Recently W. W. Hala and Cyril M. Smith⁴ of Brooklyn, report a gram negative, motile bacillus, unidentified, but probably belonging to some intermediate class of the colon typhoid-enteritidis group.

Nosologically, there still seems to exist a disagreement among the various investigators as to the true place of this disease. The weight of evidence seems to point to epidemic encephalitis being a distinct disease, while others claim that it is identical with poliomyelitis.

Bassoe⁵ states that the etiologic relation of this disease to influenza rests on the above described coincidence of the two epidemics and he suggests that it may itself be a cerebral form of influenza, or that it may be caused by a separate virus, which, in order to become active, must have been in contact at one time or another with that of influenza. Some of the English investigators take the same stand. F. G. Crookshanks of London speaks of the historical evidence "as to the clinical affinity and epidemiological liaison between epidemic catarrhal fever or influenza and lethargic encephalomyelitis." He is inclined to consider this disease as identical with so-called anterior poliomyelitis or poliomyelitis. He states as he says, on high bacteriological authority, that the organisms found by Von Wiesener are indistinguishable from Roesenow's diplococcus which has been found in poliomyelitis. This statement is contradicted by others.

Typical cases of the two diseases differ widely in their symptomatology. There is a more marked prodromal stage in encephalitis. It also affects all ages and shows no preference for children. Its maximum incidence occurs in winter and spring, while August and September is the season when poliomyelitis is most frequently observed. The lethargic element, so striking in the disease which is the subject of this paper is never so marked in typical cases of poliomyelitis. Meningeal symptoms are more frequent in the latter disease, where the fluid is frequently quite early opalescent and shows marked pleocytosis. Inoculation experiments have been made in various cases, and the results were very striking in the virulent Australian epidemic, which had a mortality of 70 per cent. The virus produced typical lesions, not only when inoculated into monkeys, but also into sheep, a horse and a goat. This is at variance with the results ob-

tained with the virus from poliomyelitis, which affects only monkeys.

In poliomyelitis the blood shows marked leucocytosis and only a very slight one in lethargic encephalitis. It is perhaps worth mentioning that the three cases reported all gave a history of having had influenza at different times preceding the onset of encephalitis, although one should here remember the natural tendency to diagnose during and for some time after an epidemic any similar disease as a case of the prevailing epidemic.

Dr. Farquhar Buzzard, in a lecture delivered before the Medical Society of London, states that lethargic encephalitis is undoubtedly an entirely different disease than acute poliomyelitis.

The diagnosis is easy to make in typical cases during an epidemic and rests on the presence of cranial nerve palsies, lethargy and rise of temperature with a negative spinal fluid. But at times it offers the greatest difficulties.

The treatment which was used in the one case under my observation which has made a fairly rapid recovery, consisted in intravenous injections of sodium salicylate twice daily, with the internal administration of hexamethylenamine. It is, of course, impossible to state whether this had any effect whatever on the process.

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DIAGNOSIS AND TREATMENT OF TUBERCULOSIS OF THE GENITO-URINARY TRACT.

BY ARTHUR H. CROSBIE, M.D., BOSTON.

THERE is nothing particularly new to bring forward in this paper. However, a résumé of the means we have today to arrive at an accurate diagnosis can do no harm, especially as one still sees occasionally a surgeon who when he finds acid fast bacilli in the bladder urine is content to remove the kidney on the side where he can feel a mass without further study. I know of one case where this was done and the enlarged kidney proved to be a

normal hypertrophied kidney and the dead kidney was left with fatal results.

Tuberculosis of the kidney presents many difficult problems for the urologists to solve. We will consider it first.

Symptoms. In most cases there are many points in the history which point to tuberculosis of the kidney. The most prominent symptom is irritability of the bladder. This occurs in all cases where the disease is near the kidney pelvis and there is a discharge of bacilli into the urine. This almost always produces tuberculous ulcerations about the ureteric orifice on the infected side with resulting bladder irritability. I know of nothing that produces a more severe cystitis than tuberculous ulcers of the bladder. In many cases the bladder can hold not more than 20 or 30 cc. of urine. In a small number of early cases where the disease is confined to a small area of tuberculosis in the cortex, there may be no bladder symptoms. As a rule, though, it is a safe guess that where a bladder holds 200 cc. of fluid without pain the case is not one of renal tuberculosis.

In taking the history of these cases the story of old healed tuberculosis elsewhere in the body is always suggestive. Bone tuberculosis is very frequently associated with renal tuberculosis. I have just seen a man who had tuberculous epididymitis (left) twenty years ago. Four months ago he began to have frequency. Examination revealed right renal tuberculosis. Of course, in many cases no history of a previous lesion can be obtained, but one always feels that somewhere there is a concealed focus.

