phagia by pressure on the esophagus, and engorgement of the thoracic veins by pressure on the left azygos veins.

In Breton's case the exudate seems to have exerted pressure almost exclusively on the thoracic aorta, resulting in retrosternal pain and precordial angina, palpitations, dyspnea on exertion, accentuated closure of the aortic valves, and hypertrophy of the left ventricle with the apex-beat displaced toward the left.

Posterior mediastinal pleurisy is always unilateral. In six of the twelve reported cases, the left posterior mediastinal pleura was affected, and in five of these the exudate was purulent, in one putrid; the right posterior mediastinal pleura was affected in six cases, and in all of these cases but one was the exudate serous.

The prognosis of posterior mediastinal pleurisy seems to be very much less serious than of the anterior, as, out of the twelve cases, only two ended fatally. In this connection it may be worthy of note that, out of the seven cases with purulent or putrid exudate, vomica occurred in not less than five, and that in two of these five cases thoracotomy was not found necessary, as the abscess gradually emptied itself completely through the air passages.

The diagnosis of posterior mediastinal pleurisy, in cases in which no symptoms of pressure on the posterior mediastinum are present, is based on the same principles as the one of any encysted pleuritic effusion. When symptoms of pressure arise, a differential diagnosis must be made between posterior mediastinal pleurisy and any disease which is liable to produce pressure.

I shall confine myself to the enumeration of such diseases: (1) abscess of the posterior mediastinum, whether due to trauma, foreign body, suppuration of glands, perforation of esophagus or trachea, or to an inflammation spreading from an adjacent organ as, a retropharyngeal abscess, a pulmonary abscess, a suppurative pericarditis, a vertebral osteitis, or to metastasis; furthermore, (2) hypertrophic glands, (3) aneurism, (4) gumma, (5) neoplasm.

In case stridor is present, a differentiation should be made, as Dieulafoy points out, from any tracheal lesion, whether intrinsic or extrinsic, which is liable to produce stridulous dyspnea, as intratracheal gumma, polyp, stenosis, pressure from cervical glands or from struma.

TREATMENT

The treatment of mediastinal pleurisy, whether anterior or posterior, differs in no way from the usual one of any encysted pleurisy except that the indication for surgical interference comes earlier than in any other form. In order to be able to make a thoracocentesis or a thoracotomy at the proper moment, we should not hesitate to make not only one, but if necessary, several exploratory punctures to locate the exudate. No rule can be given as to where to introduce the exploratory needle. By minute physical examination we should try to determine where the maximum flatness is located, where the vocal fremitus is least perceptible, where the breath-sounds are most distant, where egophony is most pronounced, and introduce the needle in the outer edge of the area thus determined.

CONCLUSIONS

1. The clinical manifestations of mediastinal exudative pleurisy differ according to the part of the mediastinal pleura involved, and consequently according to the part of the mediastinum exposed to pressure.

2. For this reason three different forms of mediastinal pleurisy are to be distinguished: (1) pleuritis mediastinalis anterior sinistra, (2) pleuritis mediastinalis anterior dextra, (3) pleuritis mediastinalis posterior.

3. This distinction is justified, not merely from an anatomic point of view, but because it corresponds closely to clinical facts. Pleuritis mediastinalis anterior sinistra resembles very much exudative pericarditis. The most striking symptom of a pleuritis mediastinalis anterior dextra is a very deep cyanosis of head, neck, thorax and upper extremities. A posterior mediastinal pleurisy will, provided the exudate is deeply situated and is sufficiently large, cause inspiratory stridor and sometimes a deviation of the trachea by pressure on the trachea, dysphagia by pressure on the esophagus, engorgement of the intercostal veins by pressure on the azygos veins, and paroxysmal cough by pressure on the pneumogastric nerve.

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ABSTRACT OF DISCUSSION

DR. DELANCEY ROCHESTER, Buffalo, N. Y.: Although I have nothing to offer in the way of cases to report in support of Dr. Frick's position, I do not believe that such additions to the literature should go without some discussion. We owe him a great deal for his careful analysis of his cases and for the careful examination and the knowledge displayed in making the diagnosis and his confirmation of it by exploration and, whenever possible, by autopsy. The literature on this subject will be greatly added to; we shall all be required to look more carefully into these cases hereafter. When there is cyanosis and difficult breathing, cases that have heretofore been looked on as cardiac, can now be proved to be mediastinal pleurisy, a condition which can be relieved by operative procedures.

