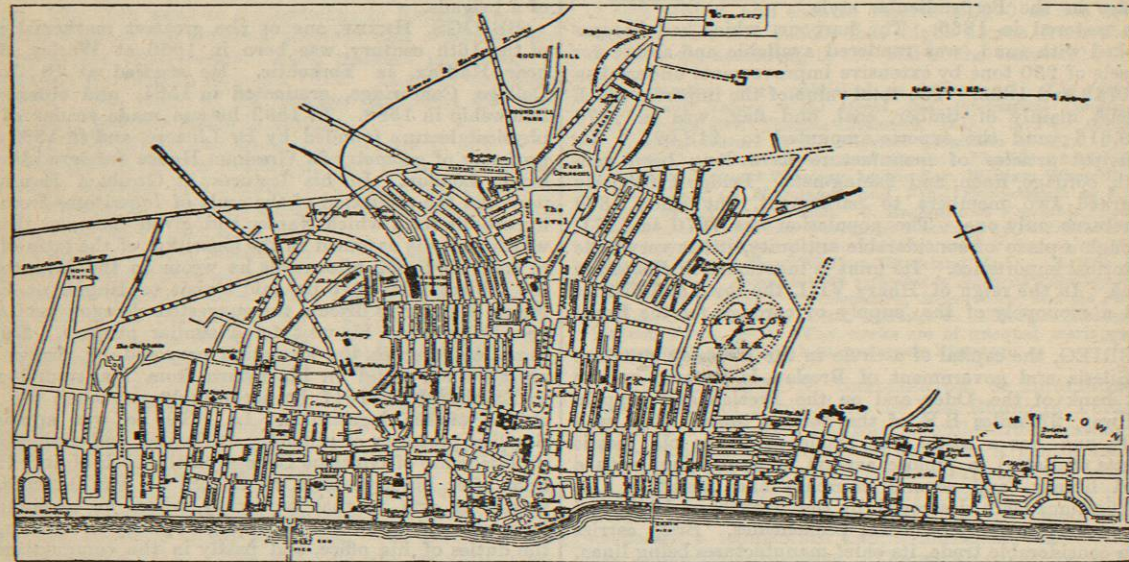


mentorum VI. libri priores, London, 1620, folio. 7. *A Treatise on the North-West Passage to the South Sea*, London, 1622, 4to, reprinted in Purchas's *Pilgrims*, vol. iii. p. 852. 8. *Arithmetica Logarithmica*, London, 1624, folio. 9. *Trigonometria Britannica*, Goude, 1663, folio. 10. *Two Letters to Archbishop Usher*. 11. *Mathematica ab Antiquis minus cognita*. Some other works, as his *Commentaries on the Geometry of Peter Ramus*, and *Remarks on the Treatise of Longomontanus respecting the Quadrature of the Circle*, have not been published.

BRIGHTON, a parliamentary borough, and one of the most fashionable watering-places of England, is situated on the coast of Sussex between Beachy Head and Selsea Bill, in 50° 50' N. lat. and 0° 8' W. long. By railway it is 50 miles from London and 28 from Chichester. Its sea-frontage of handsome mansions and hotels extends upwards of three miles from Kemp Town in the east to what was formerly the suburban village of Cliftonville in the parish of Hove; while its depth inland at the centre is rather



Plan of Brighton.

in the reign of Henry VII., and is probably one of the oldest buildings in the town, and Trinity chapel, in Ship Street, memorable as the scene of the labours of Frederick William Robertson. The most important of the secular edifices are the town-hall, the market, the pavilion, the aquarium, the theatre, the proprietary college, the Sussex county hospital, the new workhouse, the infirmary, the blind asylum, and the female orphan asylum. The pavilion, with its strange assemblage of domes and minarets, was built in 1784-7 as a residence for the Prince of Wales (afterwards George IV.), and about 1818 it was refashioned by Nash into a grotesque imitation of Chinese architecture. It has a frontage to the east of 300 feet, and occupies, with its gardens, about 11½ acres. In 1850 it was purchased by the town for £53,000, and its spacious rooms, greatly altered from time to time, are now appropriated to a variety of uses,—one serving as a museum, another as an assembly-room, others as picture-galleries. The pavilion dome, formerly the royal stables, is now converted into a magnificent hall for high-class musical performances; it is lighted by a glazed dome, with



Arms of Brighton.

