

wycham, and regards it as of Saxon derivation. Hutton, the historian of Birmingham, has the fanciful etymology of *Brom* (broom), *wyck* (a descent), and *ham* (a home), making together, the home on the hill by the heath. As regards the history of the town, we must agree with Hutton that "the way is long, dark, and slippery." In *Domesday Book* it is rated at four miles of land with half a mile of woods, the whole valued at £203. Two hundred years later the family of De Bermingham, the owners of the place, come into sight,—one of them, William, being killed at the battle of Evesham, in 1265, fighting with Simon de Montfort and the barons against Henry the Third. The son of this William afterwards took part in the French war, and was made prisoner; his father's estates, forfeited by treason, were restored to him. Thenceforward we find the family engaged in various local and other offices, but seemingly abstaining from politics. They held the place until 1527, when Edward de Bermingham was deprived of his property by means of John Dudley, duke of Northumberland, who trumped up a pretended charge of riot and robbery against him, and procured Birmingham for himself. On the attainder of Dudley the manor passed to the Crown, and was granted to Thomas Marrow, of Berkswell, from whom by marriage and descent it went to Christopher Musgrave, and finally, as regards the only valuable part—the market tolls—by purchase to the town itself. In the Wars of the Roses it does not seem that Birmingham took any part; but energy revived in the civil war under Charles I., when the town sided actively with the Parliamentarians. In 1642, when Charles was marching from Shrewsbury to relieve Banbury, the Birmingham people seized part of his baggage, including much plate, money, and wine, which they sent to the Parliamentary garrison at Warwick. Before the battle of Edgehill Charles rested for two nights at Aston Hall, near the town, as the guest of Sir Thomas Holte. The Birmingham people resented this by helping the Parliamentarians to cannonade the hall and to levy a fine upon Sir Thomas Holte. They also set to work, and supplied the Parliamentary army with 15,000 sword blades, refusing to make a single blade for the Royalists. These manifestations of hostility were avenged in April 1643, by Prince Rupert, who, with 2000 men and several pieces of artillery, attacked the town, planting his cannon on an eminence near Sparkbrook, still known as Camp Hill. The townspeople resisted, but were beaten, many persons being killed or wounded. Amongst the former was Lord Denbigh, one of the Royalist officers. Having captured the place, Prince Rupert allowed his troops to plunder it, to burn about eighty houses, and to set their prisoners to ransom. He also levied a fine of £30,000, equal to at least £100,000 of the present value of money. This bitter lesson kept Birmingham quiet during the rest of the civil war, though the sympathies of the people with the Parliamentarians were unabated. In 1665 Birmingham suffered heavy losses by the plague, great numbers of dead being buried in the Pest Field, at Ladbroke wood, then a lonely place far outside the town, but long since thickly covered with buildings. In 1688 the Revolution provoked a temporary outbreak of Protestant feeling. James II. had given timber from the royal forest of Needwood, near Burton, to build a Catholic chapel and convent in a place still called Mass-house Lane. This edifice the mob promptly destroyed when James gave place to William and Mary. Rather more than a century of quiet prosperity ensued, and then occurred the serious and most lamentable outbreak of popular fury known as the Church and King riots of 1791. For some years there had been much political activity in Birmingham, the dissenters, particularly the Unitarians, being desirous of relief from the political and religious disabilities under which they laboured. The leader in these movements was the famous Dr Priestley, who kept up an active controversy with the local clergy and others, and thus drew upon himself and his co-religionists the hatred of the more violent members of the Church and Tory party. The smouldering fire broke out on the occasion of the French Revolution. On the 14th of July a dinner of Birmingham Liberals was held at the Royal Hotel to celebrate the destruction of the Bastille. This was the signal of a popular outbreak. A Church and King mob, encouraged and organized by leaders of better station, but who were too cowardly to show themselves, began an attack upon the Unitarians. Dr Priestley was not present at the dinner, but his house at Fair Hill, Sparkbrook, was one of the first to be sacked and burnt—his library and laboratory, with all his manuscripts, the records of life-long scientific and philosophical inquiries, perishing in the flames. The house and library of Hutton, the historian and antiquary, were also destroyed. The Unitarian chapel was burnt, and several houses belonging to members of the sect were sacked and burnt. The riot continued until a strong body of troops was marched into the town, but before their arrival damage to the amount of more than £60,000 had been done. Some of the rioters perished in the burning buildings, in the cellars of which they drank themselves into stupefaction. Others were tried and imprisoned, and four of the prisoners were hanged. The persecuted Unitarians recovered a small part of their losses from the county; but Dr Priestley himself, owing to the unworthy prejudice against him, was in a great measure forced to remove to the

United States of America, where he spent the rest of his life. A late atonement was made by the town to his memory in 1873, by the erection of a statue in his honour in front of the Town-Hall, and the foundation of a Priestley scholarship at the Midland Institute.

