

may entirely prevent seizures. Although hay-fever never proves fatal, and usually leaves no sign, it may lead to the development of more serious ailments, as asthma, chronic bronchitis, impaired hearing, etc.

Treatment.—For those who possess the means to travel, there is no remedy so effectual as removal from the hay-fever zone in time to prevent the attack. A sea-voyage, so arranged that the patient is on the ocean at the time of the attack, or residence in Europe, especially in Switzerland, during the same period, is always effectual. There are various parts of the United States where exemption from the seizures may also be secured for one or many years, but the immunity does not always continue indefinitely. The White Mountains, the Catskills, the highest points of the Alleghanies, the Adirondacks, and the Rocky Mountains, are to be recommended. Many seashore places can be resorted to with confidence of relief, so long as the breezes blow from the ocean: Fire Island and the Isles of Shoals are among the most desirable. Certain parts of Canada, Mackinaw, and Marquette, on the upper lakes, are suitable resorts for many cases. As no specific has been discovered, the remedies are very numerous. As is the case in the neuroses, a remedy acting favorably on one occasion will usually fail to relieve when employed again. Quinine has been more useful than any other agent, and may be depended on to give more or less relief if used efficiently. Before the access of the paroxysm it should be administered in the quantity of five grains three times a day for a week, and, when the first symptoms of irritation of the nares are felt, a solution of the muriate (the most soluble salt) should be applied to the nares. When the disease has begun, the best results are obtained from full doses of the iodide of potassium—fifteen grains every four to eight hours. If an abundant secretion is poured out, atropine will be found highly useful. The author has had excellent results from minute doses of morphine and atropine (morphine sulphate gr. $\frac{1}{2}$, atropine sulphate gr. $\frac{1}{200}$) when the paroxysm is well advanced. When asthmatic symptoms are experienced, the most useful remedies are iodides and grindelia. Local applications are, if rightly managed, more efficient than internal remedies. Carbolate of iodine may be applied by the post-nasal syringe thoroughly to the posterior nares, and by the straight syringe through the anterior nares (℞ Acid. carbol. ʒ iij, tinct. iodi ʒ v. M. Sig. Add from one to five minims to a gill of water). A simple expedient consists in vaporizing iodine and cautiously inhaling the vapor through the nares. This may be accomplished by placing a few drops of the tincture in a warm vial. Solutions of chlorate of potash, of chloride of sodium, and of iodide of potassium, properly diluted, are also used with effect by the syringe and douche. Cocaine in solution, or in the form of pellet placed alongside the septum and allowed to dissolve slowly, has proved to be the most effective agent for affording relief. The dose will be $\frac{1}{8}$ – $\frac{1}{4}$ gr.

WHOOPIING-COUGH—PERTUSSIS.

Definition.—*Whooping-cough* is a specific disease, occurring chiefly in childhood, and once only during life, and characterized by successive forcible expirations, and at their termination by a loud, resounding, sonorous inspiration.

Causes.—Rosenthal has shown that irritation of the internal branch of the superior laryngeal nerve produces relaxation of the diaphragm, spasm of the glottis, and a convulsive expiration—the series of acts which constitute a paroxysm of whooping-cough. Hence, we may conclude that the special exciting cause of this disease is a contagious principle which acts upon the respiratory organs, with special excitation of the filaments of the superior laryngeal nerves. The nature of this principle has hitherto escaped recognition. The morbid material may excite the disease at any age, but it is most common from the first to the seventh year, and it happens in females more frequently than in males. Pertussis occurs among all races and classes, and is more prevalent in winter and spring, although it is encountered at other seasons. As epidemics of whooping-cough sometimes precede, accompany, or follow epidemics of measles, a relationship has been supposed to exist between them; but there is no real foundation for such an opinion. One attack removes the susceptibility to the disease, and it is uncommon for a second attack to occur in the same individual. The period of incubation is, probably, about ten days, but it varies considerably.

