

that spoken in the Tyrolean valleys of Groden, Abtei, and Eneberg. It has a scanty literature, consisting of a translation of the Bible, some prayer and hymn books, and one newspaper, the *Fögl d'Engiadina*, printed once a week at Samaden. German is now taught in all the schools of the valley. The wealth of the inhabitants consists in their hay meadows and pastures. The lower Alps feed large herds of cows, the upper are let to Bergamasque shepherds, who travel thither every summer with their flocks. A considerable trade is also carried on in Italian products and Val Tellina wines, in which the Engadiner serve as carriers. Formerly many of them used to emigrate to different parts of the world, where they found employment, especially as pastry-cooks. Of late years the sudden influx of strangers has changed the picturesque villages into groups of hotels, and diverted the inhabitants from their former pursuits. The iron springs of St Moritz, the cause and centre of the immigration of summer visitors from all parts of Europe, have been known since the 16th century. They had been steadily resorted to by Germans and Italians since the days of Paracelsus, though it was not till the present century that any bath-house was erected for the convenience of the guests, who found sufficient accommodation in the village. The waters are highly charged with alkaline salts and carbonate of iron, with a small proportion of phosphoric acid, and traces of iodine, bromine, &c. Their influence, in combination with mountain air, is extremely beneficial in cases requiring strong tonic treatment.

See Coxo, *Travels in Switzerland*; Theobald, *Naturbilde aus den Rhätischen Alpen*; Ball, *Central Alps*; Mrs H. Freshfield, *A Summer Tour in the Grisons*; Caviczol, *Engadine*; Lechner, *Piz Languard*; Dr Burney Yeo, *A Season at St Moritz* (for medical and botanical information); *Fortnightly Review*, No. cxi., new series. (D. W. F.)

ENGEL, JOHANNA JAKOB (1741-1802), a German writer, chiefly distinguished as a dramatist, was born at Parchim, in Mecklenburg, on the 11th September 1741. His father was a clergyman, and he himself studied for the church, though he did not enter upon the clerical profession. He studied at Rostock and Bützow, and afterwards at Leipsic, where he took his doctor's degree in 1769. In the same year he produced his first drama, *Der dankbare Sohn*, which was received with marked approval. In 1776 he was appointed professor of moral philosophy and belles-lettres in the Joachimsthal gymnasium at Berlin, and a few years later he became tutor to the Prussian crown-prince, afterwards Frederick William III. The lessons which he gave his royal pupil in ethics and politics were published in 1798, with the title *Fürstenspiegel*, and furnish a favourable specimen of his powers as a popular philosophical writer. In 1787 he was admitted a member of the Academy of Sciences of Berlin, and in the same year he became director of the royal theatre. In the latter situation he was not successful, owing chiefly to an infirmity of temper, and he resigned it in 1794. For some time he resided at Schwerin, but on the accession of his former pupil Frederick William III. to the throne he was invited to return to Berlin, and received a pension. He died while on a visit to his native place on the 28th June, 1802.

Besides numerous dramas, some of which had a considerable success, Engel was the author of several valuable works on æsthetical subjects. His *Anfangsgründe einer Theorie der Dichtungsarten* (Leipsic, 1783) was one of the earliest works on the theory of poetry produced in Germany, and showed fine taste and acute critical faculty, if it lacked the loftier qualities of imagination and true poetic insight. The same excellences and the same defects were apparent in his *Ideen zu einer Mimik* (2 vols. Leipsic, 1785) written in the form of letters. His *Philosophie für die Welt* (Leipsic, 1788) consists chiefly of dialogues on men and morals, written in an attractive style, and con-

taining much just reflection and criticism. His last work, a romance entitled *Lorenz Stark* (Leipsic, 1795), though its plot was weak, achieved a great success, in virtue of the purity of its style, the marked individuality of its characters, and the interest of its dialogues. Engel's *Sämmtliche Schriften* were published in 12 volumes at Berlin in 1801-6, and a new edition of them appeared at Frankfurt in 1857.