As if ashamed of the excesses of 1791, Birmingham thenceforth became a thoroughly Liberal and, with one or two exceptions, a peaceful town. In the dismal period from 1817 to 1819, when the manufacturing districts were heavily distressed and were disturbed by riots, Birmingham remained quiet. Even when some of the inhabitants were tried and punished for demanding parliamentary representation, and for electing Sir Charles Wolseley as their delegate, there was no demonstration of violence—the wise counsels of the leaders inducing orderly submission to the law. The same prudent course was observed when in the Reform agitation of 1831–32 the Political Union was formed, under the leadership of Thomas Attwood, to promote the passing of the Reform Bill. Almost the whole town, and great part of the surrounding district, joined in this agitation; vast meetings were held on Newhall Hill; there was much talk of marching upon London 100,000 strong; but, owing to the firmness and statesmanship of Mr Attwood and his associates, there was no rioting or any sign of violence. Ultimately the Political Union succeeded in its object, and Birmingham helped to secure for the nation the enfranchisement of the middle classes and other political reforms. One exception to the tranquillity of the town has to be recorded—the occurrence of riots in 1839, during the Chartist agitation. Chartism took a strong hold in Birmingham, and, under the influence of Mr Feargus O'Connor and some of his associates, nightly meetings of a threatening character were held in the Bull Ring. The magistrates resolved to put these down, and having obtained the help of a detachment of the metropolitan police—the town then having no local police force—a meeting was dispersed, and a riot ensued, which resulted in injury to several persons, and required military force to suppress it. This happened on the 4th of July. On the 15th of the same month another meeting took place, and the mob, strongly armed and numbering many thousands, set fire to several houses in the Bull Ring, some of which were burned to the ground, and others were greatly damaged. The military again interfered, and order was restored, several of the ringleaders being afterwards tried and imprisoned for their share in the disturbance. There was another riot in 1867, caused by the ferocious attacks of a lecturer named Murphy upon the Roman Catholics, which led to the sacking of a street chiefly inhabited by Irishmen; but the incident was comparatively trivial, and further disorders were prevented by the prompt action of the authorities. (J. T. B.)

BIRON, ARMAND DE GONTAULT, a baron and marshal of France, and a celebrated general, who signalized himself by his valour and conduct in several sieges and battles in the 16th century. He was made grand master of the artillery in 1569, and commanded at the siege of Rochelle, and in Guienne. He was one of the first who declared for Henry IV.; he brought a part of Normandy under his subjection, and dissuaded him from retiring to England or Rochelle. Biron was killed by a cannon-ball at the siege of Epernay, July 26, 1592. He was a man of considerable literary attainments, and used to carry a pocket-book, in which he noted everything that appeared remarkable. This gave rise to a proverb at court, when a person happened to say anything uncommon, "You have found that in Biron's pocket-book."

BIRON, CHARLES DE GONTAULT, son of the above and born in 1562, created duke of Biron and admiral of France by Henry IV., was a man of great intrepidity, but fickle and treacherous. In 1601 he was sent as ambassador to the court of queen Elizabeth to announce his royal master's marriage with Mary of Medici; but being discovered in a treasonable correspondence with Spain, he was beheaded in the Bastille at Paris, July 31, 1602. The extent to which he had carried his treason was not great, and Henry by sparing his life would not have shown undue clemency.

BIRS NIMRUD. See **BABYLON**, page 183.

BISACCIA, a city of Italy, in the Principato Ulteriore, 60 miles E. of Naples. It is a bishopric in conjunction with St. Angelo, and contains 5342 inhabitants. Formerly it was the chief city in a principality belonging to the Pignatelli family, and it is believed to occupy the site of the ancient Romulea, a Samnite town of considerable size which was captured by the Romans about 297 B.C.

BISCAY, or **VIZCAYA**, one of the three Basque provinces of Spain, with the title of Seignory. It is bounded on the N. by the bay to which it gives its name, E. by Guipuzcoa, S. by Alava, and W. by Santander. Its area is 845 square miles, and its population in 1867 was 183,098. The coastline, which extends from Ondarroa to a short distance to the east of Castro, is bold and rugged, and in some places is deeply indented. The only river of any size is the Nervion or Ibaizabal, on which Bilbao is situated; the others, which are numerous, are merely large mountain streams. The surface of the country is for the most part very mountainous, but at the same time is diversified with numerous narrow valleys and small plains. Some of the mountains are almost entirely composed of naked calcareous rock, but most of them are covered to their summits with forests of oaks, chestnuts, or pine trees. Holly and arbutus are also common, and furze and heath abound in the poorer parts. The province produces wheat, maize, barley, rye, flax, grapes, peaches, apples, and other fruits. The farms are generally small, and are for the most part tilled by manual labour. The wild boar, lynx, fox, and other wild animals, are found in the forests; and deer, rabbits, partridges, woodcocks, and other kinds of game are plentiful. Sheep and goats are the principal domestic animals. In minerals Biscay is very rich. Iron of the finest quality is found in almost every part, and forms a main article of export. The best mines are those of Somorostro, near the coast. The amount obtained in 1866 was about 80,000 tons. Lead, zinc, alum, and sulphur, are also present in smaller quantities; and marble, lime, and sandstone are abundant. The manufacture of the iron ore is the chief branch of industry; but porcelain, linens, copper and brass wares, ropes, and leather, are also produced. The fisheries are actively prosecuted along the coast by a hardy race of fishers, who were the first of their craft in Europe to pursue the whale, formerly abundant in the Bay of Biscay. Cod, bream, tunny, and anchovy are the principal fish taken. Bilbao is the capital of the province, with a population of 17,649; the other towns, Portugaleta, Miravalles, Durango, and Orozco, are all very small. The principal ports, besides Portugaleta, are Plencia, Bermeo, and Hea. After the fall of the Romans this Cantabrian province came successively into the hands of the Suevi, Franks, and Goths, and formed for some time an independent lordship. The legislative authority was exercised by the lord and a junta of popular representatives. The latter regularly assembled every two years, and on any emergency held an extraordinary meeting under an old tree at Guernica. Although incorporated with Spain, the Biscayans still maintain a republican form of administration, nominating their own governors and magistrates, regulating the amount of the taxes, and exercising various other privileges. They are a brave and active people, and their history is largely composed of exploits in defence of their liberties. For their linguistic and ethnographic affinities, see the article **BASQUE PROVINCES**. The name Biscay is not unfrequently employed as geographically equivalent to Basque, in that case including the three provinces of Biscay proper, Guipuzcoa, and Alava.

