hours, 24 ounces; specific gravity, 1024; reaction, acid; slight amount of albumin, but no sugar; a few coarse granular casts, numerous flat epithelial cells and a few pus cells. This specimen was not taken with a catheter, and we concluded the pus cells and most of the epithelial cells were from the labia. Six weeks later another examination of urine, removed by the catheter, showed a normal urine and it still remains normal. All of the finger nails and the great toe nails were exfoliated, beginning about the middle of August, and were replaced by brittle, poorly-developed nails, full of longitudinal ridges. They grow slowly and break off at the free border.

BACTERIOLOGY.—A bacteriologic examination was made of the fluid in the blebs. Fresh, tensely filled blebs were selected and, with a sterilized hypodermic syringe, the clear fluid was withdrawn and thrown immediately into culture tubes. Four tubes were used, with a different culture medium in each. These were given in charge of Dr. E. L. Stewart at the laboratory of the Kansas City Medical College, whose report we give:

"All the tubes showed a growth of bacteria. These were plated out and examined. The bacteria isolated in pure culture are of two types, one a micrococcus and the other a bacillus. The micrococcus answers every description of the *Staphylococcus pyogenes albus* and seemed to be quite small. The other type—a bacillus in morphology—resembled very much the typhoid bacillus as seen on agar-agar culture except that it was smaller both in length and thickness and was not so mobile as Eberth's bacillus. It grew readily on agar-agar, gelatin, potato and bouillon, and maintained its mobility and morphology on all four cultures. On agar-agar it first appeared as minute white specks, later becoming confluent and evenly disseminated except at the border, where there seemed to be a slight elevation. In gelatin a stab culture gave a crater form liquefaction which proceeded with moderate rapidity. On potato the growth was not as rapid as on other cultures, but in forty-eight hours showed a smooth, glistening culture. It seemed to stain with carbol fuchsin better than with methylene blue and was decolorized by Gram's method. No experimental inoculations were made."

BLOOD EXAMINATION.—We did not succeed in getting a proper examination of the blood at the time the eruption was profuse. Such an examination was made in February, about six months after that stage had passed, but while a few blebs were present on different parts of the body. This examination showed a normal blood in every way.

We were unable to secure material for a histologic examination.

The period of profuse eruption continued from early in June till late in August, nearly three months. The last week in August the number of bullæ diminished rapidly and seemed to cease about September 1. For about two months there were none to be seen on the body, but on the mucous surface of the labia, which had been better during the three months mentioned, the same condition reappeared as before. It still continues, fresh blebs continually appear and soon break, leaving raw surfaces. This location seems never to be entirely free; on other parts of the body a few poorly-formed, superficial bullæ form, soon rupture and disappear. The patient has gained in strength and appears in nearly normal health in every other way.

TREATMENT.—The treatment of the case consisted in the use of nutritious foods, perfect rest in bed, removal of all excitement and worry, and the administration of tonics, especially arsenic. Quinin, iron and strychnia were also freely given. The treatment which gave the most comfort and seemed to do the most good was the antiseptic bath. It seems all observers agree that this is a valuable aid in treatment. Hebra and Kaposi report severe cases cured by means of the continuous bath. We were unable to secure such a bath, but used a simple warm water bath and also medicated or antiseptic baths (bichlorid and boracic acid). The simple bath did not seem to accomplish as much as the medicated. The bichlorid bath seemed to do more for the patient than any other kind. This was given as strong as 1 in 5000, the patient

remaining in it fifteen minutes. This strength was not used daily for fear of getting too much absorption of mercury, but a weaker solution, 1 in 20,000, was used more frequently than the other.

We are not trying to prove the cause of this disease in this paper, but simply reporting our observations. It seems quite reasonable to me to conclude that the point of departure from health is in the nervous system and through this the skin manifestations take place.

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THE TREATMENT OF EMPYEMA BY CONTINUOUS ASPIRATION.

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The disastrous results which sometimes follow simple open drainage of empyemas have induced a number of experimental and practical workers to undertake improved methods of treating such cases. These bad results consist in the failure of healing; in the formation of fistulas leading down to large cavities, often persisting for years after incision and drainage; osteomyelitis of ribs; retracting of connective tissue about the pleura, resulting in distortion of the thoracic viscera; infection with tubercle bacilli; secondary and remoter conditions such as amyloid degeneration and intercurrent diseases; and especially the distortions of the skeleton and the distant musculature due to the contraction and collapse of the chest walls. Most of these consequences are due to the mechanical conditions under which healing has to take place.

