

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-

ease has been known for several centuries, and there have been within the past fifty years several extensive outbreaks, notably those of 1833, 1847-'48, and the recent outbreak in 1889-'90. Many of the epidemics have started in Russia, hence the name Russian fever. In October of 1889 it prevailed extensively in St. Petersburg. During November and December it spread to Germany, France, and western Europe, appearing in London about the end of December. Cases appeared in this country about Christmas, and the disease rapidly became epidemic.

Etiology.—The conditions which favor its development and rapid spread are unknown, and the exhaustive literature of the past year has not brought us nearer a solution of the problem. It appears to be independent of meteorological conditions. While some authorities hold that the affection is due to a miasmatic material in the atmosphere, others probably more correctly hold that it is due to a specific virus of the most intense infectiveness. Like other rapidly spreading diseases, it is conveyed along lines of travel. The bacteriological examinations which have been made in large numbers of cases leave us still in doubt, and the varied character of the germs found by reliable observers indicates that the true virus has not yet been detected. The pus organisms and the *diplococcus pneumoniae* have been found oftenest, but these are widespread organisms and are probably not associated in a causative manner with the disease.

Morbid Anatomy.—Uncomplicated cases recover. In the delicate and aged alone do we see fatal results, and then only from the intensity of the fever or the profound depression. Injection and swelling of the pharyngeal and laryngeal mucosa, bronchitis, and a catarrhal condition of the stomach and intestines may be present.

The complications are very varied. Severe bronchitis, lobar and lobular pneumonia, and nephritis may exist.

Symptoms.—In many cases the attack closely resembles an ordinary catarrh with slight fever, dryness and swelling of the nasal mucosa, and then increase in the secretion. In the severer cases the coryza is subsidiary or absent, and the symptoms are those of an infection of varying grades of severity. A striking feature is the severe nervous manifestation at the outset, the headache, pain in the back and legs, and a general soreness as if bruised or beaten. With the exception of dengue and small-pox there is no affection in which these symptoms are more pronounced. Delirium may be marked. Associated with these is a prostration and cardiac weakness out of proportion to the intensity of the fever, and sometimes very alarming. The pulse is feeble, small, and intermittent. Death may result directly from heart-failure, as in cases mentioned by Wilks.

Serious nervous complications are marked *delirium* and *meningitis*, the latter usually in association with pneumonia. Bristowe has reported several cases of *abscess of the brain* following influenza. Peripheral neuritis was not very uncommon in the last epidemic. *Mental disorders* are

not infrequent. Inaptitude for mental exertion, depression of spirits, even insanity, may follow an attack.

Affections of the respiratory organs are the most serious. Many cases present an intense *bronchitis*, involving the large and small tubes and coming on with high fever, sometimes with delirium. An intense general bronchitis was common during the recent epidemic. In children it may be complicated with broncho-pneumonia. By far the most serious and fatal complication is *pneumonia*, which may follow the bronchitis, or set in with well-characterised symptoms. Sometimes the symptoms may at first be obscure and the pneumonia atypical. Thus, after an initial rigor, with some dyspnoea and high fever, the local signs may be obscure and it may not be until the third or fourth day, or even later, that the physical signs of a pneumonia are detected. The sputa may not be rusty until the fourth or fifth day. The crisis may be deferred or the defervescence may be by lysis. A considerable proportion of the cases, however, run a normal course. So far as I could see, there was nothing special or peculiar in the pneumonia; all the anomalies which have been mentioned as occurring in influenza are found in any large series of cases. Abscess of the lung may follow. Pleurisy is not an uncommon complication, and empyema may develop.

The gastro-intestinal symptoms may be marked; thus, with the initial fever, there may be nausea and vomiting. Diarrhoea is not uncommon; indeed, the brunt of the catarrhal process may fall upon the gastro-intestinal mucosa.

The *diagnosis* of the disease offers no difficulties when it occurs in epidemic form. Coryza is not always present, and the symptoms may be those of general fever with great prostration. In other instances the bronchitis may be an important feature. The severe prostration, fever, delirium, with the initial bronchitis, and occasionally epistaxis, may lead to the diagnosis of typhoid fever. The complications are, as a rule, readily recognised, though at first the symptoms of the pneumonia may be somewhat indefinite.

Treatment.—In every case the disease should be regarded as serious, and the patient should be confined to bed until the fever has completely disappeared. In this way alone can serious complications be avoided. From the outset the treatment should be supporting, and the patient should be carefully fed and well nursed. The bowels should be opened by a dose of calomel or a saline draught. At night ten grains of Dover's powder may be given. At the onset a warm bath is sometimes grateful in relieving the pain in the back and limbs, but great care should be taken to have the bed well warmed, and the patient should be given after it a drink of hot lemonade. If the fever is high and there is delirium, small doses of antipyrin may be given and an ice-cap applied to the head. The medicinal antipyretics should be used with caution, as profound prostration sometimes develops in these cases. Too much stress should not be

laid upon the mental features. Delirium may be marked even with slight fever. In the cases with great cardiac weakness stimulants should be given freely, and during convalescence strychnia in full doses.

