

Montana, Nebraska, Tennessee, South Dakota and New Mexico.

I may here interpolate that an act to introduce osteopathy in Pennsylvania on exactly the same footing with the profession of medicine has just been vetoed by the governor.

The examination and registration of nurses was provided for in four states: California, Colorado, Connecticut and New Jersey.

Seven states adopted more stringent provisions to regulate the sale of poisons and narcotic drugs: Connecticut, Massachusetts, Minnesota, Nebraska, North Carolina, Texas and Wyoming.

An act to provide a method for locating and destroying mosquito-breeding areas has been adopted by the State of New Jersey. This experiment will be watched with intense interest.

This list, of course, could be amplified, but enough has been said to indicate a widespread and intelligent interest in sanitary matters in every section of this immense country. On the whole, it indicates an advance. But any one who is on the ground during a session of a state legislature can not but be struck with the amount of crude, ill-digested and even nefarious legislation of this kind which is presented, and with the necessity for having intelligent medical men on the spot who can watch purely commercial schemes presented under the guise of sanitation and science and inform the legislators of their true character.

An intelligent and conscientious chief executive is, however, often our only bulwark against disaster.

The limitation of tuberculosis by curing the disease in its early stages before it becomes a serious menace to the public health, especially in the case of the indigent, appeals very directly to the sympathies of our people and, as will have been noted, has received considerable attention at the hands of our legislatures.

The scheme which we are outlining in Pennsylvania for this purpose is a comprehensive one. It contemplates utilizing the great forest reservations of the state for the purpose of hospital or sanatorium treatment. It is proposed to have two colonies at widely separated points that they may be accessible from different parts of the state. Instead of massive structures of brick or stone, we shall erect a large number of frame cottages, each of which will accommodate but a comparatively small number of patients. Somewhat apart from these will be an infirmary for those in the more advanced stage of the disease. In this building those to whom we can not hold out hopes of recovery will be afforded shelter and the comforts of a home in the closing days of life, and this extension of relief will be more than justified in the fact that we are removing them from their confined, crowded, ill-ventilated and often impoverished homes at the time when they would be most in danger of communicating the disease to other members of the family and the greatest menace to the public.

After recovery, the male patients will be offered opportunities for work in forestry, for which they will be entitled to their board and clothing, for a sufficient time to test their strength and the reality of the cure. Men whose previous occupations have been such as to create irritating dust, such as saw sharpeners and stone cutters, will be urged to seek permanent work of a less objectionable nature, and patients of both sexes will be counseled to find, so far as possible, opportunities for work in the country.

Entirely distinct from this enterprise, which is so

elastic as to be capable of almost indefinite expansion, while it reduces expenditures to a minimum compatible with the best results, is our plan to establish in each of the sixty-six counties of the state a dispensary for tuberculosis, also under the direct supervision of the department of health. The object of these dispensaries will be twofold: First, that many patients who might be unable to leave their homes for a prolonged stay in a sanatorium could frequently come here for advice in regard to matters of diet, medication, when needed, and the open air treatment, so far as it is possible of being carried on at home. Second, they would also receive careful instruction in all the precautions necessary to be observed for the protection of others; and their compliance with these instructions would be made an essential to their continuing to receive state treatment. In fact, "the dissemination of knowledge relating to the prevention and cure of tuberculosis and for the study of social and occupational conditions that predispose to its development" is expressly noted in the act creating the system as one of its important objects. I am proud as a Pennsylvanian to be able to state that our legislature has just appropriated the sum of one million dollars, to be used in the manner indicated, at the discretion of the department of health, and has at the same time authorized the selection of one or two tracts of land, within the boundaries of State Forestry Reservations, to be devoted to this object.

The advances made in other states in this most promising field of state medicine will be watched with the closest attention and every suggestion which promises to make such enterprises more successful and thus aid in lifting this shadow which darkens so many homes, will be taken advantage of. As such plans are being carried out in so many states, why should not we who are entrusted with them join hands in this inspiring work and help each other in solving the problems of our individual states?