BISCAY, BAY OF, in French the *Golfe de Gascogne*, and the Roman *Sinus Aquitanicus*, an extensive gulf or bay of the Atlantic, enclosed by the northern coast of Spain and the western coast of France. It extends from the island of Ushant, on the coast of Finistère, to Cape Ortegal on the north of Galicia. In the Spanish portion of the bay the water is about 200 fathoms deep, while in the French portion it is only 20 fathoms. Navigation is impeded by strong westerly winds, and by Rennel's Current, which sets in from the west and sweeps along the southern and eastern shores sometimes at a rate of 27 miles

a day. The Loire, Charente, Gironde, and Adour, besides numerous smaller streams from the Spanish mountains, fall into the bay.

BISCEGLIA, perhaps the ancient *Natium*, a fortified seaport of Italy, in the province of Terra di Bari, situated on a rocky promontory on the Adriatic, 21 miles W.N.W. of Bari. It is the seat of a bishopric, and has a cathedral, numerous churches and convents, and a theatre. Some ruins still exist of a hospital, founded by Bohemund for pilgrims to the Holy Land. Its harbour is only accessible to small vessels, and it has little trade. Being destitute of springs, it has numerous reservoirs for the collection of rain-water. Population, 21,371.

BISCHWEILER, a town of Alsace, 14 miles N. of Strasburg, on the railway from Hagenau. It has manufactures of woollen and linen stuffs, oil, soap, earthenware, &c., and some trade in hops, hemp, leather, and tobacco. Population in 1871, 9220, including that of Hanhoffen, which numbered 689.

BISCUIT. See **BAKING**, page 252.

BISHOP, the title of an ecclesiastical dignitary set over the presbyters and deacons at a very early period in the Christian church. The word is derived from the Saxon *bisceop*, which is a corruption of the Greek word *episcopos*, which signifies an "overlooker" or "overseer," and the churches in which the order of bishops is recognized as distinct from and superior to the order of presbyters are styled "Episcopal churches." The early history of the Episcopal order is obscure, but it would appear that the first bishops were established in the chief cities of Christendom, and each bishop had a certain territorial district placed under his superintendence, whence the city was termed the see (*sedes*) of the bishop, and the district his parish (*παροικία*), and subsequently his diocese (*διοίκησις*). In course of time the districts assigned to the first bishops became too populous, whereupon the clergy of each diocese, as the case might be, appear to have assembled and to have subdivided the diocese, and to have selected a second bishop, and so bishops and dioceses were multiplied, according to the wants of the churches, until it was thought expedient to reserve the right of erecting new bishoprics to provincial councils, and this reservation was made a rule of the church by a decree of the Council of Sardica. Meanwhile the bishops of the new sees had grouped themselves round the bishops of the more ancient sees, who exercised over them a certain spiritual authority as primates, and presided in their councils; and as some of the great cities in which the sees of the first bishops had been established were distinguished by the title of "metropolis," or mother-city, and were in fact the chief cities of civil provinces of the Roman empire, the bishops of those sees came to be distinguished by the title of metropolitan bishops, and exercised a superior authority in the councils of the church in proportion to the greater importance of their respective sees. This superior dignity of the metropolitan bishops over the others was formally recognized at the Council of Nicea as being in accordance with custom. Upon the establishment of Christianity as the religion of the Roman empire a coercive jurisdiction was engrafted on the spiritual superiority of the metropolitan, and the district over which the metropolitan exercised this jurisdiction was termed his province, the earliest ecclesiastical provinces being for the most part conterminous with the civil provinces of the empire. From the circumstance that there was no metropolitan city in Western Africa, the term metropolitan was never adopted in the Carthaginian Church, the senior bishop of that church being termed the primate, and having precedence and authority as such over the other bishops.

In the Church of Rome the Pope claims of right the

appointment of all the bishops; but the exercise of this right is modified by concordats with the sovereigns of the respective states. In France, since the concordat between Pope Leo X. and King Francis I., the sovereign has had the exclusive right of nominating the bishops, but the nomination is subject to the Pope's confirmation. In Austria (with the exception of four bishoprics), in Bavaria, in Spain, and in Portugal, the bishops are also nominated by the sovereign. In some countries the bishops are elected by the chapter of the cathedral church, as in Würtemberg, or by the bishops of the province, as in Ireland. In England, in the United States of America, and in Belgium, the Pope selects one out of a list of candidates submitted to him by the chapter. In all cases the bishop-nominate or the bishop-elect, as the case may be, has to obtain from the Holy See certain letters, entitled provisions, to authorize his consecration, and to recommend him to the protection of the sovereign and to the good offices of his metropolitan.

In the Church of Russia, after its separation from that of Constantinople, the right to elect a bishop was for some centuries vested in a synod of bishops, but by a regulation of the Emperor Peter the Great, the Holy Synod was restricted to recommend two persons to the sovereign for him to select one of them to be bishop. This regulation, however, is not always observed, and the sovereign, if he thinks fit, sets aside the list submitted to him by the Synod, and nominates of his own choice a person whom the Synod is obliged to elect. In Russia a diocese sometimes contains two capital cities, and the bishop has his title from both.

In the Church of the Levant, properly called the Greek Church, which is governed by the four patriarchs of Constantinople, Antioch, Jerusalem, and Alexandria, each patriarch has the right of confirming the election of the bishops within his patriarchate; but the firman or barot of the sultan is likewise necessary to give full authority to the bishops after their confirmation.