Pathological Anatomy.—The only lesions are hyperæmia of the mucous membrane of the nares, pharynx, larynx, bronchial tubes, etc., increased secretion after a preliminary dryness of the membrane, the secretion at first consisting of transparent mucus, afterward becoming more or less purulent, and, when this condition has been reached, the redness of the membrane is succeeded by paleness and anæmia. Various pulmonary and cerebral lesions occur also during the course of whooping-cough, but these are complications not necessary to the disease.

Symptoms.—There are three well-defined stages of the ordinary or common form of the disease—the *catarrhal*, the *spasmodic*, and the *terminal*—and there is a complicated form. The catarrhal stage can not be differentiated from an ordinary catarrh. There occur coryza, more or less cough, and slight fever with evening exacerbation, and morning remission or intermittence, general *malaise* and loss of appetite. After one or two weeks the cough changes its character; it becomes more persistent, and assumes a somewhat spasmodic and paroxysmal character. As a rule gradually, but sometimes suddenly, the characteristic whoop is heard. Then the paroxysms have a distinctive character: the cough consists of a succession of short, rapid,

expiratory efforts; the face gets red; the eyes swell and protrude; the body is more and more bent forward in the effort at coughing; then, when the breath is entirely exhausted, a deep, loud, crowing inspiration occurs. During each paroxysm there may be two, three, or more of such efforts, and at the expiration of them the patient brings up a quantity of tenacious, glairy mucus, which is dislodged with difficulty, and is often accompanied by vomiting. In the progress of the case, the expiratory effort is less, the inspiratory is not so long delayed, the secretion becomes less viscid and more purulent, and vomiting occurs less frequently. The peculiar *whoop* or sonorous inspiration is after a time wanting to some of the paroxysms, and ultimately ceases altogether. During the paroxysm, the expiratory effort coincides with a partial occlusion of the glottis, the venous blood accumulates, and more or less cyanosis of the face and head is produced; hæmorrhage may occur from the nose, the ears, rarely from the bronchi, and under the conjunctiva. The frequent collision of the under surface of the tongue with the front teeth excites an ulceration of the frænum and neighboring portion of the tongue. In some cases the sudden compression of the abdominal organs, produced by the coughing, gives rise to the formation of hernia, to prolapse of the bowel, and to involuntary evacuations. The duration of the paroxysms varies from a few seconds to several minutes, and the number of them, daily, is very various, ranging from ten to a hundred, the average being about twenty or thirty. During the period of maximum severity, the attacks are rather more numerous by night than by day, destroying sleep, which may ultimately induce a serious state. The frequent vomiting, also, causes such a loss of aliment that considerable weakness and emaciation result. On the other hand, when the paroxysms are widely separated, the health may be fairly well maintained. The action of the heart is very rapid during the paroxysm, but in the interval it may be normal, unless the system is reduced. The skin is more or less relaxed, and during a paroxysm may be covered with sweat. Attacks are induced by various causes. Imitation is a strong motive; the presence of food in the stomach and the inhalation of dust or irritating fumes of any kind may excite attacks. When the paroxysm is about to approach, the child takes refuge with its nurse, or seizes hold of some object of support, the face turns pale, and then comes the explosion.

Course, Duration, and Termination.—In a well-defined case of the ordinary form the course is tolerably uniform. The catarrhal stage continues two or three weeks, the spasmodic three or four, and the terminal stage a week or two, although it may be prolonged by a cough of habit. The course of whooping-cough may, however, be much modified by the occurrence of *complications*. These occur chiefly in the lungs and the brain. In every severe case of whooping-cough there is probably more or less pulmonary congestion, due to the