While giving one another freely of our best inspirations, let us indulge in a noble rivalry to obtain each for his own state the most successful exhibit and the happiest results. So may we deserve well of the Republic!

Original Articles

THE DIAGNOSIS OF DISEASES OF THE PROSTATE.

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There is no organ in the human body concerning the diseases of which the average physician has less definite knowledge than he has of those of the prostate gland. Yet there are few conditions susceptible of more accurate diagnosis if the various types of its disorders are familiar to the examiner. In the following paper an effort will be made to present a classification and a brief description of the pathology and diagnostic features of these conditions.

Refinement in diagnosing the sub-varieties of prostatitis is not of so much importance in the prognosis and treatment as is the necessity of recognizing the prostate as the source of reinfections and the cause of urinary irritation, sexual weakness or obscure referred pain or symptoms.

When approached in a scientific manner and consid-

ered with due regard for the anatomy and physiology of the gland and its related organs, these affections lose much of their former vague character. They offer an exceedingly interesting field for work on account of the diagnostic accuracy attainable and the success which, as a rule, follows the institution of appropriate treatment.

This paper is based largely on the facts observed or confirmed by the study of 108 prostates. Of these 61 were chronically inflamed, 34 were normal, 5 were acutely inflamed, 5 were hypertrophied, 2 were of the subchronic type and 1 was subacute.

Especial attention will be devoted to the chronic inflammations. Of the 61 of this class 47 gave a history of a previous gonorrhea, which was apparently the main etiologic factor. The remaining 14 were caused by masturbation, prolonged ungratified sexual desire and instrumentation. Fourteen of the patients had urethral strictures. In one patient large numbers of colon-like bacilli were found in the secretion from the prostate; no gonococci could be found nor was the history like that of gonorrhea. The ages of the patients varied from 19 to 50 years, with an average of 30. Only 8 of the 61 gave a history of acute prostatitis. Most of the patients came for treatment of a persistent or recurrent urethral discharge. My experience has been that in the great majority of patients chronic prostatitis and seminal vesiculitis are insidious in their onset and the patient is unaware that his prostate is involved. In fact, many patients will insist that the prostate is not inflamed because there have been no symptoms of a sudden or acute onset or pain that suggests the prostate as the seat of the trouble.

Several of the diseases included in the table of classification are so easily diagnosed that they do not justify much consideration and are given merely to complete the list.

ACUTE PROSTATITIS.
 Parenchymatous.
 Interstitial.
PERIPROSTATITIS.
ABSCESSSES OF THE PROSTATE.
 Follicular.
 Interstitial.
SUBACUTE PROSTATITIS.
CHRONIC PROSTATITIS.
 Parenchymatous (catarrhal).
 Interstitial.
 Prostatic urethra and verumontanum.
 Atrophic.
SUBCHRONIC PROSTATITIS.
NEUROSIS OF THE PROSTATE.
HYPERTROPHY OF THE PROSTATE.
 Parenchymatous.
 Interstitial.
 Many subvarieties.
TUBERCULOSIS OF THE PROSTATE.
CARCINOMA OF THE PROSTATE.
SARCOMA OF THE PROSTATE.
SYPHILIS OF THE PROSTATE.
CYSTS OF THE PROSTATE.
CALCULUS OF THE PROSTATE.

Each of the above names indicates the character of the inflammation and to some extent its chief location. The line of demarcation, however, between acute and subacute inflammation or the subacute and chronic is not well marked from a pathologic standpoint, but is mainly chronologic. A much prolonged acute condition is properly classed subacute, while a very persistent subacute is gradually merged into the chronic. The subchronic are those of long duration where there is still an increase in the prostatic fluid with but very few pus cells. Two of the patients clearly belong to this type.

ACUTE PROSTATITIS.