The bishops of the Church of England are twenty-eight in number, two of them being metropolitans, namely, Canterbury and York, who enjoy the more dignified title of archbishop, and have a special precedence assigned to them by law (see ARCHBISHOP). The twenty-six diocesan bishops, with the exception of the bishop of the Isle of Man, who is designated the bishop of Sodor and Man, are lords of parliament, and take precedence of the barons in the House of Lords; but the junior bishop for the time being is, by statute, disentitled from being summoned to parliament. From this disqualification the bishops of London, Durham, and Winchester are exempt. These three bishops have precedence over one another in the order in which their names are above mentioned, and they precede all the other bishops, the latter taking precedence of one another according to the date of their appointment. The junior bishop who has a seat in parliament acts as chaplain to the House of Lords.

In the Church of England the bishops exercise certain spiritual functions which are held not to be within the competence of the presbyters. They alone can administer the rite of confirmation to baptized persons, and they alone can ordain candidates for the sacred ministry. These functions the bishops exercise in virtue of their order, but they are also empowered by law to exercise a certain jurisdiction over all consecrated places and over all ordained persons. This jurisdiction they exercise for the most part through their consistorial courts, or through commissioners appointed under 3 and 4 Vict. c. 86, called the Church Discipline Act. The bishops also exercise a certain jurisdiction over marriages, inasmuch as they have by the canons of the Church of England a power of dispensing

with the proclamation of bans before marriage. These dispensations are termed marriage licences, and their legal validity is recognized by the Marriage Act, 4 Geo. IV. c. 76. The bishops had formerly jurisdiction over all questions touching the validity of marriages and the status of married persons, but this jurisdiction has been transferred from the consistorial courts of the bishops to a court of the Crown by 20 and 21 Vict. c. 85. They have in a similar manner been relieved of their jurisdiction in testamentary matters, and in matters of defamation and of brawling in churches; and the only jurisdiction which they continue to exercise over the general laity is with regard to their use of the churches and churchyards. The churchwardens, who are representative officers of the parishes, are also executive officers of the bishops in all matters touching the decency and order of the churches and of the churchyards, and they are responsible to the bishops for the due discharge of their duties; but the abolition of church-rates has relieved the churchwardens of the most onerous part of their duties, which was connected with the stewardship of the church funds of their parishes.

The bishops are still authorized by law to dedicate and set apart buildings for the solemnization of divine service, and grounds for the performance of burials, according to the rites and ceremonies of the Church of England; and such buildings and grounds, after they have been duly consecrated according to law, cannot be diverted to any secular purpose except under the authority of an Act of parliament.

The bishops of England have also jurisdiction to examine clerks who may be presented to benefices within their respective dioceses, and they are bound in each case by the 95th canon of 1604 to inquire and inform themselves of the sufficiency of each clerk within twenty-eight days, after which time, if they have not rejected him as insufficiently qualified, they are bound to institute him, or to license him, as the case may be, to the benefice, and thereupon to send their mandate to the archdeacon to induct him into the temporalities of the benefice. Where the bishop himself is patron of a benefice within his own diocese he is empowered to collate a clerk to it,—in other words, to confer it on the clerk without the latter being presented to him. Where the clerk himself is patron of the living, the bishop may institute him on his own petition. See BENEFICE.

The qualifications of a bishop of the Church of England are, that he should be a learned presbyter of at least thirty years of age, born in lawful matrimony, and of good life and behaviour. The mode of his appointment is regulated by 24 Henry VIII. c. 20. Upon the avoidance of a bishopric the Crown is authorized to issue to the dean and chapter of the cathedral church of the see a licence for them to proceed to the election of a bishop, accompanied by a letter missive containing the name of the person whom they are to elect. The dean and chapter are thereupon required, within twelve days, to elect the person so named by the Crown to be the bishop of the vacant see, failing which election the Crown is empowered to name, by letters patent under the Great Seal addressed to the archbishop and metropolitan of the province, such person to be bishop as the Crown shall think able and convenient. Upon the election being reported to the Crown, a mandate issues from the Crown to the archbishop and metropolitan, requesting him and commanding him to confirm the election, and to invest and consecrate the bishop-elect. Thereupon the archbishop issues a commission to his vicar-general to examine formally the process of the election of the bishop, and to supply by his authority all defects in matters of form, and to administer to the bishop-elect the oaths of allegiance, of supremacy, and of canonical obedience.

After this formal confirmation of the bishop's election has taken place, the archbishop, with the assistance of at least two bishops, proceeds to consecrate the bishop-elect. The most important part of the religious ceremony on this occasion consists in the imposition of hands, in other words, in the archbishop and the bishops placing their hands simultaneously upon the head of the bishop-elect kneeling before them, and in the name of the Holy Trinity committing to him his office of bishop; after which the archbishop delivers to him the Holy Bible and addresses to him a short admonition to preach faithfully the Word of God. The bishop is required afterwards, by statute, to do homage to the Crown, upon which he is put into possession of the temporalities of his see. In the case of the avoidance of the archbishopric of either province, the Crown sends a mandate to the archbishop of the other province to confirm and consecrate the archbishop-elect, and the practice is, for the most part, for the archbishop of the other province to send a commission to four or more bishops of the province of the archbishop-elect to confirm his election and to invest and consecrate him.

