vantage to have the nerve trying duties of an attendant upon the dangerous insane daily compared with the less onerous duties of those who guard sane men serving short sentences for drunkenness or vagrancy. These and other intercurrent influences make against the *morale* of nurses and attendants who care for the criminal insane.

If we were facing the problem of providing for the convict and criminal insane, with no money invested in a plant, we would like to select a hundred acres of rough, high land adjacent to some railroad and abundantly supplied with water. To build economically the prison population of the state ought to be employed, and this means that the work must be done under the auspices of the prison commissioners, or of the State Board of Charity which has jurisdiction over the prison department of the State Farm. But we can build "castles in Spain" and hospitals for the criminal insane, in imagination, without an appropriation or the consent of any one.

We appreciate and sympathize with the sentiment which has torn down the walls of the airing courts which formerly offended the eye in connection with many hospitals and asylums, but in building for six hundred or more criminal insane I would advise inclosing fifty acres or more with a stone wall that could be depended on to keep the public out and the patients in except by suitably guarded exits and entrances. These walls would be so far distant from the buildings as not to suggest the conventional airing court of the old-time asylum at all. If the buildings stood on the highest elevation the top of the walls might be below the level of the foundations of the buildings and still be effective. If the whole surrounding wall was well lighted at night and adequately patrolled there would be little incentive for patients — truly insane or malingerers — scheming with friends outside for saws, or making keys to lead them to liberty. In other words, our outer defenses should be of the most complete prison construction to safeguard the public, while within the gates our construction should be simple and of the most approved hospital designs for the progress of science and the cure of disease.

One hospital building proper, thoroughly equipped after the manner of a complete general hospital, should be within the gates, yet some distance from the asylum buildings. It might have four open wards of fifteen beds each, with fifteen single rooms additional for selected cases. It should have its own kitchen and dining-room, as well as sun room and reading room, and have a trained woman nurse in charge, assisted by the necessary number of men nurses. As an adjunct to this acute hospital building there should be an extensive hydropathic plant with a competent physical instructor in charge who should teach the whole attendant body the art of the masseur and the principles and practice of hydrotherapy and physical training. Not only the acute cases should here be treated, but a considerable percentage of chronic cases capable of physical improvement should be sent here daily as "out-patients" for their own good and for the good

of the student body receiving instruction in this department. So thoroughly convinced are we of the value of the so-called physiological therapy that we would count money well spent in developing this line of treatment to its highest plane.

Another specially constructed building, with its own kitchen, sun rooms and broad porches, where patients could be moved on wheeled chairs and beds to sit or sleep in the open air, and wheeled into a warmed room for change of clothing or bedding, would be needed for the tuberculous. Shaeks and tents might well help out in summer for selected cases, but there is usually a reason why a man with a sentence should be provided with substantial accommodations.

For other buildings within the gates we would not ask better than duplicates of the more recently constructed asylum buildings at State Farm, except a detached building for the convalescing and the quiet men of good conduct and honorable previous record, who are only technically criminals. This should be apart and have its own dining-room, walks, flower beds in summer and sheltering grove.

Outside the gates, beside accommodations for the superintendent and other medical officers, we would have modest cottages built by the state and rented to married nurses and attendants at a price just covering interest on investment and cost of repairs. A comfortable nurses' home, with reading room and rooms for recreation for those who have not come to their birthright, would be an essential part of the plan. The scheme includes such wages for competent nurses and attendants as will enable a man to marry and live in modest comfort and be retained for years, if competent, as a professional nurse and attendant on the insane.

Such are some of the essential features of the hospital for insane criminals we have built without an appropriation from the stuff of which dreams are made.

GENERAL PERITONITIS. PROLONGED IRRIGATION OF THE ABDOMINAL CAVITY.

BY L. R. G. CRANDON, M.D., AND DAVID D. SCANNELL, M.D.,
Assistant Visiting Surgeons, Boston City Hospital.

PRELIMINARY REPORT.

