

recorder of Hull, and in 1847 was returned to Parliament for that city. His remarkable ability made itself quickly apparent, and in 1848 he became president of the Poor-Law Board. In 1852 he sat for Leeds, and was again appointed president of the Poor-Law Board, which office he held till 1855. In 1856 he was made chancellor of the Duchy of Lancaster, with a seat in the cabinet.

BAINI, GIUSEPPE, a learned musical critic and composer of church music, was born at Rome in 1775, and died there in 1844. He was instructed in composition by his uncle, Lorenzo Bains, and afterwards by Jannacconi. In 1814 he was appointed musical director to the choir of the pontifical chapel, in which he had for several years been one of the principal bass singers. His compositions were very favourable specimens of the severe ecclesiastical style; one in particular, a *Miserere*, was long performed alternately with the more celebrated work of Allegri in the services of the Sistine chapel during Passion week. Bains held a higher place, however, as a musical critic and historian than as a composer, and his *Life of Palestrina (Memorie storico-critiche della vita e delle opere di Giovanni Pierluigi da Palestrina, 1828)* ranks as one of the best works of its class.

BAIRAM, a Turkish or Persian word meaning *feast*, is the name applied to the two great Mahometan festivals. The first of these, called generally, though, according to some authorities, incorrectly, the Greater Bairam, is the day following the Ramadan, or month of fasting. It lasts strictly for only one day, though the common people generally extend it to three, and is a period of great animation and enjoyment. What is called commonly the Lesser Bairam follows the first at an interval of sixty days. It is the feast of sacrifices, at which all Mahometans imitate the offerings of animals which are then being made at Mecca to commemorate Abraham's offering of Isaac. It lasts for four days, and is not of so sacred a character as the first Bairam.

BAIRD, GENERAL SIR DAVID, Bart., was born at Newbyth in Aberdeenshire, in December 1757. He entered the British army in 1773, and was sent to India with the 73d Highlanders in 1779. In the following year he had the misfortune to fall into the hands of Hyder Ali, in the Mysore chief's perfidious attack on a handful of British troops at Perambucum. The prisoners, it is well known, were most barbarously treated. Baird survived his captivity; and on his release, visited his native country, but returned to India in 1791 as a lieutenant-colonel. When Harris marched against Tippoo Sahib, Baird, now a major-general, served under him in that campaign; and when it was resolved to storm Seringapatam, he solicited and obtained the honour of leading the storming party to the breach. He made a daring assault, and was soon a master of the stronghold in which he had long been the prisoner. Through some misconception, Baird seems to have looked upon the temporary appointment of Colonel Wellesley to hold the captured town as permanently superseding him, and on this ground he judged himself to have been treated with injustice and disrespect. He afterwards received the thanks of the British Parliament and of the East India Company for his gallant bearing on that important day, and a pension was offered him by the Company, which he declined, apparently from the hope of receiving the order of the Bath from the Government. General Baird commanded the Indian army which was sent in 1801 to co-operate with Hutchinson in the expulsion of the French from Egypt. He landed at Kosseir, conducted his army to Keneh on the Nile, and thence to Rosetta, where he arrived just as the French were treating for the evacuation of Alexandria. On his return to India in 1802 he was employed against Scindia, but irritated at some

neglect he had experienced, he relinquished his command and returned to Europe. In 1804 he was knighted, and in the following year commanded the expedition against the Cape of Good Hope, and captured Cape Town; but here again his usual ill-luck attended him, for he was recalled before he had organised his conquest, for having sanctioned the expedition of Sir Home Popham against Buenos Ayres. He served again in 1807 in the expedition against Copenhagen, and in the following year commanded the considerable force which was sent to Spain to co-operate with Sir John Moore. In the battle of Coruña, where, after the death of Moore, he held supreme command, a grape-shot shattered his left arm, so that it had to be amputated at the shoulder-joint. He again obtained the thanks of Parliament for his gallant services, and was rewarded with the decoration of the order of the Bath, and the rank of a baronet. Sir David married Miss Campbell Preston, a Perthshire heiress, in 1810. In 1820 he was appointed commander-in-chief in Ireland; but the post does not appear to have been suitable for him, and he was removed in 1821. From that period he no more appeared in public life. He died on the 18th August 1829. (See Hook's *Life of Sir David Baird*.)

