

The Boston Medical and Surgical Journal

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August 31, 1916

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Massachusetts Medical Society.

PAPERS READ BEFORE THE SECTION OF TUBERCULOSIS, WITH THE DISCUSSION, JUNE 6, 1916.

CONTACT POINTS BETWEEN PULMONARY TUBERCULOSIS AND SYPHILIS.

BY JAMES A. LYON, M.D., RUTLAND, MASS.

IN searching through the voluminous literature on the subject of pulmonary syphilis, one is amazed and bewildered by the diversity of opinions held by the medical profession on this important and, to me in the light of my experience, unusual and uncommon condition. It has been frequently suggested to me that a large percentage of the cases at Rutland would be found to possess definite pulmonary syphilitic lesions, were a careful and diligent search instituted. To test this supposition 471 of our patients have been subjected to the Wassermann test. The results of these tests, together with a study of their clinical significance, form a part of this paper.

The credit for the first anatomical description of pulmonary syphilis must be given to Depaul who, in 1853, read before the Paris Academy a paper entitled "A Manifestation of Congenital Syphilis, Consisting in an Alteration of the Lungs Not Yet Described." Virchow was inclined to express himself with considerable reserve about

the disease and was doubtful as to most of the cases that had been previously reported. He mentions having observed certain lesions of the lungs which he considered syphilitic, particularly so if there were other manifestations of syphilis elsewhere in the body. The most marked lesions that he found were a fibrous interstitial pneumonia along the bronchi, leading to the formation of fibrous bands passing from the centre of the lung along the bronchi and vessels toward the periphery, thus forming by their contraction more or less deformity of the lung. Along with this condition he believed that in certain cases there was an associated pleurisy, later on forming fibrous nodules beneath the pleura. He states that caseous pneumonia and gummata might also be discovered, and describes cavities formed from the breaking down of foci of caseous pneumonia, thus bringing up the question of syphilitic phthisis. All subsequent descriptions of the disease are based on this work of Virchow.

Carlier, in 1882, collected 75 cases from different sources, and of these he reported the autopsy findings in 50. Hiller, in 1884, collected 87 cases, 84 of which were examined post-mortem. Of these Carlier had previously reported 20. Hiller himself reported two cases in which syphilis of the lungs was undoubtedly present, there being also other evidences of syphilis. He is positive in his denial of the existence of a syphilitic phthisis and he believes that the cavities found in the cases reported should be considered bronchiectatic and not syphilitic. From the description of these cavities he was in all probability correct in his theory. Only 28 of

the 84 cases of Hiller with autopsies should be considered as syphilitic, the doubtful cases in all likelihood being pulmonary tuberculosis with fibrosis.

All authorities, with almost the single exception of Pancretius, agree that pulmonary syphilis is rare. Most of the cases that he reported are clinical and consist of rather indefinite pulmonary lesions, with frequently obscure general manifestations of syphilis which responded to iodide of potassium. From the report of the autopsies which he gives it would appear that most of his cases were also ones of tuberculosis.

West maintains that out of 6000 syphilitic patients treated at the hospital in Copenhagen during a period of seven years, only 2 furnished clinical evidence of pulmonary syphilis. He also states that of 18 autopsies of adults who died of acquired syphilis, specific disease of the lungs was found in but three instances. Out of 105 autopsies on children with congenital syphilis the lungs were affected in but four instances. Lenhart states that his teacher, E. Wagner, could recall but one instance in which he could make a clinical diagnosis of pulmonary syphilis, and in which a cure followed anti-luetic treatment.

Fowler maintains that pulmonary syphilis is a rare disease, and bases his statement on the fact that he was able to find only 12 specimens in the museum of the London hospital of the Royal College of Surgeons. He contends that two of these may be excluded as either not of that nature, or of a character so doubtful that they are inadmissible as evidence. None of these specimens is from a case of congenital syphilis.

Councilman, who reports two cases with autopsy, states that the essential process in the production of a gumma in the lung is a pneumonia with fibrinous exudation, accompanied by a fibrous change in the alveolar wall, the whole subsequently undergoing caseation. A hyaline degeneration of the capillaries of the affected area is stated to be the first step in the process; this is followed by atrophy of the alveolar wall. The alveoli become distended with large pale epithelial cells and fibrin; the cells also undergo hyaline degeneration, forming smooth bodies staining with eosin and varying in size from one-half the diameter of a red blood corpuscle up to that of a large epithelial cell. The capillaries become converted into rigid tubes and their lumen is much narrowed. Similar changes occur in the small veins and arteries. Immediately around the bronchi and arteries there is a formation of connective tissue, and here the alveolar walls show much thickening and contain small round cells. The whole of the structure thus altered tends to undergo necrosis, and when that change is complete a caseous-looking mass results.