DR. FRANK SMITHIES, Ann Arbor, Mich.: Were any photographic findings registered in these cases?

DR. ANDERS FRICK, Chicago: No photographs were taken of the anterior mediastinal pleurises. In a few cases of left posterior mediastinal pleurisy, however, skiagraphs were taken and they indicated a shadow or dark zone to the left of the posterior mediastinum. In these cases, also, there was dulness between the spine and the left scapula.

TRAUMATIC RUPTURE OF THE FIXED PORTION OF THE MALE URETHRA *

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Traumatic rupture of the fixed portion of the male urethra is a most serious injury, both in its immediate aspect and remote consequences: immediately serious, because of leakage of urine following the several classical paths of extravasation, with subsequent decomposition, or on account of complicating lesions of osseous or soft tissues; remotely so, owing to formation of traumatic stricture, with its attendant urinary stagnation and infection of the entire urinary tract.

The force causing a rupture of the urethra acts in one of two ways—in a direct manner, the patient falling astride an object, or indirectly, the pelvic bones being crushed together, the force usually acting in the coronal plane of the body.

* Read in the Section on Surgery of the American Medical Association, at the Sixty-First Annual Session, at St. Louis, June, 1910.

Produced in a direct manner, the urethral tear may be in a part anterior, within, or posterior to the layers of the triangular ligament, usually without complicating factors. Indirectly produced by crushing force, the tear in the urethra is often associated with an injury to the pelvic bones or soft tissues; these latter may be so dis-jointed or broken, the pelvic fascia so lacerated and torn from its attachments as to allow the bladder and prostate gland to hang loosely in the pelvis. The tear of the puboprostatic ligaments opens a communication between the space of Retzius and the perineum.

A tear of the membranous urethra, accompanied by laceration of one or both layers of the triangular fascial septum, or a transverse rupture of the urethra at the apex of the prostate gland, are the types of injury found as a result of force acting in an indirect manner.

The signs of a ruptured urethra are patent in the great majority of cases. With a history of an injury as described, coupled with a varying amount of free blood issuing from the urethra, inability to pass urine (when the urethra is completely torn) or difficulty experienced in voiding a small quantity of urine, always preceded by pure blood from the canal (when the tear in the urethra is partial) are extremely suggestive. Attempts made to pass a catheter are futile and usually serve to increase the bleeding.

Depending on the part of the fixed urethra injured, local inspection reveals a fulness and perhaps discoloration of the upper part of the perineum, noticeable at the perineoscrotal junction when the bulbous part of the tube is injured; or the swelling may be confined to the middle of the perineum or about the anal region when the tear is located between the layers of the triangular ligament or posterior to them. The tumefaction is caused by an effusion of blood perhaps mixed with urine. If, for any reason, the lesion is not immediately repaired, infection occurs extending along paths previously mentioned—underneath Colles' fascia through the abdomino-scrotal passageway to the anterior and lateral abdominal walls following injury to the bulbous urethra; confined, at first, between the layers of the triangular ligament, subsequently ulcerating either through the anterior leaflet, gaining access to the space bounded by Colles' fascia, or through the posterior leaflet, invading the cellular tissue about the rectum.

The lesion is an anatomic one and requires an anatomic operation for its repair. It is a self-evident proposition that a procedure which restores the parts as nearly as possible to normal, brought about with a minimum of injury to surrounding structures, carrying with it a minimum mortality and shorter period of disability, both immediate and remote, is the procedure of choice. These factors are conserved by performing a circular urethrorrhaphy through a perineal opening, which incision gives access to all parts of the fixed portion of the male urethra.

The operation is greatly facilitated by placing the patient in the exaggerated dorsal position. For this purpose, the old Clover's crutch is used, supplemented by a sand-bag placed under the sacrum, which flexes the pelvis on the vertebral column so as to bring the perineum in the horizontal plane. This position renders the structures taut and makes possible an anatomic dissection. The object of this dissection resolves itself into an effort to find the proximal end of the torn urethra, the distal end being readily located by means of a sound introduced through the external meatus.

When the tear is situated anterior to the superficial triangular ligament, the proximal end of the urethra may be found through the original tear in the accelerator urinae muscle; or this structure may be split along its median raphe, affording further working room and the end readily found.

