

larynx (in Dr. Elsberg's two cases and one of my own, the largest endoscopic tube was used) and, furthermore, we are so much nearer the foreign body for manipulation. I should, therefore, answer the question that tracheotomy with subsequent removal is by far the best method in these cases; and objection to it can not be maintained. It is a time saver. In one instance in which no haste was necessary, I timed the operator and it took 1½ minutes until the trachea was opened and ready for the tube. In the after-treatment it will be necessary to keep the temperature of the room warm, to prevent, to a great degree, the danger of pneumonia.

Special care and nursing is required for a few days, and although none of these patients was possessed of means, yet they could and did secure the needed attention. As these remarks are intended for the presentation of personal experience, no general reference to the literature of the subject is made, nor is such necessary, as the subject has been so well presented with a reference of 50 recent cases in a paper by Thomas A. Clayton.\*

#### CONCLUSIONS..

As a result of my experience, I conclude:

1. The diagnosis may often be fully established by auscultation and percussion and the use of Roentgen rays may not always be depended on.

2. Solid bodies producing occlusion should be operated on immediately.

3. Tracheotomy affords by far the best chance for the patient.

4. The public, as well as the profession, is in great debt to Professor Killian for his valuable instruments and his work on "Bronchoscopy," resulting in the saving of many lives that otherwise would have been lost.

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### DIAGNOSIS OF TUBERCULOSIS IN INFANTS AND CHILDREN.\*

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The cause of tuberculosis is the tubercle bacilli. It is an infectious disease. About 8 per cent. of all children who die show at autopsy evidences of tuberculosis. Tuberculosis in one or in both parents is a distinctly predisposing cause, and poor hygiene, improper food or, in fact, any influence of a debilitating nature predisposes to the disease. Bronchopneumonia, pleurisy, repeated attacks of bronchitis or chronic throat conditions and the acute infectious diseases, pertussis, measles and influenza, all predispose the child to subsequent tubercular infection.

Tuberculosis is common in children over 4 months of age, but congenital tuberculosis is rare and the number of cases reported of children who die of tuberculosis before the fourth month are probably many of them congenital. The infection may enter through the respiratory tract, the digestive tract and the skin. The latter is very rare. In a large majority of cases, probably 90 per cent., infection takes place through the respiratory tract. Diseases of mucous membranes, such as one sees in chronic throat conditions in children, especially enlarged tonsils, increase the possi-

bilities of a tuberculous infection, as a healthy mucous membrane offers more resistance to the passage through it of the tubercle bacillus than a mucous membrane in a diseased condition. The tubercle bacillus is usually carried by air containing the tubercle of dried sputum. After penetrating the mucous membrane, the bacilli enter the lymphatic ducts and are arrested in their progress by the lymphatic glands. These glands may be those of the neck, trachea or larger bronchi. As a result of this infection the glands undergo acute inflammation and caseation or the process may be checked and encapsulation takes place, the disease being arrested permanently or perhaps only for a time. A great deal depends on the child's resistance, the process being much more likely to be checked by the lymphatic glands in a strong and vigorous child than in one which is frail and delicate. The initial lesion may be in the walls of the smaller bronchi, alveoli, or in the connective tissue of the lung.

As a diseased intestinal mucous membrane offers less resistance than does a healthy one to the passage of the tubercle bacillus, chronic intestinal disease or intestinal ulceration increases the liability of infection of the mesenteric glands. In infancy meningitis is often associated with tuberculosis in some other part of the body, and in the first two years of life tuberculosis shows itself especially in the bronchial lymph glands, lungs and brain. It is very important to appreciate the fact that tuberculosis of the lymph glands is a prominent characteristic of the disease in early infancy and childhood, and that this glandular tuberculosis may remain dormant months or years, but in the end may set up a rapidly developing tuberculosis. After the third year tuberculosis of the mesenteric glands, the peritoneum and the intestines is more commonly seen than in earlier life, but during the entire period of infancy and childhood the lungs are almost invariably involved in all cases of moderately advanced tuberculosis.

The most common form of tuberculosis is a double tuberculous bronchopneumonia, a disease running a more rapid course in infants than in older children. In this tuberculous bronchopneumonia the breaking down of the lungs and the formation of cavities is very common, and the younger the child the more rapid is this process. Simple bronchopneumonia is usually also present in these lungs. In a very large majority of cases the bronchial glands and the glands at the root of the lung are involved, one or more of them perhaps having undergone caseation, possibly ulcerating into a bronchus and rapidly spreading the disease to the surrounding lung.

