails. Cf. Carnforth and Ulverston.

- (2) The rest of the county is divided by the Ribble into two very different areas. The north is agricultural and pastoral, and has its natural capital in Lancaster on a height that commands the plain and the mouth of the Lune; the south is covered with mining and manufacturing towns, which circle round Manchester.
 - (3) There is also a cross division of the county, the population being much denser inland than along the coast; but the magnificent sands along the low, sloping shore have made Blackpool, Southport, and several towns round Morecambe Bay very popular watering-places. Fleetwood and Heysham are 'Irish' ports.
 - (4) The mass of the country between the Ribble and the Mersey is underlaid by a very rich coal-field, which has its centre at Wigan; and the coal, the climate, the wonderful water-power of the Pennines, and the easy access to the sea, combined to raise up the gigantic cotton industry of South Lancashire. Cf. Bootle jute.
 - (5) The chief towns in the Ribble district, i.e. Preston, Blackburn, Burnley, and Accrington, specialise in weaving; but the quality of the water and the abundance of rags gave rise to the important paper industry of Darwen. Preston has the additional advantage of standing just where the *London and North-Western Railway* main line crosses the head of navigation on the Ribble, and is joined by the *Lancashire and Yorkshire Railway*.
 - (6) The Mersey valley has a slightly better climate, more water-power, and easier access to the sea; and, as the water-power collects in the Irwell, Manchester is the natural metropolis of the district. Cf. p. 25.
 - (7) The great spinning towns are perched amongst the
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waterfalls on the edge of the hills behind it—Oldham, Bolton (le-Moors), Rochdale, and their smaller neighbours—Bury, Ashton, and Bacup. The latter, like Darwen, and for the same reasons, has a large paper industry.

- (8) Away from the hills and their water-power, the coal is used for other purposes—*e.g.* at St. Helens for glass, at Widnes for alkali, and at Warrington for iron-wire works. Warrington also has the advantage of standing on the *London and North-Western Railway* main line, where it crosses the Mersey at the natural head of navigation.
- (9) The obvious outlet for the activity of this great district, with its population of 3,000,000, is Liverpool. Cf. p. 25.

3. Cheshire (about 1000 square miles) is simply a continuation of the Lancashire plain into the basins of the Weaver and the Dee.

- (1) As the formation changes, however, to red marl, it is not fit for tillage; but it grows some of the best pasture in England, and the climate is very suitable for cheese-making.
- (2) Where the county rises up to the Pennines, it is underlaid by a bed of the Lancashire coal; and this and the water-power have developed textile industries. The towns on the Upper Mersey, especially Stockport and Staleybridge, naturally share in the cotton trade of Manchester; but Macclesfield and Congleton have developed silk industries, for which the water in the Dane basin is very suitable.
- (3) The Weaver runs through the largest salt-field in the kingdom, and the salt has been worked since the time of the Romans, mainly at Nantwich, Northwich, and Middlewich. It is most important in the glass and chemical trades of Lancashire. Cf. p. 61.
- (4) The natural outlet of the county is the Mersey; the 'in-port' of Runcorn has great iron works, Eastham is the

terminus of the Ship Canal, and Birkenhead is really a suburb of Liverpool. Port Sunlight is the site of huge soapworks and a beautiful model village.

- (5) Chester, with its famous castle and cathedral, occupies the usual site for an old political and ecclesiastical capital, *i.e.* a river-guarded rock rising from a fertile plain; and Crewe occupies a characteristic site for a modern railway junction, for it commands the easiest routes into Wales and round the Pennines, *via* the Dee and the Trent valleys, as well as all the traffic converging on the Lancashire plain from the south.

N.B.—Cf. Crewe and Barrow with Doncaster and Middlesborough, or with Darlington and Sheffield.

Chapter 16. The Trent.

1. Derbyshire (about 1000 square miles), like the other 'Pennine' counties, consists of mountain, moor, and plain; but the moorland is mainly to the east of the Derwent, while the mountains and plains are to the west of it.

- (1) As the mountains are of limestone, they are full of caves, *e.g.* at Castleton; and the natural beauty, the fine air, and the presence of mineral springs, have made Matlock and Buxton popular resorts, especially for invalids (*cf.* Harrogate). This 'Peak district' also contains valuable building-stone and lead mines, *e.g.* near Bakewell, but the town of Glossop naturally shares in the Manchester cotton industry.
- (2) The moors in the east contain an extension of the Yorkshire coal-field, on which a number of manufacturing towns have sprung up; and the suitability of the water makes them specialise in silk. The chief silk centres are Derby, Ilkestone, and Chesterfield; but the two former (and Belper) also manufacture cotton—of course, in the form of hosiery. Cf. Nottingham, p. 26.

- (3) Between Derby and Ilkestone iron is also worked; and, as the position commands all traffic round the end of the Pennines, Derby has become a great junction and manufacturer of rolling-stock for the *Midland Railway*. The presence of marble and porcelain 'earths' in the neighbourhood also gave it its large marble and china industries. Chesterfield is the great smelting centre.

2. Staffordshire (nearly 1200 square miles) is mainly agricultural in area, but almost entirely industrial in population, partly because much of the soil is cold clay.

- (1) The broad plain of the Trent is famous for pasture and barley fields, which gave rise to the leather (boots) industry of Stafford and the brewing of Burton. It was, therefore, a suitable site in olden days for a political capital, and for an ecclesiastical capital such as Lichfield.
- (2) The 'Pennine' moorland in the north contains a coal-field round Longtown; and, as the Upper Trent valley is rich in gypsum and other earthenware materials, the district has become the home of the English 'Potteries,' though most of the materials are now imported. The chief towns engaged in the industry are Burslem, Stoke, Hanley, Newcastle-under-Lyme, and Etruria. Burslem was the birthplace of the great potter of the country—Josiah Wedgwood.

N.B.—It is mainly the gypsum which makes the Burton water so suitable for brewing, as the Leek water is for dyeing silk.

- (3) The Cannock Chase moorland in the south also contains a coal-field; and, as the formation is limestone and full of iron ore, the district has become the chief seat of the hardware industry. Cf. the Oldbury aluminium.
- (4) The great centres are Wolverhampton, Walsall, West Bromwich, Wednesbury, and Bilston; and, as they are so far from the sea, they specialise in railway stock and in articles which demand a considerable amount of labour for a small amount of raw material,

e.g. screws, locks, nails, bedsteads, etc. Railway traffic between Wolverhampton and Derby has developed the junction of Tamworth. Cf. The Soho engines.

3. Nottinghamshire (about 800 square miles) is confined to the low plain of the Trent, except where the Pennine moors overlap its south-west corner.

- (1) In this little strip of moor there is fortunately coal, and Nottingham and Mansfield use the fuel in manufacturing cotton hosiery and lace (cf. p. 26). Nottingham is also naturally an important railway junction at the southern end of the eastern plain of England.
- (2) Newark and Retford are agricultural centres that have also become fairly busy junctions.
- (3) Memories of Robin Hood still survive in names scattered through Sherwood Forest.

4. Leicestershire (800 square miles) consists mainly of the fertile plain of the Soar, which is an expanse of red sandstone shut in by the old rocks of the Charnwood 'Forest' on the west and by the Oolitic escarpment on the east.

- (1) Consequently, it is mainly pastoral, its long-woolled sheep, its cattle, and its pigs being all famous; indeed, they are responsible for all the characteristic industries of the county—woollen and leather goods, cheese, and pork pies—except the Charnwood granite quarrying.
- (2) The old rock round Ashby-de-la-Zouch contains a small coal-field, which supplies the mills of Leicester, Loughborough, and Hinckley. Leicester is the centre of the woollen hosiery—as Nottingham is of the cotton hosiery—of the whole country, but it also makes cotton hosiery and lace, boots and shoes, and elastic web; and its position makes it a busy railway junction now as it made it an important road junction in Roman times.
- (3) Except for the iron industry of Holwell and Waltham, the eastern portion of the county is entirely given up to

farming, Melton Mowbray being specially famous for its pork pies and its 'Stilton' cheese (cf. p. 49). It is also, like Market Harborough, a great fox-hunting centre.

Chapter 17. The Wash.

1. Lincolnshire (nearly 2800 square miles) is a large plain, crossed from north to south by two lines of uplands, and skirted by fenland from the mouth of the Nen to the mouth of the Trent.

- (1) The uplands are very famous for sheep, and some of the wool from the chalk range is used in the little woollen industry of Louth. The oölitic range was the site of the old Ermine Street ; and the commanding height above the Witham, on which the castle and cathedral of Lincoln now stand, was the site of a great Roman camp and 'colony' (*Lindum colonia*) before it became the political and ecclesiastical capital of a shire. The north end of the range is rich in iron, *e.g.* at Frodingham.
- (2) Though the name "Fens" is generally restricted to the Holland district, the fenland really extends all along the coast. It contains only one town of importance, Great Grimsby, the metropolis of the British fishing industry, and, therefore, an important railway terminus ; but in the old days of small vessels, before the Witham and the Welland were silted up, Boston and Spalding were busy little ports, and even played a conspicuous part in colonising the United States.
- (3) The rest of the county is entirely agricultural, producing grain, peas, and beans, and all sorts of roots ; and the towns, *e.g.* Lincoln, Grantham, Stamford, and Gainsborough, are mainly engaged in manufacturing agricultural implements. As Grantham stands where traffic from London naturally converges on the plain of the Trent, it is also an important junction and market centre. Horncastle has a famous horse-fair.

2. Rutlandshire (about 150 square miles), the smallest English county, lies partly on the oölitic uplands and partly on the sandstone plain of the Welland.

- (1) The west is, therefore, pastoral, and the east is agricultural; but in the fine Vale of Catmose iron-ore is worked, and boots are made at Oakham, and Uppingham has a famous school.

3. Northamptonshire (nearly 1000 square miles) consists of the central portion of the oölitic range and the plain of the Nen.

- (1) As this central portion of the range sends the Avon to the Severn and the Cherwell to the Thames, as well as the Nen and the Welland to the Wash, it naturally commands the easiest routes—military or commercial—between the three basins; and the historic heights of Naseby now look down on the junction of Kettering, as the Castle of Fotheringay looks down on the junction of Peterborough.
- (2) Where the hills sink into the fenland, there are still remnants of Hereward's old forest of Rockingham; but the marshes amongst which the monks of Crowland and Peterborough found safety, have now been drained. The fertility of the drained lands has maintained Peterborough in modern times as a rich ecclesiastical centre.
- (3) As the oölitic formation is mainly pastoral, and as there is no coal in the county for textile industries—though iron is largely worked, *e.g.* round Wellingborough—the staple industry is leather. Northampton itself is the centre of the English boot and shoe industry, and Wellingborough, Kettering, and Daventry are also engaged in it.

4. Huntingdonshire (about 350 square miles) is a low plain of clay that sinks into fenland in the east.

- (1) It is, therefore, almost entirely a dairy county, Stilton being the chief cheese centre. All the towns are

very small, even those along the Ouse; but the most important are Huntingdon (with Godmanchester), St. Ives, and St. Neots, which makes paper and parchment.

5. Bedfordshire (about 450 square miles) stretches across the plain of the Ouse to the Chilterna.

- (1) As three-quarters of the soil is rich clay, it was a great wheat district before the Repeal of the Corn Laws; and that gave rise—under the influence of Queen Mary of Scots—to the straw-plait industry of Luton, Dunstable, and Leighton Buzzard.
- (2) The county town of Bedford has been a great educational centre since the century before John Bunyan; but, though it is on the main line of the *Midland Railway* and at the head of navigation on the Ouse, it has not much industrial importance.

6. Cambridgeshire (about 800 square miles) is entirely fenland except where it is crossed by the chalk escarpment of the Gog Magog hills.

- (1) The northern portion is still called the Isle of Ely; but the 'isle' itself is now only a slight rise on the banks of the Ouse, from which its ancient cathedral looks across the market gardens of the Bedford Level to its fellow-sentinel at Peterborough. The vegetables find a ready market in the university town of Cambridge, and much farm produce is exported by the Wisbech Canal.

7. Norfolk (about 2100 square miles), except for the strip of fenland through which the Ouse empties, slopes very gently down from the chalk escarpment of the East Anglian Heights to the reclaimed plain of the lower Yare.

- (1) Where the chalk formation reaches the sea on the north, popular little watering-places have sprung up, e.g. Hunstanton and Cromer; but, as the latter faces full into the keen east wind, it is not very suitable for all kinds of invalids.

- (2) As the prevailing chalk formation is generally covered with sand, it forms an excellent soil for turnips and barley; the chalk downs themselves provide the best of pasture for sheep; and the strip of fenland along the Ouse, like the Lincoln and Cambridge fens, grows very good white mustard.
- (3) Norwich (by-the-Sea) stands amongst the sheep-farms; its position at the confluence of the Wensum and the Yare gave it a good harbour in the days when it was 'by-the-sea'; its lonely heights were a fit site for the castle and cathedral of a political and ecclesiastical capital; it was conveniently placed for trade with the Flemish wool merchants; and, until the textile trades were attracted to the coal-fields, it was the woollen metropolis of the country. It specialises now in the manufacture of mustard and silk (crape).
- (4) The old Norwich bay was silted up by the same process by which the Wash is now being silted up; and the reclaimed land is very low and full of pools or 'Broads,' which are periodically flooded by the overflow of the rivers. These 'Broads' teem with wild-fowl, and the neighbouring villages supply the finest turkeys and geese to the Christmas markets.
- (5) The famous 'Roads' off the coast, and the confluence of the Yare, the Waveney, and the Bure in a single harbour, have made Yarmouth the centre of the English herring-fishery; but the other harbour of the county, King's Lynn, is important now mainly as a junction on which traffic must converge to get round the Wash. The distribution of the Yarmouth fish has developed a junction also at the old market-town of Thetford.

8. Suffolk (nearly 1500 square miles), though not so large or so exposed as Norfolk, resembles the latter very closely in position, structure, and products.

- (1) The chalk downs of the west make Newmarket a great racing centre; and the rich clay lands between Bury

St. Edmunds, Stowmarket (the old central capital), and Sudbury, produce splendid barley, butter, and cart-horses. Stowmarket has also a gun-cotton, and Sudbury a silk, industry.

- (2) The low alluvial plain in the east is being slowly washed away by the sea, especially round Dunwich and Aldeburgh; and the silt is making even wide estuaries, like that of the Orwell, practically useless for navigation. Indeed, the most important industry of Ipswich now is the manufacture of agricultural implements; but the town is naturally a junction for traffic round the head of the estuary. Cf. Colchester.
- (3) The little creek of Lowestoft has an important herring-fishery, but the small sea-trade of the country goes mainly through Yarmouth and Harwich.

Chapter 18. The Thames (North).

1. Essex (about 1550 square miles) resembles the East Anglian type of county, but the chalk downs are confined to the north-west corner, while the alluvial tract is much larger than in Norfolk or Suffolk.

- (1) The coast is deeply indented by shallow creeks, fringed by swampy islands, and so low that it has to be protected by embankments; but where a muddy well-sheltered creek has some percentage of fresh water flowing through it, oysters thrive to perfection, *e.g.* all round the Blackwater estuary from Colchester to Malden. Cf. the Delaware estuary, U.S.A.
- (2) The coast is otherwise more or less useless except for the production of salt, *e.g.* at Malden, and for watering-places like Southend and Clacton; but Harwich and Shoeburyness are exceptions. The harder rock along the estuary of the Stour, and the position with regard to the continent, have made Harwich an important packet-station and outport of London; and

the desolate, unhealthy flats of Shoeburyness are an appropriate site for the chief artillery station in the kingdom. Cf. the Purfleet powder-stores.

- (3) The soil is mainly composed of clay, and in former times was covered with wheat fields, which have now been largely thrown into pasture; but there is some variety of soil in the west. The chalk downs supply material for 'Portland' cement; the lands below them grow very good turnips and barley; and there are large areas of peas, beans, and hops, not to mention innumerable market-gardens between Romford and Walthamstow.
- (4) The latter corner is really a suburb of London, and contains in West Ham a city of 280,000 inhabitants; and the remains of Epping and Hainault forests, and the excellent railway service of the *Great Eastern*, are drawing a large population to places like Leyton, Barking, and Woodford. Cf. Walthamstow (95,000).
- (5) Chelmsford, in the middle of the old agricultural area, was the natural capital; Romford uses the local supplies of hops and barley in its great breweries, and imports the excellent hops of Kent and the equally excellent barley of Norfolk and Suffolk; West Ham, which includes Stratford, the Victoria Docks, etc., specialises in manure and other chemical works, including soap.