Doubts having been raised whether a bishop of the Church of England, being a lord of parliament, could resign his seat in the Upper House of parliament, although several precedents to that effect are on record, a statute of the realm (19 and 20 Vict. c. 115), which is confined to the case of the bishops of London and Durham, was passed in 1856, declaring that on the resignation of their sees being accepted by their respective metropolitans, those bishops should cease to sit as lords of parliament, and their sees should be filled up in the manner provided by law in the case of the avoidance of a bishopric. By a subsequent statute (32 and 33 Vict. c. 111), provision has been made for the case of an archbishop or bishop being permanently incapacitated by age or mental infirmity. If the archbishop or bishop is capable of executing an act of resignation, a representation may be made to the Crown, which is empowered to declare the see to be vacant, but if the archbishop or bishop should be incapacitated from intimating his desire to resign his bishopric, the Crown may grant a licence to the dean and chapter of the cathedral church of the diocese to appoint a bishop-coadjutor. This Act was to be in force for two years; it has been continued for three years more by 35 and 36 Vict. c. 40.

A peculiar institution of the Church of England, established by 26 Henry VIII. c. 14, having been long allowed to remain dormant, has been recently revived, under which every archbishop and bishop, being disposed to have a suffragan to assist him, may name two honest and discreet spiritual persons for the Crown to give to one of them the title, name, style, and dignity of a bishop of any one of twenty-six sees enumerated in the statute, as the Crown may think convenient. The Crown, having made choice of one of such persons, is empowered to present him by letters patent under the great seal to the metropolitan, requiring him to consecrate him to the same name, title, style, and dignity of a bishop; and the person so consecrated is thereupon entitled to exercise, under a commission from the bishop who has nominated him, such authority and jurisdiction, within the diocese of such bishop, as shall be given to him by the commission, and no other.

The first colonial bishopric of the Church of England was that of Nova Scotia, founded in 1787, since which time various colonial bishoprics have been established, some of which were constituted by letters patent of the Crown only, whilst others have been confirmed by acts of the imperial or colonial legislatures. With regard to those bishoprics which have been constituted by letters patent of the Crown only, where the bishopric has been established in a Crown colony, the bishop is legally entitled to exercise the jurisdiction conferred upon him by the letters patent; but where the bishopric has been established in a colony possessing at the time an indepen-

dent legislature, the bishop is not entitled to exercise such jurisdiction unless it has been confirmed to him by an imperial or colonial statute. The report of the judicial committee of the Privy Council in the case of the bishop of Natal (Moore's *Privy Council Reports*, N.S., iii. p. 115) is an exposition of the law on this subject. On the other hand, where bishoprics have been constituted by letters patent of the Crown, in pursuance of imperial statutes, as was the case of the East Indian bishoprics, or where bishoprics constituted by letters patent have subsequently been confirmed or recognized by colonial statutes, the bishop's jurisdiction is complete; otherwise his authority is only pastoral or spiritual. The practice adopted by the Crown, since the decision of the judicial committee in the case of the bishop of Natal has revealed the invalidity of the letters patent granted to many colonial bishops, has been to grant licences to the archbishop of Canterbury to consecrate bishops for the colonies without any definite diocese, and without any authority to exercise coercive jurisdiction. The Crown has also revoked the letters patent erecting Gibraltar into a bishop's see, and the last appointed bishop has been consecrated under a licence from the Crown, and is a titular bishop, having only consensual authority in that colony. (T. T.)

BISHOP, SIR HENRY ROWLEY, musical composer, was born in London on the 18th November 1786. He received his artistic training from Francesco Bianchi, at whose instance, probably, he was employed to write his first work, the ballet of *Tamerlan et Bajazet*, produced at Covent Garden in 1806. This proved successful, and was followed within two years by several others, of which *Caractacus*, a pantomimic ballet, written for Drury Lane, may be named. In 1809 his first opera, *The Circassian's Bride*, was produced at Drury Lane; but by a singular misfortune the theatre was burned down after one performance, and the score of the work perished in the flames. His next work of importance, the opera of *The Maniac*, written for the Lyceum in 1810, established his reputation, and probably secured for him the appointment of composer for Covent Garden theatre. The numerous works—operas, burlettas, cantatas, incidental music to Shakespeare's plays, &c.—which he composed while in this position, are now in great part forgotten. The most successful were—*The Virgin of the Sun* (1812), *The Miller and his Men* (1813), *Guy Raverling* and *The Slave* (1816), *Maid Marian and Clari*, introducing the air of "Home, Sweet Home" (1822). His English adaptations, or rather mangled versions, of Mozart's *Don Giovanni* and *Figaro*, and Rossini's *Il Barbiere* and *Guillaume Tell*, were certainly no true service to art. It seems almost incredible that a man of Bishop's undoubted genius should have been so misguided as to suppress the incomparable *Figaro* overture of Mozart in favour of one of his own. In 1824 Bishop was induced by Elliston to transfer his services from Covent Garden to the rival house in Drury Lane, for which he wrote with unusual care the opera of *Aladdin*, intended to compete with Weber's *Oberon*, commissioned by the other house. As was to be expected the result was a failure, and with *Aladdin* Bishop's career as an operatic composer may be said to close. On the formation of the Philharmonic Society (1813) Bishop was appointed one of the directors, and he took his turn as conductor of its concerts during the period when that office was held by different musicians in rotation. In 1841 he was appointed to the "Reid" chair of music in the University of Edinburgh, but he resigned the office in 1843. He was knighted by the queen in 1842, being the first musician who ever received that honour. In 1848 he succeeded Dr Crotch in the chair of music at Oxford. The music for the ode on the occasion of the installation of Lord Derby as chancellor of the university (1853) proved to be his last work. He died on the 30th April 1855 in impoverished circumstances, though few composers ever made more by their labours. Bishop's name will live in connection with his numerous glees, songs, and smaller compositions, rather than with his larger works, which are now seldom or never performed in their entirety. His Shake-

spear songs and glees are familiar favourites with all vocalists, and genius is discernible in not a few of them. His melodies are clear, flowing, appropriate, and often charming; and his harmony is always pure, simple, and sweet. He was a prominent example of both the strength and the weakness of the native English school, in which the name of Purcell alone stands unquestionably higher than his.

