

products which may have been present before the routine diet is established.

Early surgical procedures in punctured wounds of the buttocks (Fig. 1), with the missile deeply situated, may often be the means of preventing a possible complication of tetanus and saving life. The important

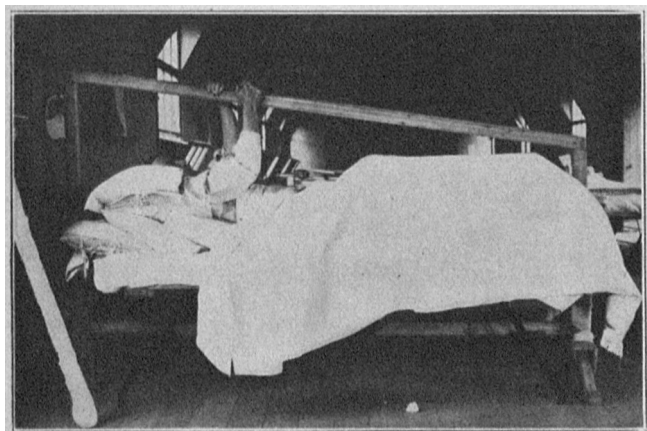


Fig. 7.—Balkan sling, consisting of two uprights, a base bar and a slanting bar. By using this the patient is able to lift himself above the bed, and dressings may be applied or the bedding changed. This device is also of great use in fractures of the femur.

factors here are to remove the missile and infected particles carried in with it, to free the area of pyogenic organisms which use up the oxygen, thereby making it unfavorable for the growth of the anaerobic tetanus bacillus, and lastly to convert the punctured wound to an open one by liberal incisions and gauze-pack drainage. As practically all these wounds are infected and should be treated as such, one should not wait for symptoms, but establish surgical measures as a routine procedure. As a successful lateral Roentgen-ray view of the missile in this region is next to impossible, and as the anteroposterior view locates the missile only in an upward and downward and lateral direction and does not show the depth of it, Roentgen localization of the bullet by one of the various methods is imperative for a skilful removal of the foreign body (Fig. 2).

As a preventive measure against the gas bacillus infection of the buttocks, the foregoing surgical procedure should be adopted. When, however, the gas bacillus infection is really present, more radical steps are necessary. Multiple, long, deep, parallel incisions are made (Fig. 3). These may be united subcutaneously, and gauze drainage connecting the various incisions lifts the skin and fatty tissue from the underlying structures and keeps the edges of the incision apart and renders the field an aerobic rather than an anaerobic medium. Oxygen introduced into the tissues by means of a hollow needle connected to an oxygen tank by a rubber tubing is employed with great success. The Roentgen ray is of considerable assistance in diagnosing the presence of the gas infection and its extent, and will assist the surgeon in determining his surgical procedure.<sup>2</sup>

In the extensively lacerated and deeply situated buttock wounds, involving the rectum and near the rectum (Figs. 4 and 5), an early colostomy should be made. This operation I believe should be done early, preferably at the casualty clearing hospital, which

would correspond to the field hospital in the United States Army, as these patients frequently enter the base hospital in a moribund condition. If the wound is near the rectum, but the rectum itself is not involved, a left inguinal colostomy may be made (Fig. 6). If, on the other hand, the rectum is severely injured, it is preferable to make the colostomy higher up—in the transverse colon in the left hypochondrium.

A convenient appliance for assisting in the care of these buttock patients is the so-called Balkan sling (Fig. 7). This was used extensively during the Balkan war, and is particularly valuable in a hospital in which there is a large amount of work and a scarcity of hands to do it. By using this sling, the patient is able to raise himself above the bed and the nurse or surgeon may apply the dressings with little or no assistance.

122 South Michigan Avenue.

### Clinical Notes, Suggestions, and New Instruments

#### REPORT OF A CASE OF DIAPHRAGMATIC HERNIA \*

GEORGE F. KOEHLER, M.D., PORTLAND, ORE.

