

which case aconite may be given. Cold compresses may be placed on the gland, but children, as a rule, prefer hot applications. A pad of cotton wadding covered with oiled silk is the best application. Suppuration is almost unknown, and need not be dreaded, even though the gland become very tense. Should redness and tenderness develop, leeches may be used. With delirium and head symptoms the ice-cap may be applied. In a robust subject, unless the signs of constitutional depression are extreme, a free venesection may do good. For the orchitis, rest, with support and protection of the swollen gland with cotton-wool, is usually sufficient.

XI. WHOOPING-COUGH.

Definition.—A specific affection characterised by convulsive cough and a long-drawn inspiration, during which the "whoop" is produced.

Etiology.—The disease occurs in epidemic form, but sporadic cases appear in a community from time to time. It is directly contagious from person to person; but dwelling-rooms, houses, school-rooms, and other localities may be infected by a sick child. It is, however, in this way less infectious than other diseases, and is probably most often taken by direct contact. The nature of the virus is still doubtful, many organisms having been described in the sputum. The observations of Afanassjew in 1887 have been the most satisfactory. He has cultivated a short bacillus, which grows with well-marked characters, and, when inoculated into the trachea of animals, produces a catarrhal condition of the mucous membrane. Cornil and Babes* conclude that the organism has not characteristics sufficiently pronounced, or an influence on animals sufficiently characteristic, to enable us to say that it is specific. Epidemics prevail for two or three months, usually during the winter and spring, and have a curious relation to other diseases, often preceding or following measles, less frequently scarlet fever.

Children between the first and second dentition are commonly affected. Sucklings are, however, not exempt, and I have seen very severe attacks in infants under six weeks. It is stated that girls are more subject to the disease than boys. Adults and old people are sometimes attacked, and in the aged it may be a very serious affection. Many persons possess immunity against the disease, and, though frequently exposed, escape. Delicate anæmic children with nasal or bronchial catarrh are more subject to the disease than others. According to the United States Census Reports, the disease is more than twice as fatal in the negro race than in others.

Morbid Anatomy.—Whooping-cough itself has no special pathological changes. In fatal cases pulmonary complications, particularly broncho-pneumonia, are usually present. Collapse and compensatory em-

* Les Bactéries, 1890.

physema, vesicular and interstitial, are found, and the tracheal and bronchial glands are enlarged.

Symptoms.—Catarrhal and paroxysmal stages can be recognized. There is a variable period of incubation of from seven to ten days. In the *catarrhal stage* the child has the symptoms of an ordinary cold, which may begin with slight fever, running at the nose, injection of the eyes, and a bronchial cough, usually dry and sometimes giving indications of a spasmodic character. The fever is usually not high, and slight attention is paid to the symptoms, which are thought to be those of an ordinary cold. After lasting for a week or ten days, instead of subsiding, the cough becomes worse and more convulsive in character.

The *paroxysmal stage*, marked by the characteristic cough, dates from the first appearance of the "whoop." The fit begins with a series of from fifteen to twenty short coughs of increasing intensity, and then with a deep inspiration the air is drawn into the lungs, making the "whoop," which may be heard at a distance and from which the disease takes its name. This loud inspiratory sound may sometimes precede the series of spasmodic expiratory efforts. Several coughing-fits may succeed each other until a tenacious mucus is expectorated. This may be small in amount, but after a series of coughing-fits a considerable quantity may be expectorated. Not infrequently it is brought up by vomiting or by a combination of cough and regurgitation. There may be only four or five of these attacks in the day, or in severe cases they may recur every half-hour. During the attack the thorax is very strongly compressed by the powerful expiratory efforts, and, as very little air passes in through the glottis, there are signs of defective aëration of the blood; the face becomes swollen and congested, the veins are prominent, the eyeballs protrude, and the conjunctivæ become deeply engorged. Suffocation indeed seems imminent, when with a deep crowing inspiration air enters the lungs and the color is quickly restored. Children are usually terrified at the onset, and run at once to the mother or nurse to be supported during the attack. Few diseases are more painful to witness. In severe paroxysms vomiting is frequent and the sphincters may be opened.

An ulcer under the tongue is a very common event, and was thought at one time to be the cause of the disease.

During the attack, if the chest be examined, the resonance is defective in the expiratory stage, full and clear during the deep, crowing inspiration; but on auscultation during the latter there may be no vesicular murmur heard, owing to the slowness with which the air passes the narrowed glottis. Bronchial râles are occasionally heard.

Among circumstances which precipitate an attack are emotion, such as crying, and any irritation about the throat. Even the act of swallowing sometimes seems sufficient. In a close dusty atmosphere the coughing-fits are more frequent. After lasting for three or four weeks the attacks

become lighter and finally cease. In cases of ordinary severity the course of the disease is rarely under six weeks.

