

E.—LUNGS.

(1.) BRONCHIAL CATARRH (*Catarrhus Bronchialis Acutus, Chronicus*). *Bronchitis*.—In the physiological condition all mucous membranes are covered with a certain amount of secretion, essential to the functions of mucous membranes. Now, the bronchial mucous membrane likewise secretes a certain quantity of mucus, and in fact just as much as will suffice to prevent its becoming dry. Every hyperæmia of the membrane causes an augmentation of the secretion; more is poured out than can be evaporated, and the consequence of this is an accumulation of mucus in the bronchi, which condition has been denominated bronchial catarrh, or, in severer forms, bronchitis.

Pathological Anatomy.—Bronchial catarrh may occur either in the bronchi of the first and second order alone, the smaller remaining unaffected, or conversely; the principal morbid alterations are found in these, while the large bronchi remain normal, or finally the bronchi of all orders may be uniformly affected. Both lungs are seldom attacked simultaneously, a fact more particularly marked in typhus and the exanthematous fevers, and seldom only is the catarrh equally intensely developed throughout the bronchi of a lung. Generally, the secretion is most profuse in the lower lobes, and the morbid alterations of the mucous membrane more marked than at the apices of the lungs; this is probably due to purely mechanical circumstances, the greater part of the secretion of the upper lobes descending by its own weight into the principal bronchi, while it can only be removed from the lower lobes by the action of the cilia, and by violent expirations and coughing.

The affected portion of the mucous membrane is of a pink-red color, where the inflammation has attained a high grade. Its vessels present an arborescent injected appearance, and this injection increases more and more, and finally in the highest grade becomes so intense that the mucous membrane assumes a scarlet-red, velvety appearance. At the same time it increases in thickness, as may be ascertained with the greatest ease by making a few transverse incisions into it, and by comparing the incisions of a normal bronchus with those of a catarrhal bronchus, both being of the same order. In addition the mucous membrane appears softened, is easily lacerated, and cannot be pulled off in patches from the submucous tissue.

But the inflammatory redness should be strictly distinguished from the redness of imbibition, which is found in all cadavers after putrefaction has begun. In morbilli, it is claimed that sometimes the bronchial mucous membrane is covered with the same spots as the integument; in small-pox, pustules are met with in the trachea and in

the bronchi of the first and second order. The erosions, which accompany chronic bronchial catarrh of the adult, have never yet been found in children, even when they had a cough for many years.

The secretion is sometimes frothy, and whitish, sometimes only permeated by a few air-bubbles, a semifluid, yellowish mass, filling up the whole calibre of a bronchus. Microscopically, it is composed of a few characteristic epithelium-cells, most of which are seen to be oval without complete angles, and of pus-cells which here are unusually large, finely granular, and globular. In addition to these inflammatory corpuscles, now and then entire pieces of softened mucous membrane are found.

When a slight pressure is exercised upon the incised catarrhal lung, a drop of this secretion will ooze out from every diseased bronchus; the number and size of the yellow dots thus produced in the red pulmonary parenchyma furnish a means of judging the extent and severity of the catarrh. I am unable to decide whether coagulæ of fibrin also occur in this secretion, as some authors state; for I have never yet found them. It is remarkable that lungs thus affected do not collapse on opening the thorax, on account of the large quantities of the accumulated secretion, which prevent a communication between the external air and that in the lungs. In chronic catarrhs, the bronchi become somewhat dilated, a condition caused by the super-vention of softening and atony of the mucous membrane. But the dilatation is always slight, cylindrical, and never cystic; cystic bronchiectasis never occurs in the infant. In bronchial catarrh one portion or another of the pulmonary parenchyma sooner or later generally becomes affected in the form of lobar pneumonia, which will be specially described in the following section.

Symptoms.—They are divisible into subjective and objective. The subjective only come into consideration in children who are more than two years old, and consist of pains along the sternum, to which, during cough, a girdle-like pain, corresponding in direction to the insertion of the diaphragm, becomes superadded, and sometimes in a general *malaise*, which manifests itself by a depression of spirits, and disgust for the customary amusements. The objective symptoms are derived from physical exploration, from the kind of cough, the expectoration, and the invariable fever. The cough is always the most striking symptom; it alone causes the parents to seek medical assistance. Generally, the paroxysms of cough are tolerably severe, and last from half to one minute, recur several times in the hour, are less frequent during sleep, but do not cease completely. Many children sleep on, notwithstanding the cough; others, however, always wake up, and from these constant interruptions in their night's rest become very

much reduced. The short, abrupt, frequently-recurring, hacking cough is very suspicious, for it usually points to the existence of tuberculosis. A bad sign furthermore is, when the children cough more when laid on one or on the other side than on the back, for this cough too, in most cases, is due to great material alterations in the pulmonary structure. Children with simple bronchitis cough less in the dorsal decubitus than in the upright posture; no difference can be noted in them between the dorsal and the lateral decubitus. Nor is the pain so severe as to cause them to distort the face when coughing, or to give other manifestations of pain after the cough has ceased.