Acute prostatitis may readily be recognized by rectal palpation. The gland is tender, hard and swollen. The induration may be limited to one or more follicles, to one-half of the prostate or it may be uniformly enlarged in its entirety. The mucous lining is chiefly involved at times, and the swelling is not proportionate to the purulent secretion expressed by gentle palpation. (Massage is not indicated in the acute condition.) The infiltration may be extensive in the stroma of the gland, in which case there is much enlargement and perhaps throbbing and pain. In severe cases the inflammation may extend through the capsule into the tissues surrounding the prostate, causing a periprostatitis. By palpation, then, one can detect a hard, fixed, tender condition of the anterior rectal wall. An occasional examination of the prostate should be made during the latter stage of gonorrhea or at any time when there is an increase in the frequency or pain during urination or if there is terminal hematuria. The symptoms of acute prostatitis are too well known to be mentioned here. The point I wish to emphasize is that the prostate should be suspected and an examination made even if the evidence indicating it be only indirect or circumstantial.

PROSTATIC ABSCESS.

Abscesses of the prostate are of two varieties: 1. Those caused by the occlusion of the duct of an inflamed follicle. 2. Those beginning as an area of intense inflammation or a necrotic spot in the interstitial tissue. In either case they may extend and become of considerable size and may rupture into the urethra, into the rectum or into the connective tissue around the prostate. The first variety is more frequent and less serious than the second. As a rule, these follicular abscesses rupture into the urethra and drain through it for a considerable length of time, contaminating the urine with proteid. At first this is serum albumin and globulin, later albumose is found instead. The only reason I can give for this change is that when the secretion is exuding rapidly the serum albumin and pus escape from the prostate before the ferment, infection,* tissue digestion or whatever it is has time to change the exudate into albumose as is the case when the secretion is retained longer. Occasionally serum albumin, nuclealbumin, albumose and globulin will all be found in the fluid from an inflamed prostate.

After abscesses and certain acute inflammations the gland becomes atrophic and is found to be small and irregular in contour.

SUBACUTE AND CHRONIC PROSTATITIS.

Subacute prostatitis of long duration is comparatively rare and is not difficult to recognize by rectal palpation and an examination of the secretion expressed

*An editorial in THE JOURNAL of the American Medical Association, April 20, 1907, referring to the work of Ople and Barker of the Rockefeller Institute (Jour. Experimental Medicine, March 14, 1907), called my attention to the fact that disintegrating leucocytes liberate proteid digesting enzymes. After a consideration of this subject and a review of the original paper, I have come to the conclusion that this leucoprotease, as it is called, is probably the substance which digests the proteid in the prostate and accounts for the large amount of albumose found in it when inflamed. It has been clearly demonstrated that this enzyme from the polymorphonuclear cells, acting in a faintly alkaline medium, will digest proteid. The prostatic secretion is uniformly alkaline in reaction, when tested with litmus, and apparently forms a suitable medium for the action of this proteid splitting ferment. That there occasionally may be some other factor is suggested by the disproportion in the number of pus cells and the amount of albumose found in a few subchronic conditions where there are scarcely any leucocytes but much albumose.

which contains more pus, as a rule, than chronic prostatitis. One patient had a subacute inflammation, apparently caused by the colon bacillus, which kept about the same for eight months in spite of the treatment, but finally yielded. There was much swelling of the gland and a large number of pus cells were found in the secretion, but there was not the usual pain and frequency in urinating. The sexual function was much weakened, at one time no erections being possible.

Chronic prostatitis is the class in which the largest number of diagnostic errors are made, and especially is this true if the physician depend on palpation alone. An unfortunate idea is prevalent that a chronic inflammation of the prostate necessarily causes enlargement or considerable irregularity of the gland. Palpation alone is unreliable, except in the hands of an expert, if the findings be negative, as the inflammation may be so limited to the mucous lining that the prostate feels apparently normal.

SYMPTOMS.

With a persistent or recurrent urethritis the prostate should always be regarded as the most likely focus of the infection. All symptoms involving the urinary or sexual functions should suggest the necessity of examining the prostate and its secretion. Sexual weakness is frequently seen in these patients; erections may be weak or absent, and ejaculations may be premature or painful, nocturnal emissions are frequent and the discharged semen may be stained with blood; this is more likely if the vesicles are inflamed.

