

mended for the refining of gold by the formation of a bromide; and it is thought that bromine vapour might be used with advantage for toughening brittle gold.

BROMLEY, a market-town of England, in the county of Kent, 10 miles S.E. of London. It is situated on high ground to the north of the river Ravensbourne, and since the opening of the railway has become a favourite residence for men of business from London. It has a town-hall—built in 1864, an old market-house, a literary institution, and a college, originally founded in 1666 by Bishop Warner for the residence and support of clergymen's widows. The church is a fine Gothic building, containing some handsome monuments; and in the vicinity is a palace, erected in 1777 in room of an older structure, for the bishops of Rochester, to whom the manor has belonged since the time of Ethelbert. In the gardens attached is a mineral spring known as St Blaze's Well, which was in great repute before the Reformation. The population of the parish, which in 1861 was only 5505, amounted at the census of 1871 to 10,674. The parish includes the villages of Plaistow, Sundridge, Bickley, Widmore, Elmstead, Southboro', and Bromley Common.

BROMSGROVE, a market-town of England, in the county of Worcester, 13 miles S. by W. of Birmingham, with a station on the Birmingham and Worcester Railway, at the distance of a mile and a half. The church of St John is a fine old building, restored in 1858, with a tower and spire 189 feet in height. The free grammar school, founded by Edward VI., has been recently enlarged; and a literary institute and a school of art have been established. The principal manufactures of the town are nails, buttons, needles, and coarse linen stuffs; and there are also waggon-works and malt-kilns. The population of the Improvement District in 1871 was 6967.

BRONCHITIS, inflammation of the mucous membrane of the bronchial tubes. Well known as one of the most common diseases of the climate of Great Britain, bronchitis exists in either an acute or a chronic form.

Acute bronchitis, like other inflammatory affections of the chest, generally arises as the result of exposure to cold, particularly if accompanied with damp, or of sudden change from a heated to a cool atmosphere. The symptoms vary according to the severity of the attack, and more especially according to the extent to which the inflammatory action spreads in the bronchial tubes. The disease usually manifests itself at first in the form of a catarrh, or common cold; but the accompanying feverishness and general constitutional disturbance proclaim the attack to be something more severe, and symptoms denoting the onset of bronchitis soon present themselves. A short, painful, dry cough, accompanied with rapid and wheezing respiration, a feeling of rawness and pain in the throat and behind the breast bone, and of oppression or tightness throughout the chest, mark the early stages of the disease. In some cases, from the first, symptoms of the form of asthma known as the *bronchitic* are superadded, and greatly aggravate the patient's suffering. See ASTHMA.

After a few days expectoration begins to come with the cough, at first scanty and viscid or frothy, but soon becoming copious and of purulent character. In general, after free expectoration has been established the more urgent and painful symptoms abate; and while the cough may persist for a length of time, often extending to three or four weeks, in the majority of instances convalescence advances, and the patient is ultimately restored to health, although there is not unfrequently left a tendency to a recurrence of the disease on exposure to its exciting causes.

When the ear or the stethoscope is applied to the chest of a person suffering from such an attack as that now described, there are heard in the earlier stages snoring or cooing

sounds, mixed up with others of wheezing or fine whistling quality, accompanying respiration. These are denominated dry sounds, and they are occasionally so abundant and distinct as to convey their vibrations to the hand applied to the chest, as well as to be audible to a bystander at some distance. As the disease progresses these sounds become to a large extent replaced by others of crackling or bubbling character, which are termed moist sounds or râles. Both these kinds of abnormal sounds are readily explained by a reference to the pathological condition of the parts. One of the first effects of inflammation upon the bronchial mucous membrane is to cause some degree of swelling, which, together with the presence of a tough secretion closely adhering to it, tends to diminish the calibre of the tubes. The respired air as it passes over this surface gives rise to the dry or sonorous breath sounds, the coarser being generated in the large, and the finer or wheezing sounds in the small divisions of the bronchi. Before long, however, the discharge from the bronchial mucous membrane becomes more abundant and less glutinous, and accumulates in the tubes till dislodged by coughing. The respired air, as it passes through this fluid, causes the moist râles above described. In most instances both moist and dry sounds are heard abundantly in the same case, since different portions of the bronchial tubes are affected at different times in the course of the disease.