When the pleural cavity is widely opened the lung, on account of its elastic tissue, retracts immediately toward its root. During expiration there is a slight tendency on the part of the collapsed lung to expand, owing to the air from the injured lung being driven by expiratory pressure into the bronchus of the opposite side. During this temporary distension of the lung adhesion between parietal and visceral pleuræ can occur. The unfolding of the collapsed lung and the filling out of the pleural cavity take place partly by a progressive union between the parietal and visceral pleuræ due to the relief of tension at the point where granulations are most effective, during expiration (Roser).

Another cause of the closure of these cavities is to be found in the filling of the space by granulation tissue, while retraction of the new-formed scar tissue aids in drawing together the pleural surfaces, diminishing the size of the cavity. Relaxation of the diaphragm and the partial collapse of the chest wall, together with the adaptation brought about by the attendant scoliosis, give assistance in the process.

When cavities are very large interruption of any one of these processes may stop the progress of healing and the condition may persist for years.

Naturally the proper material to fill this space is the lung. To close the cavity by the alteration of the chest wall or by the pulling over of the mediastinal organs to meet the parietal pleura are makeshifts of but slight physiologic value. Obviously the correct procedure lies in the rapid closure of the cavity by inducing the lung at once to meet the parietal pleura, so that the pleural surfaces may quickly heal by granulation.

Several attempts have been made by different workers to overcome the pneumatic difficulties involved in these cases. Schede showed in 1890 that a common bandage could be made to act in a valvular way if it were made very large and put on very tight, and he has given us

certain special directions about the method of its application. The effect of such a dressing is to allow some air to escape into the dressing while but little air is allowed to enter. In this way the advance made by the expanding lung is to some extent maintained by permitting adhesion of pleural surfaces and removing tension from the pleural new connective tissue, which may proliferate and retract.

A mackintosh has been used for the purpose of aiding in this valve action of the dressing, and oiled silk and plates of glass have been applied with the same end. Thiersch was the first to suggest the thin rubber plate for this purpose. Buelau was the first to recommend continuous aspiration drainage. He used for this purpose the well-known siphon principle.

All of these methods, however, from a physical point of view, are defective, and in comparison with the recently proposed plan of Georg Perthes,¹ mere child's play, excepting under the simplest conditions.

Briefly stated, Perthes' method consists in making an adequate opening, if necessary with rib resection, and then continuously maintaining a pressure less than that of the atmosphere in the pleural cavity, so that the lung may be made to more rapidly approach the chest walls. The striking results obtained by this method, obviating the need of destructive operative procedures, induce the writer to make a report on the management of two cases of empyema treated by him in this way, especially as he is able to give minute directions for the application of the principle in private houses.

The method calls for some special apparatus which is not expensive, but requires some mechanical ingenuity and attention for its construction and care. In the first place, there must be a properly constructed cover for the wound. Next there must be a continuously acting air pump to remove the air from the pleural cavity. In the third place, a collecting vessel is required for the pus, and this must be provided with a manometer.

The pump best adapted to the needs of the method is Bunsen's, which, it will be remembered, is actuated by the running water of the hydrant. This pump is a little brass instrument about seven inches long, which screws on to an ordinary hydrant. The waste water discharges into a sink, and a rubber tube connects the exhaust of the pump with the collecting vessel.

In the management of my first case the apparatus required had to be entirely extemporized. The first difficulty encountered was that the water service pipes of the house did not enter the room in which the patient lay, and beside, there was no drain through which waste water could be allowed to escape. The first difficulty was overcome by bringing water by means of a garden hose from the story above, where a large tank was located. The second difficulty was overcome by raising a window a trifle and passing a tube out to discharge the water on the ground. A Bunsen pump of metal was obtained at a supply house for chemical apparatus. The current of water was made to pass through this pump in a fair stream. The exhaust of the Bunsen pump was connected by means of a rubber tube with a glass tube passing through a rubber stopper in one neck of a three-necked Wolff bottle. The pump, therefore, diminished air pressure in this Wolff bottle. Through the second rubber stopper a tube was made to pass to the apparatus connected with the chest cavity of the patient. A manometer was connected with the third opening in the bottle. The purpose of this manometer