Frequency of urination is found in the severe cases, the pain usually occurring during the act of micturition. Urgency in the desire to void urine depends on the degree of posterior urethritis and is nearly always present to some extent when the prostatitis is well developed. In one patient there were symptoms of urinary obstruction due to an inflamed prostate which were entirely relieved after two weeks' treatment. Referred pain may be found anywhere between the umbilicus and the knees, the most frequent place being low down on the back in the region of the sacrum.

A decided feeling of mental depression occasionally follows prostatic massage which lasts for several hours. I am unable to explain the cause of this, as in other patients just the reverse is observed and they have a feeling of well-being. Neurasthenia and melancholic symptoms are sometimes encountered in chronic prostatitis.

THE PROSTATIC SECRETION.

The prostatic secretion expressed by massage may appear at the meatus or may remain in the urethra and be washed out by the urine. It is on two substances found in the secretion that we rely for an accurate diagnosis; they are pus and proteid.

When the urethra has been flushed previously with clear urine or irrigated with a physiologic salt solution and the drop of discharge obtained from the meatus after massage shows pus cells, then we know the prostate is inflamed. Should the number of pus cells be small the smear must be stained with methylene blue or azur and eosin, after fixing with heat above a flame. The presence of polymorphonuclear cells is characteristic of prostatitis if the urethra as a source of contamination is eliminated. There are large and small cells, resembling the mononuclear lymphocytes, which are found in the normal prostate in small numbers, and for this reason, in a doubtful case, the secretion should be stained. The pus and epithelial cells are frequently

more or less degenerated and do not stain clearly. This may be due to the natural process of disintegration, but, judging from the albumose constantly present, it appears more likely that a ferment of some kind is the cause of the change.

The presence of germs in the prostatic secretion, after a thorough urethral irrigation, is not as easily nor as frequently demonstrable as one would be led to suppose would be the case from the history of the recurrences in these patients. I have been able to find them in sufficient numbers to be conclusive in only six of the chronic cases. The secretion from all was not examined nor were any cultures taken. Gonococci were found in three, colon bacilli (?) in two and pseudo-gonococci in one. It seems that virulent gonococci are rarely found after two or three years unless there have been reinfections or severe recrudescences.

I purposely have omitted other well-known substances that are seen in the prostatic fluid in order to emphasize the importance of pus in making a diagnosis. Dead spermatozoa are frequently, but not always, found in the secretion expressed in chronic prostatitis. This, I think, in many of the patients, is due to a low grade seminal vesiculitis.

URINE AFTER MASSAGE.

When the secretion does not appear at the meatus, and the urine before massage is free from pus and that after contains it, we have conclusive evidence that the prostate is inflamed. The vesicles should be avoided if a differential diagnosis between vesiculitis and prostatitis is to be made. If there is pus in the urine, the urethra and bladder should be irrigated with a physiologic salt or boric acid solution and a small quantity of this left in the bladder to be passed after massage.

Another substance equally as characteristic of prostatitis is the presence of *proteid* in the urine or fluid passed after massage. This can be demonstrated easily by making a layer test with the urine superimposed on a saturated solution of magnesium sulphate (9 parts) and nitric acid (1 part). This reaction shows the presence of any proteid by a white ring at the zone of contact. The urine before massage should always be tested to find if it is free from albumin, and if it is not the urine should be voided and the bladder filled with a physiologic salt solution. If the inflammation is slight, only a small amount of urine or fluid should be retained, as the proteid may not be detected if greatly diluted. This test has been positive in 51 patients and negative in 29 with healthy prostates. The kind of proteid present naturally varies according to the character of the inflammation. An abscess draining into the urethra gives a large quantity of serum albumin; this also is found, but less abundantly, along with nuclealbumin in acute prostatitis. In the subacute, chronic and subchronic inflammations albumose is constantly found alone or combined with nuclealbumin. The urine must be tested for albumose soon after being passed, as certain changes take place, if allowed to stand many hours, that prevent as distinct a reaction as is obtained earlier. A precipitate is formed which settles to the bottom of the glass, and the urine above shows a less marked reaction than at first. This does not always occur nor am I able to explain the nature of the process.