Such are briefly the main characteristics presented by an ordinary attack of acute bronchitis running a favourable course.

The case is, however, very different when the inflammation spreads into, or when it primarily affects the minute ramifications of the bronchial tubes which are in immediate relation to the air-cells of the lungs, giving rise to that form of the disease known as *capillary bronchitis*. When this takes place all the symptoms already detailed become greatly intensified, and the patient's life is placed in imminent peril in consequence of the interruption to the entrance of air into the lungs, and thus to the due aeration of the blood. The feverishness and restlessness increase, the cough becomes incessant, the respiration extremely rapid and laboured, the nostrils dilating with each effort, and evidence of impending suffocation appears. The surface of the body is pale or dusky, the lips are livid, while breathing becomes increasingly difficult, and is attended with suffocative paroxysms which render the recumbent posture impossible. Unless speedy relief is obtained by successful efforts to clear the chest by coughing and expectoration, the patient's strength gives way, somnolence and delirium set in, and death ensues. All this may be brought about in the space of a few days, and such cases, particularly among the very young, sometimes prove fatal within forty-eight hours.

During life, in addition to the auscultatory signs present in ordinary bronchitis, there generally exist in this form of the disease abundant fine moist râles at the bases of both lungs; and the appearance of these organs after death shows the minute bronchi and many of the air-cells to be filled with matter similar to that which had been expectorated, and which has thus acted as a mechanical hindrance to the entrance of the respired air and caused death by asphyxia.

Acute bronchitis must at all times be looked upon as a severe and even serious ailment, but there are certain circumstances under which its occurrence is a matter of special anxiety to the physician. It is pre-eminently dangerous at the extremes of life, and mortality statistics show it to be one of the most fatal of the diseases of those periods. This is to be explained not only by the well recognized fact that all acute diseases tell with great severity on the feeble frames alike of infants and aged people, but more

particularly by the tendency which bronchitis undoubtedly has in attacking them to assume the capillary form, and when it does so to prove quickly fatal. The importance, therefore, of early attention to the slightest evidence of bronchitis among the very young or the aged can scarcely be overrated.

Bronchitis is also apt to be very severe when it occurs in persons who are addicted to intemperance. Again, in those who suffer from any disease affecting directly or indirectly the respiratory functions, such as consumption or heart disease, the supervention of an attack of acute bronchitis is an alarming complication, increasing, as it necessarily does, the embarrassment of breathing. The same remark is applicable to those numerous instances of its occurrence in children who are or have been suffering from such diseases as have always associated with them a certain degree of bronchial irritation, such as measles and whooping-cough.

One other source of danger of a special character in bronchitis remains to be mentioned, viz., collapse of the lung. Occasionally a branch of a bronchial tube becomes plugged up with secretion, so that the area of the lung to which this branch conducts ceases to be inflated on inspiration. The small quantity of air imprisoned in the portion of lung gradually escapes, but no fresh air enters, and the part collapses and becomes of solid consistence. Increased difficulty of breathing is the result, and where a large portion of lung is affected by the plugging up of a large bronchus, a fatal result may rapidly follow, the danger being specially great in the case of children. Fortunately, the obstruction may sometimes be removed by vigorous coughing, and relief is then obtained.

With respect to the treatment of acute bronchitis, in those mild cases which are more of the nature of a simple catarrh, little else will be found necessary than confinement in a warm room, or in bed, for a few days, and the use of light diet, together with warm diluent drinks. Additional measures are, however, called for when the disease is more markedly developed. Medicines to allay fever and promote perspiration, such as the well-known Mindererus spirit, combined with antimonial or ipecacuan wine, are highly serviceable in the earlier stages. Later on, with the view of soothing the pain of the cough, and favouring expectoration, mixtures containing squill or tolu, with the addition of some opiate, such as the ordinary paregorics, may be advantageously employed. The use of opium, however, in any form should not be resorted to in the case of young children without medical advice, since its action on them is much more potent and less under control than it is in adults. Not a few of the so-called "soothing mixtures," have been found to contain opium in quantity sufficient to prove dangerous when administered to children; and, indeed, it is to be feared that fatal results not unfrequently follow their incautious use in this way.

