

of the patients with secondary infections. This was obtained from the urine voided after thoroughly washing the glans penis, irrigating the urethra, and massaging the prostate and seminal vesicles. Colon bacilli were found in all of these except one with a pure culture of the *Staphylococcus aureus*. Dr. Edgar Paullin, the bacteriologist, who cultivated the organisms and prepared the vaccine, informed me that in two instances the colon bacilli had assumed a rather unusual morphology, appearing as diplococci, somewhat larger than gonococci.

Gonococci were not demonstrated in all of the cases, as smears failed to show them in a certain number in whom the symptoms and history were sufficiently clear to institute this plan of treatment; all of my patients being in my private practice it was not thought justifiable, for the sake of scientific accuracy, to aggravate the symptoms to obtain discharge containing gonococci, as it was hoped that the treatment would prove the diagnosis.

Stale pus and retained body fluids are poor in antibacterial substances and, when possible, should be replaced by fresh secretions rich in such substances; this become particularly imperative in prostatic and vesicular inflammation; the disintegration of the leucocytes liberates a trypticlike ferment which lessens or destroys the antibacterial substances, digests pus cells and albuminous secretion, converting it into albuminose which is constantly present and sometimes in considerable quantities, when these organs are inflamed. The removal of this secretion low in opsonic power is one of the curative factors which underlies the treatment by prostatic massage and of which we were formerly unaware; autoinoculations are also known to follow massage, and thus is explained another reason for the improvement which follows this procedure, and at the same time shows why it is inexpedient to administer a vigorous massage at the time of giving a hypodermic injection of vaccine.

Hot urethral irrigations (1 to 5,000 potassium permanganate solution to which is added 1 drachm of sodium chloride and 2 drachms of boric acid to 2 quarts) are of value and should be administered daily until the purulent discharge ceases. I am inclined to think that much of the virtue of irrigations is due to the heat and the hyperæmia which follows. Hot rectal douches appear to be of use in the treatment of prostatitis and probably produce their good effects by raising locally the opsonic index and by promoting a freer flow of blood through the inflamed parts. Hand injections and internal remedies were given when needed to keep the urethral inflammation under control.

Many phases of the subject of theoretical or academic interest present themselves for consideration, but as our knowledge is still meager it seems better to refrain from these discussions and to report only the facts and impressions gained from the use of vaccine treatment.

CONCLUSIONS.

From the experience gained in the treatment of seventy-six patients with localized genitourinary infections the conclusion that this form of treatment affords a valuable adjunct to our usual methods seems clearly demonstrated; that vaccine therapy in these affections cannot alone be relied upon seems equally warranted. No harmful results were en-

countered. More uniform results were obtained from gonococcal vaccine than from vaccine prepared from the colon bacilli and from the staphylococci which were found present as secondary infection; stock vaccine was given in treating the gonorrhœal conditions while autogenous vaccine made from organisms, at times, much attenuated was used in treating the secondary infections; perhaps more satisfactory results could have been obtained from vaccine from more active germs. While some of the patients with gonorrhœa made remarkable progress, others without complications made slight immunizing response to the injections but were ultimately cured by persistent treatment. The tendency to relapses can be lessened by injections of vaccine during the subsiding stage of acute gonorrhœa, always beginning with small doses.

From five to fifty millions were given every three to eight days during a period when the disease was in abeyance rather than when aggravated; the dosage was not regulated by the opsonic index. Massage of the prostate and vesicles, when these organs are inflamed, is particularly indicated. Hot urethral and rectal irrigations appear to raise locally the opsonic index.

1013-14 CENTURY BUILDING.

Our Readers' Discussions.

A SERIES OF PRIZE ESSAYS.

Questions for discussion in this department are announced at frequent intervals. So far as they have been decided upon, the further questions are as follows:

LXXXVII.—How do you treat supraorbital neuralgia? (Closed June 15, 1909.)

LXXXVIII.—How do you treat epistaxis? (Answers due not later than July 15, 1909.)