2. Middlesex (nearly 300 square miles) is simply an extension of the undulating clay-lands of Essex, rising in the north towards the foot hills of the Chilterns.

- (1) The highest points are occupied by such important educational and suburban centres as Harrow (on-the-Hill) and Highgate, Hampstead and Hounslow; and the lowest points are occupied by riverside resorts such as Staines, Twickenham, and Teddington (Tide-end-town). Cf. Ealing, Tottenham, etc.
- (2) The clay formation made Middlesex a famous wheat county in former times, especially round Uxbridge;

but the whole area is now devoted to pasture and market-gardens—though the clay is worked in brick-fields along the Colne—to provide milk and vegetables for London. And for this purpose the extraordinary railway facilities of the county are, of course, invaluable. Cf. p. 25.

- (3) London, however, which never was in Middlesex, has completely overshadowed all neighbouring towns, stopped their separate growth, and absorbed almost all their industries except the rifle industry of Enfield. Even Brentford, the nominal capital of the county, though it has the advantage of being a tidal port, remains a little town of less than 20,000 inhabitants.

N.B.—Almost every industry in the kingdom is represented in London, but perhaps the most characteristic are beer, glass, carriages, leather, sugar, biscuits, and jam.

3. Hertfordshire (about 600 square miles) is a section of the great chalk range, and therefore slopes gently down to the south-east from an abrupt escarpment in the north-west.

- (1) It is to this escarpment that London owes much of its water supply, for the large amount of wooded land economises the small rainfall; and the pure water and the abundance of wheat have made paper-making and straw-plaiting special industries, Hitchin being the headquarters of the plating. Cf. Bedfordshire.
- (2) The soil is splendidly cultivated, and produces all kinds of fruit, flowers, and vegetables, lavender being a speciality; and transport is provided by four trunk lines—the *London and North-Western*, *Midland*, *Great Northern*, and *Great Eastern*.
- (3) The political importance of the shire used to be very great. St. Albans was the original capital of the county, Ware was the limit of navigation on the Lea to the Danes, and half-a-dozen English sovereigns held court at Hertford. Now the only important places are the railway junctions—Hitchin, Watford, and St.

Albans—the latter, after standing on Watling Street and being the scene of three great battles, still marking a natural line of communication in peace or war.

4. Buckinghamshire (about 750 square miles) consists of three areas.

- (1) The Chilterns slope rapidly down from the Wendover heights to the little towns of Great Marlow, High Wycombe, and Chesham, supplying pure water for the prevailing paper industry; but the chalk formation continues southward over the shire, often covered with beeches (cf. Burnham Beeches), and it is mainly these woods which give the peculiar beauty to the riverside scenes, *e.g.* round Eton. Cf. the chair industry.
- (2) The fertility of the oolite and greensand formation of the Thames basin, and the shelter of the Chiltern escarpment, make the Vale of Aylesbury one of the richest grazing areas in England, with very famous dairy and poultry industries (condensed milk, butter, and ducks); and the commercial importance of this, added to its position as the natural centre of the shire, made Aylesbury the political capital.
- (3) The Ouse valley is entirely agricultural, wheat being the principal crop; and the particular toughness of the straw makes it very suitable for the plaiting industries of Buckingham, Stony Stratford, and Olney. Much the most important centre, however, is the junction of Bletchley.

5. Oxfordshire (about 750 square miles) slopes up from the narrowest part of the county both to the oolitic escarpment of the Edge Hills and to the chalk escarpment of the Chilterns.

- (1) As Oxford stands on this narrow strip, at a marked bend of the Thames, where the confluence of the Cherwell makes the river navigable for small steamers, it is a natural market commanding both sections of the shire and both parts of the Thames valley. This made it a

suitable site for a political and ecclesiastical capital ; and its ancient university owes much of its greatness to the wisdom and generosity of its ecclesiastical patrons.

- (2) The oölitic part of the shire, with its sheep-pastures, beech forests, and wheat fields, originally provided the raw material for the 'Witney' blankets (now made in Wales and Yorkshire), the doe-skin gloves of Chipping Norton and Woodstock, and the still famous Banbury cakes. Banbury is now a junction commanding the traffic of the Cherwell valley, but the Puritans long ago razed its 'Cross' to the ground.
- (3) The southern part of the shire is flat agricultural land, shut in to the very banks of the Thames by the beech-clad Chilterns, at the foot of which nestles the pretty regatta centre of Henley.

Chapter 19. The Thames (South).

1. Berkshire (about 700 square miles) consists of two very distinct parts.

- (1) The east is a stretch of flat well-forested land converging on Windsor 'Forest' ; and the great beauty of the river scenery, especially between Maidenhead and Runnymede, depends mainly on the timber. The west is a mass of chalk downs, across which the Thames has cut a beautiful valley between Wallingford and Reading, and along which the Ock and the Kennet have worn very important valleys.
- (2) The Vale of White Horse has great historic interest, mainly centering in Alfred the Great, who was born at Wantage ; its soil is extremely fertile, especially between Abingdon and Faringdon ; and it is the 'line of least resistance' for rail between Swindon and Didcot (for Oxford), and for the *Berks and Wilts Canal* between Abingdon and Bristol.

- (3) The Kennet valley is less fertile, but is a highway of traffic from Reading to Bristol, as is shown by the military importance in former days of Newbury and Hungerford, both of which are now on the *Avon and Kennet Canal*. Reading occupies a fine position for a capital, at the confluence of two rivers, where the Thames finally breaks across the chalk uplands on to the London clay-flats; and it owed the rise of its large biscuit industry to the excellent wheat of these clay lands.

2. Surrey (about 750 square miles) consists of the North Downs and their two slopes—to the Thames and to the Weald.

- (1) In the west the Downs are narrowed to the ridge of the Hog's Back, but in the east they expand into the breezy flat of Epsom. As the chief rivers, *e.g.* the Wey and the Mole, rise in the Wealden Heights, they have to cut their way to the Thames across the chalk downs; and the passes thus made, *e.g.* at Farnham, Guildford, and Dorking, have always commanded the traffic between London and the south coast. Guildford, on the central pass, is the capital of the shire.
- (2) The northern slope contains all the riverside towns, *e.g.* Kew, Richmond, and Kingston—where the old Saxon 'king's stone' is still kept—and Croydon, which is simply a suburb of London. The natural line of approach from the west made Bagshot Heath once notorious for highwaymen, and now makes Surrey famous for market-gardens and orchards. Cf. the Mitcham lavender, roses, etc.
- (3) The southern slope contains two small river-plains divided by the 1,000 feet of Leith Hill. The Mole plain contains a low belt of clay from which 'Fuller's Earth' is extracted, *e.g.* near Reigate; the agriculture of the upper Wey valley made Godalming a little market-town, and easy access to London made it a suitable site for the Charter-house School.

3. Kent (about 1550 square miles) reproduces on a larger scale all the characteristic features of Surrey.

- (1) The North Downs continue to expand, until, in the east, they stretch—except for the marshy land round the Stour estuary—from the North Foreland to the Folkestone cliffs; and upon their abrupt seaward slopes a number of fashionable watering-places have sprung up, *e.g.* Ramsgate and Margate, Deal and Walmer, Folkestone and Dover. Cf. the huge export of chalk.
- (2) The chief rivers, *e.g.* the Darent, the Medway, and the Stour, rise in the Weald, and cut their way through the chalk; and, as the Downs are wider than in Surrey, the river-cut passes are generally important enough to be guarded by a town at each end. Cf. Maidstone and Rochester with Ashford and Canterbury. Indeed, the position of Maidstone—Medway's-town—was so important that it became the capital of the shire.
- (3) These river-valleys form also the great hop and orchard country. The best cherries come from the Medway valley, between Maidstone and Tonbridge, and from the Darent valley, between Sevenoaks and Dartford ('Darent-ford'). The best hops come also from the Medway valley and from the Stour valley, especially round Ashford and between Canterbury and Faversham. There are also orchards of plums and of filberts, and innumerable market-gardens.
- (4) The Downs and the inland river-valleys are remarkably healthy, and contain one or two celebrated invalid resorts, *e.g.* Tunbridge Wells; but along the north and the south coasts there are considerable areas of very unhealthy marsh, especially the Isle of Sheppey and Romney Marsh. Both areas produce fine cattle-pasture, but their commercial value is widely different.
- (5) The Medway estuary contains the double episcopal town of Strood-Rochester, the great docks and arsenals of Chatham and Sheerness, and the packet-station of Queenborough, while the Swale estuary is famous only

for oysters, *e.g.* round Whitstable. Romney Marsh does little beyond providing a good site for an artillery station at Lydd.

- (6) The north-west corner of the shire is simply a suburb of London. The river from Gravesend to Woolwich, the chief military arsenal of the kingdom, is part of the Port of London; Blackheath, which commands the approach from the east, was once as famous for highwaymen as it is now for suburban schools (*cf.* Bagshot); and towns like Bromley, Beckenham, and Chislehurst are merely residential centres for London.
- (7) The Cinque Ports were also merely 'outports' of London, as Dover and Folkestone still are. Romney, Sandwich, and Hythe are now inland, having been silted up since the days of King John; and the same cause has raised a very dangerous submarine bank in the Goodwin Sands, though the 'Downs' anchorage between the Goodwins and the two Forelands is very safe, except during *south* gales.
- (8) The famous Isle of Thanet is also no longer an island, but its dry climate and easy access from London have attracted a great many visitors to its various watering-places, especially Ramsgate and Margate; and the development of railway traffic has had a similar effect on Folkestone and Dover, and to some extent on Deal and Walmer.
- (9) The great inland junction which commands the cross traffic between London and these various places, is Canterbury, the first important camp on the old Roman highway of Watling Street, and the oldest *see* of the English Church.

Chapter 20. The Severn.

1. Shropshire (about 1300 square miles) consists of two very different parts, between which the Severn makes a fairly accurate boundary.

- (1) The north belongs to the Cheshire plain, and has a rich soil and numerous meres and rivers; it is mainly pastoral, but the shelter of the Welsh mountains enables more grain to be grown than in Cheshire; its chief centres are little market towns like Oswestry, Whitchurch, and Ellesmere, with its pretty mere. As Oswestry commands the Dee-and-Severn traffic, it has been made the locomotive centre of the *Cambrian Railway*.
- (2) The south is entirely hill country, rising in the Cleve Hills to over 1800 feet; it has very few rivers and a poor soil except along the narrow plain of the Severn round Bridgewater and along the still narrower plain of the Teme round the old military centre and modern railway junction of Ludlow.
- (3) All the important towns lie along the Severn, partly because it is a natural highway, and partly because it cuts through a coal and iron-field just below the isolated peak of the Wrekin (1342 feet). Shrewsbury has a fine position for a capital, commanding the navigation of the Severn, in the middle of the shire, between plain and hill country, the scene of many a 'Border' battle, and now an important junction.
- (4) The other towns are all on the coal-field and occupied in hardware industries, e.g. Coalbrookdale, Ironbridge, Wellington, Madeley, Much Wenlock, and Broseley—the latter specialising in tiles and tobacco-pipes.

2. Worcestershire (nearly 750 square miles) consists mainly of the rich plain of the Severn, which produces splendid hops and fruit, especially apples, pears, and plums.

- (1) The richness of the plain is largely due to the mud left by river floods, especially in the Vale of Worcester and the Vale of Evesham; the Pershore 'peninsula' between the two vales is now the chief plum-growing

centre in the kingdom, and has also a large cider and perry industry.

N.B.—Perashore=Pear-shore.

- (2) Worcester is the natural capital, and from the time of the Romans, who paid their soldiers partly with the salt of Droitwich (cf. 'salary'), down to Cromwell's 'Crowning Mercy,' it was a place of great political importance. Its central position commands the navigation and passage of the Severn, the Teme route into Wales, and the still more important Avon route into the Midlands (cf. the battles of Evesham, Edgehill, and Tewkesbury). It is now a great railway and canal junction.

The rich land, the Severn salmon, and the abundance of salt made it also a great ecclesiastical centre; and, under Church patronage, it developed its local supplies of raw material. The old Abberley deer forest (cf. Shropshire=*Shrub*-shire) supplied materials for its gloves, the oölitic flint for its china, the barley fields for its vinegar, and the vinegar industry led to its sauces in modern times.

- (3) The Malvern Hills are famous now for nothing but their mineral springs and their fine air and scenery, but the Clent Hills contain a corner of the 'Black Country' coal- and iron-field, and this maintains the numerous industries of the district—the hardware of Dudley, the nails of Bromsgrove, the chains of Cradley, the carpets of Kidderminster, the glass and pottery of Stourbridge, the needles and fish-hooks of Redditch. Cf. p. 46.

3. Herefordshire (nearly 850 square miles) is an undulating well-watered plain, the rich red soil of which produces splendid cattle-pastures, hops, and fruit (especially apples).

- (1) The river-girt hill on which Hereford stands in the middle of this fertile plain, was a suitable place for a political and ecclesiastical capital, and it is now the natural site for an important railway junction—with a large cider industry and famous rose gardens.

- (2) In former days the shire was covered with castles to defend the Welsh 'Marches,' e.g. Wigmore; and the modern little market towns, e.g. Leominster and Ledbury, were strategic points—Leominster commanding the Ley valley (cf. Mortimer's Cross), and Ledbury commanding the route round the Malvern Hills. The markets formerly were devoted to dairy produce, but fruit and hops are now more important.
- (3) Ross commands the approach to the exquisite scenery of the Wye valley, where it skirts the Forest of Dean.

4. Monmouthshire (nearly 600 square miles) may be divided into two very distinct parts by a line drawn from the mouth of the Usk to the Sugar Loaf.

- (1) The low valleys of the Usk and the Wye are very fertile, producing abundance of fruit and hops, and enclose an area of great beauty and historic interest (cf. Tintern Abbey and Caerleon). This used to be by far the most important part of the shire, on account of its fertility and its nearness to England: Monmouth, from its nest of hills, commanded the land approach; while Chepstow, on its river-girt rock, commanded the approach from the sea.
- (2) The western half rises at once into the moorlands of the South Wales coal-field; and, as iron and limestone are also plentiful, several important towns have sprung up, e.g. Tredegar, Ebbw Vale, and Aberystychan, with minor towns, such as Risca, Abergavenny, and Pontypool. The latter collects the products of the inland towns for export *via* Newport.
- (3) Besides its shipping trade, Newport shares in the West African trade of the Severn, which includes india-rubber, gutta-percha, and palm oil (cf. Cardiff); and its connection with the copper and tin trades of Glamorganshire has thus developed brass and tin-plate industries. Chepstow has almost unique tidal advantages, owing to the rapid narrowing of

the Severn ; but it is farther than Newport from the mining district.

- (4) The land between the two ports is so low, and the tide is so strong, that the Caldicot and Wentloag levels have to be protected by sea-walls.

5. Gloucestershire (about 1200 square miles) includes three clearly defined areas of hill, plain, and forest.

- (1) The plain—or vales of Gloucester and Berkeley—has been fertilised for centuries by the rich mud left by river floods, and is now a continuous stretch of orchards and dairy farms from Tewkesbury to the estuary, the narrow vale of Berkeley being specially famous for its 'Double Gloucester' cheese.
- (2) The natural centre—and therefore the political and ecclesiastical capital—is Gloucester, which was for centuries the lowest place at which the Severn was bridged; it is still the limit of navigation for sea-going ships, though they now reach it by the Berkeley Canal; and it still commands the cross-river traffic and the agricultural wealth of the plain.
- (3) The oölitic range of the Cotswolds provides fine sheep-pasture; and this fact, and the peculiar suitability of the Frome water for dyeing 'grain' colours, gave rise to the woollen industry of the 'West of England Tweed' towns, of which Stroud is the most important, because it commands the Frome valley through the Cotswolds.
- (4) The eastern slope of the range down into the Thames valley encouraged the agriculture for which Cirencester, with its agricultural college, is still famous; and the good air, the beautiful scenery, and the presence of mineral springs, developed in Cheltenham a fashionable health-resort beneath the shelter of the escarpment.
- (5) On each side of the Severn estuary there is a small coal-field. The field in the Forest of Dean is not so important as the oak and beech timber above it; but the field along the Lower Avon has been largely

responsible for the development of the various industries of Bristol. The great importance of Bristol in former times was due to its command of the only easy route into the Thames valley, and subsequently to its command of the early American trade. Cf. p. 26.

N.B.—Several Roman roads met at Cirencester, including the famous Fosse Way, Icknield Street, and Ermine Street.

6. Warwickshire (nearly 900 square miles) falls almost entirely within the plain of the Upper Avon, and once formed the Forest of Arden.