BAIREUTH, or BAYREUTH, the capital of the circle of Upper Franconia, in Bavaria, is pleasantly situated in a valley on the left bank of the Red Main, 40 miles N.N.E. of Nuremberg. It is well built, with broad, regular, and well-paved streets, and is partially surrounded by old walls. The river is crossed here by two bridges. Most of the buildings are of comparatively modern date, the city having suffered severely from the Hussites in 1430, and from a conflagration in 1621. Among the more important are—the old castle, erected in 1454, the new castle, built in 1753, the opera-house, one of the finest in Germany, the gymnasium, founded in 1664, the riding school, and the barracks. Among the ecclesiastical buildings, the *Stadtkirche*, dating from 1439, and containing the monuments of the margraves of Baireuth, is the most important; and there are also a handsome synagogue, a public library, theatre, hospital, and an orphan and a lunatic asylum. In 1841, a monument, by Schwanthaler, was erected here to Jean Paul Richter, who spent the last twenty years of his life in the city, and has left some beautiful descriptions of the neighbourhood in his *Siebenkäs*. His house was in Friedrichsstrasse. Baireuth is a railway junction, and has an active trade, chiefly in grain and horses. It manufactures woollen, linen, and cotton goods, leather, delft and other earthenware, and tobacco, and has also several breweries and distilleries. About half a league distant is the village of St George, noted for its marble works; and about two miles to the E. is the Hermitage, a fanciful building, erected in the early part of the last century, with gardens containing terraces, statues, and fountains. Baireuth has been chosen by Richard Wagner as the scene of his musical festivals, and a theatre is being erected for his special use. Population, 17,841. Baireuth was formerly the capital of a principality of the same name, which was annexed in 1791 to the kingdom of Prussia. In 1807 it was ceded by Prussia to France, which kept possession of it till 1810, when it was transferred to Bavaria.

BAJA, a market-town of Hungary, in the county of Bacs, on the left bank of the Danube, 90 miles S. of Pesth. It was burned down in 1807, but has since been well built. It carries on a considerable trade in grain and pigs, and its four annual markets are largely attended. The Roman Catholics, the Greek Church, and the Jews have each a place of worship in the town, which also possesses a gymnasium, and a castle belonging to the Grassalkovich family. Population, 18,110.

BAJAZET I., sultan of the Turks, commenced to reign in 1339, and died in 1403. The well-known story of the iron cage, in which this monarch was said to have been carried about by his conqueror Timur, has no authority, and probably originated in a mistake as to the word for a *litter*, in which Bajazet was carried.

BAJAZET II., son of Mahomet II., succeeded his father as sultan in 1481, and died in 1512. See CONSTANTINOPLE and TURKEY.

BAJUS, or DE BAY, MICHAEL, a celebrated theologian, was born at Melin in Hainaut in 1513. He distinguished himself highly during his course of study at Louvain, and was quickly promoted to a professorship in the college of that town. In 1549 he took his doctor's degree, and two years later he was appointed regius professor of divinity. On account of his eminence in theological learning he was selected by the king of Spain to go to the great council at Trent, in the proceedings of which he took a prominent part. His studies having been chiefly directed to Augustine, with whose works he was very familiar, Bajus found that his doctrines on the fundamental points of freewill, predestination, grace, and the sacraments, were in direct opposition to the scholastic theology recognised as orthodox by the powerful body of the Jesuits. Eighteen propositions, said to be gathered from the works of Bajus and his colleague Hessels, were condemned by the Sorbonne, and a more extensive collection of seventy-six were censured by Pope Pius V. in 1567. This censure, which did not press very heavily on Bajus, who was not indeed mentioned as holding the condemned doctrines, was confirmed by a bull of Gregory XIII. in 1580. Bajus, who was a man of meek and mild temper, quietly made such submission as was requisite under the circumstances, continued to hold his professorship, and even advanced to the dignity of chancellor of the university. He died in 1589, in the 77th year of his age. His principal works have been published in a collected form at Cologne, 1696, 1 vol. 4to, in 2 parts; some large treatises have not been published. The doctrines for which Bajus was censured, and the discussions arising with regard to them, are interesting in connection with the history of Jansenism, for Jansen did little more than reproduce the Augustinianism of Bajus.

BAJZA, ANTON, a distinguished Hungarian poet and critic, was born at Szücs in 1804. His earliest contributions were made to Kiszalud's *Aurora*, a literary paper of which he was editor from 1830 to 1837. He also wrote largely in the *Kritische Blätter*, the *Athenæum*, and the *Figyelmező*, or *Observer*. His criticisms on dramatic art were considered the best of these miscellaneous writings. In 1830 he published translations of some foreign dramas, *Ausländische Bühne*, and in 1835 a collection of his own poems. In 1837 he was made director of the newly established national theatre at Pesth. He then, for some years, devoted himself to historical writing, and published in succession the *Historical Library (Történeti Könyvtár)*, 6 vols. 1843-45; the *Modern Plutarch (Új Plutarch)*, 1845-47; and the *Universal History (Világtörténet)*, 1847. These works are to some extent translations from German authors. In 1847 Bajza edited the journal of the opposition, *Ellenör*, at Leipsic, and in March 1848 Kossuth made him editor of his paper, *Kossuth Hírlapja*. In 1850 he was attacked with brain disease, and died in 1858.