The expectoration, so important in adults, enabling us to judge of the condition of the lungs, is very seldom seen in children. By the sound of the cough it is, indeed, perceived whether any mucus is or is not propelled out of the larynx, but, from the hawkings and the rotatory movements of the tongue of children from three to five years of age, we learn that they do not know as yet how to execute any other movement than to regularly swallow down again the sputum that has already reached the root of the tongue. Only when the paroxysms of cough are very violent, and the mouth is held wide open, is it possible, occasionally, to see the sputa; they may be often easily obtained, after a loose cough, by wiping the root of the tongue with a clean piece of rag, to which they will remain adherent. In bronchial catarrh, the sputa are either white and frothy or yellowish, and then, as a rule, less rich in air-bubbles. They are never colored bloody; still, as in every violent exertion, so also from coughing, small bleedings may take place from the larynx, fauces, and mouth, the blood of which, however, is never uniformly mixed with the sputa, but always seen in clear single streaks, or in masses. In the majority of cases, the expression of the face, in simple bronchitis, is but little changed; since, as a rule, no fever is present, the temperature of the head, therefore, also remains unaugmented, and no reddening of the cheeks is observable. But, if the bronchitis is very extensive, if the bronchi of all orders, in both lungs, are affected, then a very marked cyanosis supervenes, for which, when such a child is seen for the first time, a different cause is uselessly sought in the circulation. Such an extensive affection of the bronchi is extremely dangerous, the respiration is as labored as in pneumonia, and death ensues usually by suffocation. In the dissection, the pulmonary parenchyma is only occasionally found perfectly normal; generally, lobular pneumonia has supervened in several places.

The physical exploration of the lungs of small children has already been commented upon on page 18. All the cautions and deviations

from the examination of the adult were enumerated there, and will have to be kept constantly in view in the following section on the various pulmonary affections. The examination of older children—those that are over five years of age—differs in no respect from that of the adult, but in children of from one to five years the possibility of such an undertaking depends entirely upon the conduct of the physician. The main point always is, and always will be, to get on friendly terms with the child, and then only to commence the examination. If the child is immediately ordered to be undressed, and the percussion and auscultation undertaken without any further precaution, in ninety-nine cases in one hundred an uproarious cry will be set up, which will not cease till the cause has been altogether withdrawn—still more, it will always be set up again as soon as the physician, who has created such an impression, returns; under which circumstances the formation of a correct diagnosis and the institution of a rational treatment are, of course, altogether out of the question.

Percussion in bronchial catarrh gives totally negative results; the tympanitic percussion-sound generally is very marked, and the physiological dulness on the right side posteriorly, when the abdominal organs are pressed upward, is, in small children, very marked during bronchitis, for the temporary blocking up of the air in the bronchi, by the accumulated masses of mucus within them, is very readily effected.

Palpation is the most useful, and, at the same time, the simplest method of examination. In bronchial catarrh, mucus and sibilant râles are distinctly felt over the whole thorax, strongest, as a rule, over the larynx and trachea, for here the largest mucus-bubbles burst, and single tenacious mucus-lamellæ are kept in a state of vibration by the current of air up and down. If a conclusion were formed as to the extent of the catarrh, from the extent of surface over which these moist râles are felt, we would very often commit a serious error, for, as often as any râles, at all loud, form in the larynx, it will be easy to feel them over the whole thorax, and a few active coughs, which result in expelling the mucus from the larynx, frequently suffice to cause the rhonchi to disappear from the entire chest. Only when no râles are felt over the neck, but, on the contrary, are perceptible over one side, or over a circumscribed space, then they will not disappear after so short a time, but will be noticeable for weeks, and even months. If any great importance can be at all attached to the feeling of the rhonchi, then it is a less favorable sign when they appear over a circumscribed spot than when they are diffused over the en-

tire chest, inasmuch as, in the first case, the bronchitis has established itself in the bronchi of the third and fourth order, while in the second a single sputum in the trachea, which will be coughed up in the next hour, may possibly be the cause. But if the râles which are diffused over the whole thorax are constantly felt for days, and even weeks, then it is a proof of the existence of the most extensive bronchitis, which is usually already combined with very considerable dyspnoea.