The clinical picture that one meets with in tuberculosis in infancy and childhood presents many curious features often rendering an early diagnosis difficult and at times well-nigh impossible. For the sake of convenience I will describe a chronic, a subacute and an acute form of pulmonary tuberculosis:

*Chronic Pulmonary Tuberculosis.*—This is a form in which we have the lung bound down with pleural adhesions, portions of the lung the seat of recent tuberculous infection, other portions showing the typical evidences of old tuberculous disease, dense fibrous tissue surrounding small or large cavities or caseous masses, enlarged bronchial glands with perhaps calcification or caseation. In these cases the younger the child the less frequently do we find a complicating tuberculous enteritis. This is probably due to the fact that tuberculous enteritis in the large majority of cases is secondary in

\* Read in the Section on Diseases of Children of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.  
3. American Medicine, March 17, 1906.

its nature, usually following tuberculosis of some part of the respiratory tract. Pulmonary tuberculosis in infants runs a more rapid course than in older children, hence less time is given for secondary tuberculous infection of the intestine. Abscess formation in the infant is usually present at death, but has not advanced as a rule as far as we find to be the case in older children; consequently, the amount of tuberculous material coughed up and swallowed is probably distinctly less in infants than in older children. Disturbances of digestion are very common in tuberculous infants, but they are usually dependent on the depressed vitality of the baby and its weakened digestive powers and not on tuberculous disease.

The history of these cases is often as follows: First, there is primary bronchopneumonia which runs a slow course and ends in an incomplete cure. The cough does not entirely disappear, the child's health and strength does not completely return. Some broncho-vesicular breathing and impairment of resonance remains. A second attack of bronchopneumonia occurs, and again the recovery is incomplete or the child develops measles, pertussis or severe influenza, which is followed by a rapid increase in the tuberculous symptoms. The earliest evidences of lung involvement are usually found in the upper middle part of the lung, either in front, the upper axilla or in the interscapular region; that is, in the upper portion of the lung, but not as in adults at the apex of the lung, showing clearly that the infection occurs usually through the bronchial glands at the root of the lung. The disease runs a slow course. At death cavities are usually present and are more easily recognized during life in older children than in infants. This is due to the fact that in infants cavity formation is often deep seated in the lung, surrounded by a zone of tuberculous and non-tuberculous pneumonia, and that the cavities are less likely to be walled off by dense fibrous tissue. In fact, after the eighth year of life, the disease in children approaches closely the adult type. Toward the end of life the pulmonary symptoms are easily recognized and the secondary evidences of tuberculosis in the brain, glands and peritoneum are usually distinct.

**Subacute Cases.**—The disease in these cases runs a more rapid course, the ordinary duration being from two to six months. The pulmonary symptoms appear early in the disease, perhaps in the very beginning of the illness, and the symptoms at this stage of the disease are those of an ordinary attack of bronchitis or of a mild bronchopneumonia. An attack of pertussis or measles in which the child recovers imperfectly, the cough persisting, the temperature remaining above normal and the child failing to regain in the proper time its former health, should make one suspicious of the development of a possible previous latent tuberculosis.

In these subacute cases, while the pulmonary symptoms are often present from the beginning of the illness, cases are not infrequent in which a gradual loss of weight and strength precede for a month or six weeks the development of the lung symptoms, or at least during this month or six weeks the cough is comparatively slight and spasmodic in type, resembling more or less the cough of pertussis.

In these cases the fever usually rises, the pulmonary symptoms progress, the cough increases in amount and the child continually loses in strength and weight, respiration becomes more rapid, the pulse increases in frequency and indigestion, resulting from the child's weak-

ened physical condition, helps still further to reduce its vitality. Hemoptysis is rare, and the severe diarrhea with abdominal pain and tenderness indicating a high degree of tuberculous enteritis is also rare. Dropsy is occasionally met with, and when present usually indicates that the child's death is not far distant. Toward the latter part of the disease anemia becomes marked and nephritis, due to amyloid degeneration of the kidneys, may develop. The following case seen in consultation February 15, 1906, with Dr. Waldo F. Sawyer, Vineland, N. J., represents this type of illness:

**CASE 1.**—Oscar K., aged 5, was breast-fed until 11 months. He had pertussis at the age of 3 months and measles at the age of 1 year. He made good recovery from both. There was a maternal family history of tuberculosis.