interference with the respiration occasioned by the paroxysms of coughing. When this occurs, the breathing is more or less oppressed in the intervals between the paroxysms; the face is constantly somewhat cyanosed; the action of the heart is quick; the pulse is weak, and the general condition is depressed. A frequent and very fatal complication of whooping-cough is capillary bronchitis, with the attendant accidents of atelectasis and broncho-pneumonia. Not unfrequently these complications lead to caseous pneumonia, emphysema, dilated bronchi, and phthisis. If capillary bronchitis comes on, the greatly diminished aëration of the blood increases the passive cerebral congestion, and becomes, therefore, a cause of convulsions in children. The cerebral complications consist in convulsions and hydrocephalus, the result, chiefly, of the mechanical obstacles in the course of the circulation. The fluid is poured out in the ventricles, in the perivascular lymph-spaces, and in the subarachnoid spaces, and the brain is more or less compressed and anæmic. Sometimes a vessel yields under the increased pressure in coughing, and cerebral hæmorrhage results. These cerebral states are accompanied by the usual signs and symptoms. The duration and termination of a complicated case will, of course, be determined by the character of the complication. The usual termination of uncomplicated cases is in recovery, but there are exceptions to this statement. In young and feeble subjects, the action of the heart may be suspended by the expiratory effort in coughing, or exhaustion may result from loss of sleep and uncontrollable vomiting.

Treatment.—Arising from the action of a morbid principle, whose nature is unknown, obviously no cure will be discovered until the nature of the cause is ascertained. The treatment must therefore be merely symptomatic. During the catarrhal stage, those remedies are employed that have been most useful in ordinary bronchial catarrh (℞ Syrup. scillæ comp. ℥j, tinct. aconiti rad. ℥xvi, tinct. opii deodor. ℥viiij, syrup. tolu ℥vij, aq. lauro-cerasi ℥j. M. Sig. A teaspoonful every two, three, or four hours). Other formulæ may be found under the head of "bronchial catarrh." The iodide and bromide of ammonium given together are highly beneficial during the catarrhal stage and as the spasmodic stage is about to develop. Tincture of aconite-root, tincture of belladonna, deodorized tincture of opium, and fluid extract of ipecacuanha, in suitable proportions according to age, is a most serviceable combination. Tincture of lobelia may be substituted for ipecac in the above formula, as advised by Ringer, who regards it as highly serviceable in whooping-cough. If the child is old enough, a gargle of bromide of potassium may also be used with advantage during this stage. As the spasmodic stage approaches, the antispasmodic remedies come into use. Probably the most efficient of them all is opium, in the form of the alkaloid codeine, which can be employed with proper precautions, even in the case of infants. A slight hypnotic

effect should be maintained constantly, if we would obtain the best results from it. The bromides have an undoubtedly good effect in moderating the violence of the spasmodic attacks. Of these, the monobromide of camphor seems on the whole to be most beneficial. It can be given in an emulsion or pill-form, in from two to ten grains, every four hours. The very best results, and often an immediate arrest of the disease, can be procured by full doses of quinine. Not all cases are affected so favorably; but in the author's experience no single remedy does so much good in this disease. Atropine often acts most favorably, but is uncertain. Cocaine locally and by the stomach is an effective remedy, and although acting similarly to atropine is a far more valuable remedy. The cough by habit, which remains after the subsidence of the paroxysms, is often admirably relieved by dilute hydrocyanic acid. This is also a useful remedy during the maximum of the disease. Excellent results have been obtained from the use of the mineral acids, especially nitric, in the treatment of the disease during its various stages. The acids should be well diluted, and given in some simple sirup, especially as large doses are necessary. Among the more recent remedies are quebracho and grindelia, which are respiratory sedatives, and are often highly serviceable. Some of the so-called mineral tonics—copper, zinc, and lead—have been administered with alleged success. Of these, probably, the best results have been obtained from acetate of lead, which is exhibited in from one fourth of a grain up to five grains, according to the age. If the tubes are much obstructed by mucus, or if capillary bronchitis supervene, emetics may become imperatively necessary. The yellow subsulphate of mercury, alum, apomorphine, and ipecac, are the emetics best suited to the purpose. Good results are obtained by the inhalation of carbolic spray in many cases. An atomizer may be used directly to deliver the spray in the fauces, or indirectly by filling the air of the apartment. A one per cent. solution is strong enough for this purpose. Like other neuroses, whooping-cough is much influenced by psychical impressions. Change of air and scene is therefore highly beneficial. To this mental impression must be referred the supposed agency of the ammoniacal odors of gas-works, and of such medicines as cochineal, which affect the mind by a brilliant color or disagreeable odor.