When the tear is located at the apex of the prostate gland, the incision through the skin of the perineum may at once open an area filled with clotted blood, or it may be necessary to cut the central tendon of the perineum to reach the site of injury.

It is in those patients suffering from a rupture at the bulbomembranous juncture or situated in the membranous urethra, between the layers of the triangular ligament, that the procedure of retrograde urethral catheterization becomes necessary, rather than a suprapubic cystotomy as an aid in finding the proximal end of the torn urethra. The anatomic landmark sought is the apex of the prostate gland. The technic is similar to that carried out by Young in the performance of perineal prostatectomy, but without a guide. This step is not difficult of accomplishment, by reason of the excellent position of the patient. The urethra, immediately in front of the apex of the prostate, is opened by a linear incision, through which a small sound or guide is introduced from behind forward, facilitating the discovery of the proximal torn end of the urethra.

With both the distal and proximal ends of the ruptured urethra secured, the exaggerated dorsal position of the patient is modified, relaxing the perineal structures, thus aiding the suturing of the anterior wall of the torn canal; then the introduction of a rubber catheter from the external meatus to the bladder, completion of the circular urethrorrhaphy and closing the linear incision in the urethra at the apex of the prostate.

If the general condition of the patient does not warrant the completion of the technic of suturing the ends of the torn canal the catheter will act as a splint favoring the reparative process.

It is observed that following a rupture of any part of the fixed urethra, complicated or not by injury to surrounding structures, a catheter introduced into the bladder through the proximal torn end will evacuate a large quantity of clear urine. This retention is probably due to interference with the nerve-supply of the internal vesical sphincter, increasing its tonicity, a fact of importance, in that primary shock may be combated without the fear of continuous leakage of urine demanding immediate drainage of the bladder.

Perhaps the vulnerating force may be of sufficient degree so to distort and dislocate the perineal structures as to make it impossible to discover the proximal end of the torn urethra. In this case the only resource is to open the bladder suprapubically and carry out a retrograde catheterization. The condition of the patient may contraindicate a complete operation as a primary procedure. This matter of time, type and choice must be determined by the individual operator.

The force necessary to produce an injury of so grave a nature as rupture of the urethra undoubtedly devitalizes tissues, predisposing to infection. This imminent danger may be anticipated by appropriate drainage. If the character of the injury is such as will lead to infection underneath Colles' fascia, a rubber tissue drain of this space emerging through the perineal incision is indicated, or a through-and-through perforated tubular drain from the perineal incision, following the abdomino-scrotal passageway on one or both sides, making its exit

at the pubes, may prevent a serious and annoying infection.

The wound in the perineum associated with an uncomplicated rupture of the urethra at the apex of the prostate will be cared for with a rubber tissue drain from the site of the rupture to the perineal surface.

When the ligamentous attachments of the prostate are torn, affording a communication between the prevesical space and the perineum, a perforated rubber tube, introduced through a small incision in the median line immediately above the symphysis pubis, passing to one or the other side of the prostate and emerging from the perineal incision, will prove a wise precaution.

REPORT OF CASES

The following cases typify the subject-matter:

CASE 1.—Patient.—(Admission 40,078).—J. L. M., electrician, aged 30, was admitted to the Allegheny General Hospital, Aug. 2, 1909. The patient was on a ladder removing electric lamps, when it slipped and he fell astride an iron pipe.

Examination.—This showed on the inner aspect of right thigh a bruise, and also a slight bruise on right side of scrotum. In the median line of the perineum a small tumefaction was observed. The patient suffered very little pain. Blood escaped from the external meatus. Attempts at urination were unsuccessful, producing great distress and increasing, apparently, the swelling in the perineum and area about the anal region. The bladder on palpation was found moderately distended. Attempts at catheterization were unsuccessful.

Operation.—The patient was placed in the exaggerated dorsal position; a sound was introduced and felt at a point posterior to the base of the triangular ligament; a median incision was made from the perineo-scrotal junction to within half an inch of the anal fold; the area was opened containing clotted blood, mixed with urine. The entire prostate gland, presenting a minute portion of urethra at its apex, was found hanging loosely in the injured area. The structures about the gland were torn and lacerated, allowing the examining finger to be readily inserted into the space of Retzius and palpated through the anterior abdominal wall, immediately above the symphysis pubis. Suture of the anterior wall of the urethra with interrupted catgut sutures, the introduction of a catheter into the bladder and also through the anterior portion of the urethra, evacuation of clear urine, completion of circular urethrorrhaphy, the introduction of a perforated rubber drainage tube through a small median incision immediately above pubes and brought out through the perineal wound, along left side of gland, with closure of skin wound completed the operation.

