its extent. The patient being unable to endure a radical operation a right inguinal ileostomy should undoubtedly have been performed, but having promised before operation not to leave her with an artificial anus under any circumstances, we were compelled to content ourselves with snipping a few adhesions and closing the abdomen.

To our great surprise the patient evidenced remarkable recuperative powers, and although the obstruction was not in the least degree removed, she was still alive at the end of two weeks. At this juncture patient consented to an artificial anus, provided we promised to do a subsequent operation and remove it. Accordingly, Oct. 15, 1904, the second laparotomy was performed and a right inguinal ileostomy established. The incision was made in the line of the preceding one, and a loop of ileum two inches from its termination in the cecum was brought out and suspended on a glass rod by running the same through the mesentery, after the manner of Grieg Smith, and the redundant incision closed. In twenty-four hours the ileum was opened. The relief from suffering was magical, as would have been expected. Recovery was rapid, appetite returned, and patient was given six weeks in which to go home and recuperate. At the end of this time she returned, much increased in weight, looking well, and according to her statement, feeling better than she had in ten years.

A third abdominal section was performed Dec. 28, 1904. Incision was made in the left inguinal region, and the ileum was resected (intra-abdominally) two inches from its termination in the artificial anus. The distal end was inverted and closed by a silk purse string suture. The free proximal end was implanted by Murphy button into the lower end of the descending colon just above its passage over the pelvic brim—the operation constituting technically a left inguinal ileo-colic implantation. It was with some hesitancy that the Murphy button was used in this procedure as the colon was so narrowed and shrunken from years of comparative disuse that it was at first doubtful whether or not the button could ever pass through. It was, however, finally adopted. The bowels moved naturally in forty-eight hours. The patient said this was the first natural and comfortable bowel movement she had had in approximately fifteen years. The button was passed on the twenty-second day. Nothing thenceforth passed through the artificial anus but an occasional drop of mucus, and patient was dismissed for another holiday.

March 31, 1905, she returned in excellent condition, the fourth and last laparotomy was done, the old scar of the first two operations in the right iliac fossa was dissected out, and the abdomen opened. Many old and dense adhesions were broken up and the cecum with the appendix buried in a tumorous mass, the entire ascending colon up to and including a portion of the hepatic flexure and the four inches of ileum leading up to the ileo-cecal juncture constituting the artificial anus all removed in one mass. The distal end of the hepatic flexure was inverted with silk purse-string. The abdomen was closed, and April 28, 1905, the patient was dismissed without obstruction, without tumor, and without artificial anus, and in excellent health and comfort.

Owing to an oversight, the microscopic nature of the tumor was not determined, but from the history of the case, the absence of mesenteric lymphatic involvement, the macroscopic appearance of the growth, together with the subsequent conduct of the case, I believe that there was nothing malignant. I judge it to have been fibrolipoma. Operation, however, was just as essential as if it had been malignant. For a distance of six inches the caliber of the ascending colon through the tumorous mass was reduced to the size of a goose quill.

The case emphasizes the value of intermittent surgery in certain intestinal conditions where there is a neoplasm, stricture, volvulus, or other obstruction to be removed and where the patient's physical condition debars an immediate radical procedure. A quick, clean enterostomy or colostomy in these cases is, indeed, one of the most valuable resources known to surgery. Whether the obstruction be acute or chronic, when the patient's abil-

ity to endure a radical operation has long since vanished, a timely opening of the bowel just above the seat of obstruction is a procedure to which every such victim is most honestly entitled. By this means the patient is immediately given a respite from his suffering and an opportunity to gain sufficient strength for whatever radical operation should be attempted at a later date.

Another point which this case illustrates is the "resisting power" so often evidenced by those who have been invalids for years. There is no doubt that old chronics oft times show a most remarkable ability to withstand the exhausting effect of surgical procedure. The intestine, from long-continued overdistension from gas, has acquired a degree of toleration which is truly astonishing, while from chronic fecal retention there results a degree of acquired immunity from intestinal toxemia which undoubtedly contributes largely to the actual recovery of these cases after operations. These facts should not be lost sight of in estimating the probable termination of any prospective operation on such cases. It must ever be remembered, too, that in *acute* obstructions the effects of gaseous and fecal distention are quite the opposite. In a subject who is accustomed to daily normal bowel movements, the obstructive retention can not but result in a deleterious amount of auto-intoxication, while the sudden, unusual and persistent gaseous distension is sure to induce a degree of intestinal paresis which, even after the relief of the obstruction, may be sufficient to produce death.

Thus it would seem that in chronic cases the intestinal canal is one of the most tolerant of all of the abdominal organs, while in acute conditions, especially acute obstruction, it is one of the most easily damaged.