more than a mile. In general appearance the style of the town strikingly resembles that of London; and many of its streets and squares seem as if they had been transported as they stand from the "West End." As far, indeed, as its character is not affected by its natural situation, it is nothing more or less than a vigorous offshoot supported by the sap of the greater city, a fact which is popularly recognized by the designation of London-super-Mare. During the present century its growth has been rapid and continuous, about four hundred new houses being often built in the space of a year. Its streets and squares already amount to four hundred; but in comparison with this extent the number of its really remarkable buildings is rather small, and nearly all of them are of modern date. Among its twenty Episcopalian and between thirty and forty Nonconformist churches two only need be specially mentioned,—the parish church of St Nicholas, which was built

a diameter only 20 feet less than that of the dome of St Paul's of London. The county hospital was built in 1828 by Sir Charles Barry, at a cost of £10,000, and has since been largely extended. It is "open to the sick and lame poor of every country and nation." There are a large number of minor benevolent establishments in the town, and so various are its educational institutions that it has been called the city of schools. Among the bathing establishments the most remarkable are Brill's and the New Turkish Baths; the former includes extensive swimming baths for both sexes.

The tendency of the currents in the channel opposite Brighton is to drive the shingle eastward, and within the memory of man large portions of the coast have thus been destroyed. To prevent this erosion the whole sea-frontage of the town at the east end is protected by a great sea-wall, which was built between 1827 and 1838. It is a mile long, 60 feet high, and 23 feet thick at the base, and cost £100,000. The beach is further ribbed from north to south by various "groynes," or jetties, one of which, constructed of concrete in 1867, at a cost of £5000, stretches about 50 feet into the sea. There are two piers which serve as promenades. The first, an elegant chain fabric commenced by Sir S. Brown, R.N., in 1822, was

opened to the public in the following year. It is 1136 feet in length and 15 feet in width, the four cast-iron columns on which it is suspended being supported by stone buttresses based on oaken piles driven into the solid chalk. The cost was £20,000, and in 1836 an additional expenditure was necessary to repair the damage inflicted by a great storm in November of that year, which was within a little of destroying the structure altogether. A new pier further to the west was opened in 1866. Its total length is 1115 feet, and it affords accommodation for 2000 people. The town is well supplied with water by the corporation water-works, and by an artesian well, 1285 feet deep, at Warren Farm, the boring of which lasted from 1858 to 1862. The sewage is effectively removed by an intercepting sewer 5 miles in length, which discharges into the sea 2 miles east of the parish boundary. Since the opening of the Brighton railway in 1841 the town has developed wonderfully; but, with the exception of the railway works, no manufacturing establishment exists, and no tall chimneys are seen. Owing to the absence of a natural harbour the commerce of the place is insignificant, but the mackerel and herring-fisheries are carried on by about 120 boats. The races, which are held in August to the north and north-east of the town, and the great volunteer reviews, which of late years have drawn many thousands to the neighbouring downs, add considerably to the local trade. The town is governed by a mayor, thirteen aldermen, and a council. It returns two members to parliament.

Brighton, originally Brighthelmstone, plainly derives its name from some Saxon Brighthelm, but who or what he was there seems no means of discovering. The present contracted form of the word came into general use only in the end of the 18th century, but it is sometimes found in the documents of the time of Charles II. At the time of the Conquest Brighton was a small fishing village, and the lordship of the manor was bestowed by the Conqueror on his nephew William de Warenne, who received as rent from the fishermen 4000 herrings. In 1513 it was burnt by the French under Messire Pregel, whom the English chronicles call Prior John; and in 1545 it was again greatly damaged by Claude d'Anneballe, the admiral of Francis I. At that time it is represented as a quadrangular town of four or five streets. There were then no defences, but in 1558 a small circular fort was erected by Elizabeth. The town seems to have rapidly recovered its prosperity, for in 1579 it possessed 80 fishing-boats, with 400 fishermen and 10,000 nets. The whole Elizabethan town, however, has been destroyed by the sea, which in 1699 swept away 160 houses, and in 1703 and 1706 did almost as much damage. The modern reputation of Brighton is due to Dr Richard Russell, a native of Lewes, who resided there in 1750, and wrote a book on the advantages of sea-bathing, which led a number of people of high rank—among others the dukes of Cumberland and Marlborough—to place themselves under his direction. The Prince Regent followed, and the fortunes of Brighton were made. Bedford Square was commenced in 1810, and the building of Kemp Town took place between 1821 and 1830. A charter of incorporation was granted in 1854. In 1761 the population was only about 2000; in 1801 it had risen to 7339, by 1841 to 48,567, and by 1851 to 69,673. In 1861 there were 77,693 inhabitants in the municipal borough, and 87,317 within the parliamentary limits, the number of houses being respectively 12,727 and 13,983, while in 1871 the municipal borough had a population of 90,011, inhabiting 14,438 houses, and the parliamentary borough 103,758, with 16,284. See Lower's *History of Sussex*, 1870, and papers in the *Sussex Archaeological Collections*.