BAKARGANJ, a district of British India in the Dacca division, under the Lieutenant-Governor of Bengal, situated between 23° 14' 27" and 21° 48' N. lat., and 89° 55' 10" and 91° 4' 50" E. long. It is bounded on the N. by the districts of Dacca and Faridpur, from which it is separated by the Padma and Mainakátkhál; on the E. by the

Meghná and Sháhábápur rivers, and by the Bay of Bengal, which separates it from Noakhál and Tipperah; on the S. by the Bay of Bengal; and on the W. by Jesser and Faridpur districts. Area, 4935 square miles; population, 2,377,433. The general aspect of the district is that of a flat even country, dotted with clusters of bamboos and betel-nut trees, and intersected by a perfect network of dark-coloured and sluggish streams. There is not a hill or hillock in the whole district, but it derives a certain picturesque beauty from its wide expanses of cultivation, and the greenness and freshness of the vegetation. This is especially conspicuous in the rains, but at no time of the year does the district present a dried or burnt-up appearance. The villages, which are always walled round by groves of bamboos and betel-nut palms, have often a very striking appearance; and Bákarganj has many beauties of detail which strike a traveller in passing through the country. The level of the country is low, forming as it does a part of the great Gangetic delta; and the rivers, streams, and water-courses are so numerous that it is very difficult to travel except by boat at any season of the year. Every natural hollow is full of water, around the margin of which long grasses, reeds, and other aquatic plants grow in the greatest profusion, often making it difficult to say where the land ends and where the water begins. Towards the north-west the country is very marshy, and nothing is to be seen for miles but tracts of unreclaimed swamps and rice lands, with a few huts scattered here and there, and raised on mounds of earth. In the south of the district, along the sea face of the Bay of Bengal, lie the forest tracts of the Sundarbans, the habitation of tigers, leopards, and other wild beasts.

The principal rivers of the district are the Meghná, the Ariál Khán, and the Haringhátá or Baleswar, with their numerous offshoots. The Meghná represents the accumulated waters of the Brahmaputra and Ganges. It flows along the eastern boundary of the district in a southerly direction for about 100 miles, till it debouches into the Bay of Bengal. During the latter part of its course this noble river expands into a large estuary containing many islands, the principal of which is that of Dakshin Sháhábápur. The Ariál Khán, a branch of the Ganges, enters the district from the north, and flows generally in a south-easterly direction till it falls into the estuary of the Meghná. The main channel of the Ariál Khán is about 1700 yards in width in the dry season, and from 2000 to 3000 yards in the rains. It receives a number of tributaries, sends off several offshoots, and is navigable throughout the year by native cargo boats of the largest size. The Haringhátá, Baleswar, Madhumati, and Garai, are various local names for the same river in different parts of its course, and represent another great offshoot of the Ganges. It enters Bákarganj near the north-west corner of the district, whence it forms its western boundary, and runs south, but with great windings in its upper reaches, till it crosses the Sundarbans, and finally falls into the Bay of Bengal by a large and deep estuary, capable of receiving merchant ships of considerable burden. In the whole of its course through the district the river is navigable by native boats of large tonnage, and by large sea-going ships as high up as Morrellganj, in the neighbouring district of Jesser. Among its many tributaries in Bákarganj the most important is the Kachá, itself a considerable stream and navigable by large boats all the year round, which flows in a southerly direction for 20 miles, when it falls into the Baleswar. Other rivers of minor importance are the Barisál, Bishkhálí, Nihálganj, Khairábád, Ghágar, Kumár, &c. All the rivers in the district are subject to tidal action from the Meghná on the north, and from the Bay of Bengal on the south, and nearly all of them are navigable at high tide by country boats of all sizes. The rise of the tide is very considerable in the estuary of the Meghná, and many of the creeks and water-courses in the island of Dakshin Sháhábápur, which are almost dry at ebb tide, contain 18 or 19 feet of water at the flood. A very strong "bore" or tidal wave runs up the estuary of the Meghná at spring tides, and a singular sound like thunder, known as the "Barisál Guns," is often heard far out at sea about the time it is coming in. There are numerous marshes in the district, of great size and depth, and abounding in fish. The following peculiarity of some of them is quoted from Colonel Gastrell's *Geographical and Statistical Report of the District (1868)*:—"In some of the swamps, especially in those of Bákarganj, the surface growth of aquatic plants, mixed with drift weeds,

grasses, and rice stalks, increases annually, and in process of time a crust is formed capable of supporting human beings, and on which rice is cultivated. Small floating patches are thus formed, and the natives assert that in very strong blowing weather these are sometimes carried from one side of the swamp to the other, and are a cause of great dispute. A Government official, whose duties often took him to these swamps, mentioned that the first time he found himself on ground of this kind, being totally unaware of its nature, he was greatly alarmed at feeling, as he thought, the earth moving beneath him; and still more astonished when, on seeking information from the inhabitants, he was told 'it was only the tide coming in.' The owners of these floating fields make holes through them, and catch the fish which are immediately attracted by the light."

The census of 1872 disclosed a population of 2,377,433 souls in Bākarganj district, spread over 4935 square miles, inhabiting 4269 villages and 321,657 houses; persons per square mile, 482; per village, 557; per house, 7.4. The Mahometans are the largest section of the population, and number 1,540,965, or 64.8 per cent. of the total inhabitants; Hindus, 827,393, or 34.8 per cent.; Buddhist, 4049, or .2 per cent.; Christians, 4852, or .2 per cent.; and persons of unspecified religion, 174 souls. The Musalmāns of Bākarganj are among the worst of their creed, steeped in ignorance and prejudice, easily excited to violence and murder, very litigious, and grossly immoral. The Farāzīs or Puritan sect of Mahometans are exceedingly numerous in the district. The Buddhist population consists of Maghs or the people of Arākān, who first settled in Bākarganj about seventy years ago, and have made themselves very useful in the clearing of the Sundarbans. A gipsy-like tribe called the Behājīs are rather numerous in this district. They principally live in boats, travelling from place to place, profess Muhammadanism, and gain their subsistence by wood-cutting in the Sundarbans, fishing, fortune-telling, and trading in trinkets. The Christian community of Bākarganj owes its origin to the Roman Catholic monastery at Bandel near Calcutta, and to the Protestant (Baptist) missionaries at Serampur. The principal native converts come from the Hindu low-caste Chandāls, &c., who subsist by cultivation.