From the outset of the attack the employment of warm applications to the chest in the form of fomentations or poultices affords great relief. Few remedial measures are of greater value than the frequent inhalation of steam. This is accomplished readily enough in the case of adults by the use of an inhaler or simply by breathing over an open-mouthed vessel containing boiling water. In children in whom this plan cannot be carried out in the same manner, there is in general no difficulty in surrounding them with an atmosphere of steam by placing around them vessels containing hot water, the vapour from which envelopes them. The relief to the cough and breathing, and the aid to expectoration afforded by this simple plan, are often surprising, and the cases are rare where it cannot be borne.

Should the cough persist for a length of time, and the disease threaten to become chronic, counter-irritant applica-

tions to the chest in front and behind, in the form of stimulating liniments, or even of blisters, will be rendered necessary.

When the bronchitis is of the capillary form, the great object is to maintain the patient's strength, and to endeavour to secure the expulsion of the morbid secretion from the fine bronchi. In addition to the remedies already alluded to, stimulants are called for from the first; and should the cough be ineffectual in relieving the bronchial tubes, the administration of an emetic dose of sulphate of zinc or squill may produce a good effect.

During the whole course of any attack of bronchitis, attention must be paid to the due nourishment of the patient; and during the subsequent convalescence, which, particularly in elderly persons, is apt to be slow, tonics and stimulants may have to be prescribed.

Chronic bronchitis may arise as the result of repeated attacks of the acute form, or it may exist altogether independently. It occurs more frequently among persons advanced in life than among the young, although no age is exempt from it.

The usual history of this form of bronchitis is that of a cough recurring during the colder seasons of the year, and in its earlier stages, departing entirely in summer, so that it is frequently called "winter cough." In many persons subject to it, however, attacks are apt to be excited at any time by very slight causes, such as changes in the weather; and in advanced cases of the disease the cough is seldom altogether absent.

The symptoms and auscultatory signs of chronic bronchitis are on the whole similar to those pertaining to the acute form, except that the febrile disturbance and pain are much less marked. The cough is usually more troublesome in the morning than during the day. There is usually free and copious expectoration, and occasionally this is so abundant as to constitute what is termed *bronchorrhœa*.

Chronic bronchitis leads to alterations of structure in the affected bronchial tubes, their mucous membrane becoming thickened or even ulcerated, while occasionally permanent dilatation of the bronchi takes place, often accompanied with profuse fetid expectoration. In long standing cases of chronic bronchitis, the nutrition of the lungs becomes impaired, and dilatation of the air-tubes (*emphysema*) and other complications result, giving rise to more or less constant breathlessness. Chronic bronchitis is liable in some instances, particularly when accompanied with loss of flesh and strength, to be mistaken for consumption; but the physician who carefully regards the history of the case and observes the physical signs and symptoms, will in general be able to distinguish the one disease from the other.

Chronic bronchitis may arise secondarily to some other ailment. This is especially the case in Bright's disease of the kidneys, and in heart disease, of both of which maladies it often proves a serious complication.

Chronic bronchitis does not often prove directly fatal, nor is it necessarily inconsistent with long life. Its chief danger lies in the tendency to intercurrent acute attacks, particularly in the aged; and in this manner it very frequently causes death.

The treatment to be adopted in chronic bronchitis depends upon the severity of the case, the age of the patient, and the presence or absence of complications. Attention to the general health is a matter of prime importance in all cases of the disease, more particularly among persons whose avocations entail exposure, and tonics with cod-liver oil will be found highly advantageous. The use of a respirator in very cold or damp weather is a valuable means of protection. In those aggravated forms of chronic bronchitis, where the slightest exposure to cold air brings on fresh attacks, it may become necessary, where circum-



stances permit, to enjoin confinement to a warm room or removal to a more genial climate during the winter months.