By auscultation we learn, in bronchial catarrh, little more than by palpation. By a little practice, the rhonchi may be felt just as well as heard; it is even possible to distinguish the pitch and intensity, and, in addition to that, we have the advantage of being able to carry out the examination quicker, more accurately, and with less opposition on the part of the child, by palpation. Auscultation is desirable mostly because by it a complication with pneumonia, which is recognized by fine crepitation, and, later, by bronchial respiration, may be diagnosed. I cannot participate in the views of some authors, who maintain that fine crepitating râles are heard in bronchitis capillaris. By this hypothesis the last distinguishing mark between bronchitis and pneumonia would be lost, and the confusion, which is already sufficiently embarrassing without this, would thus become still greater. Where crepitating râles are heard in a child, simple catarrh of the small bronchi cannot be assumed to exist, but a pneumonic, alveolar disease. The presence of rhonchi of various kinds, and of rough vesicular breathing, answers for bronchial catarrh and bronchitis; crepitating râles and, still less, bronchial breathing, ought never to occur in this condition.

The respiration in children with ordinary bronchitis does not deviate from that of the physiological state, but, when the affection is very extensive, the respirations become more frequent and laborious; but, as fever generally is superadded, and also accelerates the respiration, it is difficult to determine how much of the frequency of the respiration should be ascribed to the catarrh, and how much to the fever. The movements of the *alæ nasi*, which accompany every act of respiration, are very rare in bronchitis, and, almost without exception, indicate a complication with pneumonia.

The duration of this disease varies exceedingly, according to the cause and the constitution of the child. A child that is not predisposed to catarrhs may contract a cough through external irritation, such as cooling of the thorax, too cold air, injurious and impure atmosphere; but it hardly ever lasts long, and disappears in a few days. On the other hand, there are children who, without being

the progeny of tuberculous parents, suffer for years, with only short remissions, from bronchial catarrhs; and, lastly, we have the actually tuberculous, who very seldom get rid of it. The prognosis is not always to be given as favorably as we should be inclined to assume from the general well-being of the child. The simplest bronchitis, when it becomes greatly diffused, may eventuate in death by suffocation; that founded upon tuberculosis, of course, offers but a very unfavorable prognosis.

Etiology.—There is hardly a child living who has not had a bronchial catarrh in early life, and there is no age at which this affection occurs oftener than in that of the first childhood, particularly at the time of the first dentition. Thus, for instance, all children cough who drivél during dentition, for the garments are perpetually kept wet by the saliva, and that produces a cooling of the chest. Bronchial catarrh prevails more generally in winter than in summer, in the cities and quarters inhabited by the poor, more frequently than in the country. Children reared in dusty manufacturing cities usually suffer, and children of tuberculous parents so regularly suffer from it that it does not at all attract attention, and therefore is not mentioned, if special inquiry be not made concerning it. Besides these more external causes, there is also a contagion which conveys the bronchial catarrh from one person to another, namely, influenza (*die Grippe*). Essentially it consists of a bronchial catarrh, which is ushered in by febrile symptoms and anorexia, and spares no age, not even the youngest infant. In healthy children, influenza has its regular course, and, in from two to three weeks, terminates in complete recovery; in tuberculous children, on the contrary, it often ushers in the further development of the cachexia, the children continue to cough, become feverish, and finally perish in a hectic condition.

Bronchitis, furthermore, occurs as a complication in a number of general diseases. Thus the bronchial membrane, like the intestinal mucous membrane, is implicated in every typhus fever, and, in mild cases of febris typhodes, this constant symptom is the most important one in confirming the diagnosis.

Rokitansky is even of the opinion that bronchitis (bronchostasis) forms the foundation of the exanthematous contagious typhodes, such, for example, as occur in Ireland.

The more detailed views concerning this condition have already been given on page 185, in connection with typhus abdominalis.

Bronchitis, lastly, is a constant symptom in measles, where it probably originates through a morbillous efflorescence of the mucous membrane, and hence must occur without any exception. It is frequently met with in scarlatina, and in both genuine and spurious variola.