Barisāl, the neaquarters station, situated on the west bank of the Barisāl river, in 21° 41' 40" N. lat., and 90° 24' 30" E. long., is the only town containing upwards of 5000 inhabitants. In 1872 its population amounted to 7684 souls; municipal income, £1019, 18s.; municipal expenditure, £1006, 2s.; incidence of taxation, 2s. 7½d. per head. There are also three other municipal towns—(1.) Nalchitī, a large trading village; principal exports, rice and paddy; imports, salt, tobacco, oil, and sugar; (2.) Jhālākātī or Mahārājganj, a large timber market, also trading in rice, paddy, and salt; (3.) Daulat Khān, the principal village in the island of Dakshīn, Shāhbāzpur; exports, betel-nut. A number of small trading villages exist throughout the district, and each locality has its periodical fairs for purposes of traffic. The material condition of the people is good. Every inhabitant is a small landholder, and cultivates sufficient rice and other necessaries for the support of his family. Owing to this reason, hired labour is very scarce, and during the harvest season, when the few available labourers are sought for by the landholders, the price of labour rises to 1s. per diem. The average cost of living to a labouring man is about 6s. per month. Except in the larger villages, the dwellings of the people are very isolated. The inhabitants seldom congregate together into hamlets, but each man builds his homestead on the highest spot on his own land without any reference to his neighbours. Rice is the great crop of the district, and three harvests are obtained annually—the *āman*, or winter rice; *āus*, or autumn crop; and *boro*, or spring rice. The former yields the finest grain, and is the staple crop of the district. It is sown at the setting in of the rains in April or May, transplanted from the beginning of June to the middle of August, and reaped in November or December. About 100 varieties of the *āman* rice are cultivated in the district. The *āus* crop is sown in the early part of the hot weather, and reaped in August. Upwards of 20 varieties of this rice are produced. The *boro* or spring rice is of a coarse description, largely used by the poorer classes, and is cultivated to a considerable extent in the alluvial river accre-

tions, and on other low-lying grounds. It is sown broadcast in December, and reaped in April or May. Bākarganj exports its rice chiefly to Calcutta. The average yield of rice land here is from 17½ to 22 cwt. per acre. Other crops—*khesrī* (*Lathyrus sativus*), *musurī* (*Cicer lens*), *sarishā* or mustard, rape-seed, linseed, jute, sugar-cane, betel-nut, &c. Manufactures—pottery, coarse cloth, oil, fine mats, and molasses. The district has only five small roads, but its rivers afford ample means of communication.

Like all other districts of Bengal, Bākarganj has steadily increased in prosperity since its administration passed into the hands of English officers, and especially of late years, since the country has been directly under the Crown. From the time of the acquisition of Bengal by the British in 1765 up to the end of 1817, Bākarganj formed a part of the Dacca district. It was then formed into a separate collectorship, with the object of encouraging enterprising persons to cultivate its immense tracts of waste lands. In 1818 the net revenue of the district amounted to £96,438, and the net civil expenditure to £13,647. Two years later (1820) the net district revenue had slightly decreased to £95,709, while the net expenditure on civil administration had increased to £16,659. During the next forty years both revenue and expenditure rapidly increased, and in 1860–61 the net revenue of the district amounted to £150,305, and the net civil expenditure to £32,584. In 1870–71 the total net revenue was £203,445, and net civil expenditure, £44,902. The land revenue of Bākarganj is settled in perpetuity with the *zamīndārs*. In 1872 the district contained 4729 estates, held by 5960 proprietors, who were assessed at a total revenue of £143,156. In 1871 the machinery for protecting the district consisted of 583 men of the regular police of all ranks, maintained at a total cost of £11,186. Attached to the regular police is a river patrol consisting of five boats, and manned by a crew of 35 men. The village watch or rural police consisted in 1871 of 5135 men, maintained at a cost of £18,486, paid by the landholders and villagers, each village watchman having besides a small plot of ground rent free. A municipal police of 53 men was also maintained in the towns and large villages, at a total cost of £403, 14s., defrayed out of municipal receipts. Education is in a very backward state in Bākarganj, owing to the inhabitants being almost wholly composed of petty husbandmen, the majority of whom are Mahometans of the most bigoted tenets. In 1856–57 the district contained 5 schools, attended by 482 pupils, and maintained at a total cost of £595, 13s. In 1871–72 there were 78 Government and aided schools, attended by 3713 pupils, and maintained at a total cost of £3767, 12s., the total cost to the state being £1232, 10s. This is exclusive of private schools uninspected by the education department. The census report of 1872 returned the total number of schools (Government and private) at 512, attended by a total of 7299 pupils. Barisāl town contains a Government school, which is the largest in Eastern Bengal, and financially the most successful; the cost to Government for its 355 pupils in 1872 being only £31, 12s. Bākarganj district is divided into 5 magisterial sub-divisions, viz., Barisāl, Dakshīn Shāhbāzpur, Mādāripur, Pirozpur, and Fatuākhālī, comprising 18 police circles or *thānās*, and 54 fiscal divisions or *pargānās*. The climate of Bākarganj is one of the healthiest in Eastern Bengal, owing to the strong south-west monsoon, which comes up directly from the Bay of Bengal, and keeps the atmosphere cool; but the heavy rain-fall and consequent humidity of the atmosphere, combined with the use of bad water, are fruitful sources of disease. The average annual temperature varies from 78° to 85°. The thermometer ranges from 62° to 98°. The endemic diseases of Bākarganj are fevers of the intermittent, remittent, and continued types, attributable to the extreme dampness and malarious nature of the district. Cholera is always present, the number of cases increasing in the hot season and the beginning of the cold weather. Smallpox occasionally makes its appearance in an epidemic form,—frequently caused by inoculation, which is carried on to a great extent in Bākarganj by the native medical practitioners.