- (1) As the Avon was the key to the county, the most suitable position for a capital was the river-guarded rock of Warwick, near the centre of the plain; and the connection of the Avon valley with the Trent and the Welland valleys made Rugby a suitable place for a great school and for a great railway junction.
- (2) The valley has also unique historic interest, which centres round the names of Lady Godiva, Queen Elizabeth, and Shakespeare—Coventry, Kenilworth, and Stratford. Coventry has water so suitable for silk dyeing that it used to have a large ribbon industry, and the industry is still maintained; but its cycle industry is now more important. It was also a great ecclesiastical centre till the time of Henry VIII., and a political centre till Charles II. destroyed its walls; and its central position between the ports of London, Liverpool, Hull, and Bristol, makes it still a great canal junction.
- (3) There is a small coal-field between the two junctions of Tamworth and Nuneaton, and the north-west corner of the shire overlaps the 'Black Country' coal-field. The mineral wealth and the position in the very heart of the kingdom have made Birmingham the centre of the British hardware industries (cf. p. 16). In spite of the smoke, dirt, and dense population, the city is healthy, mainly owing to its height; and there is an accessible health resort at the foot of the Edge Hills, where Leamington has some mineral springs.

Chapter 21. Southern Basins.

1. Sussex (about 1450 square miles) is naturally divided into three parallel belts of land.

- (1) The South Downs have the usual monotonous outline and magnificent sheep-walks of chalk hills, and have given their name to a special breed of sheep that is very famous for mutton. The remains of British 'barrows' and Roman camps show the strategic value, even in the earliest times, of these treeless heights overlooking the sea.
- (2) The Weald consists mainly of a clay basin rising to the Forest Ridge. As its name implies, it used to be covered with forest, from patches of which the little towns of Horsham and Midhurst still obtain the wood for their barrel industry. In the days when iron was smelted with wood, it was the scene of the chief iron-works of the country, especially between Battle and Cuckfield, the stiff soil being very favourable to oak-trees.
- (3) Along the coast, except at Hastings and between Brighton and Beachy Head, there is a low alluvial strip, along which there was a series of small harbours guarded by castles, *e.g.* Pevensey and Rye, with castles of their own; and Littlehampton and Shoreham, guarded respectively by the castles of Arundel and Bramber, commanding the passes of the Arun and the Adur valleys.
- (4) Chichester, the best of these harbours, was a real harbour in the days of Earl Godwin, as Selsea was a real 'Seals' Island.'
- (5) Along this sunny south coast, sheltered by the Downs from the north wind, and conveniently near to London, most of these old harbours still linger on, and new towns have sprung up, as health-resorts, *e.g.* Brighton, Eastbourne, and Worthing (cf. St. Leonards and Bognor). Brighton owed its original supremacy mainly to its possession of mineral springs.

- (6) The shire has its political capital in Lewes, and its ecclesiastical capital in Chichester. Chichester owed its importance to its harbour and to the arable land behind, in the centre of which stands Goodwood. Lewes owed its importance to its command of the two routes inland—that up the valley of the Ouse from Newhaven, and that from Pevensey between the Downs and the pathless forest.
- (7) Newhaven, which was 'new' only after the Cinque Ports had been silted up, is an outport of London, with a fast packet-service to Dieppe.

2. Hampshire (about 1600 square miles) consists of a broad alluvial plain which spreads along both sides of the Solent and Spithead, and rises both in the north and in the south into chalk hills.

- (1) This plain is most remarkable for its two great harbours of Portsmouth and Southampton; but it also contains the New Forest, which supplies valuable timber to the Portsea dockyards, and the numerous yachting centres, *e.g.* Cowes and Newport, which have supplied so many trained sailors to the Navy.
- (2) The mild climate has also encouraged the growth of fashionable and invalid resorts, *e.g.* Bournemouth and Christchurch, Southsea and Ryde.
- (3) All the chalk ranges are famous for their 'Down' mutton; and the range in the Isle of Wight has also some magnificent cliffs, *e.g.* The Needles and St. Catherine's Point, and shelters some very mild watering-places, *e.g.* Ventnor and Shanklin.
- (4) The landward half of the shire is largely filled with the double range of the Downs. The North Downs descend to the heather-clad common on which Aldershot and Farnborough stand, and the pass across them into the Test valley is commanded by the junctions of Basingstoke and Whitchurch; the passes across the South Downs are commanded by the junctions of Romsey,

Winchester, and Petersfield ; and the country between the two ranges is devoted to agriculture, especially barley round Andover and hops round Alton.

N.B.—The wheat raised is of excellent quality.

- (5) Its central position, and the strategic importance of the seaward face of the Downs, have made Winchester for the last 1800 years a great political and ecclesiastical capital ; but the city has gradually spread down from the hill on which its old castle and its first cathedral stood, to the more convenient level of the railway along the Itchen valley.

This 'Royal City' has had a wonderful history, in which its bishops have played a conspicuous part ; and it owes its great school to one of them, who was born near Fareham—William of Wykeham.

- (6) The Channel Islands are attached to the diocese of Winchester, but really belong to France both in structure and in language. They export to England very large quantities of early vegetables and fruit, and are noted for their milch-cattle and their shell-fish. St. Helier is the chief market, and St. Peter Port the best harbour.

3. Wiltshire (about 1350 square miles) contains in Salisbury Plain the axis of the chalk system, and therefore belongs to several river basins.

- (1) The plain itself is a wide expanse of sheep pasture, from which the carpet factories of Wilton are partly supplied ; and its great importance in the earliest times is proved by the wonderful British remains, *e.g.* Stonehenge. Wilton was the natural centre of this south portion of the shire ; and its complete command of the Wily, Avon, Bourne, and Nadder valleys, caused it not only to give its name to the shire, but also to become the political and ecclesiastical capital of Wessex.
- (2) Later on, the capital was moved to the conical hill on which the ruins of Old Sarum can still be traced, and which commanded the confluence of the Wily and

the Avon; and eventually it was again moved down from the hill—which was very much exposed, and had no fresh water—to the banks of the Avon, where Salisbury is now an important junction.

N.B.—The cathedral spire is the highest in the country.

- (3) The part of the shire which belongs to the basin of the 'Bristol' Avon is a typical Cotswold area; and the pastoral, agricultural, and manufacturing interests of Stroud and Cirencester are all reproduced in the corn, cheese, and broadcloth industries of Chippenham, another of Alfred's old capitals. Trowbridge, Bradford, Malmesbury, and Westbury also make broadcloth; and Calne cures bacon. Trowbridge, on a hill commanding the Vale of Pewsey, is an important junction.
- (4) The part of the shire which belongs to the Thames basin, contains the two natural lines of traffic round the Marlborough Downs, another old prehistoric centre (cf. Avebury and Silbury Hill). The north route is marked by the great junction of Swindon; and the country between Swindon and Cricklade is famous for cheese and bacon (Swindon=swine-hill). The south route includes the fertile Vale of Pewsey, in which Devizes has a large barley market and manufactures snuff. Marlborough itself is a fine healthy site for a school.

4. Dorsetshire (nearly 1000 square miles) is mainly filled with the two chalk ranges.

- (1) The north range, or Dorset Heights, is easily crossed by the valleys of the Stour, the Frome, and the Yeo; and the Stour valley produces excellent butter and bacon, especially between Stalbridge and Shaftesbury. Sherbourne naturally shares in the glove industry of Yeovil (see Somersetshire), and has also a famous school.
- (2) The south range contains some splendid coast scenery between Weymouth and Swanage, e.g. St. Alban's Head, and provides as good shelter for Poole Harbour as Port-

land Bill does for Weymouth. The only passage across the range is commanded by the river-girt hill of Dorchester; and this was therefore a suitable place for a Roman camp, and has now become an important junction for the packet-station of Weymouth at the seaward end of the passage.

- (3) Between Wareham and Poole there is an expanse of heath-clad common, from which the fine 'Poole' clay is exported to the 'Potteries'; and between Wareham and Swanage there are splendid quarries of building-stone and 'Furbeck' marble. Portland also has excellent building-stone, and the peculiar connection of the 'island' with the mainland by the long shingle ridge of Chesil Beach made it a suitable site for a convict-station. Cf. Dartmoor, p. 71.
- (4) 'Portland' cement is a mixture of chalk and clay, such as is made on the clay flats below the chalk cliffs at Lyme Regis; and it gets its name from its resemblance to the Portland stone, which is oölitic limestone.

Chapter 22. South-West Basins.

1. Somersetshire (nearly 1650 square miles) is, except in the extreme west, a county of rich farms and orchards, famous for cheese and cider.

- (1) The west is a mass of mountainous country, made of very old rock, and rising to 1300 feet in the Brendon and the Quantock Hills and to 1700 feet in Exmoor. It is, therefore, wild and barren, with great tracts of bog; but along its abrupt seaward face there are several picturesque watering-places, *e.g.* Minehead and Porlock.
- (2) The centre of the shire is occupied by the plain of the Parret Basin, most of which was a trackless marsh centering round Athelney in King Alfred's days (cf. 'Sedge-moor').

Taunton, on a slight hill above the river Tone, commanded the most fertile part of the plain before the Bridgewater 'levels' were drained, and thus became the capital of the shire; Yeovil, above the old Fosse Way, has in its glove industry one of the industries which do not depend on coal; and Bridgewater, besides being the natural outlet for the agricultural wealth, has a mixture of clay and sand left by the tide out of which it makes its famous Bath-brick.

- (3) The Brent 'Marshes' are really part of the Parret basin, for the Polden Hills are only about 300 feet high; and, like their neighbours, they have been drained and dyked, though they still contain large areas of peat. The slopes up to the Mendips form the splendid pastures which have made Cheddar so famous for cheese, and are covered with orchards between the two old ecclesiastical towns of Glastonbury and Wells.
 - (4) The two ends of the Mendips are important because of the traffic that converges on them. Near the seaward end Weston-super-Mare and Clevedon have become fashionable watering-places; and at the other end, Frome, like the neighbouring 'Cotswold' towns, manufactures broadcloth, for which it has a convenient coal-field at Radstock. The 'Bristol' coal-field was also worked at Nailsea, but the mines are now closed.
 - (5) Bath, with its hot springs and freestone quarries, has been famous since Roman times; and its command of the Avon valley and of the passage round the Cotswolds has made it an important junction. It is sheltered by a natural amphitheatre of hills, which has been an additional attraction to invalids.
2. Devonshire (about 2600 square miles) contains three well-defined areas.
- (1) The least important of them is the treeless tableland of Exmoor, which is an almost uninhabited waste

- of bog ; but its abrupt seaward face, as in Somersetshire, shelters several picturesque watering-places, *e.g.* Ilfracombe, Lynton, and Lynmouth.
- (2) Dartmoor, the great watershed of the shire, is covered with similar stretches of bog, but is larger, steeper, higher, and wilder than Exmoor. It is full of mineral wealth—mainly granite, marble, tin, and copper—especially at Tavistock and other towns in the Tavy and Tamar valleys ; and this mineral wealth, with its large mining population, and the fine estuary of the Tamar, have developed the double port of Plymouth and Devonport into one of the great harbours of the country.
 - (3) The desolation of Dartmoor, and the difficulty of crossing the bogs, make it a suitable place for a convict station ; but the beautiful peninsula at its southern base between Dartmouth and Plymouth is covered with cosy villages and magnificent apple orchards.
 - (4) Right across the county from sea to sea there stretches an undulating plain, which thus includes the middle valleys of the Tawe and the Exe. This is the dairy district, with its famous cream and junkets ; and the richest part of it, which is between Exeter and Tiverton, is also a great apple country. Exeter, at the head of navigation, and commanding the end of this plain between Dartmoor and the Blackdown Hills, was a good site for a political and ecclesiastical capital, and is now a very important railway centre.
 - (5) The curiously broken coast has had a great effect on the character and pursuits of the people. The fishermen of Bideford and Barnstaple, of Brixham and Dartmouth, were famous alike on the Newfoundland banks and in the ranks of Armada heroes ; the mild climate and the sheltered situation of such places as Torquay, Teignmouth, and Exmouth have made them popular health resorts ; and the convergence of traffic on the heads of the deep estuaries has raised junc-

tions like Newton Abbot and Totnes. Cf. Exeter and Barnstaple.

- (6) The eastern corner of the shire was the home of several famous industries in olden days, *e.g.* the carpets of Axminster and the beautiful hand-lace of Honiton; and the lace industry lingers on at Honiton and at Ottery St. Mary's and Tiverton, but the carpet industry has been removed to the coal-fields.

3. Cornwall (about 1350 square miles) consists mainly of barren moors rising to granite 'tors' and falling precipitously to boggy valleys.

- (1) The northern half is almost uninhabited except in the river valleys, but contains the historic ground of Tintagel and Boscastle. The Tamar valley is fertile enough to produce fine crops of cherries between Saltash and Launceston, and there are some good orchards between Saltash and Liskeard. Launceston commands the central route on to the great Bodmin Moors, and Saltash commands traffic up and across the estuary.
- (2) The southern half has important mining and fishing industries; and, as Bodmin commands the centre of the dividing line (the Camel-Fowey Valley), it is the natural capital of the shire. The little port of Padstow is the chief place on the Camel estuary, and the old battlefield of Lostwithiel is now a junction commanding the traffic around the Fowey estuary.
- (3) The mineral wealth is mainly tin, granite, and china-clay. The chief tin centres are Camborne, Illogan, St. Just, and Redruth; Penryn exports granite, and St. Austell (*viâ* Charlestown) china-clay. The commanding position of Truro at the head of such a long estuary has made it an ecclesiastical and railway centre.
- (4) The coast is very picturesque, and has important pilchard and mackerel fisheries, Mount's Bay being specially noted for pilchards; and, as the marine climate is wonderfully mild, the chief fishing ports, *e.g.* Falmouth

Penzance, and St. Ives, have also become popular resorts, especially for artists and invalids.

- (5) Falmouth has a really magnificent harbour, and is a packet station; but it is too far from any great route of traffic to be of much use. Cf. Milford Haven.
- (6) The Scilly Isles are simply a continuation of Cornwall, and have the same structure, with a slightly milder climate. Only 5 out of nearly 150 of them are inhabited, St. Mary's being the largest; and the chief occupations are fishing and the raising of early vegetables and flowers for the London market.

Chapter 23. Welsh Basins and Isle of Man.

1. The geographical isolation of Wales, the age, extent, and height of its mountains, and the origin of its people, distinguish it clearly from England.

- (1) The marine exposure makes it very wet; the extent of its mountains greatly limits agriculture; their height and inaccessibility preserved the remnants of the old Keltic inhabitants of England, with their language and customs; their structure affords most valuable minerals, especially coal and slate; and the river valleys which divide the various ranges, provide the only routes for communication and the only sites for agriculture.

2. The island of Anglesey (about 300 square miles) is the only Welsh county that is low, and even it has some fine scenery along the west coast.

- (1) Its marine climate and its low level make it suitable for farming, and it had rich copper mines round the small fishing port of Amlwch. The capital is Beaumaris, which is still amongst 'Beautiful Meadows'; but the main importance of the island is in connection with the Irish traffic, *via* Holyhead.

3. Carnarvonshire (nearly 600 square miles) consists of the Snowdon range and its various spurs.

- (1) Bangor commands the traffic converging on Holyhead both from the west and from the south, and exports the Bethesda slate, and is therefore the most important place, with a bishopric and one of the Welsh University colleges; but Carnarvon, which commands the Llanberis Pass and exports the Llanberis slate, is the capital. Port Madoc exports the Festiniog slate. The output of granite rock is $\frac{1}{11}$ of the Welsh total.
- (2) The sheltered position and the magnificent scenery of Great Orme's Head have made Llandudno a popular resort. Conway is on tidal water, and has zinc mines, but owes its fame to its river scenery.

4. Denbighshire (about 650 square miles) consists of two very different portions.

- (1) Between the Conway and the Clwyd the only places of any importance are the little farming towns of Llanrwst, Denbigh, and Ruthin, and such little summer resorts as Colwyn and Bettws-y-coed; but the Vale of Llangollen is both fertile and very beautiful, and the Dee opens from it on to a small coal-field, to which Wrexham and Ruabon owe their importance and their zinc and terra-cotta industries. Cf. p. 17.

5. Flintshire (250 square miles) is the smallest of the Welsh counties, but the existence of a coal-field along the Dee estuary has made it important.

- (1) In the sheltered and fertile Clwyd valley, Rhyl is a little watering-place, and St. Asaph is the seat of a bishopric; but all the important towns are on the coal-field, in which lead, zinc, and china-stone are worked. Flint exports coal, and has chemical works in connection with the Cheshire salt; Mostyn exports coal; Holywell has rich lead and zinc mines (cf. Llanasa) and chalk-quarries; and Mold works coal, oil-shale, limestone, etc.