Convalescence was uninterrupted and the patient was discharged Aug. 21, 1909, nineteen days after the operation. Occasionally there was a slight discharge of urine through the perineal opening, which ceased entirely within the next ten days.

CASE 2.—Patient.—(Admission 41,820).—C. B., laborer, aged 30, was admitted to the Allegheny General Hospital Jan. 1, 1910. The patient was walking in the street when he stepped on the edge of the cover of a man-hole, which turned on end, the patient falling astride it. He was helped home, suffering severe pain in the perineal region and bleeding from the meatus. He went to bed, but was unable to sleep. Next morning he had several chills and suffered severe pain in lower abdomen. A physician was sent for who found the bladder distended to within one inch of the umbilicus. An attempt to catheterize the patient was unsuccessful and bleeding from the canal commenced. The patient was sent to the hospital.

Examination.—Distended bladder was present on inspection and palpation; the area over the bulbous urethra was swollen and discolored; there was bleeding from the external meatus. Temperature was 100.4; pulse 118.

Operation.—The patient was placed in the exaggerated dorsal position and a median incision over the bulbous urethra made. Clotted blood was found underneath Colles' fascia.

There was laceration of the fibers of the accelerator urinae muscle. A sound introduced through the external meatus demonstrated the distal torn end of the urethral canal, but was unable to find the proximal end of the torn tube. The incision was carried back to within one-half inch of anal folds. Blunt dissection was made of the area on either side of the central tendon of the perineum, which structure was cut. Further dissection disclosed the apex of the prostate gland. The urethral canal was opened at the apex of the gland, being careful to grasp the mucous membrane on either side of incision. The introduction of a small sound made it possible to find the proximal torn end of the urethra, which had been severed at the bulbomembranous junction. Introduction of the catheter into the bladder evacuated a large quantity of clear urine. Suture of the anterior wall of the urethral canal, the introduction of a catheter from the external meatus to the bladder, completion of circular urethrorrhaphy, closing of the linear urethrotomy wound, the insertion of a rubber tissue drain from site of tear to perineal surface and closure of the skin incision were the further steps in the operation.

Subsequently it was necessary to pass a drainage-tube through the abdomino-scrotal passageway on both sides, owing to infection. On this account convalescence was protracted. The catheter was removed on the fifth day. Leakage of urine through perineal wound persisted for four weeks. The patient was discharged from the hospital March 12, 1910. Examination was made June 4, 1910, with the introduction of a 27 French sound without difficulty, revealing a slight roughening at site of tear. The urine was negative.

CASE 3.—Patient.—(Admission 41,092).—T. S. S., bridge inspector, aged 53, was admitted to the hospital Jan. 14, 1910. The patient was at work on a bridge when he fell astride a log. He rested about one half hour; then he resumed work, continuing until time to quit, about an hour later. He paid no attention to his hurt. While on the train bearing him to his home he coughed several times and felt as if something gave way at the site of injury. After a short time he noticed that his clothing was blood-stained and on examination found that he had bled freely from the external meatus. On his arrival home Dr. Ray (Glenshaw), who was called to see him, attempted to pass a catheter, but did not succeed, after which the patient was sent to the hospital.

Examination.—Patient walked into the hospital about nine hours after the injury. The bladder was found distended, and the external meatus closed by clotted blood; the perineum, scrotum, penis, pubic area and flanks were greatly discolored, almost black, and much swollen. The patient's general condition was good.

Operation.—Patient was placed in the exaggerated dorsal position; a sound introduced into the urethra stopped in the bulbous portion. Median incision over the bulbous urethra revealed a laceration of the accelerator urinae muscle on left side. The distal end of the torn urethra was readily found, but it was impossible to find the proximal torn end. The incision was enlarged and a technic similar to that in Case 2 carried out; the tear was found at bulbomembranous junction. Rubber tissue drain from site of rupture to perineal surface was introduced; also from prostatic area.