Pain in the kidney region is not a marked symptom in renal tuberculosis. In fact, not infrequently the only pain complained of is in the region of the well kidney, no doubt due to the increased work thrown on this kidney. Occasionally, where there are large acute abscesses in the diseased kidney, there is severe pain and fever. Investigation by Spooner¹ of Boston and others has proved that this is not due to a mixed infection as was previously taught, but by the tubercle bacilli alone. Repeated cultures from acute tuberculous kidneys of this sort have revealed a pure growth of the tubercle bacillus. The only cases that I have seen where there was a mixed infection was in three kidneys that had previously been opened and drained.

The effect of renal tuberculosis on the gen-

eral health varies a great deal. It is not uncommon to see advanced disease of one kidney in a person who is robust and apparently in perfect health, aside from the bladder symptoms. On the other hand, the patient may present all stages of emaciation. In 1916, I removed a kidney from a woman aged twenty-nine, who weighed only sixty-six and one-quarter pounds at the time of operation. She is now double that weight. If both kidneys are infected, of course the effect on the health is more marked. Where the process is acute and there is a febrile reaction there is usually loss of weight and strength.

Although red blood cells are usually present in the urine, it is rare that there is enough blood to call the patient's attention to it.

Of all symptoms, frequent urination is most marked, and it is this that generally brings the patient to consult a physician. This frequency is due, as stated above, to disease of the bladder and also to an actual polyuria.

Physical Examination. This may or may not lead one in the direction of an accurate diagnosis. In many cases the diseased kidney can be felt, in some the good kidney alone can be palpated. There may or may not be spasm over the affected side. Tenderness over the bladder is occasionally found where the disease is extensive.

In women, occasionally, the diseased ureter can be felt, by vagina, as a grisly cord. There is usually no change in blood pressure.

Examination of Urine. This, of course, is very important. If acid fast bacilli are found in a sterile specimen a good start has been made toward a diagnosis and all that is left to do is to find which side is affected and to make sure that the other side is normal. In many cases, however, it is impossible to find acid fast bacilli in the bladder urine and I have seen cases that were proved later to be tuberculous where guinea pig inoculation was negative. The urine is usually light colored, turbid, the amount of albumin, as a rule, is not very large; the sediment contains many pus cells and usually a few red blood cells, occasionally many. Casts are not frequent. Cultures from the bladder urine not infrequently show growth other than the tubercle bacillus. It is important to remember this to compare with what we get from the urine after catheterization of the kidney.

Radiographs. The importance of radiographs in the diagnosis of renal tuberculosis is

coming more and more to be felt. To be sure, in many cases the radiograms are negative, but where there is much caseation, as where there are large abscesses filled with cheesy material, one is very apt to get suggestive shadows. I have recently seen a case where the x-ray helped a great deal. This was one where there were a few shadows in the cortex of the kidney which resembled stones. This represents a form of renal tuberculosis where the disease is far removed from the pelvis and where the bladder symptoms were slight and the urine negative, except for a few pus cells. I have known of two similar cases in the past where the radiographs showed shadows in the cortex resembling stones. On operation these shadows were found to be calcified areas not resembling tuberculosis. In both cases the calcified bodies were shelled out with difficulty. One developed miliary tuberculosis following the operation and the other, after having drained a long time from the incision, had the kidney removed and it was found to be tuberculous. Therefore, in cases where the radiographs show shadows in the cortex, the greatest care should be made to rule out tuberculosis, and not being able to do so, I should recommend letting such shadows alone. Pyelograms are important, of course, to make sure that shadows are in the substance of the kidney and not in a deep calyx.

Pyelograms. There is nothing distinctive in the pyelograms in tuberculosis of the kidney. The appearance does not differ materially from a pyelonephritis of some other organism. The ureter itself will at times show strictured areas, but this is not pathognomonic.

Cystoscopic Examination. This, of course, is of prime importance. To one who is familiar with the cystoscope there is something about a tuberculous bladder that differs from all other forms of cystitis. Not infrequently, at first glance, one is able to guess accurately that it is tuberculosis and further, to tell what side it is on. Many times there will be an area of ulceration about the ureter on the affected side, while the ureteric orifice on the other side may appear perfectly normal, as also may the mucous membrane about the well ureter. As I have stated before, the tuberculous bladder is most irritable and this makes catheterization of the ureters extremely difficult. In many cases it is necessary to dilate the bladder gradually with some mild antiseptic, such as mer-