6. Merionethshire (600 square miles) is famous for its scenery and for its flannel and slate.

- (1) Its finest peaks are Aran Mawddwy and Cader Idris, and Bala is the largest lake in Wales; Festiniog has famous slate quarries, and Dolgelly manufactures flannel. Along the coast there are several little watering-places, *e.g.* Barmouth, Harlech, and Aberdovey. Dolgelly, the capital, is easily reached by rail up the Dee Valley, *via* Corwen and Bala.

7. Cardiganshire (about 700 square miles) rears sheep and ponies, and has mines of lead and zinc.

- (1) Cardigan, the capital, is the largest of a number of little fishing ports. The only other towns are seaside resorts like Aberystwith and Aberaeron, and riverside villages like Lampeter. Aberystwith is one of the seats of the Welsh University, and Lampeter has a theological college.

8. Montgomeryshire (about 750 square miles) also rears sheep and ponies, and has a few lead and zinc mines.

- (1) The sheep on the drier side of the Plinlimmon range are famous, and there is a flourishing flannel industry in the Severn valley, *e.g.* at Montgomery, Newtown, Llanidloes, and Welshpool. The latter is an important junction at the limit of navigation, and is a market for the strip of arable land along the river.

N.B.—There is excellent fishing in the Severn, Vyrnwy, and Dovey, for which Llanfyllin and the little junction of Machynlleth are good centres. The Vyrnwy supplies Liverpool with water.

9. The shires of Radnor (nearly 450 square miles) and Brecknock (700 square miles) form the most thinly populated part of Wales.

- (1) They contain many holiday resorts, *e.g.* Presteigne and Knighton, Rhayader and Crickhowell, Builth and Llandrindod (both with a variety of mineral springs). Brecon has a large lime trade.

10. Glamorganshire (about 800 square miles) is the most important county in Wales, and one of the most important in the British Isles.

- (1) It owes this importance to its abundance of coal and iron, the water-power of its rivers and the convenience of their valleys for traffic, the mild climate and fertile soil of its lowlands, and its excellent harbours.
- (2) Merthyr-Tydfil, with its dependent towns—Aberdare, Mountain Ash, Dowlais, and Hirwain—is the great iron* and steel centre; Rhondda is on the richest part of the coal-field; and Pontypridd is an important canal and railway junction for the traffic converging on Cardiff (cf. p. 28). Swansea, Neath, and Aberavon (Port Talbot) specialise in copper-smelting.
- (3) The fertile Vale of Glamorgan produces all kinds of crops, including wheat and potatoes, and contains a number of small market-towns, *e.g.* Llantrissant, Bridgend, and Cowbridge. Llandaff, which commands the end of the vale, and is now really a suburb of Cardiff, is the seat of an old bishopric.

11. Carmarthenshire (about 900 square miles) is divided by the fertile valley of the Towy into a slate and a limestone region, containing great variety of minerals.

- (1) The slate region is a waste of moorland, but the Towy valley contains the little market-towns of Llandilo and Llandovery, and the busy little port of Carmarthen commands all the traffic through the very fertile land round the head of the estuary. Llanelly, which is on an extension of the Glamorganshire coal-field, exports coal, and has metal industries.

12. Pembrokeshire (about 600 square miles) has such a mild climate and so much low land that it is mainly a farming county, but it has a strip of coal.

* Mostly from imported ore, as the local deposits are hard to work.

- (1) Pembroke, the capital, has in Milford Haven the finest natural harbour in the British Isles, and is a naval station; but the harbour is too far from any great highway of commerce to have much trade, though regular steamers ply to Cork and Waterford. St. David's is the seat of a bishopric, Milford and Haverford West are small market-towns, and Tenby—a thriving watering-place—stands on the coal-field.
- (2) The new harbour works at Goodwick have made Fishguard Bay into an excellent port, with the shortest passage to Ireland (Rosslare) of any English or Welsh port; but the *Great Western Railway* will have to improve its service in several ways before the slightly shorter sea-route, and much shorter land-route, thus provided between London and Queenstown will enable it to compete with the Holyhead route of the *London and North-Western*.

13. The Isle of Man (about 200 square miles) is mainly hilly, rising in Snaefell to over 2000 feet, but has a great plain north of the latitude of Ramsey.

- (1) The chief industry is fishing, the head-quarters of which are at the episcopal town of Peel; but lead and zinc are worked, *e.g.* at Laxey and Foxdale, and cattle are fattened for the Liverpool market. There are many interesting remains, and much fine scenery; and these attractions, along with the very mild climate, draw a great many visitors, mainly to Douglas, Ramsey, Castletown (the old capital), and Port Erin, from the densely-peopled coal-field of Lancashire.

N.B.—Ramsey has an interesting salt industry, the brine being pumped ($6\frac{1}{2}$ miles) from the Point of Ayra.

SCOTLAND.

GENERAL FEATURES.

Chapter 24. Surroundings and Ports.

1. Scotland has an even greater proportion of coast to surface than England has.

- (1) Indeed, though Scotland is only half the size of England and Wales, it has actually more coast. There is about 1 mile of coast for every 12 square miles of area, and no place is more than about 40 miles from the sea.

2. As the general character of the coast depends on the relief and geological formation of the surface, and as the eastern half of the country differs from the western in both these respects, there are considerable differences between the east and west coasts.

- (1) The east coast consists mainly of sandstone and clay, which have weathered away into monotonous outlines, and are easily worn into deep and wide estuaries round the mouth of rapid rivers, *e.g.* the Forth and the Tay; but there are fine cliffs at St. Abb's Head and Troop Head, and between Bervie and Stonehaven.
- (2) The west coast consists of such hard old rocks that its boldest peaks have been able to withstand the fiercest storms and tides of the Atlantic; but its softer portions have been 'weathered' away, and admitted the sea to a great distance inland up the famous sea lochs, *e.g.* Loch Broom, Loch Linnhe, and Loch Fyne.
- (3) The south coast is mainly low and flat, but the north coast has the characteristics of the west coast.

3. As the east coast is mainly formed by the natural sinking of the land beneath the sea, it is very deficient in bays and islands.

- (1) All the five great firths are simply river estuaries; and this fact, and their position with regard to Europe, give them great commercial importance. Of course, in this respect the two southern firths, which are mainly cut by single large rivers, are more important than the northern ones.

4. The west coast, on the other hand, has innumerable bays and islands; but the character of the land makes most of the inlets of no use for commerce.

- (1) The islands were originally part of the mainland, and still act as a wonderful natural breakwater; they have magnificent scenery, *e.g.* the western cliffs of Skye and the caves of Staffa; and the shallow sea to landward of them is an ideal herring-ground.

5. This west coast contains in Glasgow, however, the commercial and industrial capital of Scotland; and the city owes its pre-eminence to the fact that it possesses all the essentials for a really great harbour.

- (1) It is easily accessible by the largest vessels, though the harbour is an artificial one. Ocean vessels now load where, within the memory of living men, the Clyde was fordable.
- (2) It is on a rich coal- and iron-field, which has given it a very large shipbuilding and engineering industry; and the coal has attracted, as usual, other trades, especially in copper and chemicals.
- (3) It is therefore the centre of a dense population, so that there is certainty of return cargoes being obtained by vessels without much delay or diffi-

culty; and it looks towards the rising population of North America.

- (4) It stands at the end of the low central plain, where Scotland is not more than forty miles broad; and it has, therefore, excellent communication inland in all directions by rail and canal.
- (5) The soil round it is fertile and well cultivated, especially in Ayrshire, and the climate is favourable to textile manufactures and to the dairy industries which are so useful in the neighbourhood of a large city.
- (6) It collects goods from all parts of Scotland, but especially from the Clyde valley—coal and iron from Airdrie, Hamilton, Coatbridge, Wishaw, and Motherwell; linen from Johnstone; silk and muslin from Renfrew; and thread and shawls from Paisley, etc.
- (7) As the natural centre of the Clyde valley, it became the seat of a bishopric and a university, and is now one of the most important railway centres in the kingdom.

6. Edinburgh ranks next to Glasgow in size and in importance, though its port is entered as Leith.

- (1) Its importance is due historically to the famous Castle Rock, which commands the south bank of the Forth; and, when Scotland had really become one kingdom, this position made Edinburgh the natural capital.
- (2) It stands on the east end of the Lowland plain, and has excellent communication inland, so that it became naturally the seat of a bishopric and a university.
- (3) It stands on the edge of a coal-field, where it can easily import wood-pulp from Norway; and its water is very suitable both for paper-making and for brewing. It can also easily import ice and barrels from Norway for its large fishing industry.

7. Dundee and Aberdeen rank next to Edinburgh in size, but their annual tonnage in foreign and colonial trade is less than that of Greenock or

Grangemouth, which are practically suburban ports of Glasgow and Edinburgh.

- (1) Dundee has no coal or iron, but it can easily import coal from Fife; and it has communication inland by river, as well as by rail, up to Perth. It is just opposite the Baltic, from which it can import flax and hemp, and the trade in these fibres has attracted trade in other fibres, *e.g.* jute. The fertility of the sheltered Carse o' Gowrie has given it a large jam industry; and, as it was the most northerly natural harbour, it was the head-quarters of the old whale-fishery.
- (2) Aberdeen stands at the junction of two river valleys, which give easy communication inland, and which have produced a famous breed of cattle. It has an important granite industry along the coast, and its position directly opposite the Great Fishing Bank has made it one of the most important fishing centres of Great Britain. It has now a good artificial harbour. Cf. p. 91.
- (3) Ardrossan, Troon, and Ayr are outlets for the Ayrshire coal; Wick, Peterhead, and Fraserburgh are fishing ports; and Stranraer is an important packet-station, with the shortest passage to Ireland.

Chapter 25. Mountains and Uplands.

1. The division of Scotland into three areas—Highlands or mountainous northern half, Lowlands or central plain, and Uplands or hilly regions in the south—depends on a threefold division in the character of the rocks.

- (1) The Highlands are made up of huge stretches of moor and masses of mountain, interspersed with a few areas of lowland; but there is no distinct continuous range, though the general name of Grampians is applied to a large portion of the Southern Highlands.

2. The Northern Highlands are remarkable for little except their magnificent mountain and loch scenery, and their deer 'forests.'

- (1) Among the highest peaks are Ben Attow (4000 feet), Ben Dearig (3500), Ben Wyvis (3400); amongst the most picturesque lochs are Loch Torridon, Loch Duich, and Loch Hourn; and amongst the most famous deer forests are Reay, Freewater, and Dunrobin.

3. The Southern Highlands are much more important, politically and commercially.

- (1) As they run more or less east and west instead of north and south, they tend to throw off rivers more or less northward and southward, *e.g.* the Findhorn and the Spey, the Garry and the Teith; and the valleys of these rivers are of very great importance to railway traffic.
- (2) As they are, on the whole, higher in the west than in the east, the rivers have a general inclination eastward, which takes them out through the soft rocks of the east coast towards the fishing banks of the North Sea and the markets of the continent.
- (3) They are remarkable for great masses of granite, some of their highest peaks being partly or entirely of granite, *e.g.* Ben Nevis (4400), Ben Macdhui (4300), and Cairngorm (4100); and wherever these are convenient for transport, it is worked, *e.g.* at Peterhead (red granite) and Aberdeen (grey granite).
- (4) The detached character of the various portions resulted in very definite tribal limits, the names of which are still the familiar ones in use amongst the natives, *e.g.* Breadalbane, Badenoch, and Marr,—Breadalbane being dominated by the peaks of Schiehallion, Ben Lawers, and Ben More.
- (5) South of the particular range which is properly called the Grampians, there is a magnificent lake-district, including Loch Tay, Loch Katrine, and Loch Lomond.

Like the Cumbrian Lakes, they are really river-filled gorges, which radiate from the heights surrounding the Moor of Rannoch. Cf. p. 31.

4. The Uplands lie to the south of a geological 'fault' which runs from Girvan to Dunbar.

- (1) Their chief range is the Lowthers, which is the key to the whole river system of Southern Scotland; and, as they are grass-grown to the summit, they provide splendid sheep-pasture. Cf. p. 101.

5. Along the south coast of the Moray Firth and the north coast of the Solway, in Aberdeen, Caithness, and Ayrshire, there are considerable areas of low land, some of which afford splendid cattle-pasture; but the Lowlands proper include only Strathmore and the Central Plain.

- (1) This area has the most fertile soil, the readiest access to the sea, the most temperate climate, and the only supplies of coal and iron; and it is, therefore, densely peopled.
- (2) It contains several small ranges of hills, *e.g.* the Sidlaws, Ochils, Campsies, and Pentlands, and many isolated crags, *e.g.* Edinburgh Rock, Stirling Rock, and Dumbarton Rock, which were important political centres in olden times.
- (3) Outside these Lowlands the population is very thin, and is mainly confined to fishing ports, *e.g.* the capitals of all the islands from Islay to the Shetlands, and to river-side towns with woollen industries, *e.g.* Hawick and Galashiels.

Chapter 26. Rivers.

1. As the Highlands are highest in the west, all the longest Highland rivers flow to the east, the westward ones being only short torrents.

- (1) The nearness of the watershed to the west coast, and its great height, guarantee a constant and abundant rainfall; and the character of the surface favours the collection of this rainfall in lake-reservoirs and in rivers of great volume.
2. As the water-parting in the south is more or less in the middle of the country, the eastward and westward rivers are about equal in length.
 - (1) The lowness of the southern hills, and their greater distance from the sea, make the rainfall less heavy and less constant.
3. Owing to the comparative size of the two areas, the influence of the Highlands predominates in the general river system of the country.
 - (1) The eastward rivers are the most numerous, the longest, the most useful for navigation, and the least liable to floods. For instance, the Tay, the Spey, and the Tweed are all about 100 miles long, and the Dee and the Don are both more than 80; but no westward river except the Clyde (about 100 miles) approaches them in length.
 - (2) The eastward rivers have also much the largest basins. For instance, the Spey has a basin of 1400 square miles, the Tweed one of nearly 1900, and the Tay one of over 2200; the westward basins, excepting the 1600 square miles of the Clyde basin, are absolutely insignificant.
 - (3) As the eastward rivers flow over the softer rock, they carry down more alluvium to enrich the land through which they flow; and their pace is generally sufficient to prevent the alluvium collecting in a dangerous bar.
4. The River system of Scotland owes its importance mainly to the relation of plain to mountain.
 - (1) Communication across the most important mountain chains is almost entirely dependent on the river valleys. For instance, the communication between the Spey and

the Tay valleys, *via* the passes of Dalwhinnie and Killiecrankie, depends entirely on the Garry. Cf. the Nith and the Ayr, the Annan and the Clyde.

- (2) The great Lowland Plain does not coincide with any one river basin; but it is crossed by a number of rivers in all directions, so that every advantage can be taken of its narrowness, its mild climate, its fertile soil, its mineral wealth, and the political and commercial importance of its 'isthmus' character.

5. As the Scottish mountains are so much higher and steeper than the English, the Scottish rivers have also greater volume and greater pace than the English rivers; and this causes them to cut long, narrow, isolated troughs.

- (1) These troughs form the typical glens and straths, which are so unlike the broad valleys of the English rivers.
- (2) The greater volume and pace cause the rivers to carve broad estuaries, which to some extent compensate for the uselessness of the rivers themselves for navigation.

6. The rivers of the Moray Firth, with the exception of the Spey, are comparatively unimportant.

- (1) They form, however, large estuaries, *e.g.* the Dornoch Firth, most of which are useless, with the notable exception of the Cromarty Firth; and their valleys have greatly facilitated railway extension, *e.g.* those of the Helmsdale and the Shin.

7. The rivers that drain directly into the North Sea fall into three natural groups.

- (1) The northern ones, *e.g.* the Dee and the Don, are noted for their grand scenery and their cattle pastures; the Dee rises at a height of 4000 feet above the sea, and dashes down a narrow valley over innumerable falls and rapids, past Balmoral and Braemar.
- (2) The Tay and the Forth are great commercial highways through the rich agricultural soil of the Lowlands;

and they contain, in Perth and Stirling, the two great strategical points of the country in olden days. Both places command all the traffic passing through central Scotland, both are at the head of navigation on their respective rivers, and both are now important railway junctions.

- (3) The Tweed, with its famous tributaries of Etrick and Yarrow, winds through a broad fertile plain, marked by the sites of famous old abbeys and Border castles, e.g. Melrose, Dryburgh, and Kelso; and the smooth grass-grown hills of its basin, with their ideal sheep-pastures, gave rise to the woollen industries of Hawick and Galashiels. Cf. p. 32.