Of cases of acquired syphilis of the lungs there are two varieties. In one there are gummata which vary considerably in size and frequency. They may range from one eighth of an

inch to several inches in diameter, and there may be one or several of such masses scattered throughout the lung. In their incipient stage they are elastic and of a whitish or reddish-white color. At a later period they may undergo caseation and soften, or even become of firmer consistency. Accordingly gummata appear so like tuberculous masses that to differentiate them is a difficult problem. They are located in the interstitial connective tissue surrounded by a dense fibrous capsule. It is maintained by some that these gummata may soften and break into a bronchus and thus be discharged, thereby developing a cavity. Osler believes that when such a condition does occur it is caused by the action of tubercle bacilli. Usually these gummata are converted into dry, firm, cheesy masses, or else they undergo transformation into interstitial tissue. In the post-mortem examination of patients dying in the tertiary stage of syphilis stenosis of the small and large bronchi has been found, due to cicatricial contraction. These gummata may undergo fibrous changes, their resulting cicatricial contraction producing stenosis of the bronchi which, if complete, causes atelectasis of the air cells supplied by the stenosed bronchus, while a bronchiectasis may develop on the tracheal side of the stenosis.

The interstitial hyperplasia appears to have no characteristics which would in any way distinguish it from fibrosis due to tuberculosis, except in that it seems to have a tendency to be confined to one lung. This fact has been brought out very clearly by radiographs shown to me a few days ago by Dr. Holmes at the Massachusetts General Hospital. These were proven cases of syphilis, and the diagnosis of syphilis of the lungs was suspected. In one instance there was a marked destructive condition of the whole of the left lung with no apparent involvement of the other, a condition which would not be apt to occur in a given case of pulmonary tuberculosis, because of the improbability of the opposite lung escaping infection. In another case there were two well defined areas, one occupying the upper portion of the left lung, and the other located in its lower portion. These areas were clean cut and the rest of the lung was not affected, nor were there any evident lesions in the right lung. One would hardly expect to find such a condition existing in pulmonary tuberculosis.

The clinical picture produced by syphilitic disease in the lungs is rather indefinite and depends to a great degree upon the extent of the disease process. It is doubtful if a single gumma would produce symptoms unless it should be of sufficient size, or located in such a position as to cause pressure on important blood-vessels, or large bronchi. Likewise, the presence of interstitial changes at the root, or in the interior of the lung, is hardly likely to produce symptoms unless it is sufficiently extensive to interfere with the respiratory capacity.

There is a class of cases, however, in which

the clinical picture of chronic phthisis is observed, and these are described by some authors as pulmonary syphilis. They occur in patients who present evidence of tertiary lues, or have been infected from 5 to 15 or 20 years previously. Whether the symptoms produced in such cases, however, are really due to syphilis is a much-disputed question, and one that has not so far been settled.

It is safe to state that the symptoms referable to pulmonary syphilis are not as a whole alike in every case, nor are they sufficiently characteristic as a group to make positive the diagnosis of syphilitic disease of the lungs, as differentiated from other pulmonary diseases. Indeed there are no symptoms distinctive of pulmonary syphilis.

In regard to syphilitic lesions of the bronchi, it seems of importance to bring out the fact that the signs of bronchitis which are found in the second stage are, as a rule, general in their distribution; while in the tertiary stage they are usually localized, owing to the tendency at that period to form interstitial changes or gummata in the bronchi. If stenosis occurs there may at first be bronchial breathing limited in area, and this may be found most frequently about the root of the lung posteriorly. As the capacity of the bronchi becomes narrowed, the respiratory murmur over the pulmonary area which it supplies becomes more and more altered until finally it disappears when the air ceases to pass the stenosis. If bronchiectasis occurs it will be followed by cough with profuse purulent and often foetid expectoration, and it is also accompanied by general constitutional disturbances, such as loss of weight and elevation of temperature.