When expectoration is attended with difficulty, such remedies as squill in combination with ammonia may prove useful. When, on the other hand, bronchorrhœa exists, astringents are called for. The inhalation of vapour containing iodine or turpentine is often followed with marked benefit in this way. Where breathlessness accompanies the disease, besides the use of ethereal preparations, marked relief is often derived from large doses of iodide of potassium. Counter-irritation to the chest with turpentine, mustard, or croton oil is generally attended with good results. In aged and weak persons stimulants are an indispensable part of the treatment. Acute exacerbations of the disease, which are so apt to arise in the chronic form, must be dealt with on the principles already indicated in treating of acute bronchitis.

(J. O. A.)

BRÖNDSTED, PETER OLUF, archæologist, was the son of a Danish clergyman, and was born at Horsens in Jutland on 17th November 1781. He received his academical education at the university of Copenhagen; and in 1802 he visited Paris in company with his friend Koes. After remaining there two years, they went together to Italy. Both were zealously attached to the study of antiquities; and congeniality of tastes and pursuits induced them both, in 1810, to join Baron Stackelberg, Von Haller, and Linckh of Stuttgart, in an expedition to Greece, where they examined with attention the interesting remains of ancient art, and engaged with ardour in excavations among the ruins, which were carried on, especially by Bröndsted and Stackelberg, with very interesting results. The discoveries Bröndsted made were made public in several works, which show learning and sagacity such as have seldom been applied to the elucidation of antiquity with happier results. After three years of active researches in Greece, Bröndsted returned to Copenhagen, where, as a reward for his labours, he was appointed professor of Greek in the university. He now began to arrange and prepare for publication the vast materials he had collected during his travels; but finding that Copenhagen did not afford him the desired facilities, he exchanged his professorship for the office of Danish envoy at the papal court in 1818, and took up his abode at Rome. He also, in 1820 and 1821, went to Sicily and the Ionian Isles to collect additional materials for his great work; and when the artistic illustrations were completed, he obtained leave to visit Paris to superintend the publication. In 1826, he came over to London, chiefly with a view to study the Elgin marbles and other remains of antiquity in the British Museum, and became acquainted with the principal archæologists of England.

He returned to Copenhagen in 1832, when he immediately received the appointment of director of the royal museum of antiquities, and the professorship of archæology and philology. His merits were ten years afterwards further rewarded with the honourable office of rector of the university; but an unlucky fall from his horse caused the death of this eminent man on the 26th June 1842. His principal work was the *Travels and Archæological Researches in Greece*, published in German and French, 1826-30. His dissertations on points of ancient art are very numerous.

BRONGNIART, ALEXANDRE, a distinguished French mineralogist, was the son of the eminent architect who designed the Bourse and other public buildings of Paris, and was born in that city in 1770. At an early age he joined the army of the Pyrenees; but having committed some slight political offence, he was thrown into prison, and detained there for some time. On his release he was appointed professor of natural history in the Collège des Quatre Nations, and soon after succeeded Haüy as professor in the school of mines. In 1800 he was made director of

the Sèvres porcelain factory, in which he revived the almost forgotten art of painting on glass. He did not confine himself entirely to mineralogy, for it is to him that we owe the division of Reptiles into the four orders of Saurians, Batrachians, Chelonians, and Ophidians. In 1816 he was elected into the Academy; and in the following year he visited the Alps of Switzerland and Italy, and afterwards Sweden and Norway. The result of his researches he published from time to time in the *Journal des Mines* and *Dictionnaire des Sciences Naturelles*. He died at Paris, October 7, 1847.

His principal works are—*Traité élémentaire de minéralogie appliquée aux Arts*; the *Tableau des terrains qui composent l'écorce du globe*, ou *Essai sur la structure de la partie connue de la terre*; and the *Traité des Arts céramiques* 1845. Brongniart was also the coadjutor of Cuvier in the admirable *Essai sur la géographie minéralogique des environs de Paris*.

BRONTE, a city of Sicily in the intendency of Catania. It stands in a healthy situation at the western foot of Mount Etna, on the river Giaretta, near a celebrated waterfall. It has considerable manufactures of linen and woollen cloths, and some paper-mills. Good wine is produced in the neighbourhood. Bronte is of comparatively modern origin, having all been built since the 16th century. It gave the title of duke to Lord Nelson. Population, 14,589.