N.B.—Owing to the large area, however, the largest number of sheep are in Argyle (850,000), and Perth (666,000).

8. Only two of the rivers which empty through the west coast, have a length of over 50 miles.

- (1) There are innumerable mountain torrents between Cape Wrath and the Mull of Kintyre, that carve fiord-like channels in their rapid course, but not one of them is important.
- (2) The Nith (60 miles long), the Annan, and the Liddel have picturesque valleys that have greatly facilitated railway traffic; and the Nith is navigable up to Dumfries.
- (3) The Clyde is the most important river of Scotland, and represents all the industries of the county—from the pastures of the Lowland Hills to the agriculture of the Central Plain below Lanark, and to the mining and manufactures of the Glasgow coal-field.

COUNTIES.

Chapter 27. Highland Counties.

1. The thirty-three counties of Scotland seem to have arisen gradually out of the old sheriff-districts into which David I. divided the country.

- (1) They are, therefore, less ancient and less natural divisions than most of the old English shires; but some of the territorial names are probably older than the shire-names, *e.g.* Buchan, Lochaber, Athole, Carrick, and Galloway.

2. The Orkney and Shetland Islands form a separate county, with an area of about 900 square miles, about 550 of which belong to the Shetlands.

- (1) The Orkneys are a continuation of the low Caithness plain, with some magnificent sea-cliffs in Hoy. The marine climate is not at all extreme in spite of the latitude, and the soil is fairly fertile; but it is too damp for anything except green crops, and the stormy winds are fatal to trees.
- (2) As the Shetlands lie farther north, they have a still less favourable climate; but they produce a famous breed of ponies and a species of sheep that has a very soft wool.
- (3) Fishing is the chief occupation in both islands, Stromness and Lerwick being the chief ports. Kirkwall, the capital of the Orkneys, was the seat of a bishopric.

3. Caithness (nearly 700 square miles) is in many ways unlike the other counties of the north-west.

- (1) As it is much lower than the others and more surrounded by sea, its climate is milder; and its old

red sandstone formation gives it a fertile soil, which produces good turnips and potatoes.

- (2) The only centre of population inland is the railway centre of Halkirk, but fishing towns have sprung up wherever the surrounding line of cliffs has been broken down into sandy bays, e.g. at Wick and Thurso. Wick, the capital, is a great centre for the herring-fishery; and Thurso is famous for its flagstones.

N.B.—The Pentland Firth is very stormy and has a very fast tide.

4. Sutherland (about 2000 square miles) is a stretch of barren moor, broken only by masses of mountains and deep loch-filled gullies.

- (1) It is mainly occupied with poor sheep-farms and large Deer 'Forests'; the chief lochs are Loch Shin and Loch Assynt; Dornoch is the capital, but the detour of the railway round the Firth has developed Lairg and Golspie.

5. The counties of Ross and Cromarty are now treated as one, and include the island of Lewis, with a total area of about 4000 square miles.

- (1) The shire itself is uniformly high and barren, except where it falls to the sandstone lowland along the Moray Firth; and, therefore, the only centres of population are on or round the peninsula. Cromarty is a little fishing port; Dingwall, the capital, commands the railway traffic round the Cromarty Firth, as Tain commands that between the Cromarty and the Dornoch Firths.
- (2) Lewis is a tract of bog and moor, round the shores of which the herring find suitable food; and, therefore, the capital, Stornoway, is an important herring-port.

6. Inverness-shire (nearly 4100 square miles) owes its importance mainly to the opportunity afforded by Glen More for constructing the Caledonian Canal.

- (1) The south end of the canal is commanded by Fort William, while on the fertile strip of sandstone at the north end stands Inverness, the most important political and commercial centre in the Highlands (cf. Culloden Moor), with large distilleries and a wool fair. The only other towns are Kingussie, which commands the southward traffic, *via* the Dalwhinnie Pass, and Beauly, which commands the northward traffic round the Beauly Firth.
- (2) Skye, with its adjacent islets, and all the Outer Hebrides except Lewis, belong to the shire; but, as they all have poor soil and damp climate, they are of little use except for fishing, Portree being the chief harbour.
- (3) The county is a land of 'mountain, moor, and flood,' mainly valuable for its deer forests, grouse moors, and loch and river fisheries; but some of its 'floods' are being degraded to the manufacture of aluminium, *e.g.* the Falls of Foyers.

7. Argyleshire (about 3200 square miles) is, of all the Scottish shires, the most broken up by the sea, and includes a large number of islands.

- (1) These islands have been naturally severed from the mainland by the sinking of the shore and the encroaching of the sea; and Kintyre has been made an island artificially by the construction of the Crinan Canal. Amongst the most famous islands are Mull, Jura, Islay, Staffa (with Fingal's Cave), and Iona.
- (2) The shire rears more sheep than any other shire in Scotland, and abounds in game (deer and grouse), and is famous for its fish, *e.g.* the herrings of Loch Fyne and the salmon of Loch Awe. It also contains a few minerals, including the slates of Ballachulish, the marble of Tiree, and the porphyrite of Furnace; and there is a little coal near Campbeltown.
- (3) Inverary is the capital, one amongst a number of little waterside towns, *e.g.* Dunoon and Innellan, Lochgilphead

and Tarbert, Tobermory and Ardriahaig; but the most important places are Oban and Campbeltown. Oban is the centre of the West Highland traffic, both by sea and by rail (*via* Dalmally); Campbeltown has numerous distilleries. Cf. Islay.

8. The Shire of Bute (about 200 square miles) consists mainly of the two large islands of Bute and Arran.

- (1) Both are composed of old 'Highland' rock in the north, rising in Goat Fell to nearly 2900 feet, and of newer 'Lowland' rock in the south.
- (2) They are famous for their scenery, *e.g.* Glen Sannox and the Kyles of Bute; and the mild climate, especially of Bute, attracts a large number of visitors, and is very favourable to market-gardening. Rothesay, the capital of the shire, is one of the largest watering-places in Scotland; but there are several other popular resorts, *e.g.* Brodick and Lamlash.
- (3) Of the other islands included in the shire, the most important are the low fertile Cumbraes; but Holy Isle has an interesting history, and its shelter makes Lamlash Bay one of the safest refuges on the Firth of Clyde.

9. Nairnshire (nearly 200 square miles), like the other shires along the Moray Firth, consists of two parts.

- (1) The south is wild and mountainous, but the north is a low fertile tract of sandstone, which admits of agriculture, especially between Auldearn and Nairn. The latter is a little river harbour, and commands the railway traffic along the coast; its good bathing and its golf-links make it also a very popular resort.

10. Elginshire or Moray (nearly 500 square miles) very closely resembles Nairnshire, but has larger areas both of barren moorland and fertile lowland.

- (1) Elgin, the capital, stands in the middle of the shire, where moorland and lowland meet, and has a considerable amount of railway traffic converging on it, *via* Garmouth; Forres is an important junction commanding the traffic round the Findhorn estuary; Burghhead and Lossiemouth are little fishing ports; and there are several picturesque river-valley towns, *e.g.* Grantown, Rothes, and Fochabers.

11. Banffshire (nearly 700 square miles) differs from Elginshire only in having a narrower strip of fertile coast-lands.

- (1) The salmon fisheries of the Spey and the Deveron are very valuable, and a number of little ports are engaged in the herring fishery, *e.g.* Banff, Buckie, Macduff, Portsoy, and Cullen. The inland centres include the important junction of Keith and river-side villages like Duftown, most of which are occupied in distilling the 'Glenlivet' whisky. This accounts for the large and increasing barley trade of Elgin.

12. Aberdeenshire (nearly 2000 square miles) has two clearly defined areas—Highland and Lowland. It has more horses and cattle than any other county.

- (1) The low Buchan peninsula and the land between the Ythan and Don contain some of the finest cattle-pasture in the kingdom; and the little ports of Peterhead and Fraserburgh have a large herring fishery, and used to be important whaling stations. Peterhead has also valuable quarries of red granite.
- (2) The wild scenery of the Dee valley, with the attraction of Balmoral Palace, draw innumerable visitors to Braemar and Ballater; and Huntly and Inverurie are similar resorts in the less wild valleys of the Deveron and the Don.
- (3) Aberdeen stands where the meeting of the Don and the Dee valleys give easy communication inland; it has important granite and fishing industries; its very large

export of cattle has given it a very large manufacture of combs and other horn articles; it shares in the textile trade of Dundee, specialising in jute carpets; and its command of the traffic along the coastal plain has made it an important university town and railway junction. Cf. p. 81.

13. Kincardineshire, or the Mearns (nearly 400 square miles), consists of the north end of the fertile Strathmore, with the enclosing moors.

- (1) The Strathmore plain is one of the two great routes between northern and central Scotland; and this gives abundance of quick transport for the fish of Stonehaven, Bervie, and Findon (cf. Findon haddocks). Laurencekirk is a farming centre, and Banchory is a summer resort.

14. Forfarshire, or Angus (nearly 900 square miles), consists of four parallel strips of country, alternately hill and plain.

- (1) The plain of Strathmore is a rich farming district, with Forfar as its natural centre, and Brechin and Kirriemuir as outlying markets; and the fertile Carse of Gowrie is continued in the rich fruit land between Lochee and Broughty-Ferry. The Sidlaw Hills are covered with sheep-walks, and the Braes of Angus with grouse moors and deer forests.
- (2) There are several important fishing centres on the coast, e.g. Montrose, Arbroath, and Carnoustie; and their convenience for transport, and their nearness to the Fife coal and to the fibre-growing countries round the Baltic, have given them all textile industries. Montrose spins and weaves flax, and Arbroath makes canvas and sailcloth.
- (3) Dundee, though not the nominal capital, is the commercial and industrial capital, and is the third largest town in Scotland. Cf. p. 81.

15. Perthshire (about 2500 square miles) is practically the basin of the Tay, and therefore converges naturally on Perth. Cf. Yorkshire, p. 41.

- (1) Its western half is entirely Highland, and includes some magnificent loch and mountain scenery, notably the Trossachs country, as well as very valuable grouse-moors and deer-forests; its eastern half is entirely lowland, and includes the richest part of Strathmore. Thus Crieff and Comrie, Killin and Aberfeldy, Aberfoyle and Callander are tourist centres; while Alyth, Blairgowrie, and Coupar-Angus have very important fruit and farming industries.
- (2) As the shire lies wholly inland in the very heart of the country, its passes have had great political importance and still have great commercial importance. Blair-Athol and Pitlochry command the two ends of the Killiecrankie Pass, as Perth and Dunblane command the two ends of the Ochils (cf. the battles of Killiecrankie, Sheriffmuir, and Methven). Crianlarich is an important junction for Oban.
- (3) Perth occupies an ideal site for a capital, where the whole shire naturally converges at the head of navigation on the Tay, commanding the one pass between the Ochils and the Sidlaw Hills and all the traffic round the estuary, and surrounded by extremely fertile land. Its political importance was so great in former times that it was practically the capital of the kingdom, the Scottish kings being regularly crowned at Scone; and it is now the most important railway junction north of Edinburgh. It also has water that is peculiarly well suited for dyeing purposes.

Chapter 23. Lowland and Upland Counties.

1. Fifeshire (about 500 square miles) has, owing to its peninsula form, a climate very suitable for

textile manufactures, and a position very favourable for trade.

- (1) As the north part contains the fertile valley of the Eden or 'Howe of Fife,' it is naturally agricultural, and is the site of the county town, Cupar, and of the old university and episcopal centre of St. Andrews, with its famous golf-links. Since the construction of the bridge across the estuary of the Tay to Dundee, Cupar has also had some railway importance.
- (2) As the south part contains a large coal-field and several useful harbours, *e.g.* Kirkcaldy, Burntisland, Methil, and Dysart, it has great industrial and commercial importance, specialising in linen (*cf.* Forfarshire). For instance, Dunfermline is the chief centre of the table-linen industry of the country, and Kirkcaldy is the chief centre of the linoleum industry; and the importance of Dunfermline, as of Inverkeithing, has been greatly increased by the construction of the railway bridge across the Forth at Queensferry.
- (3) The long coast encourages a busy fishing industry, of which Anstruther is the head-quarters; and the volcanic rocks along the Forth have formed such a picturesque coast that a number of little summer resorts have sprung up, *e.g.* Largo, Elie, and Leven, some of them with splendid golf-links.

2. Kinross-shire (about 70 square miles) is merely a dip between the Cleish, Ochil, and Lomond Hills, in the bottom of which is Loch Leven.

- (1) The historic interest of the loch is very great, but the shire has no commercial importance, though there is a small tartan shawl and plaid industry in Milnathort, and Kinross is a favourite resort for anglers.

3. Clackmannanshire (nearly 50 square miles) is the smallest county in Scotland, but includes a strip of the 'Fife' coal-field.

- (1) Clackmannan is the nominal capital, but has been far outstripped by the coal port of Alloa, which has also large breweries. Just below the Ochil sheep-walks, Alva manufactures tweeds, etc. Cf. Tillicoultry.
4. Stirlingshire (about 450 square miles) owes its great importance to three causes.
 - (1) Stirling, on its river-girt, castle-crowned rock, rising out of the fertile carse, at the head of navigation on the Forth, and commanding the only pass between the Ochil and Lennox Hills, was the most important military centre in Scotland in olden days; and, for similar reasons, it is now a very important junction, though its importance has been greatly lessened by the construction of the Forth Bridge and of the West Highland line. (Cf. Battles of Stirling Bridge, Bannockburn, and Falkirk.)
 - (2) The fine pasture of the hills and the fertility of the carse made it also a great farming country; and Falkirk is still an important cattle market, while Stirling, with its suburbs of St. Ninians and Bannockburn, manufactures woollen goods. Larbert is an important junction in the middle of the best farming district.
 - (3) Between Denny and Grangemouth there is a valuable coal-field, which has developed the iron works of Falkirk and Carron, immensely facilitated traffic across the 'isthmus' to Glasgow, and made Grangemouth one of the most important harbours in Scotland. Montrose's old victory at Kilsyth illustrates the military importance of the depression by which rail and canal traffic is now conducted across the isthmus.
5. Dumbartonshire (nearly 250 square miles), like Stirlingshire, is half Highland and half Lowland.
 - (1) Like Stirling, too, its capital of Dumbarton stands on a river-guarded, castle-crowned rock—which commands

the mouth of the Clyde. It is now an important junction, with very famous shipbuilding yards on the estuary of the Leven; and it is the natural outlet of the Alexandria calico-printing and Turkey-red dyeing, for which the Leven water is very suitable.

- (2) Like Stirlingshire, again, it has fine Highland scenery in its northern portion, including the 'Queen of Scottish Lakes'; and the extension of the railway from Helensburgh to Crianlarich (cf. p. 93), *via* Arrochar, has immensely facilitated traffic up the west coast, and has developed a number of small loch side resorts, *e.g.* Gareloch-head. The railway ends at Mallaig.
- (3) Along the river between Dumbarton and Glasgow there are several little towns, *e.g.* Bowling, Clydebank, and Yoker, of which Clydebank has very famous shipbuilding yards and sewing-machine works; and in the detached portion of the shire, along the Forth and Clyde Canal, Kirkintilloch uses its coal in iron and chemical works.

6. Renfrewshire (about 250 square miles) consists of a river-side plain which rises to the hills of the Cunningham moorland.

- (1) As the east contains coal and much iron, and is so close to Glasgow, it is a busy commercial and industrial centre; and it contains the two important transverse valleys of Lochwinnoch and Barrhead, which give a double traffic route between Glasgow and the Ayrshire coast. All the chief towns, *e.g.* Paisley, Johnstone, Barrhead, are occupied in textile industries; but the specialities are the thread and shawls of Paisley.
- (2) The western portion is mainly devoted to shipbuilding, especially at Greenock and Port-Glasgow; and Greenock has a sugar industry, inherited from the old days of a flourishing West Indian trade. There are also several little watering-places, *e.g.* Gourrock and Wemyss Bay, the former being an important calling place for the Firth steamers.

- (3) The nominal capital of the shire is Renfrew, which is certainly the natural centre; but both Greenock and Paisley are far more important, and on the direct line between the two towns are the popular health resorts of Kilmalcolm and Bridge of Weir. Pollokshaws, though in the county, is really part of Glasgow.

7. Ayrshire (about 1150 square miles) consists of a semicircle of hills sloping gently to a central plain.

- (1) Both hills and plains are famous for their pasture, which supports the characteristic industries of the county—the carpets of Kilmarnock and Ayr, the shoes of Ayr and Maybole, the cheese of Kilmarnock and Dunlop. The plain is also noted for its early potatoes, which are largely exported from Ayr, the natural centre and capital of the shire.