Cough seems to be one of the earliest and most prominent symptoms in the cases reported in the literature on the subject. At first it is laryngeal, then it becomes tracheal or bronchial. Dyspnoea would appear to come next in point of frequency, and varies in severity according to the degree of the lesion. It may be mild when the process is slight, or very severe when marked fibrosis or stenosis of one of the main bronchi is present. The dyspnoea tends to become paroxysmal and to assume the character of bronchial asthma. Hemoptysis is not of frequent occurrence, but it may occur and prove fatal. Expectoration may be profuse, purulent, greenish or yellowish in color and offensive. It may also be streaked with blood. Foul expectoration is common in cases of advanced pulmonary syphilis. Pain may be present, but it is not so prominent a feature as in pulmonary tuberculosis. It is usually due to a syphilitic perihepatitis and not to pleural inflammation. Emaciation is not, as a rule, nearly so extreme and rapid as in tuberculosis, but with advanced lesions in the lungs the difference is not so remarkable as to be of any value from a diagnostic point of view. Night sweats may occur. Pyrexia may be present to a greater or less degree, depending upon the extensiveness of the pulmonary lesions. There may be a complete

absence of fever in the early stages of the disease, and on the other hand it may assume the hectic type, as in tuberculosis, if the process is extensive.

The lesions of pulmonary syphilis are rarely of such a nature as to produce physical signs by which they can be distinguished from other pulmonary diseases of an entirely different origin. On inspection there is likely to be an altered appearance of the chest, depending upon the extent and location of the fibrosis, but it will hardly present the retraction of the apices so frequently seen in tuberculosis. If there are extensive changes in the lungs their expansion will be diminished, and there may be unilateral retraction like that seen in cases of fibrosis from other causes. Areas of consolidation and cavities will be recognized by the ordinary signs, probably long before syphilis is suspected.

A careful inquiry should be made into all cases of pulmonary disease as to the possibility of a latent syphilitic infection. It has been my experience in the routine taking of histories that almost invariably a patient will deny that he has ever had lues, and in many instances they are perfectly honest in their statement, because they have not known of the nature of their disease. At Rutland I am able to obtain a definite syphilitic history, in many instances only after the patient has been notified of the result of the Wassermann test.

Careful search should be made for syphilitic lesions in the calvarium, the sternum, ribs, testes, larynx, liver and spleen, and if there is a suspicion of syphilis the search should not be abandoned in a case of pulmonary disease with a positive, or even a negative, Wassermann without first having a careful radiograph taken of the lungs and the long bones.

In pulmonary tuberculosis the apices of the lungs are the parts most frequently affected, and the disease has a tendency to spread downward over a definite line of march. One lung is rarely found extensively diseased without an involvement of the other. The lesions of syphilis on the other hand seem to localize themselves about the root, base, and central portions of the lung, and they are, as a rule, confined to one lung, even when there is a marked destruction of tissue. Careful study of undoubted specimens of pulmonary syphilis, however, does not bear out the statement frequently made that the lesions are generally limited to the middle portion of the lung. They are so often found elsewhere that their more frequent occurrence in that part ceases to be a factor in diagnosis.

The presence of cavity signs in the lung and the expectoration of large amounts of sputum persistently negative to tubercle bacilli should always suggest pulmonary syphilis. In these cases and in all other doubtful ones an x-ray examination should be made by a skilled roentgenologist who has had considerable experience in the taking and interpreting of chest findings. The Wassermann test should, in my opinion, be

given to every case presenting a pulmonary disease, and a negative finding after repeated tests should not necessarily be considered as evidence to exclude the possibility of a syphilitic origin. In all cases of pulmonary tuberculosis, which are at all doubtful, when the sputum is persistently negative, the subcutaneous administration of Koch's Old Tuberculin should be given in doses and periods laid down for that test. If the tuberculin reaction is negative, and there is a marked Wassermann reaction, and if the x-ray examination of the chest is confirmatory or suggestive, if lesions are found in the bones and there are other manifestations of syphilis present, a diagnosis of pulmonary syphilis would seem probable. On the other hand, if a positive reaction to tuberculin occurs in a given case of pulmonary disease with a marked positive Wassermann, it will be difficult indeed to make a correct diagnosis because the two diseases, pulmonary tuberculosis and syphilis, may co-exist while the x-ray examination may not be of assistance.