A girl, aged 12 years, had an attack of empyema on the left side two years before I saw her, at which time a large quantity of pus was evacuated. She recovered and was doing

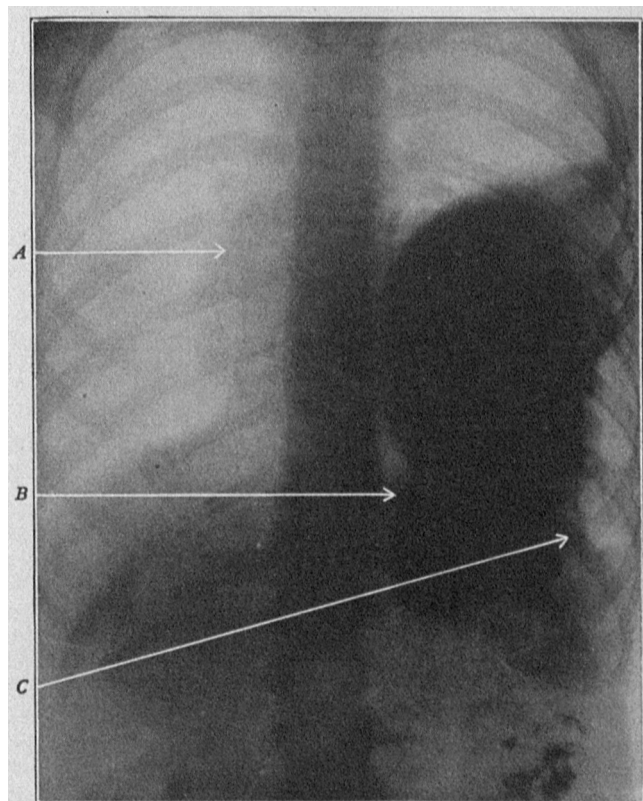


Fig. 1.—Condition before operation. A, Heart; B, esophageal orifice—cardia; C, opening in diaphragm.

well until the early part of February, 1916, when she began to vomit, had epigastric pain with much nausea, and loss of weight. The vomitus was of a coffee ground character, and the stools showed a large amount of occult blood.

2. Davis, G. G.: Roentgen-Ray Diagnosis of Gas and Pus Infections as Complications of Wounds with Deeply Buried Bullets or Shell Fragments, *Surg., Gynec. and Obst.*, 1916, 22, 635.

\* Reported to the Portland City and County Medical Society, Jan. 15, 1917.

I saw her first at this time in consultation with Dr. H. Leonard. The diagnosis of peptic ulcer was made, and the patient put to bed. She improved for a time, but after several weeks all the former symptoms returned, when operation was advised. Dr. Leonard made a posterior gastro-enterostomy after demonstrating peptic ulcer by an incision

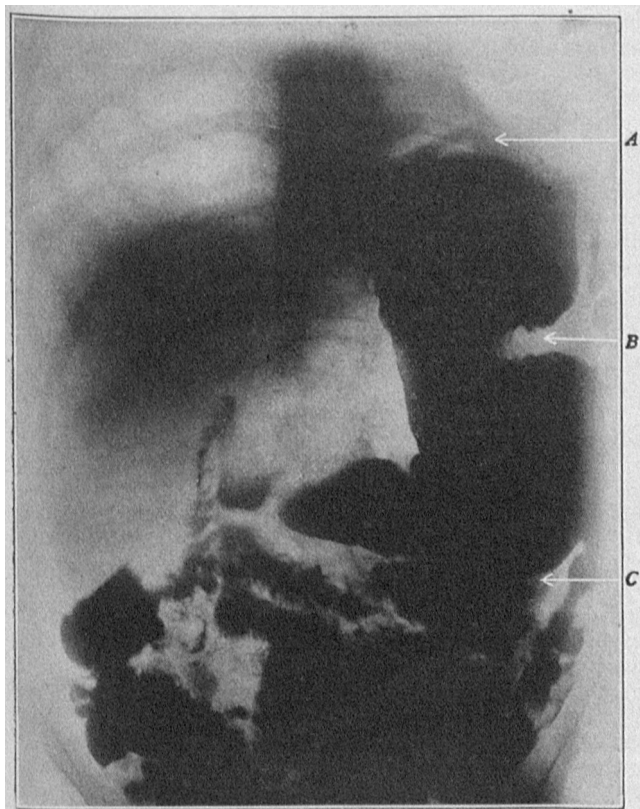


Fig. 2.—Condition after operation. A, Diaphragm; B, point of constriction; C, gastro-enterostomy.

throughout the stomach wall. She made an uneventful recovery, and seemed to be doing nicely until about three months later, when she suddenly began to vomit and have attacks of sharp pain, referred to the epigastric region, radiating into the left chest. She was brought to my office for Roentgen examination, and we were able to make the diagnosis of diaphragmatic hernia.

The accompanying illustrations show the condition before and after operation. The patient was operated on at the Good Samaritan Hospital by Drs. Leonard and Swensson. The stomach (Fig. 1) was almost entirely within the thorax, and was twisted on itself, the pylorus being uppermost and behind. The omentum was pushed in advance of the stomach and adherent to the pericardium. In order to expose the stomach sufficiently, it was necessary to cut through several of the costal cartilages. The stomach and greater part of the omentum were pulled down and replaced within the abdominal cavity. The diaphragm was sutured, and the patient made an excellent recovery, and six weeks after operation had gained 21 pounds in weight.