BRONTE, CHARLOTTE, modern English novelist, was born on the 21st April 1816. Her father, the Rev. Patrick Bronte, was a native of county Down, Ireland; her mother, Maria Branwell, was of Cornish family. At the date of his marriage, in 1812, Mr Bronte held the living of Hartshead in Yorkshire, and there his two eldest daughters, Maria and Elizabeth, were born. In 1815 he removed to Thornton, in the parish of Bradford, where Charlotte, her brother Patrick Branwell, and her younger sisters, Emily and Anne, were born. In 1820 he was presented to the living of Haworth, and removed in that year to the parsonage, a bleak and solitary house, standing close by the churchyard and backed by a wide expanse of moorland. Mrs Bronte died soon after their removal, and the little family of young children were left to educate and train themselves. They saw little of their father, whose health was bad, and who seems to have been eccentric in his modes of thinking and acting. The charge of the little flock devolved upon the eldest daughter, a girl of between seven and eight when her mother died; and, under the peculiar circumstances of their life, the children's intellectual powers and sympathies developed with rapidity. Utterly deprived of all companions of their own age, with none of the usual outlets for their pent-up energies, they lived in a little world of their own. The harsh realities around them, the bleak scenery, the coarse and rugged natures of the few inhabitants with whom they came in contact, only impelled them to construct for themselves an ideal world, modelled after their own strange and untrained imaginations, in which they found satisfaction and reality. By the time Charlotte Bronte was thirteen years of age, it had become her constant habit, and one of her few pleasures, to weave imaginary tales, idealizing her favourite historical heroes, and bodying forth in narrative form her own thoughts and feelings. Nor was she alone in this curious occupation; all the family took part in the composition of juvenile stories and magazine articles. It was a strange training for a child, boding little good for her future happiness when thrown into the ordinary routine of life.

An event which made a deep impression on this strange family circle was the entering of the two eldest girls, in 1824, at a school recently opened at Cowan's Bridge, near Haworth, and intended for daughters of clergymen. A vivid picture of this school, and one which Miss Bronte always maintained was not over-coloured, is presented in *Jane Eyre*, for the Lowood of that story is Cowan's Bridge.

Of all pupils the Brontes were the least likely to fall in well with the requirements of their new mode of life. Everything was novel and repulsive to them; their peculiar natures were repressed and stunted; their intellectual sympathies found no food. Charlotte and Emily became pupils later in the same year, but it was soon found necessary to remove Maria. Her health had given way completely, and she died a few days after her return to Haworth in the spring of 1825. But a few months later and Elizabeth followed her sister to the grave. The younger girls were removed in the autumn of 1825; and Charlotte, as the eldest of the household, took upon herself the duties that Maria had formerly discharged. For six years she remained at home leading the usual quiet, isolated life, and indulging to the full her rare faculty of composition. She then spent one of her happiest years in a school at Roe Head, and some of the acquaintances made there became life-long friends. To this school she returned in 1835 in the capacity of teacher, and for a time her sisters were with her as pupils. After three years her health, always delicate, gave way alarmingly, and she had to be withdrawn to Haworth. Two short experiences as governess in a family having shown her how little such a life was suited to her, she turned her thoughts towards taking a school, a plan which would have had the special advantage of keeping together the three devoted sisters. Some money was advanced for this scheme by their aunt, and it was resolved that, as a preliminary step, Charlotte and Emily should study French upon the Continent. In 1842, accordingly, they found themselves in Brussels, and a new world, a new experience, was opened up to Miss Bronte's vigorous and imaginative mind, a world to be afterwards reproduced in living characters. She studied hard, and before her return to England in January 1844 had acquired a very thorough knowledge of French.

She came back to a home into which a fresh element of unhappiness had been introduced. Her brother Patrick, a youth of fine talents, had fallen into habits of dissipation, which rapidly rendered him a hopeless drunkard. For some years the sisters had the misery of seeing daily before them the spectacle of a wasted life, of powers thrown away, and of opportunities despised. The details of his unfortunate story may well rest in obscurity. He lingered on till September 1848.