The complications and sequelæ of whooping-cough are important. During the extensive venous congestion hæmorrhages are very apt to occur in the form of petechiæ, particularly about the forehead, ecchymosis of the conjunctivæ, epistaxis, and occasionally hæmoptysis. Hæmorrhage from the bowels is rare. During the paroxysm convulsions may occur, due perhaps to the extreme engorgement of the cerebral cortex. Very rarely hemiplegia or monoplegia follows. Sudden death has been caused by extensive subdural hæmorrhage. Whooping-cough must be regarded as a very unusual cause of cerebral palsy in children. It was associated with three cases of my series of one hundred and twenty cases, but in none of them did the hemiplegia come on during the paroxysm, as in a case reported by S. West.

The persistent vomiting may induce marked anæmia and wasting. The pulmonary complications which follow whooping-cough are extremely serious. During the severe coughing-spells interstitial emphysema may be induced, more rarely pneumothorax. I saw one instance in which rupture occurred, evidently near the root of the lung, and the air passed along the trachea and reached the subcutaneous tissues of the neck, a condition which has been known to become general. Broncho-pneumonia, with its accompanying collapse, is the most frequent pulmonary complication and carries off a large number of children. It may be simple, but in a considerable proportion of the cases the process is tuberculous. Pleurisy is sometimes met with and occasionally lobar pneumonia. Enlargement of the bronchial glands is very common in whooping-cough and has been thought to cause the disease. It may sometimes be sufficient to produce dulness upon the manubrium. The heart stands the strain of whooping-cough remarkably well. During the spasm the radial pulse is small, the right heart engorged, and during and after the attack the cardiac action is very much disturbed. It is difficult to determine whether serious damage ever results. Possibly some of the cases of severe valvular disease in children who have had neither rheumatism nor scarlet fever may be attributed to the terrible heart strain during a prolonged attack of whooping-cough. Renal complications are very uncommon. Sugar is occasionally found in the urine.

Diagnosis.—So distinctive is the "whoop" of the disease that the diagnosis is very easy; but occasionally there are doubtful cases, particularly during epidemics, in which a series of expiratory coughs occurs without any inspiratory crow.

Prognosis.—Taken with its complications, whooping-cough must be regarded as a very fatal affection. According to Dolan it ranks third among the fatal diseases of children in England, where the death-rate per million from this disease is five thousand annually. The younger the infant the greater is the probability of serious complications. The

deaths are chiefly among children of the poor and among delicate infants.

Treatment.—Parents should be warned of the serious nature of whooping-cough, the gravity of which is scarcely appreciated by the public. Particular care should be taken that children suspected of the disease are not sent to the public schools or exposed in any way so that other children can become contaminated. There is more reprehensible neglect in connection with this than with any other disease. The medicinal treatment of whooping-cough is most unsatisfactory. Like other infectious disorders it runs its course practically uninfluenced in a majority of cases by drugs. In the catarrhal stage when there is fever the child should be in bed and a saline fever mixture administered. If the cough is distressing, ipecacuanha wine and paregoric may be given. For the paroxysmal stage a suspiciously long list of remedies has been recommended, twenty-two in one popular text-book on therapeutics. If the disease is due, as seems probable, to a germ growing upon and irritating the bronchial mucosa, a germicidal plan of treatment seems highly rational and persistent attempts should be made to discover a suitable remedy. Quinine placed upon the tongue; resorcin in one-per-cent solutions, swabbed frequently on the throat; two or three grains of iodoform to an ounce of starch powder; a spray of carbolic acid—have all been warmly recommended. J. Lewis Smith advises the use of the steam atomizer with a solution of carbolic acid, chloride of potassium and bromide of potassium in glycerin. Jacobi regards belladonna as the most satisfactory remedy. He gives it in full doses, as much as one sixth of a grain of the root or the extract to a child of six or eight months three times a day. It should be given in sufficient doses to produce the cutaneous flush. For the nervous element in the disease antipyrin has been used with apparent success.

After the severity of the attack has mitigated and convalescence has begun, the child should be watched with the greatest care. It is just at this period that the fatal broncho-pneumonias are apt to develop. The cough sometimes persists for months and the child remains weak and delicate. Change of air should be tried. Such a patient should be fed with care, and given tonics and cod-liver oil.

XII. INFLUENZA (*La Grippe*).

Definition.—An infectious disease characterised by great prostration and often catarrh of the mucous membranes, particularly the respiratory and gastro-intestinal. There is a marked liability to serious complications, particularly pneumonia.

Epidemics appear at intervals and spread with extraordinary rapidity, so that in a few weeks an entire continent may be involved. The dis-