was to regulate the air pressure in the empyema cavity. Inasmuch as there was leakage about the chest walls, air being admitted into the apparatus constantly on account of mechanical imperfections, it was necessary to provide for an excess of aspiratory action. This was admirably done by the Bunsen pump. Once set in action the pump required but little attention from the attendant. Night and day its action was continuous, and, in the main, entirely satisfactory. Variations in the water pressure, however, resulted in irregularities in the vacuum, unless this result was prevented by the use of a manometer. This simple apparatus is best understood by reference to the photograph and a reproduction of Perthes' cut. I obtained from the supply house a Y-shaped tube, such as is used in the laboratory for dividing the gas supply of an ordinary gas pipe. The lower end of the single branch of the tube was provided with a rubber tube slipped over the open end, the lower end being filled with mercury, retained by means of a pinch cock. The raising or lowering of the pinch cock raised or lowered the mercury in the arms of the Y. Connection by means of tubes was made between one of the arms of the Y and one of the necks of the Wolff bottle.

Fig. 1.—Application of dressing to side of patient. (Perthes.)

Thus, when the air was exhausted from the Wolff bottle the pressure on the mercury in the arms of the Y was altered, the mercury traveling upward in the arm nearest the Wolff bottle and sinking on the other side. If the exhaustion proceeded to a certain extent, the mercury was drawn down beyond the point of junction of the Y arms and the air passed over into the Wolff bottle. The mercury then flowed back into the Y, and the equilibrium was re-established. In order to prevent the mercury from being drawn over by the rush of air into the Wolff bottle, it was necessary to introduce into the manometer tube a glass tube provided with a bulb, so that the mercury might, when drawn up, spread out into a lake, and allow the air to pass through it. We used for this purpose an ordinary pipette. The nurse can regulate this part of the apparatus from time to time with ease.

The dressing applied on the chest wall was different from that originally described by Perthes. I prepared the apparatus used by taking dentists' heavy rubber dam material, making a small opening in the center of a piece about ten inches square, pushing the rubber drainage tube through this opening and sealing the junction between the tube and rubber plate with ordinary bicycle cement. The best tube to use for this purpose is that suggested by Perthes, a soft stomach tube. The rubber

1. Beitruge z. kl. Chir., Ed. xx, H. 1, 1895.

plate was laid on the chest wall of the patient in such a way that the tube readily entered the opening in the patient's pleural cavity. Needless to say, the apparatus had been disinfected by washing and soaking in chemical disinfectants. It was found that zinc oxid ointment spread thickly on the rubber dam tissue protected the skin, and at the same time prevented the ingress of air. The wrinkling of the rubber dam tissue may be prevented or diminished by using very heavy tissue, or by cementing the rubber dam tissue to the chest wall. The apparatus having been applied the impervious tissue may be fastened down by means of rubber adhesive plasters about the edges, and a large dressing with a hole in the middle may be fastened around the chest of the patient.

These preparations having been made, the pressure may be applied by turning on the water. At first the pressure should be low, not more than twenty-five or thirty millimeters of mercury, as measured in the Y

Fig. 2.—The author's apparatus.

arm of the manometer nearest the Wolff bottle. This can be accurately provided for before starting the apparatus in action by filling the two arms of the manometer to an equal height, this height being equal to one-half the desired pressure. At first the patient rather dislikes the pressure. Later he does not object to it. Our first patient bore thirty millimeters' pressure without complaint. He slept well while the pressure was maintained.

This entire apparatus can be provided at an expense of only a few dollars. No special apparatus is necessary, although Perthes has had such apparatus manufactured. The cost of Perthes' apparatus in Germany² is set at about sixty marks, equal to about fifteen dollars. The improvised apparatus, exclusive of the garden hose, was provided for less than five dollars.

Any physician of a mechanical turn of mind who has a good nurse to assist him can make use of this modification of Perthes' apparatus in any private home. The consumption of time and effort by the physician will be considerable. The patience of the nurse will often be

tried, but the remarkable results obtained certainly justify all efforts and any degree of patience. The writer feels confident that the enormous empyema cavity with which he had to deal in this case would not have healed spontaneously by the usual treatment in a much longer time.