curic chloride 1-50,000, for some days before it is possible to get the bladder to hold enough to allow you to get the ureters. Several years ago I made nineteen attempts before I was successful in getting both ureters and then discovered that the process was double. If it is found that the bladder does not respond readily to dilatation, spinal anesthesia should be used. This is much better than ether, as ether checks the excretion from the kidneys and renders the test very unsatisfactory. Spinal anesthesia does not affect the kidneys and does take away the sensitiveness of the bladder. The bladder can be dilated up to the point where bleeding begins. I have a man in the hospital now on whom I made four attempts and Dr. Chute made one. We were unable to see either ureter. The bladder was so sensitive that even with the local anesthesia, not more than 30 or 40 cc. could be held in the bladder. After attempting for two weeks to dilate the bladder gradually, this was given up and we gave the man spinal anesthesia. Under this, 150 cc. of boric solution was retained in the bladder and both ureters were catheterized with the greatest ease. There were severe ulcerations about the right ureter and none about the left. As we expected, clear straw-colored urine flowed from the left side while that from the right was light colored and very turbid. This illustrates a point that I wish to emphasize particularly. Repeated examination of the bladder urine failed to show tubercle bacilli. Smears from a turbid urine, from the right side, showed no tubercle bacilli, but cultures from this urine, which was full of pus, showed *no growth*. It has been my experience, and it is confirmed by the admirable work of Spooner, that no growth from a ureter catheter specimen where there is much pus means tuberculosis. Repeated cultures from the kidney urine where tubercle bacilli were found showed no growth. The opposite is a safe guess, too. If cultures from a ureter catheter specimen show growth other than tubercle bacillus the disease is almost invariably not tuberculosis, provided the kidney had not previously been opened and drained. Operation on the case mentioned above showed a typical right tuberculous kidney, tubercle bacilli being found in the kidney abscesses. More prolonged study of the urine from the affected side would doubtless have revealed acid fast bacilli. In some cases there are so

many small ulcers and pits that it is impossible to tell just which is the ureter. In these cases it often helps to inject subcutaneously 10 cc. of a solution of 0.4% indigo carmine. In about ten minutes this so colors the urine that the ureters can be easily located by the dark spurts. The presence of any leucocytes on the side that is supposed to be well should make one hesitate about operating until you are absolutely sure that this kidney is not also infected with tuberculosis. In case of doubt, it pays to inject a guinea pig and wait the result. In examining the sediment of the urine, there is a simple procedure that helps a great deal at times and that is to wash the sediment with distilled water. If there is much blood present this helps a great deal by lakeing the red blood cells so that they do not obscure the leucocytes and bacteria.

The function test with phenolsulphonephthalein is helpful, but it must be remembered that in some cases the time of appearance will be earlier on the diseased side than on the well one, although the total amount excreted is pretty sure to be less.

After the diagnosis is made there is only one safe procedure and that is nephrectomy, providing that the process is unilateral. If it is bilateral there is nothing left but hygienic treatment. Even with double tuberculosis of the kidney a patient may live on for several years. I have one man that I have under observation for three years and I cannot see that he has changed much in that time.

Anesthesia. I feel that the anesthetic of choice is gas oxygen. The reason for this is that even though we may not have found it, there is so apt to be latent tuberculosis of the lungs that may be flared up by ether.

Operation. I will not enter into the operative details, but will take up a few points of especial interest. A tuberculous kidney is very apt to be adherent to the peritoneum. It is not uncommon in removing one to tear a hole in the peritoneum. I have done this several times and have never had any trouble arising from it. In one case where the kidney was very low and had previously been opened and drained, I tore a large hole in the cecum. I sutured this at once and the patient healed readily. The question of the treatment of the ureter is still in debate. Some prefer to bring the end into the incision and suture it there, and others prefer to follow the tuberculous

ureter to the bladder. Except in extremely early cases, the ureter is always tuberculous. The stiff grisly ureter, in fact, is pathognomonic of tuberculosis of the kidney. No matter how far this ureter is followed there will still be some tuberculous tissue left for nature to take care of. The farther the ureter is followed the more is the risk in the operation. Personally, I like to cut the ureter where it is most convenient and treat the ends with carbolic acid and alcohol and drop the ureter back to take care of itself. I think that most genito-urinary surgeons use this procedure today. As to drainage, I prefer not to drain. The wound is more apt not to heal if it is drained. If the wound once becomes tuberculous it takes months to heal. Of course, in some cases that are sewed up tight, the wound will break down and become tuberculous. I have never yet had one that did not eventually heal. I had one where the whole incision gapped wide open and took nearly a year to heal. In this case, as in most of this sort, the large open wound had no bad effect on the patient's general health.