1. The rôle of drainage of the whole abdominal cavity is limited, because of:

- (a) The relative infrequency of universal infection of the abdominal cavity.
- (b) The chance, by all present methods of drainage, of carrying infection to a part as yet uncontaminated.
- (c) The insufficiency of present methods of drainage.

2. If drainage has to be established it should be such that:

- (a) The maximum drainage should take place.
- (b) The least disturbance to intestines and other viscera should be suffered.
- (c) The drainage should be continuous, or at least be continual.

(d) The drainage apparatus should be removable with the least disturbance.

3. The apparatus devised and used.

4. Conclusions on the present status of abdominal drainage.

THE APPARATUS.

Having the intention to wash and drain thoroughly the infected abdominal cavity, with the least injury to, and disturbance of, the abdominal contents, we have devised and used this apparatus.

It consists of a small reservoir (capacity 1 oz.) of nickeled brass supported on an aluminum plate, in its turn resting on the anterior iliac spines. From the bottom of this reservoir emerge four nickeled tubes, 1 cm. in diameter, easily removable and self-retaining.

female, or between the bladder and rectum in the male.

The fourth tube (the appendix tube) extends along the abdominal wall to end over the cecum.

Each tube, at its exit, is protected by two crossed pieces of nickeled wire to prevent the intestine being sucked into the tube when siphonage is established. From the side of the reservoir runs a rubber tube three or more feet long. The top of the reservoir is a screw-top cap. Into the opening of each tube, at the bottom of the reservoir, may be screwed a brass plug to close one or several of the tubes if needs be. The instrument can be perfectly sterilized, there being no complicated parts.

Use of the apparatus. — The primary cause of the peritonitis is found and repaired or removed if possible. Through a median suprapubic in-

The tube first to be inserted (the hepatic tube) runs along under the abdominal wall, curves slightly, and ends hanging over the hepatic fossa near the hepatic flexure of the large gut.

The second tube (the splenic tube) runs along beneath the abdominal wall to end over the splenic region.

The third tube (the pelvic tube) runs from the reservoir down into the pouch of Douglas in the

cision, three inches long, the hepatic and splenic tubes are inserted and pushed gently along, lifting the abdominal wall, toward their respective fossae. The pelvic tube is guided by the finger in its proper direction; and the appendix tube in a similar manner. Each tube as it is put into place is snapped into its proper hole in the bottom of the reservoir.

The bottle of salt solution is now connected

with the distal end of the rubber supply-tube of the reservoir, the fluid passes down through the reservoir out through each of the four tubes, and is allowed to run in until the abdomen is distended and fluid begins to leak through the wound about the reservoir. The supply-tube is detached from the water bottle, pinched at the end at the same time to keep it full of fluid, and is then lowered to below the level of the patient. This column of water in the supply-tube at once establishes siphon-drainage and the abdomen is drained at least till the end of one inner tube is above the level of the remaining fluid.

This alternate flooding and draining of the abdominal cavity can be done as often as one pleases without disturbing the patient, the amount of pressure-influx being regulated by the height of the supply bottle.

Dressings are now applied; the whole apparatus is supported by the aluminum plate which rests on the pelvis, and the patient is moved to bed. Here the abdominal cavity may be flushed out every fifteen minutes, or every hour, or at any interval which may seem best and quite without discomfort to the patient.

This apparatus is mechanically successful, and on the cadaver succeeds in reaching and flushing the most remote parts of the abdominal cavity, and draining them. The proper curves and lengths of these four tubes were determined by measurements and experiments on many cadavers placed at our disposition by the kindness of Professor Dwight of the Harvard Medical School.

We have had opportunity to use it in only one case clinically. This was in a case of general purulent peritonitis with marked distention following a neglected appendicitis. The appendix stump was hastily tied off through the median incision, the apparatus was inserted in a minute and one half, the cavity flushed until the fluid ran clear, and the patient put to bed with the apparatus still in position. The pulse rose during the operation, which in all took twelve minutes, from 124 to 130; about an hour after the operation it was 110. Siphonage was carried out every hour for three times, omitted six hours, and then repeated every two hours for three times. The first fluid returned turbid from several washings, but on the next day came clear as if the distended coils of the paralyzed gut had occluded the tubes. The case was thoroughly septic, practically without hope from any treatment, and died.