The heat and acetic acid test will not show up the albumose, as it is soluble when heated to the boiling point and does not even give the cloudiness at about 60 C. (140 F.) as does the Bence-Jones albumose. Nitric or citric and picric acids, if added to the boiled urine,

will cause the albumose to be precipitated when cool. This again disappears when heated. If serum albumin and nuclealbumin be present, they also may be first deposited in the bottom of the test tube by placing it in a hot water bath (after boiling and adding the acid) to keep the albumose in solution while they are being precipitated. If the tube now be allowed to cool, the albumose settles on the albumin and a very distinct line of demarcation between them and a difference in the quality of the two layers of the precipitate can be seen.

Frequently in chronic prostatitis considerable debris, composed of pus, mucus, phosphates, epithelial cells, spermatozoa, etc., will be passed in the urine after massage. This enables one to make a diagnosis by a macroscopic examination. Cloudiness that persists after the addition of acetic acid nearly always indicates an inflammation of the prostate. Large casts of the dilated follicles may also be observed. These same patients, however, on other conditions may fail to show any macroscopic debris or casts, but will have the amount of proteid considerably increased.

Two patients had a large quantity of albumose with very few pus cells in the secretion. These were followed and studied for some time and were undoubtedly cases of low grade inflammation, for which chronic prostatitis seems to be an appropriate appellation.

PERIODIC ACTIVITY OF THE PROSTATE.

In a former paper on prostatic albumin,¹ etc., I called attention to a periodic increase in the secretion, without any apparent cause, which occurred every two to six weeks. Further observation has enabled me to confirm this in many other patients. The increase varies from two to ten times the amount obtained after massage during the intervals and is sometimes attended with an aggravation of the urethral symptoms. This seemed to be analogous to menstruation in women.

Since writing this paper I have found some interesting facts bearing on this subject in Deaver's excellent monograph on "Enlargement of the Prostate." John Hunter is quoted as having studied the prostate gland of moles, and found that, while it was small and insignificant during the winter—the period of quiescence—in the rutting season it became large and filled with mucus. These observations were confirmed by Owen and by Griffith. The last-named author also found the same changes in the prostate of hedgehogs. My analogy seems borne out by these facts regardless of whether the prostate and uterus be analogues or not.

The general impression prevails that the secretion and debris are cleared out of the inflamed ducts and follicles by sexual intercourse, but from a number of observations I am sure this opinion is erroneous. The watery portion of the secretion probably escapes as part of the ejaculated fluid, but the masses of mucus, phosphates, etc., may be expressed by massage within a few hours after intercourse, showing that the so-called "active or physiologic massage" is not always to be relied on to clear out the follicles. This, I think, is the reason why many patients are not as much benefited by coitus as they are lead to expect by their genito-urinary surgeons. The seminal vesicles and ampullations of the vas deferens are emptied to a much greater extent than is the inflamed prostate.

A study of the proteid secretion from the prostate, if

carried out as a routine in the examination of the hypertrophied gland, may add new facts to our theories as to whether or not gonorrhea is a factor in causing the enlargement, as the proteid is found at times after the pus has almost entirely disappeared. The semen contains a proteid similar to that of prostatic origin which is always present to some extent, but is greatly increased if the vesicles are inflamed.

Neurosis of the prostate is occasionally seen after all the inflammatory symptoms have subsided and is probably due to the exaggerated or perverted impressions transmitted from the rich supply of nerves found in this region. The inflammation seems to be the primary cause, but the pain and irritation outlast the pus and shreds. Difficulty in urinating may at times be observed. Massage does no good, but cold sounds and the psychrophore are more beneficial.

OTHER AFFECTIONS OF THE PROSTATE.