BRIGHT'S DISEASE, a term in medicine applied to a class of diseases of the kidneys which have as their most prominent symptom the presence of albumen in the urine, and frequently also the co-existence of dropsy. These associated symptoms in connection with kidney disease were first described in 1827 by Dr Richard Bright. Since that period the subject has been investigated by many able physicians, and it is now well established that the symptoms above named, instead of being as was formerly supposed the result of one form of disease of the kidneys, may be dependent on various morbid conditions of those organs. Hence the term Bright's disease, which is retained in medical

nomenclature in honour of Dr Bright, must be understood as having a generic application.

Two varieties of Bright's disease are described, the *acute* and the *chronic*,—the former representing the inflammatory and the latter the degenerative form of kidney disease.

*Acute Bright's Disease* (synonyms—*acute desquamative nephritis*, *acute albuminuria*, &c.) commonly arises from exposure to cold, from intemperance, or as a complication of certain acute diseases, such as erysipelas, diphtheria, and especially scarlet fever, of which it is one of the most frequent and serious consequences. In this form of the disease the kidneys become congested, their blood-vessels being gorged with blood, while the tubules are distended and obstructed by accumulated epithelium, as also by effused blood and the products of inflammation, all which are shed off and appear in the urine on microscopic examination as *casts* of the uriniferous tubes.

The symptoms to which the condition gives rise are usually of a severe character. Pain in the back, vomiting, and febrile disturbance commonly usher in the attack. Dropsy, varying in degree from slight puffiness of the face to an accumulation of fluid sufficient to distend the whole body, and to occasion serious embarrassment to respiration, is a very common accompaniment. The urine is reduced in quantity, is of dark, smoky, or bloody colour, and exhibits to chemical reaction the presence of a large amount of albumen, while, under the microscope, blood corpuscles and casts, as above mentioned, are found in abundance.

This state of acute inflammation may by its severity destroy life, or, short of this, may by continuance result in the establishment of one of the chronic forms of Bright's disease. On the other hand an arrest of the inflammatory action frequently occurs, and this is marked by the increased amount of the urine, and the gradual disappearance of its albumen and other abnormal constituents; as also by the subsidence of the dropsy and the rapid recovery of strength.

Of *chronic Bright's Disease* there are several forms, named according to the structural changes undergone by the kidneys. The most frequent of these is the *large white kidney*, which is the chronic form of the desquamative nephritis above mentioned.

Another form of chronic Bright's disease is the *waxy* or *amyloid kidney*, due to the degenerative change which affects first the blood-vessels and subsequently also the tubular structures of the organ. This condition is usually found associated with some chronic ailment of an exhausting character, such as disease of bones and other scrofulous affections, or with a generally enfeebled state of health. It is marked by the passage of large quantities of albuminous urine, and is frequently accompanied with general dropsy, as also with diarrhoea and consequent loss of strength. A third form of chronic Bright's disease is the *contracted kidney*, depending on the condition known as *cirrhosis*, in which the kidneys become reduced in bulk, but dense in texture, from an abnormal development of their connective tissue and relative atrophy of their true structure. This form of the disease, which is commonly, though not exclusively connected with a gouty constitution, is apt to escape detection in its earlier stages from the more obscure character of the symptoms, there being less albuminuria and less dropsy than in the other varieties. Its later progress, however, enables it to be readily recognized. Dimness of vision, due to a morbid condition of the retina, and also hypertrophy of the heart leading to fatal apoplexy, are frequent accompaniments of this form of the disease.

A fourth variety of chronic Bright's disease is described by authors on the subject, viz., *fatty degeneration of the kidneys*, occasionally occurring in old age and in connection with a similar degeneration of other organs.



The kidneys being among the most important excretory organs of the body, it follows that when their function is interrupted, as it is alike in acute and chronic Bright's disease, serious results are apt to arise from the retention in the economy of those effete matters which it is the office of the kidneys to eliminate. The blood being thus contaminated, and at the same time impoverished by the draining away of its albumen from the kidneys, is rendered unfit to carry on the processes of healthy nutrition; and, as a consequence, various secondary diseases are liable to be induced. Inflammatory affections within the chest are of frequent occurrence, but the most dangerous of all the complications of Bright's disease are the nervous symptoms which may arise at any stage, and which are ascribed to the effects of uramic poisoning.