The catheter was removed on the sixth day. Convalescence was uninterrupted. Patient was discharged Feb. 5, 1910, twenty-two days after operation. There was a slight leakage of urine at the time of discharge. This ceased within a week; the wound remained closed for ten days and then opened again for a few days, since which time there has been no leakage. On examination June 4, 1910, a 27 French sound was readily introduced. There was slight roughening at point of tear in urethral canal; urine negative.

CONCLUSIONS

1. Rupture at any point of the fixed portion of the male urethra is an injury of grave import.

2. The condition of the patient permitting, immediate operation to restore the integrity of the urethral canal is imperative.

3. Repair of the torn urethra at any point may be done through a median perineal incision.

4. Shock is to be overcome as a primary measure; leakage of urine in the early hours following traumatism is not to be feared.

5. Appropriate drainage is to be instituted as a prophylactic measure against infection.

6. Of great importance in the technic is the proper position of the patient.

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ABSTRACT OF DISCUSSION

DR. HARRY M. SHERMAN, San Francisco: The mechanism by which the urethra may be wounded through a pelvic wound might be explained a little more explicitly. The two ossa innominata may be pressed together, as when force is applied on either side of the body, or they may be forced apart, as when the force is applied antero-posteriorly. If a force presses the two bones together, the urethra may be pinched off between the two descending rami of the pubic bone, or one bone may slide past the other, like the blades of a pair of scissors, thus cutting off the urethra. When this occurs, the urethral injury outranks the injury to the skeleton, and the possible extravasation of urine outranks the injury to the urethra. That is, when this accident occurs the extravasation of urine is the matter of major moment, and the one which requires most attention. The plans which have been detailed for the drainage of the different layers of areolar tissue are ample. Especially would I emphasize that which drains from the space of Retzius down behind the pubic bone, and so out through the perineum. Drainage is the keynote to the situation, so far as my experience goes with these cases.

DR. GEORGE F. CORRIGAN, Newark, N. J.: Three or four months ago I had a case similar to the one described by Dr. Gaub. This man was going down in an elevator when the car slipped and he fell on a wheelbarrow, rupturing the perineum. He was brought to the hospital and several attempts were made to repair the damaged urethra. The openings in the urethra and neck of the bladder were closed; both operations failed, however. I propose in the next few weeks to operate on this man, and I am glad to have heard this paper. I fear that in doing an operation of this kind we must divert the urinary flow, in order to be successful. After the necessary preparation I will make an inverted Y-incision in the perineum, and dissect the rectum freely from the surrounding structures as well as the urethra, and endeavor to find the opening. I will pass a catheter or grooved staff after denuding the cicatricial tissue around the opening in the urethra, and then attempt to close the latter with chromicized catgut. If I do not go further, the operation will not be a success. I think that the proper procedure is to drain the bladder from above.

DR. PARKER SYMS, New York City: Immediate drainage in these cases is the important factor in saving life. Immediate repair of the injury to the urethra is most important, when it can be done with safety. I desire to report what I consider to have been a surgical curiosity—an instance of this kind which came under my observation several years ago. A mining engineer fell astride a rock and sustained rupture of the urethra, with complete retention of urine. He had to travel nine days on mule-back before he could get any surgical aid. In the meantime, he had to rely on his own ingenuity. He constructed a catheter by putting a quill on the end of a reed and after much trouble and pain, he succeeded in relieving himself. The extreme lithotomy position is a great aid in exposing the deep portions of the perineum.

DR. J. HARTLEY ANDERSON, Pittsburg: Rupture of the urethra back of the triangular ligament is one degree of a rupture which we see in fracture of the pelvis in which the prostate is also injured, and in which there is also an extra-peritoneal rupture of the bladder. The operation which Dr. Gaub performed with considerable success is probably the most convenient for the lower part of the bladder, the pros-

tate and the prostatic urethra. When there is a rupture of the bladder involving the anterior surface, the result of crushing force, it is necessary to make a suprapubic incision, and any attempt to suture the bladder in any other way will be found to be a difficult procedure. At the same time the suprapubic opening gives us the advantage of draining the prevesical space, and combined with the Proust incision drainage of the deep perineum.

The one thing that we find in these cases of ruptured urethra is the enormous displacement of the bladder where the true ligaments of the bladder are ruptured. We may find that the prostate is shoved up two or three inches, and it is almost impossible to reach it, but by making use of Young's retractors we are able to pull the bladder down and suture it into position. Drainage, especially if there has been extravasation of the urine, or an external perineal wound, is very important. The frequency of pelvic cellulitis is great, and if the fractured pubic bones are exposed, pelvic deformity and pyemia are after the results. Stricture and tortuous urethra are nearly always the final results of complete tears of the deep urethra.