ENGELBRECHTSDATTER, DORTHE (1634-1716), a Norwegian poetess, who enjoyed a very wide reputation throughout Scandinavia and over Germany during the first half of the 18th century. She was born at Bergen in January 1634; her father, Engelbrecht Jörgensen, was originally rector of the high school in that city, and afterwards dean of the cathedral. In 1652 she married Ambrosius Hardenbech, a theological writer famous for his flowery funeral sermons, who succeeded her father at the cathedral, when the latter died in 1659. By the poetess Hardenbech had five sons and four daughters. In 1678 her first volume appeared, *Sjælens aandelige Sangoffer*, (The Soul's Spiritual Offering of Song), published at Copenhagen. This volume of hymns and devotional pieces, very modestly brought out, had an unparalleled success, and surpassed in popularity every similar collection of that age. The fortunate poetess was invited to Denmark, and on her arrival at Copenhagen was presented at court. She was also introduced to Thomas Kingo, the father of Danish poetry, and the eminent pair greeted one another with a brace of improvised couplets, which have been preserved, and of which the poetess's reply is incomparably the neater. The next fifteen years of her life were extremely unhappy. In 1683 her husband died, and before 1698 she had buried all her nine children. In the midst of her troubles appeared her second work, the *Taaereoffer* (Sacrifice of Tears), which is a continuous religious poem in four books. This was combined with the *Sangoffer*, and no less than three editions of the united works were published before her death, and many after it. In 1698 she brought out a third volume of sacred verse, *Et kristeligt Valet fra Verden* (A Christian Rejection of the World), a very tame production. In her old age she was honoured by a visit from the great poet of her time, Pæter Dass, who made the laborious journey to Bergen merely to see her. She died, aged eighty-two, in 1716. The first verses of Dorthé Engelbrechtsdatter are the best; her *Sangoffer* was dedicated to Jesus, the *Taaereoffer* to Queen Charlotte Amalia; the change is significant of her different position in the eyes of the world. She is, all through, a dull and tiresome writer, but her immense fame among her contemporaries, and her merit as one of the earliest writers of verse in modern Norway, give her a position in literature.

ENGHIEN, LOUIS-ANTOINE-HENRI DE BOURBON-CONDE, DUC D' (1772-1804), was the son of Henri-Louis-Joseph, prince of Condé, and of Louise-Marie-Thérèse-Bathilde d'Orléans, and was born at Chantilly on the 2nd August 1772. He was educated privately by the Abbé Millot, and was trained in the art of war by his grandfather the prince of Condé, with whom he was present at the battle of St Omer in 1788. In 1789 he, along with the other members of his family, went into exile. In 1792 he joined the royalist forces under his father in Flanders, and on the dissolution of this army he served under his grandfather, and specially distinguished himself at the battle of Berstheim in 1793. In 1794 he was made knight of the order of St Louis, and from 1796 to 1799 he commanded the vanguard of his grandfather's forces. When these were disbanded in 1801, he contracted a private marriage with the Princess Charlotte, niece of Cardinal de Rohan, and took up his residence near Ettenheim in Baden. Being suspected of concocting a plot against Napoleon Bonaparte,

spies were placed to watch his movements, who reported, it is said falsely, that he was in the habit of making frequent secret journeys along with General Dumouriez. Bonaparte therefore thought it necessary to seize his papers, and on the 14th March 1804 caused his château to be surrounded by 400 gendarmes, who took the duke prisoner, and conducted him to Strasburg. After being brought to Paris on the 20th March, he was conducted to Vincennes, where he was tried by court martial, and without being found guilty of any definite charges, was on the morning of the 21st at four o'clock condemned to death as a traitor. Half-an-hour afterwards he was led out to execution, and as soon as he was dead he was thrown into a grave, which, in anticipation of his sentence, had been prepared beforehand. Upon Napoleon's conduct in these arbitrary proceedings various interpretations have been put, but there are scarcely materials for forming a decisive judgment. It was in reference to the execution of the

Duc d'Engbien that Fouché made the remark which has passed into a proverb: "It was worse than a crime; it was a blunder." After the Restoration the remains of the duke were removed to the chapel of the castle at Vincennes.