N.B.—It stands next to Aberdeenshire for cattle (100,000).

- (2) The Carrick uplands and the Cunningham moorland are comparatively unimportant. The former verges on the fishing ports of Ballantrae and Girvan; the picturesque coast of the latter is dotted with little summer resorts, such as Largs and West Kilbride (cf. Prestwick, with its famous golf-links). The curious island peak of Ailsa Craig also belongs to the county.
- (3) The fertile plain is underlaid by a valuable coal-field from Cumnock to Dalry; and there is a large export of coal from Ayr and Troon, Irvine and Ardrossan. In the latter district, however, much of the product is used in the ironworks of Dalry and Kilwinning, in the engine-shops and woollen factories of Kilmarnock, and the lace industry of Galston and Newmilns.

N.B.—More iron-ore is raised than in any other Scotch county.

- (4) Kilmarnock, which commands the approach to Glasgow, *via* the low level of the Garnock valley, with its supplies of coal and iron, has been made the head-quarters of the *Glasgow and South-Western Railway*.

8. Lanarkshire (nearly 900 square miles), the largest county of the Lowland Plain, is simply the basin of the Clyde.

- (1) It is naturally divided into three areas. The upper valley of the Clyde, down to the important junction of Carstairs, is a tract of bleak pasture; the fertile river-side lands below Lanark are very highly cultivated, and produce all kinds of fruit and vegetables, especially strawberries; and, finally, the river enters the rich Glasgow coal- and iron-field.
- (2) This lower reach of the Clyde was always an important centre on which traffic of all kinds converged (cf. battles of Bothwell Brig and Langside); and an immense amount of railway traffic now converges on it, *via* the important junctions of Coatbridge, Motherwell, and Holytown. Along the edges of the valley on both sides there is a series of towns engaged in coal mining and iron industries, *e.g.* Airdrie, Coatbridge, Motherwell, Wishaw, and Hamilton.
- (3) The nominal capital is Lanark, which lies amongst very pretty river scenery; but Glasgow, with its suburbs, *e.g.* Rutherglen, Govan, Partick, is overwhelmingly more important, being the commercial and industrial capital of Scotland and the second city in the United Kingdom.

9. Linlithgowshire, or West Lothian (120 square miles) is divided into two portions by a high ridge of hills between Bathgate and Linlithgow.

- (1) West of this ridge there is the Bathgate coal-field, and east of it an area of oil-shale; between Linlithgow and the rising port of Bo'ness there is rich agricultural land. Bathgate and Broxburn make 'paraffin' products.

10. Edinburghshire or Midlothian (about 350 square miles) slopes down from the pastoral upland of the Pentland and Moorfoot Hills to the plain of the Forth.

- (1) To the east of the Pentlands there is the Dalkeith coal-field, and to the west of them the oil-shale of West Calder. The Esk water is very suitable for paper-making, and the industry is carried on at Penicuik. Granton and Newhaven are fishing-ports, and Portobello and Musselburgh are really residential suburbs of Edinburgh. Roslyn manufactures gunpowder.

11. Haddingtonshire, or East Lothian (about 250 square miles), like the rest of the Lothians, is hilly in the south, and has a fertile plain along the Forth.

- (1) Except for a small area of coal round Tranent, the county is entirely pastoral and agricultural, Gifford being the centre of the sheep farms, and Haddington of the agriculture. Dunbar, on its rocky castled promontory, used to be very important, but is now only a fishing port; Preston-(salt)-pans still makes salt, and commands the coastal approach on Edinburgh; and North Berwick, with its Law and the famous Bass Rock, is a popular resort, especially for golfers.

12. Berwickshire (about 450 square miles) contains the foot-hills of the Lammermuirs and the 'Merse' plain of the Tweed.

- (1) The hills are entirely devoted to sheep-farms, the centre of which is the county town of Greenlaw; Duns, a more important centre on the rich agricultural plain, was a less safe place for a capital in former times; Eyemouth is a busy little fishing-port. Coldstream, which commands the lowest ford by which armies could cross the Tweed, has given its name to a famous regiment.

13. Roxburghshire (about 650 square miles) is practically the basin of the Teviot, with its famous breed of Cheviot sheep.

- (1) Jedburgh, the capital, is in the centre of the basin (cf. battle of Ancrum Moor); Kelso, at the end of the

valley, has a better position for external trade (in wool); and Hawick owes its much greater importance partly to the water-power of the higher valley, and partly to its being on the natural line of communication between Edinburgh and Carlisle, *via* the valleys of the Liddel and the Gala Water (cf. p. 86). Melrose, like Jedburgh and Kelso, has famous abbey ruins.

14. Selkirkshire (about 250 square miles) contains a little arable land along the Ettrick and the Yarrow, but is otherwise entirely pastoral.

- (1) Selkirk, which commands both the valleys, is the capital (cf. battle of Philiphaugh); and Galashiels, like Hawick, manufactures tweeds and tartans.

15. Peeblesshire (about 350 square miles) is an entirely upland county, devoted mainly to sheep-farming.

- (1) The most important valleys are those of the upper Tweed and the Lyne Water; and Peebles, the capital, stands where the various valleys converge on the main Tweed valley. Innerleithen has a small woollen industry, and, like Peebles, is a favourite resort for anglers.

16. Dumfriesshire (about 1050 square miles) is a very important commercial highway.

- (1) The two fertile valleys of Nithsdale and Annandale practically monopolise the West Coast traffic between England and Scotland, and contain important junctions at Dumfries and Lockerbie. Dumfries, the capital, is also the head of navigation on the Nith, and the centre of a rich farming district; it commands English traffic with Stranraer, and makes tweeds, etc.
- (2) The northern hills contain mineral wealth, *e.g.* coal at Sanquhar, lead at Wanlockhead, and mineral springs at Moffat; and their grass-grown slopes make splendid sheep-walks. Langholm, like the neighbouring towns

on the east of the water-parting, manufactures woollen* goods. Cf. Roxburghshire.

- (3) Besides the river-port of Dumfries, which owes its importance entirely to the high tides of the narrowing Solway, there are several little fishing-ports, *e.g.* Annan; and at the head of the now drained Solway Moss stands the famous Border village of Gretna, built across the old coach road, and having a station on each of the great trunk lines north.

17. Kirkcudbrightshire (about 900 square miles) is the wildest and highest part of the southern uplands, reaching in Merrick a height of nearly 2800 feet.

- (1) The lower ground along the river-valleys is fertile and well cultivated, and on it several little market towns have sprung up, *e.g.* Kirkcudbright, Castle Douglas, and Dalbeattie. Maxwelltown, though actually in Kirkcudbright, is really a suburb of Dumfries. The county is noted for its honey and 'Galloway' cattle.

18. Wigtonshire (nearly 500 square miles) is a stretch of barren moor in the north, but slopes down to fertile land in the south—the Rhinns and Machers.

- (1) The county is almost entirely pastoral, and the mild climate and good pasture of the low levels encourage a considerable dairy industry, which has been greatly developed by the increased railway traffic to Stranraer, the nearest port to Ireland. Wigton, the capital, commands traffic round the bay; and Newton-Stewart is the chief dairy centre, with large cheese factories.

* Dumfries stands next to Perthshire for the number of its sheep (560,000); and Scotland generally, like Wales, but unlike England, is largely increasing its number of sheep.

IRELAND.

GENERAL FEATURES.

Chapter 29. Surroundings and Surface.

1. Ireland resembles Great Britain more in the character of its coast than in anything else.

- (1) The west coast is deeply broken by lochs and fiords, while the east is only worn into shallow curves; the west coast is marked by precipitous cliffs, while the east is generally low and monotonous; the west is fringed by islands, while the east is practically islandless.
- (2) These islands are, however, too small to shelter the coast; and, though the fiords provide many natural harbours, especially in the south-west, the best of them do not look towards the great European markets, and are cut off by mountains from easy communication inland.
- (3) The north coast, like that of Great Britain, has some magnificent cliffs and island scenery, *e.g.* the Giant's Causeway and Rathlin; and the south coast, also like that of Great Britain, resembles the west coast in its western portion and the east coast in its eastern part. Cf. Kerry with Cornwall, and Cork with Southampton.

2. There are three chief ports—Belfast, Dublin, and Cork. The last has a population of about 100,000; Dublin has 290,000; and Belfast has 350,000.

- (1) Dublin has naturally a very poor harbour, but a fine artificial one has been constructed at Kingstown; the

central position just opposite the dense population of South Lancashire, and the very easy communication inland, are favourable for trade; and the quality of the water is very suitable for brewing and silk dyeing, stout and poplins being the special products.

- (2) Belfast stands on a well sheltered estuary, which runs right up into the Ulster flax- and iron-field; it is near enough to the Ayrshire coast to be able to import coal very easily; its soil and climate are very favourable to a linen industry; and the modern demand for steel ships has given it a large shipbuilding industry.
 - (3) Cork, which is a much smaller town than the other two, is completely land-locked; its island-port of Queenstown has a large cattle and dairy trade, and used to be a very important calling-station for American steamers. Recent improvements in ocean transport have largely obviated, however, the necessity for landing mails and passengers to be forwarded by rail.
3. There are three other ports which, though quite small in population, have considerable trade—Limerick (about 45,000), Londonderry (40,000), and Waterford (28,000).

- (1) Limerick is the natural outlet for the rich plain of the Shannon, which includes the magnificent cattle pastures of the Golden Vale; and it commands all the traffic round the long estuary of the Shannon.
- (2) Londonderry is the natural outlet for the pasture and flax-fields of the Foyle basin, and commands the traffic round Lough Foyle.
- (3) Waterford, the natural outlet for the Barrow basin, is well sheltered by Hook Head, and has a large cattle trade with Bristol, as well as a packet service with Milford Haven.

4. In surface and climate Ireland is very unlike

Great Britain, being practically one great plain encircled by a rim of mountains and broken by a few hills.

- (1) As the formation is mainly limestone, and as the rainfall is constant, the fertility is very great; but pasture is much more profitable than agriculture, and the unvaried surface has made pastoral farming the one universal industry.
- (2) The exposure to the full violence of the south-west winds directly off the Atlantic makes the rainfall very heavy; and, as the surrounding ridge of mountains is too low to effectually condense the clouds, the rain is distributed very evenly over the whole country.
- (3) This universal rainfall and the dead level cause the collection of water everywhere, either in bogs, of which the Bog of Allen is the largest, or in strings of river-joined lakes, like those of the Erne, the Shannon, and Killarney; and, for the same reason, there are innumerable streams which all collect in the one great waterway of the Shannon.
- (4) As the country is largely destitute of minerals, there are no manufactures except in the north and east, where coal can be easily imported from Ayrshire and Lancashire; but peat supplies the ordinary domestic fuel.
- (5) The dead level has greatly facilitated the construction of railways and canals, both of which converge on Dublin.

5. The rim of mountains is broadest and most continuous towards the north and towards the south.

- (1) The chief ranges in the south vary in height from about 2600 feet in the Knockmealdown Mountains to 3000 in the Wicklow Mountains, and 3400 in the Macgillicuddy's Reeks; in the north the Donegal Mountains are over 2400 feet, and the Mourne Mountains are nearly 2800.
- (2) In the west the Connemara Mountains are nearly 2400 feet, and the Muilrea and Nephin Beg Mountains

nearly 2700; but there is not a single hill of importance between the Connaught ranges and Dublin Bay.

- (3) Of the hills which cross the plain, the most important are the Slieve Bloom (about 1700 feet) and the Silvermine (nearly 2300); and, like the mountains of Great Britain, they have a general direction from S.W. to N.E.

6. The river system is also unlike that of Great Britain.

- (1) As the mountains are along the coast, most of the rivers reach the sea on the side of the island on which they rise (cf. p 35); and, as the mountains are broadest towards the north and the south, the northern and southern rivers are comparatively long, e.g. the Barrow, Blackwater, and Bann.
- (2) As the main water-parting lies nearer to the east than to the west coast, the westward rivers have the greater length and the larger basins. For instance, the Shannon is 225 miles long, and drains an area of about 7000 square miles; the Liffey is only 50 miles long, and does not drain 500 square miles.
- (3) Owing to the flatness of the country, the Shannon is navigable up to Lough Allen—i.e. for over 200 miles; and its lakes are merely expansions of its very sluggish current. In length, direction, and tides it presents a strong resemblance to the Severn.

COUNTIES.

Chapter 30. Ulster.

1. Antrim (1200 square miles), the chief manufacturing county of Ireland, consists of a high table-land descending abruptly to the sea and gently to the valley of the Bann.

- (1) All the available land is used for flax and oats, the chief flax markets being at Ballymena and Ballymoney. Belfast is, of course, the great centre of the linen trade; but Lisburn is noted for its damasks, and Ballymena uses the water power of the Main valley in spinning yarn and bleaching ('shirtings').
- (2) The coast is famous for its scenery, and has important mining and fishing industries. The finest scenery is at the Giant's Causeway and Fair Head, for which Portrush and Ballycastle are popular centres; rock-salt is worked at Carrickfergus, and iron and limestone round Ballymena, Cushendall, and Glenarm; and Larne is a busy packet-station.
- (3) Antrim, the nominal capital, is an important junction between the mountains and the corner of L. Neagh, and has a busy linen trade; but Belfast is, of course, far more important, being the capital of the whole province of Ulster, and one of the most important towns in the United Kingdom (cf. p. 103). Its population increased from 37,000 in 1821 to 100,000 in 1851, and 200,000 in 1881, and is now approximately 350,000.

2. Down (850 square miles) is mainly low and level, but rises to about 2800 feet in the Mourne Mountains.

- (1) Its deeply-broken coast gives it an important fishing industry and great advantages for trade; its fertile, well-tilled soil produces all kinds of roots and flax, and its river-side meadows are famous for their horses and cattle; and the marine climate and the nearness to the Scottish coal are favourable to textile industries.
- (2) The best harbour is Warrenpoint, and there are several small ports, of which Newry is the best, with a ship-canal to Carlingford Lough; but a great deal of traffic goes through Belfast, and Bangor and Holywood are practically residential suburbs of Belfast.
- (3) Downpatrick, the capital, was the home of St. Patrick, and the old capital of the Ulster kings; it is still a little port, and occupies an important position on the isthmus between Dundrum Bay and Strangford Lough. Like Newry, it is a great linen centre; Donaghadee and Newtownards also make linen and damask, but specialise in muslin.

3. Londonderry (about 800 square miles) is mainly hilly, but sinks to a fertile plain along the Bann.

- (1) The county owes its comparatively large population partly to the commercial importance of L. Foyle, and partly to the flax industry. Londonderry specialises in shirts and lace, and cures large quantities of bacon; its river-guarded hill has been the scene of several tremendous assaults and sieges, including George Walker's memorable resistance to James II. for 105 days.
- (2) Coleraine manufactures fine linen, and exports the salmon of the Bann; Limavady shares in the general linen industry; and Castle Dawson commands the traffic round the vast waters of L. Neagh (150 square miles)

4. Armagh (about 500 square miles) is a low fertile plain in the north, but rises in the Slieve Gallion Hills to nearly 1900 feet.

- (1) The north is densely peopled and well cultivated, especially round the important junction and apple market of Portadown; all the towns are engaged in linen industries, Lurgan also specialising in muslin. Armagh, the capital, has been a very important ecclesiastical centre since the age of St. Columba.

5. Tyrone (about 1250 square miles) consists of two distinct basins separated by the spurs of the Sperrin Mountains.

- (1) The Mourne Valley towns are entirely devoted to agriculture and linen industries, *e.g.* Strabane, Newtown-Stewart, and the county town of Omagh; the eastern plain is also devoted to agriculture and linen from Cookstown to Aughnacloy, but between Dungannon and Stewartstown there is also a valuable little coal-field.

6. Monaghan (500 square miles) is mainly low and fertile in the north and hilly in the south.

- (1) The flax industry is increasing, and all the chief towns are engaged in it, *e.g.* Monaghan, Clones, Castleblayney, and Carrickmacross, Monaghan and Clones being also important junctions. The Ulster Canal runs across the most fertile part of the county.

7. Cavan (750 square miles) consists mainly of the broad valley of the Upper Erne.

- (1) The soil and climate suit flax, but potatoes and oats are the chief crops. Cavan, which has a good central position for a capital, has small linen and bleaching industries; and there are minerals in the Cuilcagh district, but they are not worked. Belturbet commands traffic round L. Erne, and Cootehill and Belanagh are little market towns.

8. Fermanagh (about 700 square miles) is practically the narrow limestone basin of Lough Erne.

- (1) Its fertile soil produces good crops of oats, especially round Newton-Butler; Enniskillen, the capital, occupies a fine commercial position on an island in the centre of the county, where traffic converges between the two lakes.