BAKER, HENRY, a distinguished naturalist, was born in Fleet Street, London, in 1698. At the age of fifteen he was apprenticed to a bookseller, with whom he remained for seven years. He then became clerk to Mr Forster, attorney, whose deaf and dumb daughter he instructed carefully, and with such success that for a time he devoted himself to the training of persons similarly afflicted. During this period of his life he published several poems, and married Sophia, youngest daughter of the famous Daniel Defoe, who bore him two sons, both of whom he survived. In 1740 he was elected fellow of the Society of Antiquaries and of the Royal Society. He contributed many memoirs to the *Transactions* of the latter society, and in 1744 received the Copley gold medal for microscopical experiments on the crystallisation and configuration of saline particles. Mr Baker died at his apartments in the Strand on the 25th of November 1774. Besides his numerous memoirs in the *Philosophical Transactions*, he published two valuable treatises on the microscope: *The Microscope made Easy*, London, 1743, and *Employment for the Microscope*, 1753. Another well-known work is his philosophical poem, *The Universe*, which has passed through several editions. Mr Baker's memory is perpetuated by the Bakerian Lecture of the Royal Society, for the foundation of which he left by will the sum of £100.

BAKER, SIR RICHARD, author of the *Chronicle of the Kings of England*, was born at Sissinghurst, in Kent, about the year 1568. He was educated at Oxford, took the degree of Master of Arts, and in 1603 received the honour of knighthood. In 1620 he was made high sheriff of Oxfordshire; but having engaged to pay some debts of his wife's family, he was reduced to poverty, and obliged to betake himself for shelter to the Fleet prison, where he died, February 18, 1645. During his confinement he composed numerous works, historical, poetical, and miscellaneous. Amongst these are *Meditations and Disquisitions on the Lord's Prayer*; *Meditations, &c., on several of the Psalms of David*; *Meditations and Prayers upon the Seven Days of the Week*; *Cato Variegatus*, or *Cato's Moral Distichs*; *Theatrum Triumphans*, or *Theatrum Redivivum*, being a reply to Prynne's *Histriomastix*, &c. His principal work, the *Chronicle of the Kings of England*, inexact and uncritical, but written in a pleasant and readable style, quickly acquired a high reputation. It was continued to 1658 by Edward Phillips, Milton's nephew, and has passed through many editions.

BAKER, THOMAS, a learned antiquary, descended from an ancient family distinguished by its loyalty, was born at Crook in 1656. He was educated at the free school at Durham, and proceeded thence, in 1674, to St John's College, Cambridge, where he afterwards obtained a fellowship. Lord Crewe, bishop of Durham, collated him to the rectory of Long-Newton in his diocese, in 1687, and further intended to give him that of Sedgefield, with a golden prebend, had not Baker incurred his displeasure for refusing to read James II.'s Declaration of Indulgence. The bishop who disgraced him for this refusal, and who was afterwards specially excepted from William's Act of Indemnity, took the oaths to that king, and kept his bishopric till his death. Baker, on the other hand, though he had opposed James, refused to take the oaths to

William; he resigned Long-Newton on the 1st of August 1690, and retired to St John's, in which he was protected till the 20th of January 1716–17, when he and one-and-twenty others were deprived of their fellowships. After the passing of the Registering Act in 1723, he could not be prevailed on to comply with its requirements by registering his annuity of £40, although that annuity, left him by his father, with £20 per annum from his elder brother's collieries, was now his whole subsistence. He retained a lively sense of the injuries he had suffered; and inscribed himself in all his own books, as well as in those which he gave to the college library, *socius ejectus*, and in some *rector ejectus*. He continued to reside in the college as commoner-master till his death on the 2d of July 1740. The whole of his valuable books and manuscripts he bequeathed to the university. The only works he published were, *Reflections on Learning, showing the Insufficiency thereof in its several particulars, in order to evince the usefulness and necessity of Revelation*, Lond. 1709–10, and the preface to Bishop Fisher's *Funeral Sermon for Margaret, Countess of Richmond and Derby*, 1708,—both without his name. His valuable manuscript collections relative to the history and antiquities of the university of Cambridge, amounting to thirty-nine volumes in folio and three in quarto, are divided between the British Museum and the public library at Cambridge,—the former possessing twenty-three volumes, the latter sixteen in folio and three in quarto. The life of Baker has been written by Robert Masters, 8vo, 1784, and by Horace Walpole, in the quarto edition of his works.