LXXXIX.—How do you try to prevent the recurrence of renal colic? (Answers due not later than August 16, 1909.)

Whoever answers one of these questions in the manner most satisfactory to the editor and his advisers will receive a prize of \$25. No importance whatever will be attached to literary style, but the award will be based solely on the value of the substance of the answer. It is requested (but not required) that the answers be short; if practicable no one answer to contain more than six hundred words.

All persons will be entitled to compete for the prize, whether subscribers or not. This prize will not be awarded to any one person more than once within one year. Every answer must be accompanied by the writer's full name and address, both of which we must be at liberty to publish. All papers contributed become the property of the JOURNAL. OUR READERS ARE ASKED TO SUGGEST TOPICS FOR DISCUSSION.

The prize of \$25 for the best essay submitted in answer to question LXXXVI has been awarded to Dr. Charles Nahum Haskell, of Bridgeport, Conn., whose article appeared on page 1311 of volume lxxxix.

PRIZE QUESTION LXXXVI.

THE EARLY DIAGNOSIS OF PULMONARY TUBERCULOUS DISEASE.

(Continued from lxxxix, p. 1313.)

Dr. Samuel Stalberg, of Philadelphia; remarks:

The form of pulmonary tuberculosis in which an early diagnosis is of the greatest value is the so called "chronic ulcerative phthisis," or plain "consumption." The onset of this disease is in the majority of cases, so insidious, and its early manifestations so indefinite, that the presentation of any symptom or sign known to be associated with the

condition, or a part of its usual picture, should compel us to look for other evidences of the disease.

And it is not alone our duty to attempt a diagnosis of phthisis when a patient presents himself for an opinion as to its presence or absence, but frequently when the patient consults us for some vague symptoms, it will be possible for us, by searching for physical signs, and by making a full inquiry into the family and personal history, to discover the presence of pulmonary tuberculosis. In the early stages there is probably no one pathognomonic sign, and it is by association of symptoms and facts alone that we can arrive at a diagnosis.

In the early diagnosis of phthisis we should consider: 1, Family history; 2, personal history; 3, symptoms; 4, physical signs; 5, tuberculin reaction; 6, sputum examination; 7, x ray or fluoroscope; and 8, recovery of tubercle bacillus from the blood.

It must be said at the outset that it will not be necessary in all cases to employ, or enter into, each of these methods, nor will it always be possible to elicit facts from each in every case, but a combination of any one or more of them is what will be conclusive. We should closely question the patient regarding the presence of tuberculosis in the immediate family. Without taking into consideration the question of heredity, it has been shown that about fifty per cent. of the cases of pulmonary tuberculosis can trace their source of contagion to cases in the members of their family—wife, father, sister, etc. More remote members of the family, such as uncles, aunts, etc., should also be inquired about.

Under personal history, the occupation, nature of the house in which the patient lives, and his mode of life, should be entered into. The influence of certain occupations on the development of tuberculosis, such as printing, clothmaking, cigarmaking, etc., is well known. Infection from living in houses that formerly harbored consumptives is a frequent occurrence. In questioning regarding occupation and place of dwelling, the physician should go back several years in the patient's life. The mode of life of the patient, whether under favorable hygienic conditions or otherwise, should be ascertained, and his habits, whether temperate, regular, etc., investigated. His previous medical history, especially in regards to chronically enlarged cervical glands and the recent attack of influenza, should be gone into.

The symptoms that an early cases of phthisis may present, one or more, are as follows:

But we will probably better understand the symptoms and physical signs by stating what we mean by an "early case." An "early case" in the majority of cases should not go beyond the stage of infiltration, and in some cases beginning consolidation. The constitutional symptoms are produced by the toxins of the soluble proteins set free by the disintegration process, while the local signs are produced by the anatomical changes.

The symptoms are, then,

Anæmia. This is a frequent mode of onset. The patient is pale, the cheeks of an ashen color, almost like the picture of pernicious anæmia, though if a blood examination were to be made, only the changes of simple anæmia would be found. To this

pallor is added a sense of languor or weakness. The patient loses weight without apparent reason. There is anorexia with gastric irritability, probably vomiting. There is shortness of breath, at first noted only on exertion, later more or less constant. Hoarseness may be present.