Hypertrophy of the prostate is not difficult to diagnose by rectal palpation, the history of urination gradually becoming more frequent and difficult, after the age of 50, worse at night, the deep urethra lengthened, residual urine present, etc. It is not within the province of the paper to go further into a discussion of the subject of enlargement of the prostate except to urge the importance of recognizing the difference between it and inflammation of the prostate. An hypertrophied gland may become inflamed and give all the symptoms of prostatitis intensified by the urinary obstruction. Acute prostatitis and much less frequently chronic prostatitis may cause urinary obstruction. There is a well-marked difference between these conditions which should always be considered in the diagnosis and treatment. The history, a careful rectal and perhaps urethral examination, a microscopic study of the secretion and a chemical examination of the urine passed after massage of the prostate will enable one to decide which is primary, the hypertrophy or the inflammation.

Tubercular prostatitis is sufficiently like that of gonorrheal origin to make a diagnosis difficult in certain instances. In tuberculosis there may be evidence of the disease in other organs, as the lungs, joints, bones, kidneys and especially in the testicles. Tubercle bacilli in the secretion would, of course, be conclusive, but they probably will not be found. Injection of the fluid into the peritoneal cavity of a guinea-pig would be more likely to clear up the case. The swollen part of the gland is usually larger, rounder and harder than in ordinary chronic inflammation. There may be a history of gonorrhea or secondary infection to add further to the confusion.

Carcinoma of the prostate has two characteristic symptoms, severe pain independent of urination and stone-like hardness. There may be marked irregularities on the rectal surface and the mucous membrane may be adherent. As the disease progresses there is infiltration of the surrounding tissue. Abundant and widely disseminated bone metastases may occur. Casper thinks the pains are evoked through the compression of the nerve trunks by the tumor and its metastatic swellings. These patients steadily grow worse, becoming pale and emaciated. They are only saved by an early diagnosis and a radical operation.

Syphilitic enlargement of the prostate is rare, but should be thought of when no other cause can be determined, and especially should antiluetic treatment be tried if other measures fail and there is a history of syphilis.

1. Prostatic Albuminuria not an Infrequent Cause of Error in the Diagnosis of So-called Orthostatic, Postural, Physiologic and Cyclic Albuminuria, N. Y. Med. Jour., Feb. 24, 1906.

CONCLUSIONS.

The prostate gland is without doubt the cause of the majority of obscure urinary and sexual symptoms and should always be examined where there is any uncertainty as to their origin.

Among the factors that tend to perpetuate a chronic or recurrent gonorrhea a nidus of infection or irritation in the prostate is the most frequent cause. It is in this variety of prostatic inflammation that the largest number of errors are made in the diagnosis.

Palpation, pus and proteid are the three things to rely on in reaching a conclusion as to the condition of the prostate. By palpation through the rectum, the gland, if diseased, may be found enlarged, nodular, irregular, boggy or apparently normal. Pus in the secretion expressed from the meatus or found in the urine or fluid voided after massage, when the urethra and bladder are excluded as possible sources, is positive proof that the prostate is inflamed. Proteid in the fluid passed after massage is equally as reliable as pus in the diagnosis of prostatitis.

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THE DIAGNOSIS OF PYELONEPHRITIS

BASED ON THE ABNORMAL RETENTION AND THE DELAYED EXCRETION OF METHYLENE BLUE.*

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The following report on what I believe to be a useful differential diagnostic symptom between simple involvement of the pelvis of the kidney and involvement of the pelvis and the parenchyma of that organ, is preliminary to a more detailed publication based on further clinical and experimental data.

There are two types of pyelitis, acute and chronic. In both the parenchyma may be involved, as autopsy of such cases shows. How can we determine whether the parenchyma is involved?

As far as one can judge from the literature there is no symptom which reliably differentiates between pyelitis and pyelonephritis. A patient, without palpable kidney tumor, without tenderness over the kidney areas, is suffering from a chronic pyuria. Despite careful bladder irrigations and in some cases despite drainage of the bladder (3 cases reported by Osler), the pyuria continues. Cystoscopy shows a chronic cystitis and by means of ureteral catheterization it is found that pus is passed from one kidney, whereas from the other the secretion is normal. Examination of the specimen from the diseased side shows a faint trace of albumin and considerable pus. Does this pus come from the pelvis or from the pelvis and the kidney parenchyma? Are we face to face with a chronic pyelitis or a chronic pyelonephritis? That question crops up in every case, and such cases are by no means rare.