BAKEWELL, a market-town in Derbyshire, on the River Wye, 152 miles from London. Its fine old church contains monuments of the families of Vernon and Manners. The inhabitants are supported by the working of the coal, lead, and zinc mines, and the stone and marble quarries in the neighbourhood. There is also a large cotton manufactory in the town established by Arkwright. Bakewell is remarkable for a chalybeate spring, frequented by invalids. It has a free school of ancient date, a literary and scientific institution, and a museum. About four miles distant is Chatsworth House, the seat of the duke of Devonshire. Population in 1871, 2283.

BAKHCHISARAI (Turkish, *the Garden Palace*), a town of Russia in the government of Taurus, situated in a narrow gorge on the banks of a small stream called the Chiryuk-Su, about 10 miles S.S.W. of Simpheropol. Of unknown origin, it became towards the close of the 15th century the residence of the Tatar khans; and its chief objects of interest are the remains of its splendour under the Tatar dynasty. The principal building, the palace, or *Khan-Serai*, was originally erected in 1519 by Abdul-Sahal-Gerai, and was restored at Potemkin's command by the architect Elson for the reception of Catherine. Not far off is a cemetery, which contains the tombs of many of the khans. There are, besides three or four churches and a synagogue, no fewer than thirty-five mosques, of which the most important was founded in the early part of the 18th century. The population still consists for the most part of Tatars, Catherine II. in 1783 having granted them the exclusive right of habitation in the city. The remainder consists of Russians, Greeks, Armenians, and Jews. Bakhchisarai is a place of considerable industry, manufacturing red and yellow morocco, sheepskin cloaks, agricultural implements, sabres, and other cutlery, and forming an important depôt for the corn, flax, fruits, tobacco, and other produce of the whole surrounding district. In the neighbourhood is Chufut-Kali (or Jews' city), the chief seat of the Karaitic Jews of the Crimea, situated on lofty and, except on one side, inaccessible cliffs. Population, 10,528.

BAKHMUT, a town of Russia in the government of Ekaterinoslav, near the river from which it derives its name. It owed its origin in the latter half of the 17th century to the discovery of salt-springs, which ceased, however, to be utilised in 1782. Its present importance is chiefly due to the extensive coal-deposits in the vicinity. Population, 16,791

BAKING. The art of baking consists in heating anything in an oven or fire so as to harden it, and in this sense the term is used when applied to the manufacture of bread, porcelain, pottery, and bricks. It is also applied to certain modes of dressing or cooking animal food; thus we speak of baked meats, pies, &c. In the present article the baking of flour or meal for use as human food will alone be treated of.

The origin of baking, as of most arts of primary importance, precedes the period of history, and is involved in the obscurity of the early ages of the human race. Excavations conducted on the site of some of the numerous lake dwellings of Switzerland have resulted in the discovery of abundant evidence that the art of making bread was practised by our prehistoric ancestors as early as the Stone Period. Not only have stones for grinding meal and baking bread been discovered, but bread itself in large quantities has been disinterred, preserved by being carbonised in the fires which frequently destroyed the pile-dwellings of the primitive inhabitants of the world. At Robenhäusen, Meisskomer discovered 8 lb of bread, a weight which would correspond with about 40 lb of newly-baked bread. At Wangen there has been discovered "actual baked bread or cake made of the crushed corn, precisely similar to that found about the same time by Mr Meisskomer at Robenhäusen. Of course, it has been burned or charred, and thus these interesting specimens have been preserved to the present day. The form of these cakes is somewhat round, and about an inch to an inch and a half in diameter. The dough did not consist of meal, but of grains of corn more or less crushed. In some specimens the halves of grains of barley are plainly discernible. The under side of these cakes is sometimes flat, sometimes concave, and there appears no doubt that the mass of dough was baked by being laid on hot stones and covered over with glowing ashes."—(Keller's *Lake Dwellings*, Lee's Translation, p. 63.)

The very early mention of bread in written history further bears out the great antiquity of the art of baking. Bread is first specifically mentioned in Genesis xviii. 5, when Abraham, wishing to entertain the three angels on the plains of Mamre, offered to "fetch a morsel of bread;" and the operation of baking is immediately thereafter alluded to in the instructions to Sarah to "make ready quickly three measures of fine meal, knead it, and make cakes upon the hearth." At the same time, when, in the city of Sodom, Lot entertained two angels, "he made them a feast, and did bake unleavened bread, and they did eat" (Genesis xix. 3). It may be inferred from the mention of unleavened bread that, in those patriarchal times, the two great classes of bread were known and used. At a period little later the art of baking was carried to high perfection in Egypt, which then took the lead in the arts of civilised life. The Egyptians baked cakes and loaves of many varieties and shapes, in which they employed several kinds of flour, and they flavoured their bread with various aromatic ingredients. The chief baker of Pharaoh, who was in prison along with Joseph, doubtless pursued his craft in its essential features in the same way as bakers do at the present day.