There are often chilly sensations or flashes of heat. There is a comparatively rapid pulse, a weak, fluttering pulse, apparently disproportionate to the amount of fever, if there is any present. A pulse of from 90 to 110 is present.

Rise in temperature sometimes occurs in early cases.

The pyrexia amounts to only a degree or two, and occurs toward the afternoon; but it must be remembered that many cases go on to the advanced stage without any fever.

Night sweats, while a symptom of later cases, do occur in early cases occasionally. There may be pain in the chest, increased by cough or forced breathing and corresponding to an area of pleurisy.

Cough. The most frequent mode of onset is with cough. It is noticed that the patient takes cold easily. At first it is dry and hacking, with the expulsion of glairy, mucoid sputum. This cough and expectoration usually is the result of a bronchitis and a congestion about a tuberculous focus in the lung with resulting increased secretion. It is not the expectoration of mucopurulent sputum due to the breaking down of lung tissue of the later stages, and does not as a rule contain tubercle bacilli. It must be remembered that some cases of phthisis go to an advanced stage with no cough at all.

Hæmoptysis. In about twenty per cent. of the cases of phthisis this hæmorrhage from the lungs, usually in the form of bloodstreaked sputum, and sometimes greater in quantity, amounting to an ounce or so of blood, is the first symptom that calls our attention to the probable presence of phthisis. Frequently the physical signs of the condition follow the spitting of blood rapidly. A hectic flush is sometimes present.

Unilateral dilatation of the pupils may be present, probably due to pressure of enlarged lymph glands on the sympathetic nerves.

Physical signs. The patient should be stripped and his bare chest examined. He should be preferably in a sitting posture. Inspection in early cases, as far as the lungs are concerned, may be negative. We may note the hectic flush, unilateral dilatation of the pupil, the pallor, and the shape of the thorax. The thorax may appear normal, but in very many cases it will present the features of the "phthisical chest"—one in which the longitudinal diameter is increased and the anteroposterior diminished. The scapulæ stand away from the ribs, the intercostal spaces are deeper than usual. There may also be emaciation. There may or may not be slight retardation of movement on the affected side, diminished expansion in the infraclavicular space, as compared with the other side. To palpation there may or may not be increase in vocal fremitus in the supraclavicular and infraclavicular space of the affected side. Percussion in incipient cases is often negative, but in some cases impaired resonance or slight dulness is present. There may be felt a form or resistance to the percussing finger.

It is auscultation that gives the most important re-

sults in the early cases. Over the affected apex, as compared always with the normal apex, or, in the case of both apices being affected, as compared with other portions of the lung, the expiratory murmur is longer, louder, and rougher than the inspiratory murmur. In health the expiratory murmur is one third the length of inspiration in duration. The respiratory murmur is diminished over the affected apex. The breath sounds are often interrupted, giving the "cogwheel" effect. Vocal resonance is increased. And in trying for vocal resonance not only spoken voice, but also whispered voice, should be employed. Both are intensified over the affected area. The last features to be noted in auscultation are râles. They are dry or moist, crepitant or subcrepitant, and, heard over one apex, are very significant in early cases, heard usually with forced respiration. But frequently these râles will not be revealed unless the patient is asked to cough. After expiring deeply, the patient coughs, following with a deep inspiration, when the râle or râles will be heard. This is diagnostic.