It has been suggested by some writers on this subject that if a pulmonary disease which has not responded to ordinary non-specific treatment were put on an anti-luetic treatment, and the process thereupon improved or disappeared, one would be justified in maintaining that the case was syphilitic. It will be noted that in the cases Numbers 1 and 2, here reported, the physical signs in the chest and the general condition showed striking improvement under nothing but the usual sanatorium treatment. Both of these patients had definite signs in the chest, and symptoms pointing to tuberculosis. An x-ray examination made in one of the cases showed an apical lesion. They had a positive and a doubtful Wassermann respectively and negative sputum. On the administration of 1 mgm. of Koch's Old Tuberculin they failed to react, as they did also to 3, 5 and 10 mgms. respectively. Both of these patients were referred to us from large hospitals. They had been examined repeatedly and considered to be tuberculous. During their stay in the sanatorium they have increased greatly in weight, and the physical signs have entirely disappeared. Had these patients been put on anti-luetic treatment and the same result had occurred, we are confident that we should have been disposed to credit the improvement to the therapeutic effect of the drugs. On the other hand, even in a given case of pulmonary syphilis where marked changes in the structure of the lung have taken place, with cavity formation, strictures of the bronchi, etc., one would not expect specific treatment to improve these conditions.

In still another instance (Case 3); where there were marked physical signs in the chest with a negative sputum on repeated examination and a positive Wassermann, the patient was put on specific treatment, mercurial inunctions and potassium iodide, and within a very few weeks the process in his chest became more active. He

began to cough and expectorate large amounts of muco-purulent sputum which contained tubercle bacilli. The x-ray diagnosis in this case was pulmonary tuberculosis, involving the upper two-thirds of the left lung and the apex of the right.

Case 4 had well defined lesions in both lungs. His sputum was positive on admission, but was negative thereafter on repeated examinations. It was only a short time before his discharge that his blood was examined and found to be positive to the Wassermann reaction. This patient gained 26 pounds in weight during his residence, and at the time of his discharge his pulmonary disease was "apparently arrested." The x-ray report is as follows: "Dilated arch with dense mottled areas in both apices." If this patient had been given specific treatment and had made a similar improvement we might have considered that this was an instance of an associated pulmonary tuberculosis and syphilis.

CASE 1. Admitted January, 1916. Female, housewife. Age 28. Married. Family history, negative. Well as a child, with the exception of having had children's diseases. Menses established at 15, but have always been irregular. Was married ten years ago, and has a healthy, living child, aged 9 years. She has had no miscarriages. She gave a negative history to syphilis prior to the positive findings of her Wassermann test, but following this she stated that she had an eruption on her skin shortly following the birth of her child. She had no treatment for this condition. During the past several years she has had pain in her back, suffered occasional chills, gradual loss of strength, anorexia, constipation, and during the past few months has lost about 12 pounds in weight. There has been no cough or expectoration.

In December, 1915, she was treated at one of the hospitals in Boston, and a diagnosis of incipient tuberculosis was made and confirmed by the x-ray examination. The process at that time, so she was told, was in the right apex. Later she was examined at another hospital, and was advised to go to Rutland for treatment. Her application blank was marked "incipient."

On admission she complained of loss of strength, constipation, slight morning expectoration and pain in the back. Her temperature was 99° F. and her pulse was 102.

Physical Examination.—Fairly well developed; fairly well nourished; attitude erect; color of lips and mucous membrane normal; teeth in good condition; pupils equal and react. Nares, pharynx and larynx normal. There are several large and small scars about the shoulders and back, which are stated to have been caused by being scalded by hot water. There is no enlargement of the lymph nodes. The chest mobility and symmetry are normal. Heart normal. On percussion there is slight dulness in the right apex anteriorly extending down to the second rib, and posteriorly extending down to the fourth vertebra. Over this area there is bronchovesicular breathing, and there are a few medium râles; the left apex is a little high pitched on percussion, and there are a few fine râles present.

The temperature throughout her stay ranged from 97 to 99° F.; her pulse has varied from 70 to 105, with a steady gain in weight and strength. The

physical signs have gradually disappeared from her chest, and her sputum has been on repeated examinations negative to tubercle bacilli. On March 14, 1916, following the routine examination of patient's blood, she was found to have a positive Wassermann. Consequently, beginning on May 16, 1916, she was given 1, 3, 5 and 10 mgms. respectively of Koch's Old Tuberculin subcutaneously, and there was not the slightest local, focal, or general reaction. This was apparently not a case of pulmonary tuberculosis, and she was discharged with instructions to take specific treatment, having gained 15 pounds in weight.

CASE 2. Admitted Feb. 11, 1916. Female. Housewife. Age 25. Married. Mother and father well. An only brother died of pulmonary tuberculosis two years previously. She was delicate as a child, having had pneumonia at the age of three months, diphtheria in childhood, measles, etc. Menses established at 14, irregular. Was married six years ago, and has two children living and well. She had an induced miscarriage two years ago, and has not been well since that time. She gave a negative history to syphilis on admission. During the past two years she has complained of a moderate cough and expectoration, together with pleural pains. She has been suffering from moderate dyspnea, and in May, 1915, she expectorated about a drachm of clear blood. The same thing occurred in January, 1916, but the blood then expectorated amounted to about one ounce. There has been a gradual loss of strength during the past two years. Her usual weight is 110 pounds, but on admission she weighed only 104 pounds.