It has been clearly shown by Yates,¹ in a careful and exhaustive research, that the total value of general peritoneal drainage, if there be any, is in the first twelve to forty-eight hours, be it with gauze, rubber-dam or other form of wick to promote capillary drainage, or with tubes even though favored by gravitation as through the vagina. General drainage is efficient only for a short time. Whatever the form of drainage used, the foreign body is quickly encapsulated by adhesions of the omentum or intestines. Moreover,

the material drained by whatever means employed is not pus or blood, but rather as Coe² remarks: "Of course, there is always a considerable discharge of fluid, but this is not the septic material we wish to remove." The free discharge of serous fluid which comes during the first hours of drainage (1) comes not from the general peritoneal cavity, but only from the region drained, and (2) the amount of this drainage seems to be in proportion to the number of wicks. In short, some of the drainage, without question, is excited by the foreign body. In other words, the evidence of the literature and experimental work, such as that done by Yates, seems to show that drainage of the general cavity, excluding thereby localized abscesses, is, on account of the constantly appearing plastic reaction of the peritoneum, mechanically and clinically impossible. The present method of establishing drainage from localized peritonitis, as in the cigarette drain (gauze wrapped in rubber-tissue), is a sign of recognition by surgeons that the main function of the gauze "drain" is to excite adhesion, and thus isolate a septic process from the general cavity.

Yates sums up the objections to attempts at drainage thus: "The most insurmountable objections to general drainage is, however, noteworthy. From the time that Chassagnac's tubes were found plugged with fibrin, in the unconscious admission of Koeberlé that all serous surfaces applied themselves tightly to his tubes, when he made the apertures small enough to prevent herniae, and by proof that Hegar's theory of capillary drainage by gauze was erroneous, and from clinical experience down to the present time, there has accumulated an array of facts that justify this main objection to general peritoneal drainage; it does not drain the general peritoneum."

Yates's conclusions seem to us mainly sound and we feel it important to quote them in full:

"Drainage of the general peritoneal cavity is physically and physiologically impossible.

"The relative encapsulation of the drain is immediate.

"The absolute encapsulation occurs early (less than six days in dogs), and can be retarded, but not prevented.

"The serous external discharge is an exudate due to the irritation of contiguous peritoneum by the drain.

"There is a similar inward current from the potential into the general cavity.

"This external exudate diminishes remarkably with the formation of encapsulating adhesions.

"These adhesions, under approximately normal conditions, form about any foreign body.

"Their extent and density depend on the degree and the duration of the irritation of this body.

"Primarily fibrinous, these adhesions become organized in a few days (three days in dogs).

"If the irritation persists, they become progressively more mature fibrous tissue.

"After irritation ceases, their disappearance

¹Yates, J. L.: An Experimental Study of the Local Effects of Peritoneal Drainage. *Surgery, Gynecology and Obstetrics*, Chicago, 1905, i, p. 477.

²New York Polyclinic, 1894, iv, p. 86, quoted by Yates.

depends principally upon a mechanical factor, -- the ability of the involved surfaces to pull themselves or to be pulled loose.

"Drains should be the least irritating, and should be gradually but finally removed as soon as possible.

"Irrigation through drains is futile to prevent adhesions, and dangerous.

"After a drain is inserted, all intra-abdominal movements should be reduced to a minimum.

"As soon as the drain is removed, intra-abdominal activity should be stimulated, to aid in the disappearance of the remaining adhesions.

"Peritonitis, if not too severe, possibly aids in the rapidity of the encapsulation of the drain.

"A drain in the presence of infection is deleterious to peritoneal resistance, and should only be introduced to exclude more malign influences.

"Postural methods, unless destined to facilitate encapsulation, are both futile and harmful, as far as drainage is concerned.

"Peritoneal drainage must be local, and unless there is something to be gained by rendering an area extraperitoneal, or making from such an area a safe path of least resistance leading outside the body, there is, aside from hemostasis, no justification for its use."