From ancient Egypt excellence in the art of baking travelled with the march of civilisation into Greece, and the allusions to bread in the works of classic authors are very

numerous. In *The Deipnosophists* of Athenæus mention is made of no less than sixty-two varieties of bread as known among the ancient Greeks, and minute descriptions of many of them are given. We learn from Pliny (*Nat. Hist.*, xviii. 28) that professional bakers were first introduced into Rome at the close of the war with Perseus, king of Macedon. By the practical Romans the baking trade was formed into a kind of incorporation or guild, with special privileges and immunities attached to the calling. Public bakeries were distributed throughout the city, to which slaves were assigned for performing the heavier and more disagreeable tasks connected with the occupation. Grain was delivered into public granaries by enrolled *Saccarii*, and it was distributed to the bakers by a corporation called the *Catabolensee*. No separate mills for grinding corn then existed, the grain being pounded and sifted in the bakeries, and hence the Roman bakers were known as *Pistores*. A special magistrate was appointed to take cognisance of every matter connected with the management of public bakeries.

The calling of the baker during the Middle Ages was considered to be one so closely affecting the interests of the public that it was put under strict regulation and supervision, and these special restrictions continued to affect the trade down to very recent times. In England, an Act of Parliament was passed in 1266 for regulating the price of bread by a public assize, and that system continued in operation till 1822 in the case of the city of London, and till 1836 for the rest of the country. The price of bread was determined by adding a certain sum to the price of every quarter of flour, in name of the baker's expenses and profit; and for the sum so arrived at tradesmen were required to bake and sell eighty quarter loaves, or a like proportion of other sizes, which it was reckoned each quarter of flour ought to yield. The following table exhibits the assize price of bread in London in 1814:—

Price of Flour in Shillings.	Price of Quarter Loaf.	Price of 8-lb Loaf.	Price of 4-lb Loaf.	Price of 2-lb Loaf.	Price of 1-lb Loaf.
30	0 6½	1 0	0 8	0 3	0 1½
35	0 7½	1 1½	0 9½	0 3½	0 1¾
40	0 8	1 2½	0 7½	0 3½	0 1¾
45	0 8½	1 4	0 8	0 4	0 2
50	0 9½	1 5½	0 8½	0 4½	0 2½
60	0 11	1 8½	0 10½	0 5	0 2½
70	1 0½	1 11	0 11½	0 5½	0 3
80	1 2	2 1½	1 1	0 6½	0 3½
90	1 3½	2 4½	1 2½	0 7½	0 3½
100	1 5	2 7½	1 3½	0 7½	0 4

The art of making bread made its way northwards very slowly; and even at present, in the northern countries of Europe and Asia, loaves of bread are seldom used except by the higher classes of inhabitants. In Sweden, for example, rolls are frequently seen in the towns, but loaves rarely. Towards the end of 1812 the captain of an English packet ordered a Gothenburg baker to bake for him a quantity of bread, to the value of £1 sterling. The baker was confounded at so large an order, and refused to comply till the captain gave him security that he would carry off and pay for the loaves, declaring that he could never dispose of so great a quantity of bread in Gothenburg if it were left upon his hands. In the country part of Sweden no bread is made but rye-cakes, nearly as hard as flint, which are only baked twice a year. About a century ago loaf-bread was almost as rare in the rural districts of Scotland, *barley bannocks* and *oaten cakes* then constituting the universal substitutes among almost all ranks. In many parts of England it is the custom for private families to bake their own bread. This is particularly the case in

Kent, and in some parts of Lancashire. In the year 1804 the town of Manchester, with a population of 90,000 persons, did not contain a single public baker. Bakers in Great Britain are now placed under the provisions of "The Bakehouses' Regulation Act, 1863" (26 and 27 Vict. cap. 40), a statute passed after a searching inquiry into the condition of bakehouses in London and of the persons employed in them. By this Act no young person under the age of 18 is permitted to work in a bakehouse between the hours of 9 P.M. and 5 A.M., and special enactments provide for securing the cleanliness and ventilation of bakehouses, and for the regulation of sleeping apartments connected with them.

As compared with wheat-flour all other materials used for making bread are of comparative insignificance. Oat cakes still form a staple article of food in many rural districts of Scotland, and are occasionally used in other countries. They are made by mixing up oatmeal, warm water, and salt, sometimes with the addition of butter or fat, into a very stiff paste, and kneading this out into a thin cake, which is first fired on a hot plate or "girdle," and finished in front of an open fire. Scones of barley-flour, sweet and tough, were formerly largely used in Scotland, but have now given place to a similar preparation of wheat flour. Rye bread, both fermented and unfermented, is largely consumed by the inhabitants of the northern parts of Europe in the poor and backward districts. Cakes of maize meal, baked like oat cakes, are consumed in some parts of the United States. The meal of various species of millet is used in Southern Europe to form bread; and in India and China, durra (*Sorghum vulgare*) and other cereal grains are baked for food. Of non-cereal flours, the principal used for bread-making is buckwheat, *Fagopyrum esculentum*, extensively employed in Russia and Holland. The flour of pease, beans, and other leguminous seeds, are also baked into cakes; and cassava cakes are made from the meal of the tapioca plant, *Jatropha Manihot*, in South America. Excepting rye, none of these substances is used for making vesiculated or fermented bread.