9. Donegal (nearly 1900 square miles) is a wide stretch of mountain, moor, and bog, with a magnificent coast.

- (1) The only towns are along the river valleys, and are very small, *e.g.* the county town of Lifford; but those at the mouths of the rivers are fairly important, especially Moville, which was a port of call for North Atlantic 'liners,' Ballyshannon, Donegal, Letterkenny, and Ardara; Ballyshannon has a famous salmon fishery.

Chapter 31. Leinster.

1. Louth (about 300 square miles) is the smallest of the Irish counties, but has good farms, fisheries, and flax industries.

- (1) Except for the granite formation of the hilly Carlingford peninsula, the whole shire consists of a low fertile limestone plain; and a large area of it is under oats and potatoes, *e.g.* round Louth and Ardee, the rest being pasture.
- (2) There are several busy little fishing ports, the Carlingford oyster fishery being specially important; but Dundalk and Drogheda practically monopolise all the commerce, mainly in live stock and dairy products. Both towns have salt and linen industries; and Dundalk, the capital and the half-way town between Belfast and Dublin, is an important junction, with a branch line to the packet station of Greenore.
- (3) The Boyne is the longest river of the east coast, being navigable for barges up to Navan; and thus Drogheda

was made the chief military centre of Ireland in former times, and was the scene of much hard fighting (cf. Battle of the Boyne and Siege of Drogheda).

2. Meath (900 square miles) is a very fertile part of the great limestone plain, though it contains patches of bog.

- (1) Oats and potatoes are grown, but the mass of the land is devoted to pasture. Trim, near which the Duke of Wellington was born, is the capital; but Navan is the most important town, as the confluence of the Black-water makes the Boyne navigable. The neighbouring Hill of Tara was the council seat of one of the old Irish kingdoms, and Kells was the "Head-Fort."

3. Westmeath (700 square miles) is an entirely pastoral county on the great limestone plain, and is famous for its black cattle.

- (1) Mullingar occupies a suitable place for the capital—in the centre of the shire—where rail and canal converge between L. Owel and L. Ennel; and it is a very popular centre for anglers. Athlone owes its importance as a river and railway junction to its command of the traffic out of and round L. Ree. Both towns are important military centres.

4. Longford (about 400 square miles) has the same fertile limestone soil, though it has also large tracts of bog.

- (1) Oats and potatoes are grown, but the pasture is more important; and Longford, the capital, has a large butter market. Ballymahon spins flax.

5. Dublin (350 square miles) is a fertile limestone plain rising in the south to the granite heights of Wicklow.

- (1) It is the best-tilled county in Ireland, a large area round the capital being under market-gardens, and

there are valuable fisheries; but its importance is really due to the convergence of commerce by rail, canal, and sea on Dublin, with its fine artificial harbour of Kingstown. Cf. p. 102.

6. Wicklow (about 800 square miles) is a mass of granite rising to 3000 feet in Lugnaquilla, with a precipitous coast.

- (1) The soil is poor, and the fisheries are neglected, partly owing to the dangerous sandbanks; but the county is very famous for its river scenery, especially in the Vale of Ovoca. Bray, Wicklow, and Arklow are all pleasure-resorts, Bray being the most popular from its nearness to Dublin.
- (2) Granite and slate are quarried, and lead is still mined near Lunganure; but the copper and sulphur industry of Cronbane has died out. The once-famous oak forests of Shillelagh have given their name to the modern Irish cudgel. Cordite is made at Arklow.

7. Carlow (about 350 square miles) is mainly an extension of the granite formation of Wicklow, but has such fertile land along the Barrow and the Slaney that it has become one of the chief dairy counties.

- (1) Carlow, the capital, has a little river traffic on the edge of the Castlecomer coal-field; and Bagenalstown is a river and railway junction, with a market for dairy produce. Cf. Tullow.

8. Kilkenny (800 square miles) consists of the narrow lowlands of the Nore valley and the hills into which they rise on each side.

- (1) These hills in the north contain quarries of black marble and the Castlecomer coal-field, which has made the capital, Kilkenny, with its river-girt castle-crowned rock, the largest inland town in Ireland.

9. King's County (about 750 square miles) contains a large section of the Bog of Allen, but is otherwise fertile.

- (1) The capital, Tullamore, is naturally a rail and canal junction in the centre of the county; Parsonstown is a market town in the most fertile part of the shire.

10. Queen's County (about 650 square miles) takes its name from Queen Mary, as King's County does from King Philip II. of Spain.

- (1) The connection is further celebrated in the name of the capital, Maryborough (cf. Philipstown in King's Co.). Portarlinton is a rail and canal junction in the fertile Barrow basin. Mountmellick works iron.

11. Kildare (nearly 700 square miles) is a very fertile tract of flat limestone (containing fine marble).

- (1) The most fertile lands are along the Liffey and the Barrow; Athy, the chief town, is a canal and railway junction at the head of barge navigation on the Barrow, and Naas is a market town that used to be the residence of the Leinster kings. The county is most famous for the camp and racecourse of the Curragh (cf. Aldershot in connection with London), and for the Romanist College at Maynooth.

12. Wexford (900 square miles) owes its importance partly to its fertility, and partly to the ease with which it was originally invaded and colonised.

- (1) Its fertile, undulating plain grows large quantities of barley, and is famous for dairy produce; and the fisheries are valuable. The confluence of the Nore makes the Bann navigable for largish boats up to New Ross, and the confluence of the Bann makes the Slaney navigable for small boats up to Enniscorthy.

Wexford, the natural outlet for the trade of the county, and the scene of many battles, is being provided with a good artificial outport at Rosslare (cf p. 77).

Chapter 32. Munster and Connaught.

1. Waterford (about 700 square miles) consists mainly of a series of deep fertile valleys.

- (1) These valleys produce excellent butter and bacon, both of which are exported in large quantities from Waterford, the most important railway junction in the S.E. of Ireland. Lismore and Portlaw are great dairy centres, Dungannon and Tramore have fisheries, and marble is quarried at Cappoquin and Whitechurch.

2. Cork (2900 square miles), the largest Irish county, is also a succession of parallel valleys which are wild and boggy in the west, but fertile and well cultivated in the east.

- (1) The river valleys, like those in Waterford, produce excellent butter and bacon, as well as oats and potatoes, and contain the chief towns of the county, *e.g.* Fermoy, Mallow, and Bandon; and at the mouth of each valley a small fishing port has sprung up, *e.g.* Youghal and Kinsale (cf. Crookhaven under the shelter of Mizen Head).
- (2) The fiords of the south-west represent the extension of these valleys seaward, and their beauty attracts a great many visitors, *e.g.* to Bantry, Skibbereen, and Glengariff. Skibbereen is a small railway junction near copper and rich manganese mines, *e.g.* at Leap.
- (3) Cork is much the most important city in the south of Ireland; it has large breweries and distilleries, and is a tourist centre, *e.g.* for Blarney.

3. Kerry (1850 square miles) is the mildest and

the most picturesque county of Ireland, but one of the most backward.

- (1) It is famous both for its coast and for its inland scenery, Kenmare and Killarney being the two most popular centres; the island of Valentia is the terminus of the Atlantic cables.
- (2) In spite of the wonderfully mild climate in which 'exotics' grow wild, the fertile valleys are almost untilled. The capital, Tralee, has a small fishing industry; and Listowel is in a cattle-grazing district, the famous Kerry cows being about the size of a donkey.

4. Tipperary (1650 square miles) is practically the basin of the Suir, and therefore naturally converges on its largest town, Clonmel.

- (1) Its inland position, its fertile limestone soil, and the protection of the hills in the west, make the Suir valley between Thurles and Tipperary the best wheat-land in Ireland; but the county is most famous for its butter and its horses, for which there are important markets at Tipperary, Nenagh, and Carrick-on-Suir. Cashel, with its isolated rock amidst rich pastures, is one of the oldest episcopal centres in Ireland.

5. Limerick (about 1050 square miles) is a wide plain with a margin of hills on the south and east.

- (1) The most fertile part of the plain is the Golden Vale, which produces the best cattle-pastures in the United Kingdom; and Limerick, the capital, does a large export trade in cattle and hay, and cures immense quantities of bacon (cf. p. 103). It is also famous for its manufactures of lace and fishing tackle, and has been the scene of some terrible battles and sieges.

6. Clare (1800 square miles) consists of the plain of the Fergus with its surrounding horse-shoe of hills.

- (1) Ennis, in the centre of the shire and commanding the estuary, is the natural capital ; the episcopal centre of Killaloe commands the traffic round L. Derg, and has slate and marble quarries ; Kilrush is a little fishing port ; Lisdoonvarna is a health resort, with mineral springs, within driving distance of the fine cliffs of Moher ; and Kilkee claims to be the prettiest watering-place in Ireland.

7. Galway (2450 square miles) consists of two clearly defined areas separated by L. Corrib.

- (1) The eastern part belongs to the great limestone plain, and its fertile pastures supply the important horse, cattle, and wool fairs of Ballinasloe ; Tuam is the seat of a Romanist archbishopric, and Portumna commands the traffic round L. Derg.
- (2) The western part contains the wild mountains and lakes of Connemara, with their famous salmon fisheries and marble ; Clifden and Roundstone are the chief centres of population, and Ballinahinch has the most famous fishing.
- (3) Galway occupies a position of commanding importance, on which all traffic must converge between L. Corrib and the sea, and Galway Bay is a magnificent natural harbour, well protected by the Aran Islands. But its distance from markets, and the absence of any great natural water-way inland like the Shannon, have neutralised all its advantages.

8. Roscommon (950 square miles) belongs wholly to the great limestone plain, and the 'peninsula' between the Suck and the Shannon is very fertile.

- (1) Roscommon is the capital, and Elphin is the seat of a bishopric.

9. Mayo (about 2100 square miles) consists of a central plain rising to the mountains round Clew Bay.

- (1) The most fertile part of the plain converges on the centre of the county, where Castlebar is the natural capital; and there are two natural outlets in Westport and Ballina. The chief industry is fishing, for which the magnificent coast line is very favourable, and there are valuable slate and marble quarries.
- (2) The whole of Clew Bay is very fine, and Achill has the grandest cliffs in the kingdom—2000 feet sheer from the ocean; Newport Bay is a perfect archipelago; and Ballinrobe is the centre for the L. Mask fishery.

10. Sligo (about 700 square miles) is a broad plain rising to the Ox and the Benbulbin Hills.

- (1) Sligo, the capital, commands both the coast fisheries and the outlet of the plain between the two ranges; Ballymote and Tobercurry have cattle markets.

11. Leitrim (about 600 square miles) is mainly mountainous to the north of L. Allen, and low to the south of it, with great stretches of bog.

- (1) The only town is Carrick-on-Shannon, which has a small river trade.

RAILWAYS AND CANALS.

Chapter 33. Railways and Canals.

1. Railways, of course, follow the 'line of the least resistance'; and the general surface of the United Kingdom is very favourable both to the construction and to the working of them.

- (1) The most notable bridges are those across the Tay (10,780 feet) and the Forth (8296 feet, with single spans of 1700 feet); the most notable tunnels are the Severn ($4\frac{1}{2}$ miles) and the Totley ($3\frac{1}{2}$ miles); and the most notable gradients are the Shap and the Beattock (both 1 in 75 for 5 or 6 miles).
- (2) There are fully 22,000 miles of rail altogether in the kingdom, which is a higher average for the area than in any other country in the world except Belgium. About 15,000 are in England and Wales, and about 4000 in Scotland.
- (3) Of the various companies, the *London and North-Western* is the richest and most important, and the *Great Western* has the most mileage.

2. Ten important railways radiate from London.

- (1) The *London and North-Western* runs from Euston through Northampton, Rugby, Stafford, Crewe, and Preston, to Carlisle, where it connects with the *Caledonian*, the combined systems being known as the *West Coast Joint Stock*. From Rugby there is a branch through Coventry, Birmingham, and Wolverhampton, to Stafford; and from Crewe, which is the centre of the whole

system, there are branches to Manchester, Liverpool, and Holyhead. The line thus connects the five largest cities of the kingdom (cf. p. 123). The Irish and 'American' traffic through Holyhead is very large, and the Scotch fish traffic and the Home-Counties milk traffic are also important.

- (2) The *Great Western* runs from Paddington through Reading, Didcot, Swindon, Bath, Bristol, Exeter, and Plymouth, to Penzance. From Didcot there is a branch through Oxford, Birmingham, Wolverhampton, Shrewsbury, and Chester, to Birkenhead; from Swindon there is a branch through Gloucester, Cardiff, and Swansea, to Milford; and from Chippenham there is a branch through Yeovil and Dorchester, to Weymouth. The early vegetables of the Scilly and the Channel Islands, and the mackerel and sprats of the Cornish peninsula, are specially important.
- (3) The *Midland* runs from St. Pancras through Leicester, Derby, Sheffield, and Leeds, to Carlisle, where it connects with the *Glasgow and South-Western* and the *North British*. From Derby, which is the centre of the system, one branch runs through Birmingham, Cheltenham, and Gloucester, to Bristol; and another runs through Nottingham and Newark, to Lincoln. There are also important branches into Lancashire. The line carries a great deal of coal to London.
- (4) The *Great Northern* runs from King's Cross through Peterborough, Newark, and Retford to Doncaster, where it joins the *North Eastern*. From Retford there is a branch to the 'Cotton' towns, and from Doncaster there is one to the 'Woollen' towns. There is also an important 'Fish' branch from Peterborough to Grimsby.
- (5) The *Great Eastern* runs from Liverpool Street to Yarmouth, both through Cambridge, Ely, and Norwich, and through Ipswich; and from the latter line there is an extremely important branch to Harwich, which does a very large fish and continental traffic.

- (6) The *London and South-Western* runs from Waterloo through Woking, Basingstoke, Salisbury, and Exeter, to Devonport and Cornwall. From Woking there is an important branch through Guildford to Portsmouth, and from Basingstoke there is an important branch through Winchester to Southampton and Weymouth. There is also a very large suburban passenger traffic, especially in Surrey.
- (7) The three lines which monopolise the short cross-channel traffic are not famous for either low fares or good service. The *South-Eastern* runs from Charing Cross through Tunbridge, Ashford, and Folkestone, to Dover; the *London, Chatham, and Dover* has branches from Faversham and Canterbury, to Margate and Ramsgate; the *London, Brighton, and South Coast* has a huge local traffic (passenger) to Brighton and a large continental traffic to Newhaven.

The *Great Central* runs from Marylebone through Aylesbury, Rugby, Leicester, Nottingham, and Sheffield, to Manchester and Liverpool, with important branches to Lincoln and Grimsby.

3. There are three other great railways in England.
- (1) The *North-Eastern* runs from Normanton through York, Darlington, and Newcastle, to Berwick. It forms an important part of the 'East Coast Joint Stock' route, joining the *Great Northern* system to the *North British* (at Berwick). There are important branches to Scarborough, Middlesborough, and Carlisle.
- (2) The *Lancashire and Yorkshire* runs from Liverpool through Wigan, Bolton, Bury, and Wakefield, to Normanton, and from Manchester through Rochdale, Halifax, and Bradford, to Leeds.
- (3) The *North Staffordshire* runs through Stoke from Crewe to Derby and from Macclesfield to Stafford.

4. Scotland has four main systems.

- (1) Glasgow is the real centre of the *Caledonian*, with direct

communication through Holytown to Edinburgh, through Carstairs to Carlisle, through Paisley to Greenock and the Clyde coast, and through Stirling to Callander and Oban and to Perth, Dundee, and Aberdeen, where it joins the *Great North of Scotland*.

- (2) Edinburgh is the centre of the *North British*, with direct communication through Falkirk to Glasgow, through Dunbar to Berwick, through Melrose and Hawick to Carlisle, and over the Forth and Tay Bridges to Dundee and Aberdeen, where it too joins the G.N.S.R.
- (3) Kilmarnock is the real centre of the *Glasgow and South-Western*, with direct communication through Ayr to Girvan and Stranraer, and through Dumfries and Annan to Carlisle; and Inverness is the real centre of the *Highland*, with direct communication through Kingussie and Blair Athole to Perth, and through Dingwall to Thurso, Wick, and Strome Ferry.

N.B.—The *G.N.S.R.* is a cross-country route which joins Aberdeen to Elgin, Banff, Fraserburgh, etc.