DR. HUGH CABOT, Boston: The care of these patients is twofold: (1) that required immediately after the injury, and (2) that of the stricture which is a necessary consequence. The most important element in the immediate care, is the provision for proper drainage of the bladder. The most difficult cases are those due to fracture of the pelvis which are not infrequently complicated by rupture of the bladder. Satisfactory drainage may be obtained either by combined suprapubic and perineal operation, or, in the less serious cases by simple perineal section. It has not seemed to me wise to attempt primary suture of the urethra, because of the unfavorable condition of the tissues. If the sutures are placed in the bruised tissue they will not hold and infiltration occurs and the patient is worse off than if a simple perineal section had been done and the stricture dealt with later, if necessary. It is, however, important at the time of the primary operation to restore the continuity of the roof of the canal, if this has been torn across. Unless this is attended to retraction of the cut ends will result in excessive scar and a stricture difficult to deal with. The restoration of the floor should be left to a subsequent time. The essential part of this stage in the operation is the free mobilization of the anterior urethra. The extent to which the urethra can be mobilized without damage to the circulation is surprising. In one case a gap of one and a half inches was closed by mobilizing the anterior urethra up to and somewhat forward of the peno-scrotal angle, the anterior segment being then sutured to the apex of the prostate. A perineal incision in the form of an inverted V gives good access to the prostate and membranous urethra and if the anterior portion of the urethra has been thoroughly mobilized the ends can be brought together without tension. The failures that I have seen after these operations have been due to fear of sufficiently mobilizing the anterior segment; it being believed that the blood supply which comes through the triangular ligament would be interfered with. This does not seem to me to be serious. The placing of an indwelling catheter at the time of operation seems to me objectionable on account of the urethritis which it produces, with resulting infiltration, scar tissue formation and increase of stricture. Drainage by a perineal tube is, I think, to be preferred.

DR. HUGH H. YOUNG, Baltimore: I have had two somewhat similar cases. One was that of a fresh rupture of the urethra which occurred in a young man who was caught between two freight cars and sustained a fracture of the pelvis, and was unable to void urine. I found that there was complete rupture of the urethra just behind the triangular ligament. The space had filled up with blood clots; the bladder and prostate were pushed upward and an immense blood clot lay between them and the triangular ligament. The interesting thing in that case was the fact that the prostate was cut off from the external sphincter, but the bladder still retained a quart of fluid. The prostatic sphincter was sufficient to prevent the escape of urine from the bladder. I brought down the prostate and made an end-to-end anastomosis with the membranous urethra.

In order to avoid urethritis I brought the catheter out through a hole in the perineum, which gave excellent drainage. The catheter was left *in situ* for a week, and primary union was obtained. No sounds were passed. The man came back to me a year later; a sound passed easily showing the absence of stricture. He was in good condition, except that he had lost erectile powers. It is interesting to note that although no sounds were passed in this case a stricture did not form, probably because the suturing was done in the membranous urethra, where there is no surrounding cavernous tissue.

In cases of carcinoma of the prostate in which I have performed an anastomosis of the bladder with the membranous urethra, no stricture has resulted. Recently I saw a young man with a similar injury, who had been treated simply by suprapubic drainage. I found a mass of scar tissue and had to dissect it out before it was possible to make an anastomosis between the prostate and membranous urethra. The operation was much more difficult than in fresh cases, and I cannot recommend too highly immediate operation and suture of the divided urethra in all these cases of complete or almost complete rupture of the urethra.

DR. OTTO C. GAUB, Pittsburg: I searched for a new type of operation, as it had been the custom in Pittsburg to open bladders suprapubically and drain perineally—a retrograde catheterization. These patients remained in the hospital for a long while. There was infection of the cellular tissue in the space of Retzius, and the patients were incapacitated for months. Stricture followed, so that the idea of treating the ruptured urethra in the manner described occurred to me after having gone over the work done by Dr. Young. I followed the description of the operation which he performed for stricture of the urethra, in which he was obliged to do a retrograde urethral catheterization.