She had been treated by various physicians and, during February, 1916, an application was made for her admission to the State Sanatorium by her physician, who stated that she was between the incipient and moderately advanced stages of her disease. The duration was stated to be two years, and the process was marked as being in the right apex anteriorly.

Her symptoms on admission consisted of moderate cough, moderate loss of strength, insomnia and moderate dyspnea.

Physical Examination.—Poorly developed and poorly nourished; attitude erect; color of lips pale; teeth fair; pupils equal and react. Lymph nodes negative. Nares, pharynx and larynx negative. Mobility and symmetry of the chest normal. Heart normal.

There is slight dulness in the right apex anteriorly, extending down to the third rib, and posteriorly extending down to the fourth vertebra; high pitched breath sounds and medium coarse râles are present over all this area.

During her residence her temperature fluctuated between 97.4° F. a.m., and 99.2° F. p.m., and her pulse varied between 70 a.m. and 106 p.m. She gained 10 pounds in weight. Her symptoms have all disappeared, and she is stronger and the physical signs in her chest are now negative.

She had a doubtful Wassermann on two examinations. Her sputum was negative to tubercle bacilli on repeated and careful examinations. On May 16, 1916, she was given 1 mgm. of Koch's Old Tuberculin subcutaneously, which failed to cause a reaction, and consequently she was given 3, 5 and 10 mgms. respectively, following which there was still no reaction. She was therefore discharged as

non-tubercular, with the recommendation that she take specific treatment.

CASE 3. Admitted October, 1913. Male. Age 20. Cook. Single. Family history, negative. As a child was delicate, and had the usual diseases of childhood. He denied having had syphilis. His present illness began in March, 1913, at which time he claims to have had a "touch of pneumonia." Since then he has been losing weight, has had a moderate cough and expectoration. He has had a slight evening temperature, night sweats and moderate loss of strength. On admission the foregoing symptoms were still present.

Physical Examination.—Fairly well developed and nourished; attitude erect; color of lips and mucous membrane normal; teeth in good condition; pupils equal and react; lymph nodes negative. The ears, nares and pharynx are normal. There is a slight thickening of both vocal cords, with moderate inflammation and catarrh. Mobility and symmetry of thorax normal. Heart normal. There are no scars of any kind upon the body. There is a slight incipient lesion in the right apex, with dulness in the left lung, extending down to the third rib anteriorly, and to the sixth vertebra posteriorly, in which area there are numerous râles, and also harsh breathing.

During the first few months of his residence he ran a rather irregular temperature and pulse. His sputum was persistently negative to tubercle bacilli. On Aug. 18, 1915, his Wassermann was positive, and on questioning him he admitted that he had had a primary lesion in 1912. He took "pills" for several months, and there were no secondary manifestations of the disease. Iodide of potassium was given, together with inunctions of mercury. Because of the "two-year residence rule," he was discharged as a patient in September, 1915, as "improved," and took up employment in this institution. Some time later he began to lose weight, his cough increased and he raised large amounts of muco-purulent sputum, which contained tubercle bacilli. The physical signs in his chest increased, and his temperature, which had been normal for several months, became elevated. The x-ray diagnosis was tuberculosis of the upper two-thirds of the left and the apex of the right lung.

CASE 4. Admitted June, 1915, Male. Age 37. Printer. Married five years, no children. Family history negative. As a child was well, with the exception of diseases of childhood. He denied having had syphilis. His present illness dated from about one year back, at which time he began to feel run down. In January, 1915, he coughed and expectorated moderately, and later he complained of dyspnea, chills, moderate fever, night sweats, etc. On admission he had practically no cough or expectoration, and none of the above symptoms were present.

Physical Examination.—General development fair; well nourished; attitude erect; color of lips and mucous membrane normal; teeth, artificial uppers, lower ones in good condition. Mobility and symmetry of thorax normal. Heart normal. There are interstitial changes in the right lung, involving the upper and middle lobes anteriorly, and the upper lobe and upper half of the lower lobe posteriorly, with moderate activity. There are scattered deposits in the apex of the left lung, with slight activity. While under treatment he ran a practi-

cally normal temperature and pulse, and his sputum, although it was examined repeatedly, was found to contain tubercle bacilli only once during his residence.