BISHOP-AUCKLAND, a market-town of England, in the county of Durham, 11 miles south-west of the city of Durham. It is beautifully situated on an eminence near the confluence of the Wear and the Gaunless; its streets are well paved and lighted, and there is a good supply of water. The parish church is 1 mile distant, at Auckland St Andrews, but there are several churches and chapels in the town. The town-house, which dates from 1863, is a handsome building, with a tower 100 feet in height; and the palace of the bishop of Durham, which stands at the north-east end of the town, is a spacious and splendid though irregular pile. The site of the palace was first chosen by Bishop Anthony Beck, in the time of Edward I. The present building covers about 5 acres, and is surrounded by a park of 800 acres. The principal industrial establishments are cotton-factories and engineering works; and in the neighbourhood of the town are several coal-mines. Population of local board district in 1871, 8736.

BISHOP-STORTFORD, a market-town of England, on the eastern border of Herts, 11 miles E.N.E. of Hertford, and 32 miles by railway from London. It is situated on both sides of the River Stort, a tributary of the Lea, and has thus direct water communication with the metropolis. The parish church of St Michael's, a fine building with a spire, dates from the reign of Henry VI., but was partly rebuilt in 1820. A town-house, a corn exchange, a union workhouse, a high school, a collegiate school, and a diocesan training school, are among the chief buildings; and there are also public baths, libraries, and banks. The industrial establishments comprise a brewery, malt-houses, coach-works, lime-kilns, and a foundry; and the trade consists chiefly in grain and malt. Stortford was in existence before the Norman conquest; and its castle, known as Waytemore Castle, was presented by William the Conqueror to Maurice, bishop of London, and his successors. The building was, however, demolished by King John, and only a few ruins remain. Sir H. Chauncey, the historian of Hertfordshire, and Hoole, the translator of Tasso, were both natives of Stortford. Population of the parish in 1871, 6250.

BISHOP-WEARMOUTH, a township of Durham in England, now incorporated in the parliamentary borough of Sunderland. See **SUNDERLAND**.

BISKARA, or **BISKRA**, a town of Algeria, in the province of Constantine, and the most important military post of the Sahara. It lies on the south side of the Aures Mountains, in a fertile district, watered by the Wadi Biskra. The streets of the town are broad, and its houses are for the most part built of brick, one story high, and with terraced roofs. Among the principal buildings are the fort of St Germain, the caravanserai, the hospital, and the barracks. A large caravan trade between the Sahara and the Tell passes through the town; iron, limestone, and saltpetre are obtained in the neighbourhood, and the surrounding country yields abundance of valuable dates. The chief articles of manufacture are burnous and carpets. An acclimatization garden has been established at Beni-Morra by the French, who first made themselves masters of Biskara in 1844. Population in 1872, 7367.

BISMUTH. This metal appears to have been unknown to the older metallurgical writers, it having been first noticed by Agricola, who speaks of it as a form of lead, and describes the method of separating it from its associ-

ated minerals by lixiviation. Mathesius in his *Bergpostilla*, written between 1553-1562, describes it as white like pyrites, and occasionally cubical like marcasite, easily overcome by the fire when melted, and running together with the tin, which thereby is rendered brittle and unsound,—the last remark referring to its occurrence with tin ores in Saxony. It was considered by the miners as a hopeful indication of silver, and even in certain cases is said to have been transformed gradually into that metal, as portions of the ore which had lain for some time exposed were found afterwards to be partly or wholly changed into silver. This remark is interesting, as the same belief seems to have come up again in our own time. The name *Wismuth* is a miner's term, whose origin is completely lost; but Mathesius assigns it a fanciful derivation from *Wisse = Wise*, a meadow, because in the mine it is found covered with flowers or incrustations of various colours, resembling a meadow covered with brilliantly coloured flowers,—an obvious confusion with the minerals known as nickel and cobalt bloom, derived from the oxidation of arsenides of nickel and cobalt, with which native bismuth is commonly associated in Saxony. It is to this association with cobalt and arsenic that must be ascribed the statements that its principal use was to produce a blue colour, and that it gave off a very poisonous furnace smoke. The chief use of the metal at that time seems to have been by pewterers, who added it to their alloy in small proportions for the purpose of rendering their wares hard and sonorous when struck.

The principal minerals containing bismuth are:—1. Native bismuth, essentially the pure metal, having all the properties described below. This, the most important ore, occurs in connection with nickel and cobalt ores at Schneeberg, Saxony, at Wheal Sparnon in Cornwall, similarly associated, and with tin ores in the mines of the St Just district. It is also found in some quantity in Bolivia. 2. Tetradymitite, or telluric bismuth, a compound in variable proportions with the isomorphous element tellurium. This contains from 60 to 80 per cent. of bismuth, 15 to 35 per cent. of tellurium, and from 3 to 5 per cent. of sulphur. It occurs usually in association with gold ores; the principal localities are Schemnitz and Retzbanya in Hungary, the gold mining district of Virginia and North Carolina, California, and other western states of America. It was also found at the Merionethshire gold mines as a rarity. 3. Bismuth silver, found at Schapbach in Baden, and near Copiapo in Chili. The mineral from the former locality contains 27 of bismuth to 15 of silver, with some lead and sulphur, and a little iron; and that from the latter 60 of silver to 10 of bismuth, the remainder being copper and arsenic. 4. Bismuthine, or bismuth glance, a sulphide of bismuth, of the composition Bi_2S_3 , containing 81.6 per cent. bismuth and 18.4 per cent. sulphur, crystallizing in acicular rhombic prisms isomorphous with antimony glance. It occurs with tin ore at Botallack and other mines near St Just in Cornwall, and in the Saxon localities given above. 5. Bismuth ochre, an earthy oxide of bismuth, containing 90 per cent. bismuth and 10 per cent. oxygen, which is derived from the oxidation both of the native metal and of the sulphide. 6. Bismutite, a hydrated carbonate of bismuth, containing 90 per cent. bismuth oxide, 6.56 per cent. carbonic acid, and 3.44 per cent. water, another product of atmospheric action upon native bismuth. It is found principally in Saxony and South Carolina. Besides the above there is also a silicate described, but this is an exceedingly rare mineral, as is also Hypochlorite, a hydrated silicate mixed with phosphate of alumina. Practically the only ore is the native metal, and of late years, from the supply not keeping pace with the demand, the price has risen very considerably. The bismuth of com-