PAROTIDITIS—MUMPS.

Definition.—*Mumps* is a specific inflammation of the parotid gland, propagated by a peculiar miasm, self-limited, occurring usually as an epidemic, and characterized by a tendency to migrate into the mamma or testes.

Causes.—Nothing is known of the *materies morbi* which give rise to this disease, except their effects. In from five to twenty days after

exposure of a healthy person to the atmosphere about an individual having the "mumps," the former is also attacked. It occurs most frequently in males, but also attacks females, and the usual age is from five to fifteen; but, during the war of the rebellion, large numbers of raw recruits were affected, whose average age was not less than twenty. Like other diseases of the same class, it usually occurs but once in the same individual.

Symptoms.—There is an initial or prodromic period, which may be so slight as to escape observation. It begins with chilliness, general *malaise*, sometimes vomiting, and a fever comes on immediately, with the usual signs and symptoms of that state. In from twelve to thirty-six hours an acute pain is felt behind the angle of the jaw, and penetrates to the throat, frequently into the ear. The jaw becomes stiff, and a swelling appears immediately under the ear and extends forward and upward, forming an immense protuberance in front of the ear and behind and beneath the angle of the jaw. To the touch, doughy and elastic, it does not pit, and is very sensitive. It is usually confined to the parotid gland, but in severe cases, as seen in the army, the neighboring glands are implicated, and an enormous swelling, reaching as low as the sternum, results. In the ordinary cases the maximum enlargement is reached in from three to six days, remains stationary for one or two days, and then rapidly subsides, completing the revolution in from eight to twelve days. In some cases the swollen part becomes intensely red, the color disappearing on pressure, to return immediately after the pressure is removed, and the epidermis desquamating as the swelling subsides. In consequence of the swelling, which often extends to and involves the neighboring tonsil, and the pain produced by all movements of the jaw, there is much difficulty in mastication and deglutition. When sapid substances, especially acids, are taken into the mouth, an acute pain shoots through the cheek into the swollen gland and ear. Speech is also more or less painful and difficult, and the voice is muffled and indistinct. A viscid saliva continuously flows from the partly-open mouth. Often only one parotid is affected, and the other is attacked in a day or two, but it not unfrequently happens that several years elapse before the second gland is infected. A so-called *metastasis* not unfrequently takes place, of which the author has seen a number of examples. During the existence of the parotid swelling, the corresponding testicle becomes painful and swollen, and often a slight bruising of the organ invites the disease. Sometimes the swelling abandons the parotid, when the testis begins to enlarge. This seems like a true metastasis. The mamma, labia majora, and the uterus, are the organs in the female to which the disease is "translated"; but such an accident must be excessively rare. In some instances an interval of several hours occurs between the disappearance from the parotid and the appearance elsewhere,

with the effect to produce alarming symptoms of depression, anxiety, almost of collapse.