ENGINEERING—the art of designing and constructing works—embraces a very wide range of subjects, and the different departments into which the profession is now divided do not admit of very strict definition; but it may be mentioned that *civil engineering* includes the design and construction of canals, river navigations, harbours, docks, roads, bridges, railways, lighthouses, water supply, irrigation, sewerage, gas supply, telegraphs, &c.; *mechanical engineering* includes machinery, mill-work, steam-engines, iron shipbuilding, agricultural implements, &c.; *mining engineering* includes the working and raising of coal, iron, lead, copper, &c., and other minerals; and *military engineering* includes fortifications, gunnery, artillery, telegraphy, &c., as applied in warfare.

## ENGLAND

### PART I.—GEOGRAPHY AND STATISTICS.

#### I. Situation.—Soil and Climate.—Political and Civil Divisions.

Situa-  
tion.

ENGLAND, comprising, with Wales, the southern portion of the island of Great Britain, extends from 49° 48' to 55° 45' N. lat., and from 1° 45' E. to 5° 44' W. long., and covers an area of 58,320 square miles. It corresponds in latitude with Northern Germany and the Netherlands. In shape it is nearly triangular; and owing to its being surrounded by the sea on all sides, except for a distance of about seventy miles on the Scottish border, it has a most extensive coast-line. The seas which encircle it are the German Ocean or North Sea on the E., and the Atlantic Ocean on the W. and S., the latter receiving in some of its parts the names of the Irish or St George's Channel, and of the English Channel. The coast is much indented, more particularly on the Atlantic side, the total length, following the indentations, being estimated at over 2000 miles.

Physical  
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ture.

There are few countries more diversified in physical structure, or in soil, climate, and natural scenery, than England. As regards physical structure, it has been truly described to be in itself "an epitome of the geology of almost the whole of Europe." Nearly all the formations of the earth's crust, from the Silurian upwards to the most recent, are to be found, in layers more or less thick, in different parts of England. The lowest geological formations, known in general as Primary or Palæozoic, are met with principally in the north and north-west of England, in the counties of Cumberland and Westmoreland, and in North Wales. The rocks of Cumberland and North Wales, belonging to the Lower Silurian formation, consist mainly of slaty and gritty strata, interbedded with various kinds of felspathic lava and volcanic ashes, accompanied by numerous bosses and dykes of greenstone, quartz-porphry, and other igneous rocks. These latter contribute greatly to give rise to that peculiar mountainous aspect which distinguishes these districts. The next geological formation, above that of the Silurian, is found in the Old Red Sandstone, and the so-called Devonian rocks, which occupy extensive tracts in Devonshire, Cornwall, South Wales, Herefordshire, and Worcestershire. Above these strata comes the Carboniferous Limestone, composed entirely of sea-shells, encrinurites, and other organic remains, which formation, stretching from South Wales through the south-west of England into Derbyshire, attains in parts a thickness of 3000 feet and more. Next above the Carboniferous Limestone come the strata,

all-important to England, known as the Coal Measures, a term originally used by the miners. The beds of coal, solid basis of England's modern supremacy in arts, manufactures, and, to some extent, political power, lie upon a peculiar stratum, which generally, but not always, is of the nature of fire-clay. Coal itself is well known to consist of mineralized vegetable matter, the intermingled shales and sandstones still showing the impressions of trunks of trees, ferns, and reed-like plants, and it is supposed that this fire-clay was the original soil upon which grew the priceless treasure.