**Examination.**—In the past three and one-half months he has lost 11 pounds; present weight, 29 pounds. He coughs very little except after eating. The cough is distinctly spasmodic, resembling pertussis. There is continued fever; present temperature, 101 F. There is marked enlargement of cervical glands and impairment of resonance in upper portion of right axilla with broncho-vesicular breathing. There are physical signs of bronchitis in left lung.

**Diagnosis.**—Subacute tuberculosis, infection through respiratory tract, tuberculosis of the lymphatics of the neck, of the glands at the root of the lung, subacute tuberculous bronchopneumonia of both lungs.

**Acute Cases.**—The acute cases show tuberculous deposits scattered over and in both lungs and miliary tubercles in both lungs, and in addition a simple bronchopneumonia. Symptoms in these cases closely resemble symptoms of ordinary bronchopneumonia non-tuberculous in type. The fever is irregular, 100 to 104 F., the cough gradually increases in severity, the pulse is rapid, there is distinct dyspnea, the child rapidly loses in weight and strength and dies with all the evidences of steadily increasing weakness, and progressive development of the lung symptoms or perhaps death is due to a tuberculous meningitis. The lungs show a diffused bronchopneumonia with scattered areas of consolidation.

The following case also shows the difficulties often met with in arriving at a positive diagnosis of tuberculosis:

**CASE 2.**—On Feb. 18, 1906, I saw in consultation with Dr. Lowenburg the child of Dr. C. Patient was a boy, aged 2, well developed and had always been in good health. His only trouble was chronic constipation, from which he had suffered almost continuously since birth. For a month before I saw him he had continued fever of a mild type except during the ten days preceding my visit, when the temperature had reached 105 daily, with 103 as the minimum.

**Examination.**—His mind was clear, his pupils normal, he complained of no headache, had a slight cough, his tongue was coated, he took his nourishment fairly well. Bowels, as usual, were constipated. Lymphatics of neck and inguinal lymphatics were enlarged, upper middle portion of left lung anteriorly showed an area of impaired resonance about as large as a silver half-dollar. His breathing over this area was harsh. A blood examination showed no evidences of malarial organisms. A Widal taken three days previously was negative. Leucocytosis, 20,000.

**Diagnosis.**—It was difficult to make a positive diagnosis. Typhoid fever was excluded by second Widal. Autointoxication of gastrointestinal origin seemed hardly probable in view of the fact that the boy had always been constipated. Malarial fever was excluded and the diagnosis seemed to rest between a tuberculosis and a central pneumonia. Forty-eight hours later the temperature dropped to normal and remained normal; the drop of temperature being preceded a few hours by a fall in the leucocytosis to 7,000, apparently confirming the diagnosis of pneumonia.

It is often extremely difficult in the earlier stages and in the latent period of tuberculosis to collect sufficient evidence on which to base a positive diagnosis. Each case must be considered and studied separately. If the child is strong tuberculosis is not so likely as in one that has been frail and delicate. The possibility or probability of infection should be considered. Has the child lived in hygienic or unhygienic surroundings? Has its life been such as to expose it often to tuberculous infection? Has it lived in a house where a previous case of tuberculosis existed? Have there been any previous signs or even suspicions that the child has been tuberculous, as shown by its lymphatics, hip-joint disease and tedious convalescence from any illness as typhoid, pneumonia, pertussis or measles?

Protracted cases of bronchopneumonia of the subacute type followed perhaps by chronic inflammation of the connective tissue of the lung, may be difficult to diagnose from cases of subacute tuberculous bronchopneumonia. In a tuberculous form the lung symptoms may not be present from the onset of the disease, and wasting and loss of strength are usually more marked than in simple bronchopneumonia. When bronchopneumonia shows a tendency to persist beyond the usual period the possibility of its being tuberculous should be considered, and if the process is tuberculous, the fever, cough and emaciation are usually progressive. Bronchopneumonia is more often found at the lower back part of the lungs, tuberculosis at the upper portion.