CASE 1.—The patient was Dr. N. of Sycamore, Ill., aged 32. A severe left-sided pneumonia preceded the empyema. Typical rusty sputum had been observed, in addition to the ordinary symptoms of that disease. The patient had been sick about three weeks.

His appearance when seen by the writer indicated extreme fatigue and exhaustion, but the expression was intelligent, although at times some mental aberration was noted. The patient had lost much weight, and the features were pale and drawn. Respiration was rapid and shallow and the pulse rate was high. On inspection of the chest the right side was seen to actively expand and contract with respiration, the excursion of the chest wall being greater than normal. The left side was bulging and comparatively inactive during respiration. The intercostal spaces projected to a marked degree. The cardiac pulsations were observed at the right of the sternum. Dulness was absolute over the entire left side from the region of the diaphragm to apex of the lung, both in front and over the back.

On account of the great pressure within the thoracic cavity, the displacement of the heart and other mediastinal organs and the embarrassment to both respiration and circulation, drainage of the pleural cavity was effected under local anesthesia (Schleich.)

The writer is strongly opposed to general anesthesia in operating on extensive pleural accumulations. Local anesthesia suffices for an incision, which is all that should be undertaken in a primary operation.

The patient bore the discomfort of the operation heroically. At least a gallon of pus was immediately discharged from the pleural cavity. A rib was not resected. It is not necessary to resect ribs, excepting where prolonged drainage is required, the intercostal spaces being amply large for all ordinary purposes, even in children. The respiration of the patient was temporarily very much embarrassed, and the pulse, for a time, was much accelerated. In a few hours, however, the patient experienced great relief. Twenty-four or forty-eight hours after the operation the condition of the patient was for a time alarming, but under appropriate stimulation the critical period was passed. For a variety of reasons not connected with the operation or the condition of the patient the aspiratory apparatus was not applied until the eighth day, although it would have been feasible and much more advantageous to apply the apparatus soon after draining the chest cavity.

At first the amount of the discharge was great, a pint being discharged in twenty-four hours. The quantity rapidly diminished until only a few ounces were found obtained in the bottle.

It was but a few days until the patient was able to sit up in bed, and in the course of four weeks the wound was entirely healed, the drainage tube having been gradually shortened.

Only a few hours after the application of the apparatus air could be heard entering the left lung and the tympanic note of pneumothorax had disappeared. A pressure of thirty millimeters of mercury was contentedly borne, the patient sleeping in perfect comfort throughout.

Drs. George Nesbitt and J. S. Brown gave the most hearty and sympathetic co-operation in carrying out the plan. About six weeks after the operation the patient went to North Carolina to recuperate. His health is now all that could be desired and there is practically no chest deformity.

The value of Perthes' method and the indications for its application are yet to be determined by the larger experience of the profession. Perthes himself reports,³ however, a number of cases, both of acute and chronic empyema, which he has treated by his method. His conclusions and comments are of interest and value.

2. C. G. Heinemann, Leipsic.

3. Mit. a. d. Grenz. Geb., Bd. vii, H. 4 u. 5.

He notes that in all recent cases the lung was distended (*entfaltet*) in a few days, "and yet the secretion diminished only gradually and the healing of the space (*spalte*) remaining after removal of the drain required a considerable time. This is only to be explained by assuming that a certain time was required until the pneumococci or streptococci imbedded in the superficial layers of the pleura died."

Perthes considers that his apparatus should be used when, four days having elapsed after incision, it is found that the lung has not resumed its contact with the parietal pleura. Of course, in many instances the tight dressing of Schede suffices.

In chronic empyema the necessity for the employment of this method of treatment is even greater than in acute cases. The second case observed by the writer convinced him of the value of the method under such circumstances.

CASE 2.—George W., aged 6, entered Wesley Hospital Dec. 1, 1901. His previous health had been excellent. Seven weeks before, the parents stated, the child became ill rather suddenly and the family physician diagnosed a pneumonia on the left side. Although the cough diminished, the patient did not improve much, and gradually the left side became more and more swollen.

On admission the patient was found to be a fairly well-developed child, but very much emaciated. He lay by preference on the right side and coughed a great deal.

Dulness on the left side extended from almost the level of the clavicle to the diaphragm, and from the spine to a point beyond the anterior median line. The heart was pushed well over to the right. The pulse ranged from 116 to 144; the respirations from 48 to 54. Marked bulging on the left side.