merce usually contains both gold and silver, often in considerable quantity, which circumstance has probably given rise to the story current about its transmutation into these metals.

Bismuth may be readily obtained in crystals by pouring it when melted into a heated iron ladle, and cooling it until a crust is formed on the surface, which must then be pierced by a red-hot iron rod, and the liquid metal poured off. The solidified portion adhering to the ladle is found to be covered with hopper-shaped crystals, which are usually beautifully irised, owing to the formation of a thin film of oxide on the surface, showing the colours of thin plates. This colouring is only obtained when the metal is quite free from arsenic. It may be purified by melting with about 10 per cent. of nitre, and keeping it constantly stirred at a temperature not much above its melting point, whereby the more oxidizable metals are removed, and form a slag at the surface. Another method of purifying it from arsenic is by fusing it with from 3 to 5 per cent. of zinc, covering the surface with charcoal to prevent oxidation of the zinc, which takes off the whole of the arsenic, and is subsequently removed by treatment with hydrochloric acid, the purified bismuth remaining insoluble. When prepared by any of these processes, Bismuth is a hard, brittle metal, and the fracture is highly crystalline and white, with a perceptible red tinge by reflected light. The crystalline form is rhombohedral, the angle of the primary rhombohedron being $87^\circ 40'$, or very close to a cube. The specific gravity is 9.83, but when subjected to great pressure the density is reduced to 9.6. The melting point is 264°C . (507°Fahr .) (Rudberg), or $268^\circ 3' (515^\circ)$ (Riemsdijck). Like water it may be cooled 6° or 7°C . below its freezing point; but when solidification sets in the temperature rises to 480°Fahr ., and continues until the mass is completely solidified. Like ice it expands about $\frac{1}{4}$ of its volume in solidification, a property which is communicated to its alloys, rendering them valuable for taking casts of incised or relief surfaces for reproduction, as printing-blocks by electrotype or other processes. It may be distilled by heating to a higher temperature in hydrogen. Despretz volatilized it by subjecting it to the current from 600 Bunsen elements. The spectrum of the vapour in the voltaic arc shows numerous brilliant green lines, one strong and one fainter line on the red, and a faint line on the orange field (Masson). The coefficient of expansion by heat is .001841, calorific conductivity 61, silver being 1000 (Calvert and Johnson), and specific heat 0.0805 (Kopp). The electric conductivity is 1.19 at 14°C ., silver being 100 at 0° (Mathieson). According to Matteucci the conductivity varies in the crystals according to the direction of the cleavages. It is the most strongly diamagnetic of all metals.

Chemical properties.

The atomic weight is 208 (Schneider) or 210 (Dumas). Like phosphorus and arsenic it is both triatomic and pentatomic, the latter state being represented only by a very unstable acid; there are also several diatomic compounds, including BiBr_2 , BiCl_2 , and BiI_2 . The triatomic compounds are the most numerous and stable. Unlike the elements chemically similar,—phosphorus, tellurium, arsenic, antimony, &c.,—it does not form a gaseous compound with hydrogen. Bismuth does not change in dry air, but in moist air it oxidizes superficially, and by long exposure may be converted into carbonate. When melted at a red heat it oxidizes, and the oxide (whose formula is Bi_2O_3), by a higher temperature, melts to a glassy substance, in which property it resembles lead, the oxide, like litharge, exerting a very corrosive action upon earthen crucibles, or substances containing silica, at a red heat. At a red-white heat it slowly decomposes water with the production of oxide. The higher oxide Bi_2O_5 corresponds to arsenic acid; it is a very unstable compound, and of no practical value. An intermediate oxide is known which is generally regarded as a compound of the other two, Bi_2O_4 , Bi_2O_5 . Bismuth unites directly with chlorine, bromine, and iodine, and when fused with sulphur forms a sulphide of the form Bi_2S_3 , corresponding to bismuth glance, and isomorphous with the corresponding sulphide of antimony. The same sulphide is produced when sulphuretted hydrogen is passed through a solution containing bismuth.