Treatment.—There is no remedy that has a marked direct influence upon the course of bronchitis. All the methods of treatment hitherto recommended are frequently found to fail. There are principally two symptoms, for the subjugation of which every effort should be made, namely, the dyspnoea, and the immoderate secretion. The first originates through the accumulation of the bronchial mucus, with the removal of which it also disappears, and the best means for effecting this is the act of vomiting. It is not necessary to give strong emetics, for, by these, vomiting is produced too rapidly, and the retchings, which in reality are the most important results, by no means stand in direct relation to the size of the dose. A very good means of inducing protracted retching and vomiting consists in the administration of a strong infusion of ipecacuanha (3 j to water ʒ j), of which even one teaspoonful has the strongest effect without implicating the alimentary canal. If, during and after vomiting, no large quantities of mucus are expelled, and if the breathing does not thereby become easier, any further emesis will prove useless, and will only give rise to a chronic gastric catarrh, by which the child is very much reduced. As to the class of expectorants, the vegetable ones only are recommendable, and even these should only be used in cases where no disturbance of the digestion exists. When the latter supervenes, the harm caused by the expectorants is more apparent than their very problematical usefulness, and this remark is especially applicable to the antimonials, *tartar emetic*, *sulphuret of antimony*, *kermes-mineral*, and *white oxide of antimony*. Muriate of ammonia, so much in vogue in bronchitis of the adult, usually is not administrable to children in any form. In acute catarrh of the bronchi of infants, a mild infusion of ipecacuanha (gr. j to water ʒ j), with a little *oxymel simplex*, or a very dilute solution of *kali carb.* (gr. ij—ʒ j) are the most appropriate remedies. Little very highly recommends frictions of the chest with turpentine every two or three hours, and covering of the chest with flannel. When the paroxysms become spastic, antispasmodics and narcotics are indicated, which not only exercise a favorable abortive effect upon the severity of the cough, but also upon the course of the disease generally. Chief among these is *aq. amygdal. amar.*, given in two or three times as many drops pro dosi as the child numbers years of age, three or four such doses daily; next laudanum, in doses already mentioned, several times; ext. belladonna, gr. $\frac{1}{20}$ to $\frac{1}{10}$, several times daily, etc.

When tuberculosis is at the bottom of the catarrh, this treatment of symptoms, as a rule, proves entirely fruitless. In these cases *ol. jecor. iron* and *quinine* must be tried. Pulv. cinchona, given in quantities such as can be taken up, on the point of a knife, can be

administered to almost all children, and I have frequently seen very suspicious bronchitis, accompanied by febrile exacerbations and emaciation, disappear under a continuous employment of this remedy for from four to eight weeks. The temperature of the room in which the little patient is confined should be uniformly warm, the garments warmer than those worn in health; the drinks should be plentiful, so that a beneficial perspiration may be established. If the cause of the catarrh still continues, its removal, of course, must be attended to; it should be particularly insisted upon not to allow the children to remain in dusty manufacturing cities, as is so often the case with the laboring classes.

In order to guard against further bronchial catarrhs, and to counteract the disposition to that disease, a systematic inuring is to be urgently recommended. As regards the clothing, no definite directions can be given; at any rate the garments should not be so warm as to make the children feel uncomfortable, and cause them to perspire profusely on taking a little exercise. More catarrhs are undoubtedly produced by these warm dressings than prevented. The best and most rational means of inuring is to sponge the whole body with cold water before the child retires for the night; this may be commenced with immediately after the eruption of the canine teeth.

(2.) LOBULAR AND LOBAR INFLAMMATION OF THE LUNGS (*Pneumonia Lobularis et Lobaris*).—Pneumonia occurs extremely frequently in children, generally, however, in a form which anatomopathologically presents a different picture from that which we are in the habit of finding in the autopsies of adults. Namely, the lungs do not become extensively inflamed, throughout one or more lobes, but only in some places scarcely of the size of peas, between which normal pulmonary tissue is found in tolerable quantities, a process that has been correctly described as lobular pneumonia. Lobar pneumonia, it is true, also occurs, but comparatively much less frequently; it may come on idiopathically, or be produced by a blow, as in the adult; usually, however, it is like pleuritis of the new-born child, of a pyæmic nature. In the latter case it always terminates fatally; the prognosis, on the whole, even in lobar pneumonia, not of a pyæmic character, is also extremely unfavorable. In the nursing, lobular pneumonia is an extremely frequent affection, and carries off many children, especially during the period of dentition. In foundling-hospitals many children die from it, and the horizontal posture in which these children are kept both night and day has been considered the chief cause. What tends to confirm this view is the circumstance that, in most of the autopsies, the posterior and lowest portions of the lungs, and consequently the most depending parts,