Leucocytosis is usually absent in tuberculosis, unless we have a case of mixed infection. The leucocytes are, however, relatively high in infants. Digestive leucocytosis must also be taken into consideration. There is leucocytosis commonly in septic conditions, diphtheria, pneumonia, and this is of importance in summing up the evidence against the case being tuberculous. Leucopenia is commonly seen in tuberculosis and malaria, also in uncomplicated cases of typhoid fever, and if the diseases in which the number of white cells is usually diminished can be excluded with the exception of tuberculosis, it may assist in deciding the case to be of a tuberculous character. Blood cultures are often of distinct advantage in a doubtful case; 5 c.c. of blood should be secured and agar cultures made, preferably 1 c.c. of blood in five different agar tubes. This may, of course, fail, but, on the other hand, it may be of advantage in establishing a differential diagnosis from pneumonia or typhoid by showing the presence of the pneumococcus or the typhoid bacillus.

Chlorosis often presents a picture resembling closely tuberculosis of the lungs and lymphatics. The anemia may be present in a marked degree early in the tuberculosis; in fact, before the lungs or glandular symptoms are observed. According to Hayem, a true chlorosis may co-exist with a latent tuberculosis. The finding of tubercle bacilli in the sputum or stools, fever, progressive loss in weight, and a family history of tuberculosis, with perhaps the history of exposure to tuberculous infection, may enable one to make the diagnosis. Occasionally it is almost impossible to decide whether or not a tuberculous element is present and producing the anemia.

Inoculation experiments of glandular substance are often of aid in a differential diagnosis, and in the more chronic types of the disease may decide the tuberculous nature of the illness. The inflammation and caseation of a few tuberculous mesenteric glands may be occasionally shown by local tenderness or pain on pressure.

Again, tuberculous infection of the cervical lymph glands is very uncommon under 3 years of age. In fact, the younger the child the less likely are the enlarged lymphatics of the neck to be tuberculous. To this rule, however, there are exceptions, a case of tuberculous cervical adenitis in an infant of four months being recently reported by Dr. L. E. LaFetra.

In a doubtful case presenting skin eruptions, the tubercle bacillus has been recovered from the eruption, as in a case recently reported by Dr. Irving Snow of Buffalo. The failure of young children to expectorate, as they swallow the expectoration as soon as it is coughed into the pharynx, makes the sputum in these cases extremely difficult to obtain. This can be overcome by passing a soft rubber tube well in the esophagus and examining the adherent mucus for tubercle bacilli.

The examination of the fluid removed by lumbar puncture will often aid in the establishment of a diagnosis. I have used tuberculin very little, as an irregular fever, not infrequently seen in young children, renders its use of doubtful value in many cases.

In closing, I do not wish to be understood to be put on record as implying that the diagnosis of tuberculosis is as a rule difficult in the advanced stages of the disease, but this paper is presented because I am often asked to decide as to the presence or absence of tuberculosis when the symptoms are vague and indefinite. In these cases the diagnosis is often obscure, and I hope the discussion of this paper may perhaps throw some light on the differential diagnosis in children in whom the symptoms of tuberculosis are vague and indefinite.

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## Special Article

### CAP AND GOWN IN MOLIERE.

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In the "*Malade Imaginaire*," Béralde, who is the mouth-piece of Molière, says to Argan, the imaginary invalid: "Yes, you have but to speak with a gown and cap and any gibberish becomes learning, and any nonsense sense"; and Toinette, the rollicking maid-servant, hastens to add: "There, sir, if it were only for your beard, that goes a great way already, for the beard makes more than half the physician." Béralde is attempting to persuade his brother Argan to become a physician in order to cure him of his infatuation for physic and the physician. But Argan, simple minded and credulous, imagines that in order to be a doctor it is necessary "to study, to know Latin, to understand the diseases and the remedies to apply," an idea that Béralde ridicules, assuring him that he already knows as much as the average physician, without ever having studied medicine, and that cap and gown take the place of learning. Argan finally yields, and he is made a doctor by a friendly faculty, after a farcical examination for which he is coached.

I had always regarded the famous scene of the reception of the Imaginary Invalid as pure burlesque, and also as a gross libel on the medical profession of the XVII century, until Reynaud's "*Les Médecins au temps de Molière*" fell into my hands. Reynaud informs us that the famous scene is by no means pure fiction, that the France of Molière abounded with friendly faculties, of whom a diploma, carrying with it the right to practice, might be had almost for the asking; and, still worse, that Montpellier, one of the oldest and most renowned faculties of Europe, was scarcely more than a diploma mill. It was a common saying at Paris, where the degree of M.D. could only be obtained by a long course of study and a term of actual experience, that to receive the cap and gown at Montpellier,