Bismuth is but slightly acted upon by hydrochloric or sulphuric acids in the cold; but the latter dissolves it more readily when heated. The best solvent is nitric acid, which attacks it readily, producing a nitrate which crystallizes from the concentrated solution in colourless transparent crystals belonging to the triatomic system, whose composition is $\text{Bi} \cdot 3\text{NO}_3 \cdot 5\text{H}_2\text{O}$. These crystals are soluble in nitric acid, but, like all neutral salts of the metal, are decomposed by water, with the formation of an insoluble basic nitrate and an acid liquor. These basic salts are very numerous and complex in constitution, the most important one being that represented by the formula $\text{Bi} \cdot \text{NO}_3 \cdot \text{H}_2\text{O}$, which is known as pearl-white, *blanc de fard*. This, which is largely used as a medicine, is prepared by adding to a concentrated solution of bismuth dissolved in nitric acid from 40 to 50 times its weight of water, which precipitates a considerable proportion in the form of a white powder; the remainder, which is retained by the acid liquor, may be separated by neutralizing the excess of acid with ammonia, when a rather

more acid salt than the first precipitate is obtained. Under the name of pearl-white the sub-nitrate is used as a cosmetic, but it has the disadvantage of being readily blackened by sulphuretted hydrogen.

Bismuth unites readily with other metals, the alloys being remarkable for their ready fusibility, and by their property of expanding on solidification. An alloy with potassium is obtained by calcining 20 parts of bismuth with 16 parts of cream of tartar in a crucible, and heating the mixture to a very strong red heat. On cooling, a button of metal is found, of a silvery white colour and lamellar fracture, which fuses easily, and remains for a long time in a pasty condition before solidification; it is brittle, can be easily powdered, and is readily decomposed by water. The alloy with sodium is obtained in a similar manner, with a sodic tartrate. With silver, gold, and metals of the platinum group, bismuth forms brittle alloys. With mercury it forms a liquid amalgam; but when equal weights of the two metals are heated together, there is a separation on cooling of octahedral crystals, which may be a solid amalgam. The copper alloy is brittle, and of a pale red colour. The ternary alloys of lead, tin, and bismuth, are the most interesting of these compounds, from their low fusibility, which is much below that of any of the components taken separately. This property was known to Sir Isaac Newton; the alloy named after him, Newton's fusible metal, melts at $94^\circ 5 \text{C}$. (202°Fahr .); it contains 8 parts of bismuth, 5 of lead, and 3 of tin. Darcet's fusible metal, containing 2 of bismuth, 1 of lead, and 1 of tin, melts at 93° ($199^\circ 4 \text{Fahr}$.). Another, with 5 of bismuth, 2 of tin, and 3 of lead, melts at $91^\circ 6$ (197°Fahr .) Rose's fusible metal, containing 420 parts of bismuth, 236 of lead, and 207 of tin, a composition corresponding to the formula $\text{Bi} \cdot \text{Sn} \cdot \text{Pb}$, fuses below 100° (212°), and remains pasty for a considerable range of temperature below that point. The expansion of this alloy by heat proceeds regularly from 0° to 35°C ., but by further heating it contracts up to 55° , from which point up to 80° the rate of expansion is more rapid than at the lower temperatures. Above 80° the normal rate is resumed. The fusibility of these alloys is increased by an addition of cadmium. Thus Wood's fusible metal, containing 1 to 2 parts of cadmium, 2 of tin, 2 of lead, and 7 to 8 of bismuth, melts between 66° and 71°C . Another, described by Lipowitz, containing 8 parts of lead, 15 of bismuth, 4 of tin, and 3 of cadmium, is silvery white, and has a specific gravity of 9.4. It softens at about 55° , and is completely liquid at a little above 60° .

Fusible alloys containing bismuth are used to some extent as safety plugs for steam boilers, as an accessory to the safety-valve,—a hole in the boiler being plugged by a disc of the metal, which in the event of the temperature of the water rising through excessive pressure is melted, and the steam passes through the aperture in the same manner as through an opened safety-valve. It is found, however, that this method is not trustworthy, owing to the liquation of the more fusible components of the mass, when subjected to continued heating near but below the melting point, leaving a more refractory alloy behind. The alloy known as Britannia metal, consisting chiefly of tin, antimony, and copper, often contains a little bismuth.

In analysis bismuth is usually separated from solution as carbonate by precipitation with carbonate of ammonia, which is then and separated into oxide by calcination at a gentle heat, in which form it is weighed and estimated. The oxide Bi_2O_3 contains 89.74 per cent. of bismuth. It is readily precipitated as sulphide by passing sulphuretted hydrogen through an acid solution, but the precipitate cannot be weighed, as it usually contains an excess of sulphur, and cannot be completely freed from water below 200° , so that it must be redissolved in nitric acid and precipitated as carbonate as above described. It may be precipitated in the metallic state by zinc, cadmium, copper, iron, or tin. A plate of copper introduced into a boiling solution of a bismuth salt, even when very weak, is readily covered with a coating of the reduced metal of a steel-gray colour.

Bismuth may be employed instead of lead for the assay of gold and silver by cupellation,—as the melted oxide is absorbed by bone ash in exactly the same manner as litharge.

The separation of bismuth from solutions in which it is associated with silver, copper, mercury, cadmium, and lead, may be effected by cyanide of potassium; by digesting the solution with an excess of this reagent the cyanides of bismuth and lead remain in the insoluble portion, while those of the other metals are contained in the filtrate. On redissolving, the lead may be precipitated as sulphate, or by hydrochloric acid and alcohol, which renders the chloride of lead insoluble. The bismuth is finally precipitated from the filtrate by sulphuretted hydrogen. From copper it is readily separated by carbonate of ammonia, bismuth being precipitated, and copper remaining in solution. Another method is by heating in a current of chlorine, when chloride of bismuth is volatilized.

The metallurgical processes for the extraction of bismuth are very simple, being mainly comprised in lixiviation out of contact with the air, and subsequent fusion of the liquated product of the first operation. At Schneeberg, in Saxony, the lixiviation is effected in cast-iron tubes placed transversely over a fire-grate which runs the whole length of the furnace. The tubes are freined, the higher