The intense bronchitis, pneumonia, and other complications should receive their appropriate treatment. The convalescence requires careful management, and it may be weeks or months before the patient is restored to full health. A good nutritious diet, change of air, and pleasant surroundings are essential. The depression of spirits following this disease is one of its most unpleasant and obstinate features.

XIII. DENGUE.

Definition.—An acute infectious disease of tropical and subtropical regions, characterised by febrile paroxysms, pains in the joints and muscles, and sometimes a cutaneous rash.

The disease was first noted in Java toward the close of the last century, and it was probably described by Rush in 1780. During this century many epidemics of it have been reported, particularly in India, Africa, and the southern United States. S. H. Dickson gave the most satisfactory account of the disease as it appeared in Charleston in 1828. Since that time there have been three or four wide-spread epidemics, confined chiefly to the Gulf States and rarely extending beyond the 32nd parallel.

Etiology.—Many observers regard it as contagious, and Dickson mentions in the history of his own household that during the epidemic of 1828 all were attacked, whereas in the epidemic of 1850 he and the cook (the only ones remaining in his household of those who composed it in 1828) alone escaped. The question can scarcely yet be considered settled. The disease spreads from place to place, and is conveyed by ships and along railroads. It is remarkable among epidemics as practically affecting all members in a community who have not been protected by a previous attack. Matas, in his excellent account,* states that one attack does not protect from subsequent infection. It attacks all races equally. The disease is stated to attack animals.

McLoughlin, of Texas, has found in the blood of patients a micrococcus, which he regards as the special agent and has been able to cultivate. The slides which he kindly sent me show a streptococcus-like organism, but it is impossible yet to speak definitely as to the relations which it bears to the disease. If it be true that animals are subject to the affection, the subject could be conclusively worked out during the next epidemic. Some writers have held that dengue is only a modified form of yellow fever. It has in some instances preceded the development of this disease.

* Keating's Encyclopedia of Diseases of Children, vol. i.

As the disease is never fatal, no observations have been made upon its pathological anatomy.

Symptoms.—The period of incubation is from three to five days, during which the patient feels well. The attack sets in suddenly with headache, chilly feelings, and intense aching pains in the joints and muscles. The fever rises gradually and may reach as high as 106° or 107°. The pulse is rapid and there are the other phenomena associated with acute fever—loss of appetite, coated tongue, slight nocturnal delirium, and concentrated urine. In the initial stage there may be an erythematous rash. In a majority of the cases the pains in the muscles, joints and bones are of a most aggravated character, and the patients speak of them as of a boring or breaking character, hence the popular name "break-bone fever." The large and small joints are affected, sometimes in succession, and they become swollen, red, and painful. The pains shift about, and in some cases cutaneous hyperæsthesia has been noted. In some instances there is a tendency to hæmorrhage, from either the nose, lungs, stomach, or bowels. Eugene Foster speaks of having seen black vomit, similar to that of yellow fever, and in three instances alarming hæmorrhage from the bowels, which in one case persisted for three months and caused death.

The fever gradually reaches its height by the third or fourth day, and the patient enters upon the apyretic period, which may last from two to four days, and in which he feels prostrated and stiff. At this time, in a large number of cases, an eruption is common which, judging from the description, has nothing distinctive, being at times macular, like measles, at others, diffuse and scarlatiniform, or papular, or lichen-like. In other instances the rash has been described as urticarial, or even vesicular. A second paroxysm of fever then occurs, and the pains return. Certain writers describe inflammation and hyperæmia of the mucous membrane of the nose, mouth, and pharynx. Enlargement of the lymph-glands is not uncommon, and may persist for weeks after the disappearance of the fever. Convalescence is often protracted, and there is a degree of mental and physical prostration out of all proportion to the severity of the primary attack. By far the most distressing symptom is the pain, which all who have experienced the disease speak of as agonising and intolerable, and more severe than that experienced in any other acute fever.

Complications are rare. Insomnia and occasionally delirium, resembling somewhat the alcoholic form, have been observed. A relapse may occur even as late as two weeks. Briefly, the course of the disease may be described as consisting of a febrile paroxysm of three or four days; a remission of variable duration, which may be wanting; and a second paroxysm of about three days. The average duration of a moderate attack is from seven to eight days.

The *diagnosis* of the disease rarely offers any special difficulties, prevailing as it does in epidemic form, and attacking all classes indiscriminately. Isolated cases might be mistaken at first for acute rheumatism.