The Coal Measures are covered by the Permian rocks of England, which complete the geological formation to which the name of Palæozoic or Primary strata has been given. "During the time they were forming," says Professor Ramsay, "this part of the world suffered many ups and downs, accompanied by large denudations; but at the close of the Permian period, a disturbance of the strata on the greatest scale put an end to this great Palæozoic epoch over all our area, and much more besides, and from the Permian beds downwards to the Cambrian strata a large part of what is now England was heaved up and formed dry land, to be again wasted and worn away by sea-waves and rivers, and all the common atmospheric agencies. This old land in great part consisted of what we now know as Wales, and the adjacent counties of Herefordshire, Monmouthshire, and Shropshire, of part of Devon and Cornwall, and probably the Pennine chain, and all the mountainous parts of Scotland. Around old Wales, on three sides of Cumberland, and probably all round and over great part of Devon and Cornwall, the New Red Sandstone was deposited. Part at least of this oldest of the Secondary rocks was formed of the waste of the older Palæozoic strata that had then risen above the surface of the water."

If, in the physical structure of England, the Primary strata form a highly important element as containing the Coal Measures, the more immediate nature of the soil is determined by the Secondary and Tertiary formations. Among the Secondary strata, none are more interesting than the so-called "Wealden series" of southern England. Geologists are agreed upon the fact that the Wealden and Purbeck beds represent the delta of an immense river, equal in size to the modern Ganges or the Mississippi, the waters of which carried down to its mouth the bodies of huge reptiles and mammalia now extinct, or the semblance

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of which is to be found only in the tropical regions. But if this much is ascertained, by the evidence of organic remains found in abundance in Kent and Sussex, there is, and in all likelihood ever will be, complete ignorance as to the shape and extent of the continent which this great river drained, and of which England then formed a part. Professor Ramsay surmises that "in size it must have been far larger than Europe, and probably as large as Asia, or the great continents of North or South America."

Alterations of coast line.

The formations of the Tertiary or Eocene period lie all over England, the most recent being represented by the alluvial beds of Norfolk, Suffolk, and South Hampshire, and of the basin of the Thames. The whole of the east coast of England, and a great part of the south coast, not only bear the mark of the most recent geological changes that have taken place in this country, but are affected by a continuation of them to this day. A long extent of coast-line constantly undergoes alterations, in some instances the land gaining upon the sea, and in others, rather less numerous, the sea upon the land. The whole of Romney Marsh, in Kent, embracing upwards of 24,000 acres, formerly constituted an arm of the sea, where vessels rode in deep water, carrying produce to ports which are no more in existence. Lydd, or, as it is called in old records, Hlyda, and Romney, though maritime still in name, retaining some of the ancient privileges of the Cinque Ports, have become, through changes in the coast-line, small inland towns; and the same has been the fate of Rye, Winchelsea, and other places in that district. Again, the Isle of Thanet, in the north-eastern corner of Kent, has ceased to be an island at all but in name. The wide estuary of the sea, separating it from the mainland, and through which ships in comparatively recent times sailed from the English Channel into the Thames, using it as the shortest road from the south to London, has entirely disappeared, leaving barely a rill of water to mark its former existence.

If the sea retreated on some parts of the coast, it encroached, and is encroaching, on the firm land over a considerable extent of other coast-line on the German Ocean, at well as on the English Channel. Ravenspur, once an important town of Yorkshire, where Bolingbroke, afterwards Henry IV., landed in 1399, is now submerged by the sea waves; and Eccles-by-the-Sea, Cromer, and other ancient ports in Norfolk have met with the same fate. It is a common occurrence for the pedestrian who rambles over the Kentish hills bounding the narrower parts of the English Channel, to find that the path he is following suddenly comes to an end at the edge of the cliff, interrupted by a vertical precipice towards the shore. The process of destruction, slow in some places, is so rapid in others that it can be traced from month to month, and even from week to week—the incessant roll of the tides washing away the soft Eocene strata forming the base of the cliffs, and leaving the summits to roll over into the sea. It is the same in Yorkshire as in Kent. Over a distance of thirty-six miles, between Bridlington and Kilnsea, says Professor Phillips, "the materials which fall from the wasting cliff are sorted by the tide; the whole shore is in motion; every cliff is hastening to its fall; the parishes are contracted, the churches wasted away." Many cliffs of the east coast, from the Humber to the mouth of the Thames, are suffering from this destructive action of the sea, in some places at an average rate of from 4 to 5 yards a year, or a quarter of a mile in a century.