After Treatment. The irritability of the bladder, which before operation is usually the prominent symptom, begins to improve very soon after operation. This improvement continues often as long as a year. As a rule, the tuberculous ulcers of the bladder disappear of their own accord. If at the end of a few months the bladder has not regained its normal capacity it can be greatly improved by gradually dilating it once or twice a week with some bland antiseptic, such as mercuric chloride 1-50,000. Aside from the bladder treatment, the only thing to do is to look after the general hygiene. I like to have patients sleep out of doors and take the cure the same as patients with tuberculosis elsewhere.

Tuberculosis of the Bladder. In my experience this is always secondary to tuberculosis of the kidney. The treatment is directed to the kidney.

Tuberculosis of the penis is very rare. The only case I have ever seen was in a ward visit with Dr. Edward L. Keyes. The condition is most apt to be confused with epithelioma and can be differentiated surely by microscopical examination.

Tuberculosis of the Epididymis. This condition, in my opinion, is always associated with tuberculosis of the seminal vesicles and

prostate and in the treatment of the epididymis this should not be lost sight of.

The onset is gradual and usually without pain. Frequently the condition is not noticed by the patient until the pressure of a beginning abscess causes discomfort. The diagnosis as a rule is not difficult. The process is confined to the epididymis and vas. The epididymis is thickened and not tender, frequently nodular. The vas is thickened and firm, resembling the feel of a tuberculous ureter. The diseases to differentiate it from are chronic inflammation, other than tuberculosis, gumma, and new growth. A patient often has to be watched for some time before one can rule out absolutely a chronic non-tuberculous inflammation. The previous history of a urethritis is of help. The vas in non-tuberculous infection is rarely much thickened. In this condition, the thickening gradually subsides while that of tuberculosis increases or remains stationary. Gumma, as a rule, is not difficult to rule out. There is the history, the Wassermann reaction and then the fact that gumma almost always affects only the testicle, while the tuberculosis is always primary in the epididymis and only affects the testicle rarely and then late in the disease. New growth is sometimes very confusing. I saw one case where there was marked thickening of the epididymis and cord. It resembled tuberculosis, except that though the cord was thickened it was not so firm and grisly as in tuberculosis. This turned out to be a new growth of embryonic origin. When in doubt it is wise to remove a small piece, under local anesthesia, for examination. Where there is a question of new growth, delay in making a diagnosis may be fatal.

In most cases of tuberculosis of the epididymis rectal examination will reveal the same trouble in the prostate and vesicles. It is my belief that the two are always associated. I believe that the prostate and vesicles are the primary focus in the genito-urinary tract and that the epididymitis is secondary, as it is in gonorrheal epididymitis.

Treatment. Unless there is active tuberculosis elsewhere in the body, keeping the patient pulled down, most cases do very well under hygienic treatment. I make sure that a man obtains out-of-door work, gets plenty of rest, fresh air, and good food. The old treatment of sending a man away on a sailing vessel for two years was and is good treatment.

It is quite true that abscesses form in the epididymis in a great many cases, but these soften down and rupture spontaneously and, after having drained for some time, heal. As a rule there is not much discomfort with these.

I am very much opposed to epididymectomy for tuberculosis of the epididymis. The primary focus in the vesicle is not attacked and I feel that more harm than good is done by the operation. If one is to do anything in an operative way, I agree with Dr. Quinby² that a radical operation should be done, removing the epididymis, the entire vas and vesicles. Most men do so well under hygienic treatment that I feel it is not advisable to put a man through the radical operation. I have known two cases to die of miliary tuberculosis following an epididymectomy and one following the radical operation. Until we have more proof that the radical operation is advisable I shall continue to treat tuberculosis of the epididymis and vesicles purely by hygiene.

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Book Reviews.

Stedman's Medical Dictionary. By THOMAS LATHROP STEDMAN, A.M., M.D. Fifth Edition. Revised. New York: William Wood & Co. 1918.

The fifth edition of Stedman's *Medical Dictionary* includes over fifteen hundred new titles and substitutes, for many of which, in addition to the system of abbreviation by initials which has been adopted by writers on war medicine and surgery, the war has been responsible. In this edition, an extensive revision has been made of the pharmaceutical terms in order that the titles and doses of all the official preparations may conform with the latest editions of *Pharmacopoeia* and *National Formulary*. This volume is an illustrated dictionary of words used in medicine, including dental, veterinary, chemical, botanical, electrical, life insurance, and other special terms; anatomical tables of the titles in general use, and those sanctioned by the Basle Anatomical Convention; official pharmaceutical preparations, chemical and therapeutic information about mineral springs in America and Europe, and a comprehensive list of synonyms.