On Oct. 2, 1915, his Wassermann was found positive, and he then informed us that he had had an initial lesion in 1900, for which he took mercurial pills for about one month. In March, 1916, an x-ray examination showed dense mottled areas in both apices. Diagnosis, pulmonary tuberculosis. He was discharged in March, 1916, having gained 26 pounds in weight, and the physical signs in his chest had entirely cleared up, there being nothing present but a few fibroid changes in the tops of both lungs.

Of the 471 cases having received the Wassermann test, 430 were negative, 10 were doubtful, 2 were unsatisfactory, and 29, or 6%, were positive. Of the 430 negative cases 140 had incipient pulmonary tuberculosis, 105 of these had repeated negative sputum, and 35 had positive sputum. Moderately advanced, 222, and of these 75 had negative sputum, and there were 149 instances where it was positive. The remaining 68 were far advanced; and of these 7 were negative, and 61 had positive sputum. The sputum was negative in 4, and positive in 2 of the doubtful cases in the incipient stage; 2 had negative and 2 had positive sputum in the moderately advanced stage. There were no doubtful cases in the far advanced stage of their pulmonary disease. Of the 2 unsatisfactory cases, both of which were in the moderately advanced stage, one had a positive sputum and the other was negative.

A positive Wassermann was obtained in 10 incipient cases, and of these cases 8 had negative sputum and 2 positive sputum. In the moderately advanced stage, 4 had negative and 11 positive sputum. In the far advanced stage there were only 4 that gave a positive Wassermann, and in each instance the sputum was positive.

From my experience at Rutland, and the careful consideration of the cases there, I am firmly convinced that all patients who are suffering from diseases of the lungs should be given repeated Wassermann tests. It is by this method, together with a careful study of the x-ray findings and physical signs in these organs, that we may hope to settle this difficult and complex question of what really constitutes clinical pulmonary syphilis.

DISCUSSION.

Dr. W. A. Hinton, Cambridge: I am much pleased with the points Dr. Lyon brought out in his paper, especially the description which he gave of the pathology of the disease. In a review of more than 5,000 autopsies, I do not recall a single case where the diagnosis of syphilis of the lungs was made in an adult. There is a good deal of work to be done on the disease, and we cannot be absolutely certain that lesions

of the lungs which we think are syphilitic are such until spirochetes are found.

In regard to the incidence of syphilis among the tuberculous, out of 1164 cases examined by the State Wassermann Laboratory from patients in the Boston Consumptives' Hospital and in Rutland, 105, or 9%, gave positive reactions; 49, or 4.5%, doubtful reactions. These Wassermann tests were done as a routine in these two institutions. It is of interest to compare these statistics with others. In the case of the Lying-in Hospital, in 1130 cases about 5.9% were positive and an equal per cent. were doubtful. It would seem to indicate that roughly from 5 to 7% of the inhabitants of Massachusetts are syphilitic. I take the statistics of the Boston Lying-in Hospital as giving the average, as these people apply for a specific complaint—pregnancy—and no diseased condition. On the other hand, in general hospitals, about 20% of all patients give a positive Wassermann.

As bearing upon the relative frequency of a negative or positive sputum in the cases with a positive Wassermann test, the following statistics will give some information: In the Boston Consumptives' Hospital and Rutland State Sanatorium in 67 positive Wassermans, 35 had a positive sputum and 32 had a negative. In 707 negative Wassermans, 364 had a positive sputum and 343 had a negative. In other words, there is no more likelihood of finding a positive Wassermann in cases with a negative sputum than in cases with a positive sputum.

In conclusion, I wish to emphasize Dr. Lyon's point to the extent of saying that I believe that all patients, whether private or institutional, who have a diagnosis suggestive of pulmonary involvement, should have a Wassermann test performed.

DR. C. MORTON SMITH, Boston: This subject was first brought to my attention about twelve or fifteen years ago, when a patient of mine, definitely luetic, who had been under treatment for a matter of three or four years, fell overboard down the Harbor one day in June. The wetting and exposure were followed by an attack of pleurisy, according to his description. Two or three months later he applied at one of the hospitals for a chest examination, and was recommended to a State sanatorium as a case of incipient tuberculosis. He remained at the institution about ten months, and during that entire period had a persistently negative sputum. It was before the days of the Wassermann test. The guinea-pig inoculated with his sputum in December was killed the following June, and, at the post mortem, showed no evidence of tuberculosis.