Meanwhile, amid their distress, the sisters, who found refuge in their habits of composition, had made their first literary venture. During their separation, while Charlotte was in Brussels, and Anne in a situation as governess, they had been quietly pursuing their favourite occupation; and in 1845 they made the discovery of each other's poetical efforts. After some correspondence with publishers they resolved to print a small volume of poems, assuming the *noms de plume* of Currer, Ellis, and Acton Bell. The book appeared in the spring of 1846, was barely noticed by the reviews, and attracted no public attention. The authors, however, were encouraged to make a further trial, and each began to prepare a prose tale. Charlotte's was *The Professor*; Emily's, *Wuthering Heights*; Anne's, *Agnes Grey*. *The Professor* was refused on all hands; the other two were accepted, but their publication was delayed for some time. Nothing daunted by her want of success, Charlotte devoted herself heart and soul to a new tale, *Jane Eyre*, which she completed in August 1847. The MS. was accepted by Messrs Smith and Elder; the book appeared with the name of Currer Bell on the title page in October 1847, and at once achieved a decided success.

Few works of an unknown author have been received with such sudden and general acclamation. The utter and even paradoxical disregard for the conventional which the book displayed, the masculine vigour and glowing energy

with which the main characters were drawn, and its intense realism, at once seized and secured the popular favour, and showed the literary world that a new and powerful competitor for its honours was in the field. Its success was not so much the result of the favourable verdicts of trained judges, for these came but slowly, as of its own intrinsic force. The delineation of the harsh and rugged but powerful northern character was the revelation of a new world, and the intensest interest was excited as to the true name and abode of the unknown author. Numerous were the conjectures as to Currer Bell, but the secret was well kept. Even the publishers were unaware of the truth, till the disclosure had to be made to them in consequence of the publication of *Wuthering Heights* and *Agnes Grey*, and of the announcement of *The Tenant of Wildfell Hall*. The public, however, remained in the dark till after the appearance of the second work by the unknown, when a shrewd Yorkshireman, who knew Haworth, divined the secret and published his discovery.

*Shirley*, this second work, fully sustained the author's high reputation. Yet it was written under melancholy circumstances. The death of Patrick Bronte, in September 1848, was followed by the deaths of Emily and Anne in quick succession. Emily died on the 19th December 1848; Anne on the 28th May 1849. *Shirley* was published in October 1849. The disclosure of Miss Bronte's name as the writer at once introduced her to the great literary society of London. She met all the most prominent men of letters of the time; yet, though she was in the world, she was not of it. Her previous life and her peculiarly sensitive and retiring disposition made notoriety and attention painful to her, and she gladly escaped to the quiet of Haworth parsonage. Slowly, and with long interruptions from failing health, her last work proceeded to completion. *Villette* was published in 1853, and was hailed with universal delight. It is in some respects the most pleasing of her works, while it at the same time exhibits some of her gravest faults. The description of the life at the foreign pension, and the whole delineation of the principal characters, are reflexes of her own experience, and impress one with their vivid reality and truth. The plot, however, is unskillfully constructed, and the interest seems to shift from one set of characters to another in the progress of the story.

In June 1854 Miss Bronte was married to her father's curate, the Rev. Mr Nicholls, and for a brief period she tasted the strange new happiness of domestic life. But the seeds of decay were in her constitution; the same malady that had carried off her sisters, worked its way with fatal facility in her enfeebled frame. She died on the 31st March 1855. After her death *The Professor*, her first luckless tale, was published from her MSS.

A comparison has sometimes been made between Miss Bronte and Miss Austen. The points of contrast are certainly more apparent than the points of similarity; and it is a fact not without significance that Miss Bronte could never thoroughly appreciate the merits of her great predecessor. Both were consummate masters of literary expression, and both finished their work with the utmost care and precision. Miss Austen is distinctly superior in skilful evolution of plot and in the nice adjustment of character and incident. But her figures are tame and lifeless when compared with those of Miss Bronte, and what she chiefly lacked, the fierce glow and fire of imagination, and the perception of depths in human nature only revealed through suffering experience, the other possessed to an almost unrivalled extent. Miss Bronte's experience was, indeed, narrow, but it was of a rare kind, such as was peculiarly adapted to her strong and yet sensitive spirit. She had too what Goethe calls the true secret of poetic genius,