In the treatment of acute Bright's disease, good results are often obtained from local depletion, from warm baths, and from the careful employment of diuretics and purgatives. Chronic Bright's disease is much less amenable to treatment, but by efforts to maintain the strength and improve the quality of the blood by strong nourishment, and at the same time by guarding against the risks of complications, life may often be prolonged in comparative comfort, and even a certain measure of improvement be experienced.

See *Report on Medical Cases*, by Richard Bright, London, 1827; *On Granular Degeneration of the Kidneys*, by Robert Christison, M.D., Edinburgh, 1839; *Diseases of the Kidney*, by Dr G. Johnson, London, 1866; *Practical Treatise on Urinary and Renal Diseases*, by Wm. Roberts, M.D., London, 1865; *On the Pathology and Treatment of Albuminuria*, by W. H. Dickinson, M.D., London, 1868; *Practical Treatise on Bright's Diseases of the Kidneys*, by T. Grainger Stewart, M.D., Edin. 1871.

BRIGNOLES, the capital of an arrondissement in the department of Var, in France, is situated in a fertile and pleasant valley on the right bank of the Calami, 22 miles N.N.E. of Toulon. It is neat and well built, and has a magnificent fountain, a public library, a normal school, manufactures of silk thread and leather, and an active trade in wines, brandy, liqueurs, and excellent prunes—the last distinctively known as *prunes de Brignoles*. The prefecture has its offices in the palace of the counts of Provence, and the old house of the Templars is occupied by the theological seminary. Brignoles is a town of great antiquity. In 1291 it gave its name to a treaty between Alphonso III. of Aragon and the king of France. In ancient documents it is often mentioned as *Villa Puerorum*, from the fact that the children of the counts of Provence were generally born and brought up in the castle. In 1524 the town was taken and pillaged by Charles V., and in 1588 it met a similar fate at the hands of the Leaguers. Population of town in 1872, 4843.

BRIL; PAUL, a Flemish painter, born at Antwerp in 1554. The success of his elder brother Matthew in the Vatican induced him to repair to Rome. On the death of Matthew, Paul, who far surpassed him as an artist, succeeded to his pensions and employments. He painted landscapes with a depth of chiaroscuro then little practised in Italy, and introduced into them figures well drawn and finely-coloured. Many of his pictures are extant in Italy. One of his best compositions is the martyrdom of St Clement, in the Sala Clementina of the Vatican. He died at Rome in 1626. (See Lanzi, *History of Painting*.)

BRINDISI, a fortified city and seaport of Italy, in the province of Otranto, is situated at the head of a bay of the Adriatic in 40° 39' 27" N. lat. and 17° 28' 44" E. long. The streets are for the most part narrow and crooked, and the town in general is in a somewhat ruinous condition. Since the restoration of its maritime importance, which is mainly due to the fact that it forms the great transit station in the overland route to Asia by the Mont Cenis Railway and the Suez Canal, some improvement

has taken place, and it bids fair to become one of the most flourishing cities in the country. The progress, however, has hitherto been comparatively slow, and the only extensive addition which has been effected is a new street leading from the railway station to the harbour. A cathedral in rather a dilapidated state, a citadel with huge round towers (founded by Frederick II. and completed by Charles V.), and a seminary (containing a library bequeathed to the town by archbishop Leo), are the only public buildings worthy of notice. The ruins of the circular church of St Giovanni, which was destroyed by earthquake, are not without interest; an ancient building of uncertain date is popularly regarded as the house where Virgil died; and there is a remarkable column supposed by some to have marked the termination of the Appian Way, but more probably belonging to an ancient temple. There are ten public schools in the town. The trade was represented in 1873 by imports to the value of £344,000, and exports to £325,000. The former consist mainly of raw silk, wheat and flour, coals, manufactured cottons, and petroleum; and the latter of manufactured coral, corn, dried fruits, and olive oil. The number of vessels that arrived at the port in 1873 was 709, of which 422 were steamships. The harbour consists of an outer and an inner portion, and the inner is divided into two basins, extending right and left. The outer port is about 6400 feet long by 3200 wide, the western arm of the inner portion 4800 by 800, and the eastern arm 3520 by 640. An extensive system of dredging has been in operation since 1866, and long lines of quays are being gradually constructed. Graving-docks are also in course of construction; and a lagoon, called *Fiume Piccolo*, close to the outer harbour, which has been a constant source of malaria, is being filled up. The population of the town, which was only 8000 in 1861, had increased to 13,755 in 1871.