As far as diagnostic signs on physical examination are concerned, it seems impossible to distinguish, from physical examination alone, a case of syphilis of the lung from tuberculosis,

judging from the cases that have proven to be definitely syphilitic; for practically all these cases have either been recommended to, or have spent a certain time in, one of the State sanatoria, having been sent there by experts. It seems to me that the x-ray furnishes one of the most valuable aids in the matter of diagnosis. The distinctions have been brought out by the reader, and I will not dwell on them.

Another point the reader mentioned is the well being of the individual with syphilis of the lung, as compared with the same degree of pulmonary involvement of tuberculosis. It seems to me that, in the matter of syphilis of the lung, the Wassermann is of about the same value as it is in other questions of syphilitic involvement. It is not so much a test as an additional symptom or sign of the disease. When we realize that the Wassermann reaction is positive in a large percentage of cases of leprosy, sleeping sickness, and certain other conditions, we see that it is far from a specific test. There are other temporary conditions in which the reaction is positive, such as certain febrile conditions, malaria at the time of the chill, pneumonia, scarlet fever, and sometimes after ether anesthesia. This winter at the Massachusetts General Hospital there were several cases of broncho-pneumonia that gave a varying degree of positive result, the reaction becoming negative, with no anti-syphilitic treatment, when the fever subsided. Probably other conditions, unknown at the present time, may give a temporary positive reaction.

There is one point not mentioned which I think is of value, and that is the need of performing the Wassermann test on other members of the family—the husband or wife, as the case may be. In cases where the patient fails to give a positive reaction, the mate may give a positive reaction in a fairly definite percentage. The same is true of examination of their children.

The x-ray plates, which Dr. Lyon speaks of as having been shown him by Dr. Holmes, were undoubtedly from one of our cases of congenital syphilis, where one lung is practically consolidated, while the other shows no evidence of involvement.

The persistent negative examination of sputum for tubercle bacilli is another striking point in this condition.

Dr. Hinton has probably given the correct solution of the failure of the pathologist to recognize this condition in the lung macroscopically. In the same way definite specific lesions of long bones are revealed by the x-ray alone.

In the matter of tuberculin tests, Dr. Otis published some cases several years ago where he did the tuberculin test on a certain number of definitely knownluetics, with no signs of tuberculosis. As I remember it, he obtained about 33 1/3% of positive reactions in syphilis. That is interesting in connection with Dr. Lyon's

observations that syphilis fails to give a positive reaction, even in large doses of the old tuberculin. I was interested in what Dr. Lyon said about the tuberculous process lighting up after the administration of mercury and potassium iodide. I was not sure that treatment of this sort would cause irritation or a lighting up of the tuberculous condition, but I am convinced that salvarsan has that effect. I am sure that I have lighted up tuberculous conditions from the injection of salvarsan in patients with a double infection. It seems to me that tuberculosis of the lungs is ordinarily one of the definite contra-indications to salvarsan. The consideration today deals with a definite luetic condition of the lung, not the combination of syphilis and tuberculosis. A certain number ofluetics are going to become tuberculous, and a certain number of tuberculous individuals will acquire syphilis. These cases of syphilis of the lung that simulate tuberculosis are of particular interest.

I do not wish to enter into controversy with the laboratory men on the subject of Wassermann reactions, but I wish to reiterate once more the fact that the Wassermann reaction is not a specific test for syphilis; it is a group reaction.

All the patients with positive reactions, even though they may be moderate or weakly positive, are sent from the Lying-in Hospital to the Syphilis Department of the Massachusetts General Hospital for observation and treatment. There is a certain number of cases that are reported as "doubtful" or "suspicious." I do not understand that the *reaction* is doubtful or suspicious, but the *laboratory man* is in doubt as to whether that patient should be called *syphilitic* or not. It would seem that more help could be given the physician if the degree of positiveness of the reaction is reported, rather than the report "suspicious" or "doubtful." The moderate and weak positive reactions to the laboratory man mean a definite per cent. hemolytic reaction. When interpreting the Wassermann findings with the clinical signs on physical examination, it may be a resolving syphilitic infection, that gives you only a moderate or weak reaction, or perhaps the patient has been recently under treatment, and thus gives a moderately positive reaction, or it may be one of the *false* positives. It leaves one less in doubt to know the degree of positiveness.