The point is well taken, that it may not be desirable to attempt complete suture of the urethra at the primary operation, but I would go so far as to say that we should restore the anterior wall of the canal. The advantage of the operation through the perineum is that we may stop at almost any stage. If the anterior wall of the urethra is reconstructed, the catheter acts as a splint, allowing the reparative processes to go on with very little scar formation.

Another point made by Dr. Young and emphasized in the paper, is the question of retention of urine. It is curious how these bladders will fill up and no leakage occur. In the third case reported in which the bladder was distended as high up as the umbilicus, at the time of operation, nine hours after injury, by putting a catheter into the bladder clear urine was found, showing that in cases of injury accompanied by severe shock, we need pay no attention to the bladder during the first two hours. The patient can be put into better shape and the severe urethral injury then attended to, restoring the canal entirely or in part, as may be indicated.

THE NEW TREATMENT OF SYPHILIS (EHRlich-HATA)

OBSERVATIONS AND RESULTS

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If Ehrlich had ceased his labors after giving to the profession his original work on blood, which was an enormous factor in giving stability to the new-born art of hematology, and his studies on immunity, he would have continued to live as one of the masters of medicine. To-day Paul Ehrlich stands before the profession as the greatest living exponent of chemotherapy. His ceaseless labors have been rewarded by the discovery of a remedy, a chemical compound more specific in its effect against syphilis than any other yet introduced.

I am privileged to be able to preface what I have to offer with the positive statement that the bioxidiamido-

arsenobenzoldichlorid, or the remedy labeled "606" (being the laboratory brand), is destructive to the *Treponema pallidum* (erroneously named *Spirochaeta pallida*, which latter term, because of usage, I shall retain in this paper) and has a prompt and specific effect on syphilitic tissue.

Prompted by the favorable reports which during July and August of 1910 accumulated in the German medical press, I visited Ehrlich at his laboratory in Frankfurt July 12. My visit was most satisfactory. One is deeply impressed by the sincerity and scientific spirit of this man and his uniform courtesy. He is of a decidedly nervous temperament, systematic, continually on the *qui vive*. While engaged in conversation he becomes fascinating. His earnestness is striking at once. The subject which he is investigating has taken full possession of him. The conversation which I had with him led me to the conclusion that he had unbounded faith in the new remedy, but that he recognized the fact that before we are justified in reaching the conclusion that the late effects of syphilis would be entirely prevented by the remedy, we must pass through a long period of probation. As he expressed it "Es muss erst grundlich ausprobiert werden."

Ehrlich understands fully the object of chemotherapy—i. e., the production of such remedies as by powerfully affecting parasitic life cause a minimum of danger to the body which harbors them. To this splendid work he is devoting his life.

There are those who contend that Ehrlich's experiments are made only on mice and rats; but he has made clear that in order to reach safe conclusions all of these chemical products must first be tried on a variety of animals and that the remedy which after animal experimentation produces the most telling results is in all likelihood, after cautious dosage and thorough observation, the remedy which when given to man for therapeutic purposes will be likely to produce similar results. This conclusion was fully justified after animal experimentation at the Ehrlich laboratory with the various arsenic preparations, more particularly the arsenophenylglycin against trypanosomiasis, and the arsenobenzol against spirillum disease. The latter is the "606" of to-day, originally elaborated by Bertheim and used to destroy the spirillum of recurring fever by Hata and finally introduced by Ehrlich, Hata and Bertheim against the *Spirochaeta pallida*.

Ehrlich has further convinced the profession that it is not possible in man to begin the use of poisons in the largest corresponding dose which is well tolerated in the animal (*dosis maxima bene tolerata*). In man we have idiosyncrasies to consider. The primary susceptibility and the acquired susceptibility offer the greatest obstruction to the use of poisonous drugs, and it is an uncontrovertible fact that all remedies which destroy living organisms in the blood or in the tissues of the body are poisonous. It has long been known that there are a number of poisons which nullify or completely destroy specific germs but the dose required, it has been found, is so large as to make it destructive to the host or to the individual organs; hence it is useless. It has been pointed out that poisons, to be of use in the economy against parasitic life, whether vegetable or animal, must leave vital organs undamaged just as do the antibodies. The further fact has become clear that remedies which destroy the living parasite must attract these offenders, "anchor" them; in other words, they must be parasitotropic. These same remedies are also organotropic; they are destructive to organic tissue; hence