Being convinced of the general soundness of these conclusions, particularly so far as they bear on the matter of general drainage of the whole peritoneal cavity, we have attempted by our apparatus to prepare a means (1) to irrigate thoroughly the infected cavity, and (2) to supply through the lymphatics of the peritoneum to the toxic blood a large supply of salt solution, to aid the body to fight and to eliminate toxins.

Clinical Department.

A CASE OF DERMOID CYST OF THE ANTERIOR MEDIASTINUM.

BY WALTER A. GRIFFIN, M.D., SHARON, MASS.

THE following case is interesting because of the rarity of the condition. Morris, of Ann Arbor, being able to find accounts of but 57 cases in the literature.¹

The patient, a boy of fifteen years, was first seen by me Aug. 14, 1905, on recommendation of Dr. Clarice J. Parsons, of Springfield. The following history was obtained. Family history: Father's father died of accident. Father's mother died of cancer of the stomach after an illness which lasted more than a year, and which was characterized by sharp pain in the epigastrium. What other symptoms were present could not be ascertained. Mother's father and mother alive and well. Father and mother of patient also well. Personal history: The patient was never very rugged. When three years old he had "catarrh of the bowels," with attacks of constipation alternating with the passage of much mucus and blood. This condition lasted, off and on, for two or three years. This was the only sickness that had ever amounted to anything. Five years ago there was a little hacking

cough lasting for a short time, and in last two or three years there have been occasional attacks of coughing, but never any sputa. There has never been any fever so far as known and never any pain except about eight months ago, when complaint was made of pain in the chest, but neither patient nor mother could remember which side was affected. It could not have been very severe since the boy's mother had always taken full care of him and had evidently kept close watch of all symptoms. At about the same time that the pain was noticed the patient began to be somewhat short of breath and to have huskiness of the voice. Some two months ago the patient's mother began to notice that the right side of the chest was fuller in appearance than the left, but she had never spoken of this to any one.

The patient looked pale and rather thin. The general musculature was decidedly below par, and when walking there was well-marked stooping. Physical examination was negative except for the chest. There was dullness on the right side beginning at the second rib, the note rapidly becoming flat on going downward and merging with the flatness of the liver. The dullness extended upward under the sternum to the level of the first interspace and merged to the left with the heart dullness. The respiratory sounds were much diminished over this area and tactile fremitus could not be felt. In back, on the contrary, there was good percussion note throughout on the right side except for slight dullness below the angle of the scapula. Here respiration was broncho-vesicular and tactile fremitus was a little increased. A few fine râles could be heard here (the only ones anywhere to be made out). At the top of the chest on both sides the respiratory murmur was exaggerated. The left border of the heart could be made out two finger-breadths outside the nipple line, and the lower border of the liver was just below the costal margin. In the right axilla there was a gland the size of an almond, and in the right side of the neck there were one or two the size of a pea. Urine and blood examinations were negative. At this time the case seemed to be one of encapsulated pleuritic effusion, or else a malignant growth.

A large-sized aspirating needle was introduced in the fifth interspace in the anterior axillary line and with considerable difficulty about two ounces of thick, glairy, dark-green fluid was obtained. This fluid showed nothing characteristic under the microscope and was sterile on culture after twenty-four hours. On the next day the pleural cavity was opened by removal of a portion of the sixth rib in the mid-axilla. By this means a small amount of the same viscid fluid was obtained. On looking into the wound a tense tumor mass was seen on a level with the incision. Into this a trocar was introduced and more fluid was obtained, together with a number of bright yellowish masses varying in size from a pin head to a pea. By enlarging the opening into the cyst the wall was explored with the finger. It was found to be about a quarter inch in thickness and firm of structure. On that part of the wall which was nearest the diaphragm three or four sessile projections could be felt. This was the only wall of the cyst to be made out. A drainage tube was introduced and the operation was terminated.

It did not occur to me or my assistants at this time that we were dealing with a dermoid cyst. Rather it appeared that the case was one of streptothricosis, this idea being suggested by the yellow granules in the discharge. Some of these were crushed under a coverglass, but no

¹ Med. News, Aug. 26, 1905.