In conformity with the geological structure of England, its mountains lie in the north and west, falling into undulating ground in the centre and towards the south, and leaving the eastern districts, bordered by the German Ocean, a uniform plain. The mountains of England may be looked upon as one principal chain, often interrupted,

however, and with endless ramifications, stretching from the Scottish border, in Northumberland, down to the western end of Cornwall, jutting out there into the Atlantic. The chain, traced in this direction, commences with the Cheviot Hills, the highest summit of which is Cheviot Peak, in Northumberland, 2676 feet above the level of the sea. Stretching south-westward, the chain next merges into the mountain ranges of Cumberland and Westmoreland, comprising Skiddaw, 3022 feet, Helvellyn, 3118 feet, and Scawfell, 3208 feet above the level of the sea. Within these ranges lie the only notable lakes of England, the largest of which, however, Windermere, does not cover more than eight square miles. After sending out numerous branches eastwards into the county of York, the chain sinks to modest elevations in Lancashire and Cheshire, but rises again in Wales, where it attains its greatest height in the summit of Wyddva, the pinnacle of the Snowdon range, 3571 feet above the sea. Partly lost in the Bristol Channel, and partly ramifying through Gloucestershire, Wilts, and Somerset, the chain next rises into high tableland in Devonshire—Dartmoor Forest, averaging an elevation of 1500 feet above the sea-level, forming its most elevated portion. The chain gradually declines from Dartmoor to the Land's End, and becomes also more contracted in that direction. From the Dunkerry Beacon, on Exmoor, 1668 feet above the sea, the mountain range goes sinking on to Carnwarth, in Cornwall, 849 feet; to Cara Brea, 697 feet; and, finally, to the famous headland of Bolerium, the granite masses of which oppose the ever-surgings waters of the Atlantic, but rise only about 60 feet above them.

Essentially dependent on the configuration of the chain of mountains traversing England is that of its rivers. As the mountainous regions are in the west, the principal rivers flow away from them, towards the east, with but few exceptions. Surrounded by the sea, and with a moist atmosphere, England has a comparatively large number of rivers, though none of them of great length, their course being in most instances the shortest allowed by the configuration of the island. At the head of English rivers, with acknowledged supremacy over the rest, stands the Thames. It drains an area of 6160 square miles, exclusive of its lower estuary, calculated to embrace an additional drainage of about 4000 square miles. Next, in extent of area of drainage, come the Trent and Ouse, the joint waters of which form the Humber, carrying off the rainfall from 9550 square miles of land, or about one-sixth of the whole of England. The Witham, the Welland, the Nen and their tributaries, flowing into the old estuary of the Wash, drain together an area of 5850 square miles. In comparison with the drainage area of these rivers, running principally from east to west, that of currents following an opposite direction is small; but several of them are nevertheless of great commercial and industrial importance. Foremost among these westerly-flowing rivers stands the Severn, the course of which is only a short distance from the head of the Thames, the watershed being formed here by the narrow Oolitic escarpment of the Cotswold hills. The Severn drains an area of 8580 square miles, being more than that of all the other westward-running rivers together. Next to it stand the Mersey, which, with its sea-estuary, drains 1750 square miles, the Avon, which drains 1210 square miles, and the Eden, which drains 995 square miles of land. In Camden's *Britannia*, published in 1605, there is a list enumerating 553 rivers and streams, with separate names, in England and Wales; but it cannot be said that there are, at the utmost, more than fifty rivers that can properly be described as navigable. The former importance of the rivers of England, connected with each other by a vast network of canals, for inland