Course, Duration, and Termination.—The course of the disease is much affected by the hygienic surroundings of the patient and by the constitutional state of those attacked. During the late war, the cases of mumps were accompanied by high fever, often delirium, and by great depression of the vital powers; pneumonia was a not unfrequent complication, and those who recovered had a tedious convalescence, the blood being much impoverished and the body emaciated. Under ordinary circumstances, mumps is a mild disease, which always terminates in recovery, its duration varying from four to ten or twelve days. The importance of mumps is to be regarded from another point of view. In some persons, the subjects of a dyscrasia, the morbid condition is awakened from its dormant state by an attack of mumps. The tubercular diathesis is the most common of these. Rarely has the gland suppured, when attacked by mumps, but suppuration is the usual result when an inflammation of the parotid occurs in the course of typhoid fever. Atrophy is said to have taken place, but this must be an excessively uncommon event. The glands to which translation has occurred usually recover in a few days, without receiving any injury. The author has seen several cases in which the testes were injured—the damage consisting not in atrophy, but in an epididymitis, with occlusion of the spermatic duct.

Diagnosis.—The prevalence of an epidemic, the occurrence of swelling in the parotid gland with fever, and the subsidence of the swelling and fever in a few days, are clinical features which readily separate mumps from other affections. In children having bad teeth there may be produced a swelling of the parotid and submaxillary glands, but here the pain and swelling about the tooth will explain the nature of the case. Inflammation and suppuration of the parotid will be differentiated by the formation of pus and by the usual symptoms of glandular inflammation.

Treatment.—As this is a self-limited disease for which we have no remedy, it is wisest to attempt no perturbing treatment. Relief to the pain is best afforded by some warm applications, and by the internal use of morphine and quinine. A mild laxative should be administered, and, if the skin is hot and dry, the body may be sponged off with cold water, and some tincture of aconite administered. Recent observations have apparently demonstrated that pilocarpus possesses a peculiar curative power. This may be given in the form of the fluid extract, or of the alkaloid pilocarpine, and is well worthy of further trials. The patient should be kept in-doors, and every effort made to avoid the least contusion of the testes.

MALARIAL DISEASES.

INTERMITTENT AND REMITTENT FEVERS.

Definition.—*Malarial fevers* are characterized by their prevalence in certain regions of the world known to produce the poison, *malaria*, by their periodicity, and by the regular succession of the cold, hot, and sweating stage. Various designations have been applied to these forms of fever, such as *fever and ague*, *chills*, *bilious fever*, *bilious remittent*, etc.

Causes.—The great etiological factor is *malaria*. The telluric and other conditions favorable to the development of malaria exist largely in this country, along the Atlantic seaboard as far north as Boston; in all that great interior region drained by the Mississippi and its tributaries, the valley of the Sacramento on the Western coast, etc. For an exhaustive account, the reader is referred to the recent work of Lombard, or to Hirsch.* The presence in the atmosphere of a morbid principle, which is developed when certain atmospheric and telluric influences exist, is now almost universally admitted. Although the existence of such a principle is admitted, the attempts to isolate and define it have proved abortive, unless the recent discovery of Klebs and Tommasi-Crudeli supply the missing form.† The "Bacillus Malariae," which they have discovered floating in the atmosphere of the Pontine marshes, produces paroxysms of intermittent fever in the animals subjected to its action by inoculation. If this discovery is confirmed, and these rod-like bodies are proved to be the cause of those phenomena which we call malarial fever, it will prove to be the first and most important step toward permanent eradication of the disease. Malaria is also called "marsh-miasm," because of the abundance of this poison about marshes. But not all marshes produce malaria. The "Dismal Swamp," for example, is free from marsh-miasm, although apparently well adapted to produce it. Its exemption is supposed to be due to the growth of the cypress-tree. Marshes, or moist alluvium, subject to annual overflow, and exposed to the action of the sun, by

* For an account of the great interior valley of this continent, see the monumental work of Dr. Daniel Drake ("A Systematic Treatise, Historical, Etiological, and Practical, of the Principal Diseases of the Interior Valley of North America," page 723), for the reasons which induce him to accept the doctrine of the cryptogamic origin of malarial diseases.

† Klebs und Tommasi-Crudeli. "Studien über die Ursache des Wechselfiebers und über die Natur der Malaria," "Archiv für experimentelle Pathologie und Pharmacologie," Bd. xl, s. 311.