The grain of wheat consists of an outer husk or covering, an embryo or germ, and a central mass of farinaceous material. The outer husk is composed of several distinct layers of ligneous tissue, closely adhering to the seed, and very hard in texture. In grinding, this is detached in scales, and constitutes the chief proportion of the bran. The inner portion of the envelope is softer, and contains an active nitrogenous principle, termed cerealin, and is besides rich in fat and salts. This portion goes with the pollard or parings in the dressing of wheat flour. Towards the centre of the grain the substance becomes whiter in colour and more friable in texture, so that, in grinding, the finest flour in consistency is always the whitest in appearance. By agriculturists several hundred varieties of wheat and a number of distinct species are recognised; but in commerce the grain is distinguished as white and red, or as hard and soft wheats. There is a considerable range of difference in the proportions of their proximate constituents, hard wheats as a rule being much more nitrogenous than the soft varieties; and similarly, wheats grown in hot climates are also usually richest in nitrogen. The following analyses of two typical varieties of wheat are taken from Payen's tables, water being neglected:—

	Hard Wheat. Taganrog.	Soft Wheat. Touelle.
Nitrogenous matter	20.00	12.65
Starch	68.80	74.51
Dextrin	8.00	6.05
Cellulose	3.10	2.80
Fatty matter	2.25	1.87
Mineral matter	2.85	2.12

When wheat is ground it is sifted or dressed into a series

of mill products, ranging from fine flour to bran, according to the size of the ground particles. The divisions vary in different mills and localities; but the accompanying table—the result of an elaborate series of experiments by Messrs Lawes and Gilbert—may be regarded as a standard of the relative proportions of mill products:—

Mean Yield of Flour, Bran, &c., in 100 parts Meal.

	Wheat of 1846. 7 Cases.	Wheat of 1847. 19 Cases.	Wheat of 1848. 2 Cases.	Mean of the 28 Cases.
1. Wire 1.....	44.0	35.7	47.4	41.1
2. Wire 2.....	17.9	16.4	23.9	18.6
3. Wire 3.....	8.7	13.3	2.0	9.2
Amounts of 1, 2, and 3 together.....	69.3	70.2	73.3	70.2
4. Tails.....	4.9	5.8	2.1	5.3
5. Fine Sharps or Middlings.....	10.2	8.7	4.5	8.8
6. Coarse Sharps.....	3.5	3.3	3.6	3.4
7. Fine Pollard.....	3.9	1.8	2.6	2.4
8. Coarse Pollard.....	4.4	7.2	7.9	6.5
9. Long Bran.....	3.5	2.5	5.9	3.0

The tails and fine sharps are generally passed through the mill a second time, bringing up the yield of flour to about 80 per cent. of the entire grain. As an example of mill products in practice, the following table is copied from the actual mill receipts of a Scotch miller. The quantity dealt with represents 16 quarters of wheat, weighing 63¾ lb per bushel, in all 578 st. 11 lb. The yield was—

	St.	Lb.
Fine Flour.....	414	0
Odd and Second Flour.....	23	13
Parings (Sharps and Pollards).....	36	12
Bran and Shellings.....	92	0
Waste.....	11	0

The composition of flour and bran given in the understated table is the mean result of a series of fourteen analyses by Peligot:—

	Flour.	Bran.
Water.....	14.0	10.30
Fatty matters.....	1.2	2.82
Nitrogenous substances insoluble in water (gluten).....	12.8	10.84
soluble (albumen).....	1.8	1.64
Non-nitrogenous soluble substances—dextrin, sugar, &c.....	7.2	5.80
Starch.....	59.7	22.62
Cellulose.....	1.7	43.98
Salts.....	1.6	2.52

It is a disputed point whether dextrin or sugar exists in flour of the best quality; but the action of heat and moisture in the baking process quickly transforms a portion of the starch into the soluble condition. In flour of inferior quality a large percentage of dextrin is usually found—a circumstance very detrimental to its bread-making qualities. A table of the percentage of gluten, obtained by Messrs Lawes and Gilbert from a large number of flours, shows a variation from 8.9 to 14.9 per cent. This gluten itself (the insoluble nitrogenous substance in flour) is a compound body, composed of three or four distinct substances; but its physical conditions of elasticity, tenacity, and colour are of much greater importance to the baker than either its chemical constitution or its amount.

The varieties of wheaten bread are divisible into two great classes—*Unvesiculated* and *Vesiculated* Bread. Under the first head are included such products of the art as are fired or baked without first being raised or rendered spongy by the development of carbonic acid gas within the mass, either by fermentation or otherwise. Vesiculated bread is produced when carbonic acid is either developed in or introduced into the dough, so as to permeate the mass with an infinite number of minute cavities, which render the product light and spongiform.