5. Dublin and Belfast are the two chief centres of the Irish railway system.

- (1) From Dublin the *Great Southern and Western* runs through Kildare and Maryborough to Cork, with a branch to Limerick; the *Midland Great Western* runs through Mullingar, Athlone, and Ballinasloe, to Galway; the *Dublin, Wicklow, and Wexford* connects with the cross-country *Waterford and Limerick* route; and the *Great Northern* runs through Drogheda and Dundalk to Belfast.
- (2) From Belfast the *Northern Counties*—now controlled by the *Midland* (cf. p. 118)—runs through Antrim and Coleraine to Londonderry.

6. Canals are naturally much cheaper than railways, but several causes have combined against their use in this country.

- (1) In the richest mineral districts, where they are of most use, the character of the ground has often impeded

their construction ; and in Ireland, where they have been most easy to make, there is little or no traffic. In the heart of the country, where other things are favourable, the water-supply is often deficient. Moreover, some ($\frac{1}{3}$) of the existing canals have been acquired by the railway companies, and thus beneficial competition has been thwarted.*

- (2) Where time is no object, however, the canals are very useful, especially for heavy goods ; for a horse that can draw only *one* ton in a cart, can draw *forty* tons in a barge. And there is a growing tendency towards the construction of ship-canals to enable raw materials to be imported more directly to the various seats of manufacture, *e.g.* the *Manchester* and the *Berkeley*.

7. There are altogether about 4500 miles of canal, of which about 3000 are in England.

- (1) The most important single canals in England are the *Aire and Calder* and the *Leeds and Liverpool*, but the most important navigation centre is 'Birmingham.' Various canals, including the *Grand Trunk* and the *Grand Junction*, join the Mersey to the Trent, *e.g.* *via* Northwich and Stoke, and the Trent to the Thames, *e.g.* *via* Leicester and Northampton. The Trent is also joined to the Thames *via* Birmingham and Oxford, and the Thames is joined to the Severn *via* Oxford and Stroud and *via* Reading and Bristol.
- (2) The *Forth and Clyde* is a really busy highway of commerce between Grangemouth and Bowling, but the *Caledonian* and the *Crinan* are used mainly by tourist steamers.
- (3) The two great Irish canals, the *Grand* and the *Royal*, join Dublin to the Shannon, *via* respectively Tullamore and Mullingar.

* The comparative cost of rail and water transport depends largely on the heavy expenses connected with the purchase of land in densely peopled districts. For instance, parts of the underground railway in London cost £1000 *a yard*, while railways in Ireland cost only about £13,000 *a mile*.

PROBLEM PAPER.

1. Estimate the effect on the United Kingdom (U.K.) of the possible choking up of the Florida Strait with coral.
2. Show how the position of U.K. has been as favourable to sailing ships as its structure has been to a steam navy.
3. What difference would it make to U.K. if the earth rotated in the opposite direction to its present course?
4. Discuss the probable history of Great Britain if its mountain system had been along its east coast, and had expanded towards the south.
5. Criticise the statement:—"The east and the south of England, which supported the Parliament, were more prosperous than the north and west, which supported Charles."
6. What physical features now aid commerce which once hindered it? And *vice versa*.
7. What obstacles are there to the construction of a ship-canal from the Clyde to the Forth? And what would be the advantages of such a canal?
8. Estimate the effect of planting large areas, *e.g.* of the Scottish Deer 'Forests,' with hardy timber.
9. How would the distribution of population be altered if bread-stuffs ceased to be imported?
10. What determines the position, growth, and characteristic industries of an important town?
11. What industries would naturally have flourished in England if there had been no coal? Where would the natural centres of them have been?
12. Illustrate, from Ireland and the Highlands, the danger of having only one food staple, and suggest alternatives suited to the soil and climate.
13. Which of our industries are most useful to ourselves, and which are most useful to foreigners? Give reasons.
14. Show how the substitution of iron for wood in shipbuilding has affected the old shipbuilding ports.
15. Compare the probable cost of lighting the streets of Southampton and of Wick during the summer months.
16. What difference would it have made to both islands if Ireland had been situated to the east of Great Britain?

APPROXIMATE POPULATION OF CHIEF
TOWNS.

London, - - -	6,000,000	Oldham, - - -	137,000
Glasgow, - - -	760,000	Croydon, - - -	134,000
Liverpool, - - -	685,000	Blackburn, - - -	130,000
Manchester, - - -	545,000	Brighton, - - -	} - 123,000
Birmingham, - - -	520,000	Merthyr-Tydvil, }	
Leeds, - - -	430,000	Derby, - - -	} - - 115,000
Sheffield, - - -	380,000	Willesden, }	
Belfast, - - -	350,000	Preston, - - -	} - - 112,000
Bristol, - - -	330,000	Rhondda, }	
Edinburgh, - - -	315,000	Norwich, - - -	} - - 110,000
Dublin, - - -	290,000	Birkenhead, }	
Bradford, - - -	} - - 280,000	Gateshead, }	} - - 108,000
West Ham, }			
Hull, - - -	} - 240,000	Plymouth, - - -	} - 105,000
Nottingham, }			
Salford, - - -	220,000	Halifax, - - -	} - 103,000
Newcastle, - - -	215,000	Southampton, }	
Leicester, - - -	210,000	Tottenham, - - -	} - 100,000
Portsmouth, - - -	190,000	Cork, - - -	
Bolton, - - -	} - - 170,000	South Shields, }	} - 97,000
Cardiff, }			
Dundee, - - -	160,000	Burnley, - - -	} - 96,000
Aberdeen, - - -	153,000	East Ham, - - -	
Sunderland, - - -	146,000	Huddersfield, }	} - 95,000
		Swansea, - - -	
		Middlesborough, - - -	91,000

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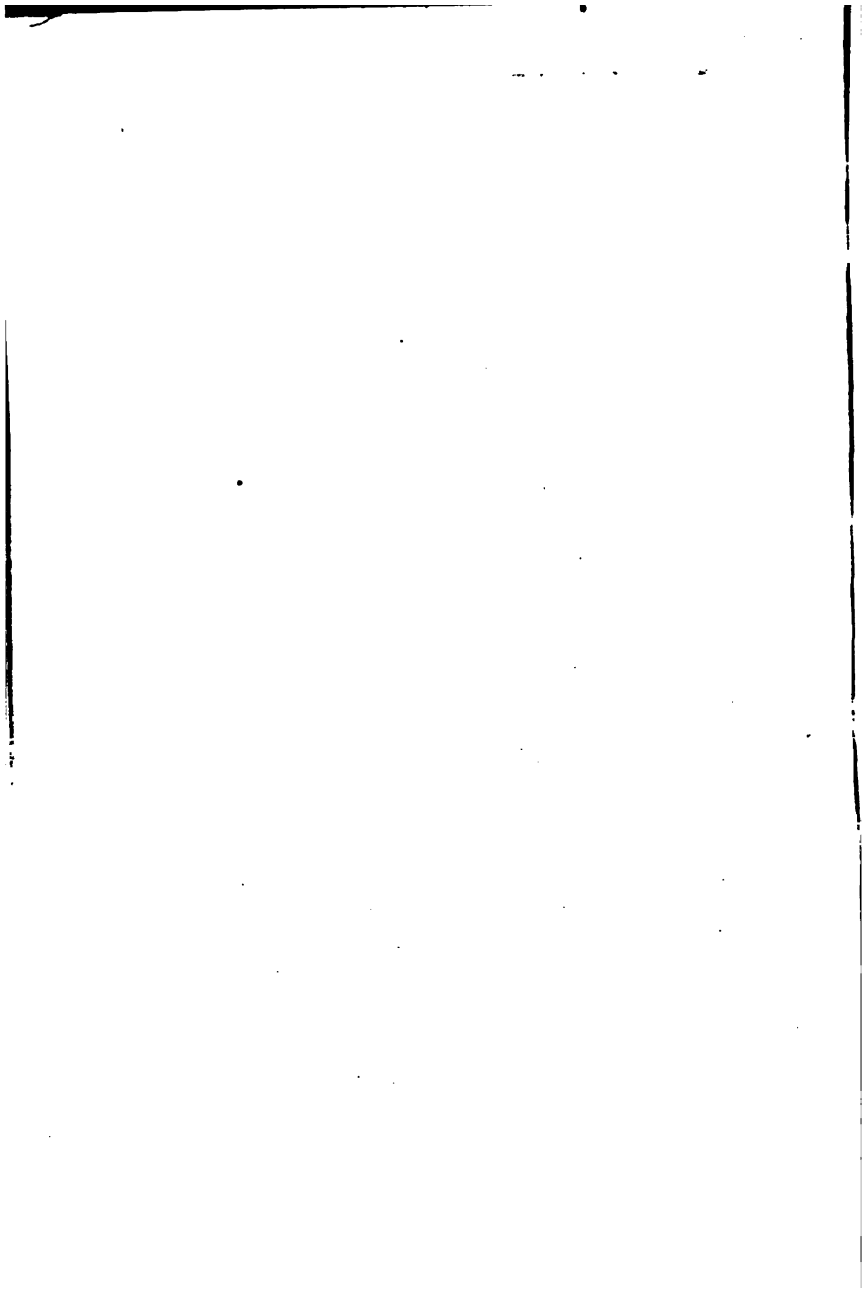
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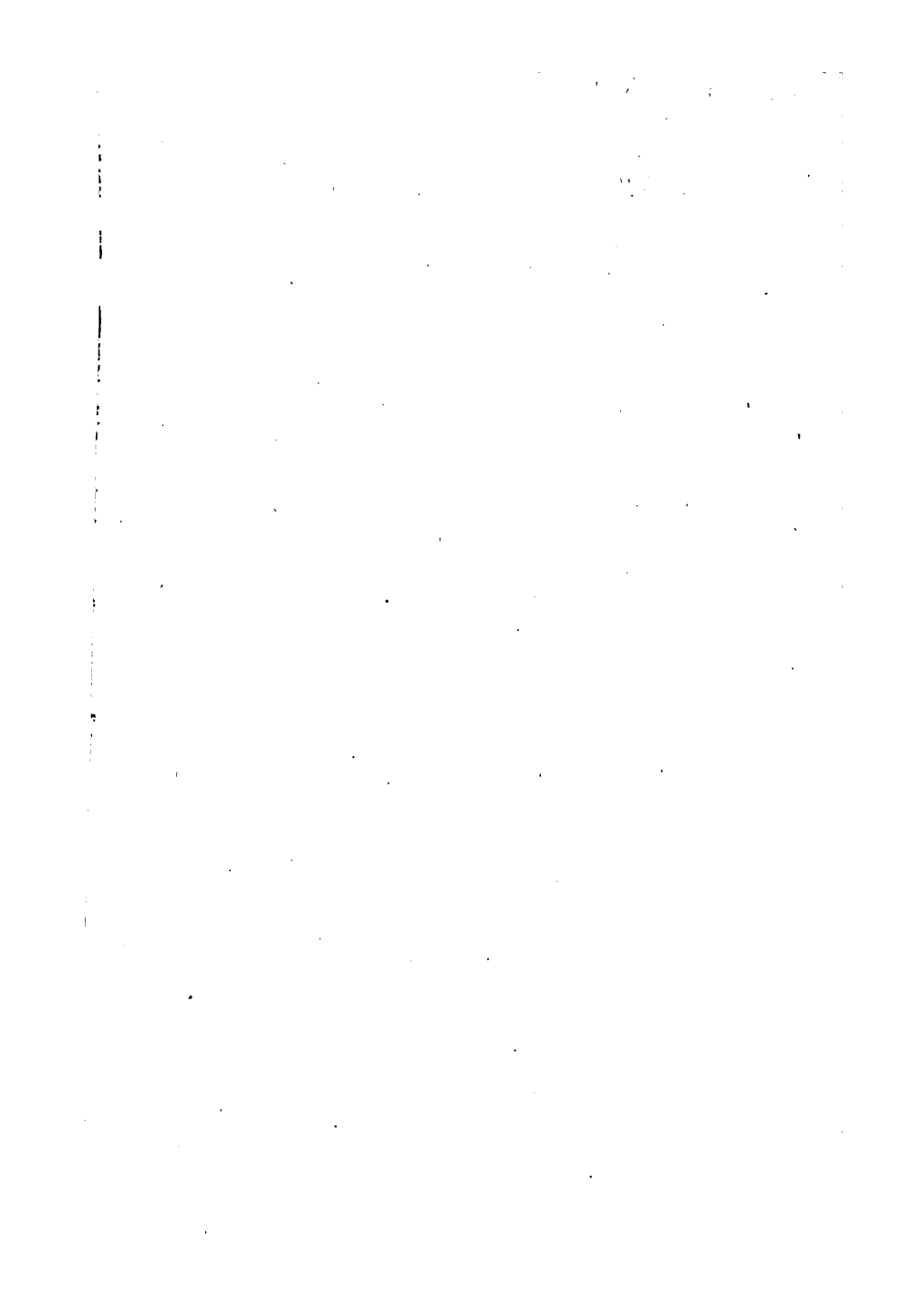
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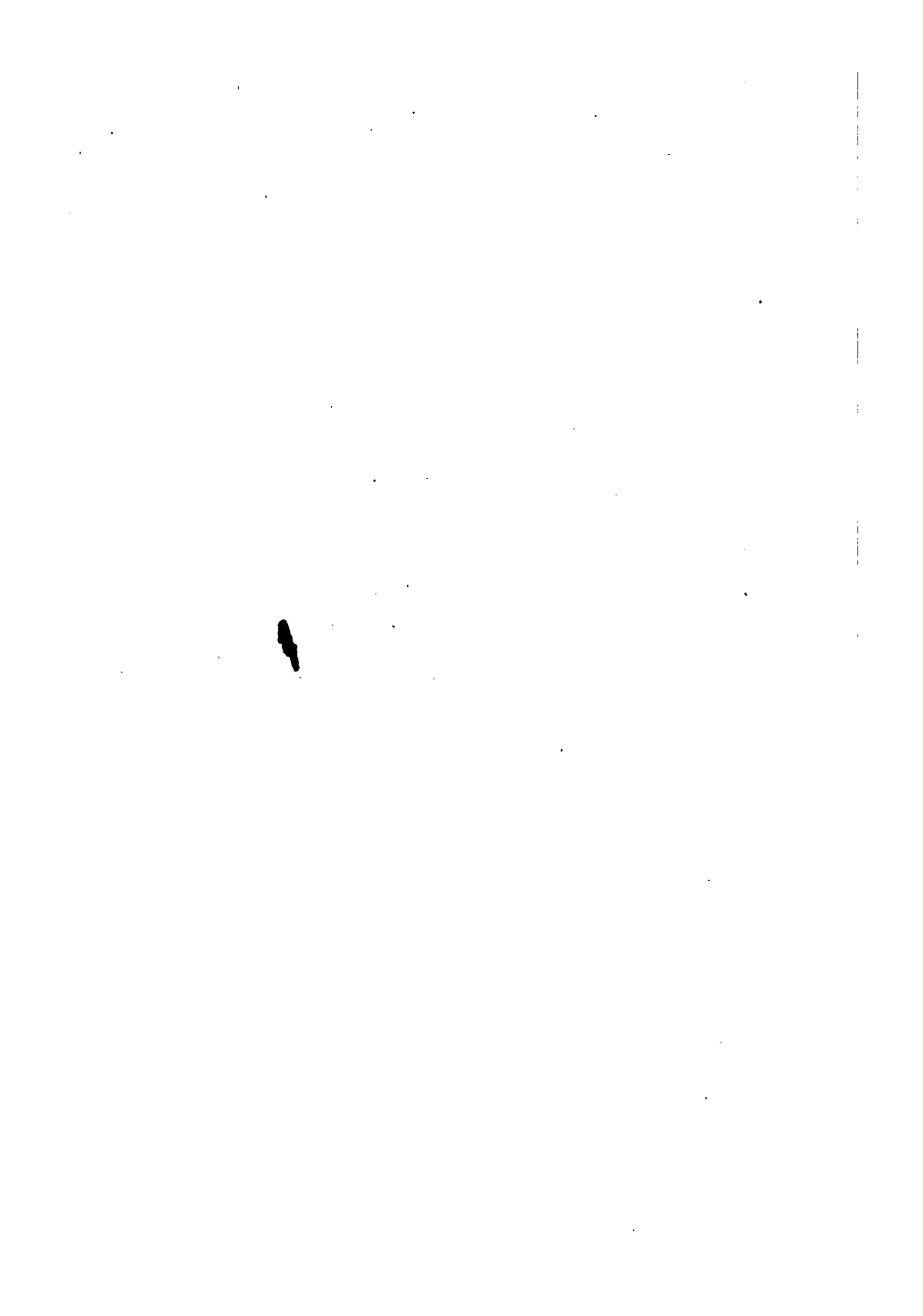
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