On account of the great embarrassment of the respiration and circulation the writer's usual practice of operating under local anesthesia was followed. At clinic an incision about one inch long was made in the anterior axillary line at the sixth interspace and an enormous quantity of pus escaped. Respiration became stormy and labored, until a large dressing was quickly applied. For several days the patient remained extremely weak, but, the temperature becoming nearly normal, improvement at last began and the cavity rapidly diminished in size. But when thirty days had passed and the cavity had for a week held two ounces of fluid, it was decided to apply Perthes' apparatus to hasten the healing process. In five days the capacity of the cavity was diminished by half. The manometric pressure was raised from thirteen to twenty-five millimeters. Two days later, January 9, it was again increased to forty-seven millimeters; January 11, to fifty-three millimeters, and January 17 to seventy millimeters. After forty-eight hours the apparatus was removed and dry dressings applied. The sinus was a little slow to heal, but on January 26 was finally cicatrized.

The deformity was very slight and will, I think, eventually almost entirely disappear.

These cases are presented because the writer considers them suggestive rather than demonstrative, and because the original apparatus of Perthes' can be extemporized in the manner indicated.

The writer believes that a very important field of usefulness exists for continuous aspiration of the pleural cavity both in acute and chronic empyema.

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The Campaign Against Quackery.—To discourage poor persons who suffer from pulmonary affections from patronizing concerns which profess to have a cure for consumption, the tuberculosis committee of the New York Charity Organization Society has issued thousands of circulars to the poor. This was because a concern had attempted to link the name of the society with one of its advertisements in such a way as to cause the impression that the society indorsed the "cure."—*Pharmaceutical Era*.

UNILATERAL DISEASE OF THE KIDNEY SIMULATING STONE.*

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When one considers the achievements in any field of surgery there is always one spot brighter than the rest by reason of especially good results; results obtained through faultless interpretation of symptoms and clinched by brilliant operation. In the field of renal surgery this applies to the operation for stone in the kidney, that is, when a stone is found. Unfortunately the elating thrill the surgeon expects to experience when the finger touches the stone in the opened kidney is not always felt; in its place is chagrin, if not discomfiture, when the fullest search fails to reveal the object sought for. To whom has it not occurred? A year ago the writer saw one of the foremost specialists in kidney surgery fail to find a stone in two cases within ten days. Were Tiffany to rewrite a paper presented before the American Surgical Association in 1889, he might readily present the reports of 200 cases instead of 21 in which the kidney was explored with results negative as to finding of a stone.

Two questions, necessarily correlated, at once arise, the solution of which would remove the obloquy attending a seemingly fruitless if not hazardous operation. They are: 1. Have we any positive and absolute method of recognizing stone in the kidney? 2. Are there not other pathologic conditions in the kidney, the symptom-complex of which covers to a nicety that of stone? In determining the first question in a positive sense the Roentgen ray was of necessity a formidable factor from the moment its penetrating power was known. With increasing experience in the methods of exposure, radiography will, in most instances, give positive results. There are few of the world's famous specialists who, like Leonard, are ready to make a negative diagnosis of kidney stone.

When I contemplate a few of the stones I have removed by operation, weighing 11, 15 and 20 grains respectively, some of them not larger than a pea, and removed from very fleshy individuals, I can not but believe that their discovery by the x-ray would have been largely a matter of chance. It goes almost without saying that an effort should be made to locate a stone by radiography in every suspicious case before operation. The sounding for kidney stone with a wax-covered ureteral bougie, as suggested by Kelly, seems to me chimerical in the extreme. To one conversant with the variations in position of a kidney stone it must be evident that its detection by sounding must be altogether fortuitous. Aside, then, from the positive presentment of a calculus by radiography the signs most relied on are pain, paroxysmal or continuous, and certain changes in the urine.

To consider the former at length is beyond the scope of this paper. Suffice it to say that the pain of stone may be simulated by any gross pathologic conditions of the kidney or ureter, such as tuberculosis, tumor, hydronephrosis, etc., and what is most relevant to the question propounded, by microscopic changes in the kidney, changes affecting either the secreting, the circulatory or supporting frame work and capsule of the gland. While ordinarily renal colic is associated with intrarenal retention from obstructed outflow, in certain chronic af-

* Read before the Southern Surgical and Gynecological Association.