Brindisi, *Brundisium*, or *Sperticor*, was originally, it would appear, a city of the Sallentines, from whom it was captured by the Romans in 267 B.C. Colonized by its conquerors in 244 B.C., it soon rose into importance, and became their chief naval station in the Adriatic. Hannibal vainly attempted to surprise the city, which remained faithful to Rome through the darkest days of the Punic struggle. During the war between Julius Caesar and Pompey the former endeavoured to shut up his rival's fleet in the inner harbour, by closing the entrance with wooden piles, which are frequently but erroneously supposed to have been the cause of the destruction of that part of the port. On the fall of the Western Empire Brundisium seems to have been outstripped by the neighbouring city of Hydruntum (Otranto). In the 10th century it was destroyed by the Saracens, but was rebuilt by Spathalupus the Byzantine governor, whose name still stands graven on the marble column above mentioned. After passing through various vicissitudes in common with the rest of Southern Italy, it fell into the hands of the Normans, and in the 11th century it was the scene of the chivalrous pageantry of Tancred's court. It was plundered in 1348 by Louis, king of Hungary, and in 1458 suffered severely from an earthquake. Some time before this last disaster a more serious injury had been inflicted by Prince Giovanni Antonio Orsini, who completely choked the entrance to the inner port by sinking a number of vessels laden with stone. The commercial importance of the city rapidly declined, and it was of no interest save to the classical scholar as the birthplace of Pacuvius, and from its association with the mirthful journey of Horace and the death of Virgil.

BRINDLEY, JAMES, a celebrated engineer, was born at Thornsett, Derbyshire, in 1716. His parents were, in very humble circumstances, and he received little or no education. At the age of seventeen he was apprenticed to a millwright near Macclesfield, and while in this employment manifested remarkable mechanical talent. Soon after completing his apprenticeship he set up in business for himself as a wheelwright, and quickly became famous for his ingenuity and skill in repairing all kinds of machinery. In 1752 he designed and set up an engine for draining some coal-pits at Clifton in Lancashire. Three years later he extended his reputation by completing the machinery for a silk-mill at Congleton. About 1754 Brindley became acquainted

with the duke of Bridgewater, and an arrangement was soon come to whereby he undertook to carry out that nobleman's scheme of inland navigation. The duke's primary object was the carriage of coal from his estate at Worsley to Manchester. The difficulties in the way were great, but all were surmounted by the genius of Brindley, whose crowning triumph was the carrying of the new canal over the River Irwell at Barton, by means of an aqueduct elevated 39 feet above the water. The great success of this canal, the first of its kind in Great Britain, encouraged similar projects, and Brindley was soon engaged extending his first work to the Mersey. He then designed and nearly completed what he called the Grand Trunk Canal, connecting the Trent and Humber with the Mersey. The Staffordshire and Worcestershire Canal, the Oxford Canal, the Stockwith and Chesterfield Canal, were all planned and carried out by him. His excessive toil broke down his strength, and he died in 1772 at the early age of fifty-six. Brindley was a man of no education; he retained to the last a peculiar roughness of character and demeanour; but his innate power of thought more than compensated for his lack of training. It is told of him that when in any difficulty he used to retire to bed, and there remain intensely pondering his problem until the solution became clear to him. His mechanical ingenuity and fertility of resources were very remarkable; he undoubtedly possessed in the very highest degree the engineering faculty, though the kind of works to which he devoted himself has been cast into the shade by the later developments of steam traffic. Brindley was an enthusiast in his business and possessed with the idea of canals. His reported answer to the committee who asked him what was the use of navigable rivers,—“To feed canals,” is characteristic, if not altogether authentic.

See Smiles, *Lives of the Engineers*, vol. i.; *Biographia Britannica*.

BRIOUË, a town of France, in the department of Haute Loire, capital of an arrondissement, is situated on the left bank of the Allier, 39 miles N.W. of Puy. The town is ill-built, but has a fine old Gothic church (St Julien), of the 12th century, with curious mosaic ornamentation, a college, a public library, and beautiful fountains, which date from the 13th century. At Old Brioude, about three miles S.S.E., are the remains of a bridge over the Allier, which consisted of a single arch 60 feet high and 206 feet in span. (See article BRIDGES, p. 332.) This fell in 1822; and a new bridge of one arch, 182 feet in span, was built in 1845. Population in 1872, 4524.