Stevens Building.

**Ration of the United States Soldier.**—The daily ration of the soldier in the United States Army consists of bread, 18 ounces; butter,  $\frac{1}{2}$  ounce, or jam, 1.28 ounces; potatoes, 20 ounces; bacon, 12 ounces; beans, 24 ounces; lard, 0.64 ounce; salt, 0.64, pepper, 0.04, and vinegar, 0.16 gill; coffee, 1.12 ounces; sugar, 3.2 ounces; evaporated milk, 5 ounces. This ration contains 4,199 calories, and is greatest of any of the armies of the world except Russia, in which the ration is said to contain 4,929 calories. The calories in the French ration are given as 3,340, the British 3,292 and the German 3,147.

## A NEW AND DELICATE METHOD FOR THE DETECTION OF MERCURY

JOSEPH A. ELLIOTT, A.B., M.D., ANN ARBOR, MICH.

Instructor in Dermatology and Syphilology, University of Michigan Medical School

A recent paper on the mode of absorption of mercury in the inunction treatment of syphilis by Dr. Wile and myself<sup>1</sup> was the stimulus in working out a new method for the detection of small amounts of mercury in the various body fluids and secretions.

In beginning this work, I found after considerable experimentation that the ordinary methods that are employed today were either not sensitive enough to detect small quantities of mercury, or that the more sensitive ones were quite complicated and open to various errors in technic. The work was first begun by the adoption of the original Reinsch method, namely, the deposition of mercury on copper wire in an acidulated solution, drying the wire and driving the mercury by heat on gold leaf, as advocated by Vogel and Lee.<sup>2</sup> This method proved satisfactory when a fairly large quantity of mercury was present. It is sensitive, however, to only one-fortieth mg. of mercury in each 50 c.c. of the solution to be tested.

In order to concentrate a known quantity of mercury in solution, methods of heat concentration were tried, as advocated by most methods now in use. In this process, however, it was found that a large proportion of the mercury was lost by volatilization. It was then decided to convert the mercurial salt, presumably a chlorid, in body fluids and secretions, into a less volatile one by the addition of potassium hydroxid, thus converting it into an oxid. By this method we found that the solution could be concentrated by heat with less loss than in an acidulated solution, the loss, however, being sufficient to render the method impracticable.

In practically all of the concentration methods described, the authors used some oxidizing agent, usually potassium chlorate, along with hydrochloric acid to break up the protein material. It has been taken for granted in such cases that the heat plus the acid is not sufficient to dissociate the mercury from the protein material that is normally present. In dealing with urine, we found that the addition of a chlorate was not only unnecessary, but also detrimental, since all of the free chlorin must be driven off, as its presence prevents the mercury from being deposited on the copper. The use, then, of an oxidizing agent was found to be impracticable because a large proportion of mercury was volatilized by the heat necessary to drive off the free chlorin.

After the foregoing experiments, we were convinced that the low point at which mercury is volatilized rendered any form of heat concentration inapplicable, so we again resorted to the so-called cold method. At this time Prof. Hobart H. Willard of the department of chemistry, in whose laboratory most of the work was done, suggested that copper dust be substituted in place of the copper wire, as giving a much greater surface area. Such

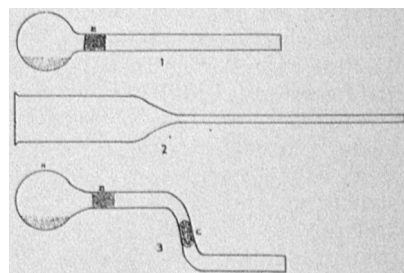


Fig. 1.—Individual pieces of apparatus: 1: A, copper dust and magnesite; B, washed asbestos; 2: funnel; 3: A, copper dust and magnesite; B, washed asbestos; C, gold leaf.

copper dust is easily obtainable from any chemical house or paint manufacturer, as it is used in making bronze paint. This led to the following method, which I have found more delicate than any one heretofore described:

Five hundred c.c. of the fluid to be examined is acidulated with from 10 to 20 c.c. of concentrated hydrochloric acid. This

1. Wile, U. J., and Elliott, J. A.: Mode of Absorption of Mercury in the Inunction Treatment of Syphilis, *THE JOURNAL A. M. A.*, April 7, 1917, p. 1024.  
2. Vogel, K. M., and Lee, O. I.: Detection of Mercury in the Excretions, *THE JOURNAL A. M. A.*, Feb. 14, 1914, p. 532.