In a considerable number of cases, the history, symptoms, and physical signs will be sufficient to enable us to diagnosticate early phthisis, but in a great many cases the results of such investigation will be negative. In these cases recourse to the various forms of tuberculin diagnosis should be resorted to. The subcutaneous method consists in injecting by the hypodermic syringe of one milligramme of Koch's tuberculin, and if there is no reaction in two or three days, two milligrammes are employed and gradually increased at intervals until five milligrammes have been injected. The reaction consists in a rise of temperature of one or more degrees, and in slight constitutional symptoms such as malaise, etc. But a better method of tuberculin diagnosis is by the conjunctival method of Calmette and Wolf-Eisner, or by the von Pirquet cutaneous method. A one per cent. solution of tuberculin in normal salt solution is instilled into the eye of the suspected patient. If tuberculosis is present, the reaction will be manifested by a congestion of the conjunctiva and caruncle with a serofibrinous exudate. The reaction disappears in from twenty-four to forty-eight hours. If a negative result is obtained, a second instillation into the second eye should be made in a few days.

The cutaneous method consists in putting a drop of diluted old tuberculin upon the skin and then scarify the latter under the drop of tuberculin. Only the most superficial layers of the epithelium need be removed. At a distance of about one inch a control abrasion is made under a drop of fifty per cent. glycerine and 0.1 per cent. phenol in salt solution. The reaction consists in the production of a hyperæmic zone, from 4 to 12 mm. in diameter, in the centre of which is a papule; the skin is slightly swollen and hard.

There are certain precautions to be observed in both the cutaneous and conjunctival methods. In general, the conjunctival and cutaneous methods give from eighty to ninety per cent. of positive results in early cases of tuberculosis, and therefore, since it is practically ascertained that the risk is very slight, they should form a most important procedure in helping us to diagnosticate early cases not diagnosticable positively by other means. In regard to x

ray and fluoroscopic examination, such methods at times are of value, as consolidation can sometimes be shown by a shadow, but this requires the services of an expert, and is often unnecessary.

In regard to the finding of the tubercle bacilli, of course that is the most conclusive evidence of the presence of phthisis, but usually their presence in the sputum indicates a stage when the lung tissue is already broken down, and the early stage is passed. Nevertheless, an examination of the sputum should be made in every case, even the earliest. And it occasionally happens that a patient will not show any signs of phthisis and yet be spitting tuberculous sputum.

Very recently a method has been devised which promises to be of great value in the early diagnosis of phthisis. Rosenberger has recovered from the blood of fifty sufferers from tuberculosis the tubercle bacilli, in most of the cases long before the presence or detection of physical signs or symptoms. The technique is simple enough, the bacilli being found by the usual staining methods.

I shall not discuss either "phthisis florida" or the pulmonary form of acute miliary tuberculosis.

Dr. Marshall Carleton Pease, of New York, observes:

While it is quite probable that a hereditary tendency to tuberculosis has, in the past, been given too much weight, yet we should still inquire into the family history. A family of which some of the members have died of tuberculosis has at least an increased possibility of an early and long concealed infection. Further predisposing causes are found in poor muscular development, delicate bodily structure, and any deformity of the chest or spine which limits the free movement of the lungs. Again, we find tuberculosis is not an infrequent accompaniment of a general weakness of the organism, due to anæmia, diabetes, ill adapted food, insanitary surroundings, and intestinal catarrh. It is comparatively common as sequence of whooping cough or measles in children, and is often the final stage of a cirrhosis, heart disease, and kidney troubles. It may be discovered as a consequence of a weakening of the lung tissues following trauma, or an inflammatory process. The latter cause does not hold good in lobar pneumonia, for the reason that this disease rarely affects the apices of the lungs. Any tuberculous foci, as Pott's disease, tuberculous glands, hip disease, etc., of course predispose to a tuberculous process in the lung. While these various ætiological factors are never alone of sufficient value to cause a diagnosis of incipient tuberculosis to be made, yet their presence should always arouse our suspicions and cause a frequent and careful search to be made for signs of beginning phthisis, and in those cases where the signs are of a doubtful character they may lead to an almost certainly positive diagnosis.

The subjective symptoms are at first very mild. There may be a slight cough in the morning, with a trace of blood in the sputum, and some loss of weight. Frequently there is a tendency to sweat at night or on slight exertion. Often a languor and a general weakness with shortness of breath on exertion are the first complaints; and with these symptoms it is common to find an accelerated pulse and