Brioude, the ancient *Brivas*, was formerly a place of considerable importance. It was in turn besieged and captured by the Goths (532), the Burgundians, the Saracens (732), and the Normans. In 1181 the viscount of Polignac, who had sacked the town two years previously, made public apology in front of the church, and established a body of twenty-five knights to defend the relics of St Julien. For some time after 1861 the town was the headquarters of the lord of Castelnaud, who was at the head of one of those bands of military adventurers which then devastated France. The knights (or canons, as they afterwards became) of St Julien bore the title of counts of Brioude, and for a long time opposed themselves to the civic liberties of the inhabitants.

BRISBANE, a town of Australia, capital of the colony of Queensland, is situated in Stanley county, on both banks of the River Brisbane, about 25 miles from its entrance into Moreton Bay. It consists of four parts,—North and South Brisbane, Kangaroo Point, and Fortitude Valley. Among its public buildings are courts of justice, houses of parliament, a governor's residence, a literary institute, a concert-room, a school of arts, and from twenty to thirty churches. It has also an excellent botanical garden. The river, which is about a quarter of a mile broad opposite the town, is navigable for vessels of considerable burden, and has been made more accessible by the partial removal of

the bar at its mouth. Regular steam communication is kept up with Sydney and other Australian ports, and a very flourishing trade is carried on in the export of wool, cotton, tallow, and hides, and the import of European manufactures. The town is the centre of a considerable railway and telegraphic system. Brisbane was founded as a penal settlement in 1825, and was named in honour of Sir Thomas M. Brisbane. In 1842 the establishment was abolished, and general colonization set in. The town was politically a part of New South Wales till 1859, when it was made the capital of Queensland. It is the seat of an Anglican and also of a Roman Catholic bishop. Its population was only 5225 by the census of 1861; but in 1871 it amounted to 15,029, of whom 7204 were males and 7825 females. The number of inhabited houses at the latter date was 2931.

BRISBANE, SIR THOMAS MAKDOUGALL, a distinguished soldier and astronomer, was born in 1773 at Brisbane in Ayrshire. He entered the army in 1789, and served in Flanders, the West Indies, and the Peninsula. In 1814 he was sent to North America; on the return of Napoleon from Elba he was recalled, but did not arrive in time to take part at the battle of Waterloo. From 1818 to 1821 he was military commander in the South of Ireland. He was then appointed governor of New South Wales, an office which he held for four years. During that time he devoted himself most earnestly to the colony under his charge; he introduced new plants and breeds of animals, encouraged the reclaiming of waste lands, and even raised the status of the convicts by his wise measure of granting tickets-of-leave for good conduct. While in Australia he occupied himself in astronomical researches, erected a large observatory, and catalogued 7385 stars scarcely before known. The Royal Society awarded him their Copley medal for this work, *The Brisbane Catalogue of Stars*. After his return he resided chiefly at Makerstoun in Roxburghshire, where he had a large and admirably equipped observatory. Three volumes of his observations were printed in the *Transactions of the Royal Society of Edinburgh*. In 1836 he was made a baronet and K.C.B.; and in 1841 he became general. He received the degree of D.C.L. from Oxford, and was elected president of the Royal Society of Edinburgh after the death of Sir Walter Scott. Sir Thomas died on the 31st January 1860. He founded two gold medals for the encouragement of scientific research, one in the award of the Royal Society, the other in that of the Society of Arts.

BRISSON, MATHURIN JACQUES, a French zoologist and natural philosopher, was born at Fontenay-le-Comte, 3d April 1723. He studied for the church, but did not take orders, as his inclination led him towards the study of natural science. He became assistant to the celebrated Réaumur, and in 1756 published the first volume of his work on the animal kingdom, containing an account of the quadrupeds and cetacea. Of his other works on natural history the most important was the *Ornithologie*, 6 vols., 1760. After the death of Réaumur and the amalgamation of his museum with the royal cabinet, Brisson gave up the study of natural history and devoted himself to physical science. He obtained an appointment as professor in the college of Navarre, and was made instructor of the royal family in natural philosophy. Several text-books on physics were published by him, and were in considerable repute for a time, but his most important piece of work was the *Tables of Specific Gravities*, published in 1787. Brisson died in 1806.

BRISSOT, JEAN PIERRE, who assumed the name *De Warville*, a celebrated Girondist, was born of humble parents at Chartres in January 1754. He received a good education, and entered the office of a lawyer at Paris. His first works, *Théorie des Lois criminelles* (1781) and *Bib-*