DR. ROGER I. LEE, Cambridge: The pathology of syphilis and tuberculosis is very similar. We all know how common pulmonary tuberculosis is. On the other hand, our pathologists tell us that syphilis of the lung is very rare. The great difficulty from the clinical point of view comes from the question of diagnosis. We have no means of diagnosing syphilis of the lung in life. We cannot find spirochetes in the sputum. Even if we did they would prob-

ably come from the mouth and not from the lung. We are, therefore, thrown back on the Wassermann reaction, which, as Dr. Smith has pointed out, is, after all, not a specific reaction. The Wassermann test is of tremendous value, and, other things being equal, a positive reaction indicates syphilis. But in the presence of any very marked disease of any sort, one has to be a little chary about accepting a positive and especially a doubtful Wassermann reaction. Furthermore, the presence of a positive Wassermann reaction in no wise necessarily involves the lungs. It is a general reaction and not at all a local reaction in the lungs. We have a positive means of diagnosing tuberculosis of the lungs by finding tubercle bacilli in the sputum. On the other hand, the absence of tubercle bacilli from the sputum, even on repeated examinations, is of no great importance. If the search is persistent enough, we usually find tubercle bacilli. I should be very regretful if this section broke up with the idea that negative sputum examination for tubercle bacilli was of any real value in eliminating tuberculosis, and in suggesting that the disease was syphilis of the lung.

Dr. Lyon and the discussers have rather restricted the discussion to the question of the relation of tuberculosis and syphilis. It seems to me that it is very much wiser to accept the experience of everybody here that, pathologically, syphilis of the lung is very rare, that clinically it is certainly very rare; and to put syphilis down as one of the rare conditions of the lung. One has to admit that there are other rare conditions in the lung which may not be syphilis. Take, for example, pneumonitis, bronchiectasis or actinomycosis, that we occasionally see and cannot explain. In other words, there is a group of pulmonary conditions, usually localized in one lung, which are due to other agents, usually infective agents, than the tubercle bacilli. It seems to me that rather than to say that some chronic non-tubercular condition of the lung, even in the presence of a positive Wassermann reaction, is syphilis, we should say that the condition probably belongs to a rare group of lung infections, and syphilis is simply one of that group.

DR. ABNER POST, Boston: Some years ago I asked one of the gentlemen who had been prominent in anti-tuberculosis work what he knew about syphilis of the lung. He answered me something like this: that he knew there was syphilis of the lung, but did not know that he had ever seen it, and did not know how he should recognize it if he were to see it. We have advanced a little bit further than that. We know that there are certain cases of syphilis of the lung at the present day. We do not know how to distinguish them exactly from tuberculosis.

It is a fact that the advance in our knowledge

of syphilitic phenomena has been due very largely to the clinicians. It was denied for some time that locomotor ataxia could possibly be of syphilitic origin, because its lesions were entirely different from those ordinarily attributed to syphilis, and the clinicians established the connection. I cannot but think that our knowledge of syphilis of the lungs must be acquired in the first place chiefly through clinical study, especially if we may include radiology as a part of the clinical study, rather than through pathology. It seems to me that in cases in which there are symptoms which simulate those of tuberculosis, but in which the lesions in the lungs are unusual, and in which tubercle bacilli are not found, with a positive Wassermann test, we should not make a hasty diagnosis of syphilis; but such cases should be regarded as possibly syphilitic, and from their study we shall learn what the clinical peculiarities are, and shall acquire at length a knowledge of syphilis of the lung which will be worth while.

TUBERCULOSIS CARRIERS.

BY CHARLES E. PERRY, M.D., NORTHAMPTON, MASS.

IN our campaign against tuberculosis we must consider the individual, the family and the public. Each is of nearly equal importance and their interests so closely allied that it is impossible to consider one without the other.

The individual's rights are to have his disease discovered at the earliest possible time and to have laid before him information concerning the possibilities of an arrest or cure if he follows the proper path, and the probable consequences if he fails to do so. He next should have an early opportunity of admission to a sanatorium, where he may be properly started on his way to health and receive an education that will be useful to him for the remainder of his life.

It is the right of the family to be protected from a source of infection and still not be deprived of the support of the wage earners, housekeepers or the comfort of loved ones for a longer period than is necessary.

The public rights should also be preserved, by protection from sources of infection, as well as by having the funds which the public provides for health work spent judiciously for the purpose for which they are intended.

At first thought, looking at tuberculosis as a communicable disease, it would seem that the problem could be solved by segregating those afflicted, but further reflection shows how obviously impracticable such a procedure would be in a State like Massachusetts, and also brings up the question as to the desirability of such a course.

It is the purpose of this paper to discuss what ought to be our attitude toward probably the