In the literature there are no definite aids that I know of to assist in this differentiation. In the two cases that are to be reported, I think I have found a differential sign which will throw some light on this question and probably help us in differentiating between simple pyelitis and pyelonephritis with formation of multiple suppurating foci in the kidney parenchyma.

CASE 1.—History.—Mrs. W., aged 35, married; has two children; was operated on for anal fistula six years ago. She had cystitis for some time, for which she was treated. About March, 1904, she developed an ascending infection of her left kidney with chills, high fever and pains in left lumbar region. No kidney enlargement and only slight local tenderness. Operation was disadvised because of poor general condition. She was treated with the usual measures and for several weeks during this illness was put on methylthionin hydrochlorid (methylene blue). Gradually the patient improved and the fever disappeared. The pains became less and slow convalescence set in. Her pyuria and bladder irritability persisted despite regular bladder irrigations, and ten months after the onset of the acute symptoms, I had an opportunity to make an inspection of her bladder and catheterize her left ureter.

Cystoscopic Examination.—Dec. 29, 1904, the bladder showed marked thickening of the mucosa, which was thrown into folds. Left ureteral orifice red and swollen. Bladder excessively irritable. Urine from left kidney was rapidly excreted and neutral in reaction. It contained pus cells, epithelial cells; no casts, no tubercle bacilli. Colon bacilli were present. As there was no mass in the kidney region and no tenderness on deep pressure, it was assumed that the pus came from the kidney pelvis and that the acute pyelitis of earlier date had become a chronic pyelitis. With this diagnosis in mind, lavage of the left pelvis was determined on and measures were taken to diminish the vesical irritability. At this time every specimen of urine was bottled and labelled in order of voiding. On standing, one-half to one inch of pus almost regularly deposited in a six-ounce bottle. In some bottles there was more pus than in others, and it was observed that occasionally there was very little and again at other times a great deal of pus.

On Jan. 2, 1905, the left kidney pelvis was irrigated with boric acid followed by silver nitrate. No effect was noted.

Jan. 19, 1905: Lavage was discontinued, as patient had her menses and a mild attack of influenza. On this date I noticed that the pus deposited in one of the bottled specimens was stained blue, while the supernatant fluid was yellow and unstained. The appearance of this blue immediately suggested methylthionin hydrochlorid (methylene blue), and to determine absolutely what this was I made various tests and microscopic examinations.

Examination of Pus.—Professor Giess of the department of physiologic chemistry, Columbia University, very kindly examined this blue pus, as well as other similar specimens passed at subsequent times, and reported as follows: "The urinary sediment was very blue, so that the quantity of pigment was relatively large and easily handled. The pus varied considerably in its coloration, many corpuscles appearing to be entirely uncolored. Others were deeply colored. Many of the latter were disintegrated into granular debris. The pigment was undoubtedly methylene blue, as shown very distinctly by its response to reducing and oxidizing agents. It was easy to convert the color to the leuco-methylene blue condition and this in turn to methylene blue. I gave no attention to solubility tests, but aimed directly at the main point. No doubt combinations of the pigment in the pus interfere with the usual solubility tests, but by treatment with acids any such combinations were broken and the tinctorial effects above referred to obtained."

Here, then we have a patient who discharges methylene blue stained pus, eight to nine months after administration of the drug. That there is no question of fraud is self-evident, as the pus alone is stained while the supernatant fluid is unstained. Moreover, the blue stained pus is limited almost completely to one specimen. Both these facts preclude deceit on the part of the patient. Where did this blue stained pus come from?

It is evident that the bladder, as well as the kidney pelvis, could be excluded from our reckonings. The bladder had been irrigated countless times and inspected several times—the pelvis also had been irrigated. The assumption was forced on the patient's physician, Dr.

*Read before the Genitourinary Section, N. Y. Acad. of Med., April, 1937.