All intestinal neoplasms should be operated on early, for, whether malignant or benign, the inevitable tendency is toward obstruction. The condition is strictly surgical. Palliative treatment leads only to a lowered vitality and an increasingly difficult operation. In view of the prompt and kindly healing of every portion of the intestinal tract, the operative outlook in regard to this organ is one of the brightest of modern surgery.

A NEW METHOD FOR THE DETERMINATION OF LEAD IN THE URINE.

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In examining two specimens of urine for lead in Prof. Charles S. Williamson's clinic at the College of Physicians and Surgeons, Chicago, I experienced great difficulty in using the different methods, inasmuch as some take too much time, some are not sufficiently sensitive, while others require expensive apparatus. Considering the fact that the amount of lead found in chronic poisoning rarely exceeds 10 mg. per liter, the method must be exceedingly sensitive. The methods heretofore used are that of Fresenius and Babo as described in v. Jaksch "Klinische Diagnostik," and that given by E. E. Putman in Keating's "Clyclopedia of the Diseases of Children." Both of these methods require a great deal of time and considerable chemical training. Two other methods, very simple, but not sufficiently sensitive, are those of v. Jaksch¹ and I. H. Abram.²

An electrolytic method was worked out by S. R. Trotman and F. H. Jacob.³

1. "Klinische Diagnostik."

2. The Lancet, London, ———, 1897.

3. British Medical Journal, ———, 1903.

This method has several advantages and does not consume a great deal of time, but requires an expensive platinum dish and an electric battery, neither of which is apt to be in the possession of the average practitioner. Other metals, if present in the urine, may lead to an erroneous conclusion.

It was my intention to find a method which would be reliable, free from fallacy, sufficiently sensitive, which could be performed by every physician, required but little chemical training, and for which the material could easily be obtained. As the destruction of organic matter is absolutely necessary I found potassium persulphate in sulphuric acid solution the best means for this purpose. Strong sulphuric acid alone does not work satisfactorily and potassium chlorate and hydrochloric acid work too slowly and give off disagreeable fumes of chlorine gas.

Five hundred cubic centimeters of the urine to be examined are placed in a porcelain dish (lead free) or in a sufficiently capacious beaker, and about 70 c.c. of concentrated sulphuric acid (free from metals) are added and the combined amounts are heated over a Bunsen burner. Potassium persulphate is added in small portions to the amount of 20 or 25 grams. The urine which is colored red by the addition of the sulphuric acid is only slightly yellow when boiling starts; the urine, probably cloudy before, almost instantly becomes clear and transparent. It is then evaporated to about half its volume.

Should the solution become cloudy during evaporation a small amount of concentrated sulphuric acid is added and the boiling continued for about ten minutes. A few crystals of potassium persulphate should be added in case the urine darkens again during evaporation, but care should be taken to remove the burner first to prevent the liquid from boiling over. This procedure is only occasionally necessary as the urine generally remains clear, and slightly yellowish. After the urine has evaporated to about 250 c.c. it is allowed to cool and about 250 c.c. alcohol (90 vol. per cent.) is added. It now is allowed to stand about four hours in a cool place; during this time the smallest amount of lead is precipitated as insoluble sulphate. The evaporation of the urine can also be carried on till less than half its volume remains, but an equal volume of the alcohol should always be added.

The solution is then filtered through a quantitative filter, washed with hydrochloric and fluoric acid, and the beaker or dish carefully washed out with alcohol. Washing the filter is only necessary once to remove coloring matter. A clean small beaker, or test tube, is put underneath the funnel, and a small hole is punched through the tip of the filter with a clean glass rod. Everything on the filter is then washed down carefully with distilled water from a wash bottle, care being taken not to get too much fluid. If carefully handled not more than 10 c.c. are required. Care also should be taken to remove all particles left on the small glass rod. If considerably more than 10 c.c. is used the solution can be evaporated again if a quantitative determination is wanted. For qualitative determination it does not matter if a few c.c. more or less of distilled water are present. The solution in the test tube now contains all the lead of the 500 c.c. urine, if such was present, in the form of an insoluble sulphate of lead. The amount is sometimes too small to be observed as a precipitate with the naked eye. It might be only a slight cloudiness, hardly visible. The solution is heated over the Bunsen burner and crystals of sodium acetate are added till the solution appears entirely clear and transparent. After the solution is cleared up it is allowed to cool and hydrogen sulphid gas is passed through it. The slightest yellowish-brown discoloration proves the presence of lead.

The test for lead with hydrogen sulphid gas is one of the most sensitive in analytical chemistry. To prove the limitations of the test I performed several experiments and found that 2 c.c. of a 0.002 per cent. lead acetate solution made up to 10 c.c. with distilled water still gave a very slight yellowish discoloration if the solution is looked at from above. This would correspond to 0.00002 gm. lead. It is preferable to pass the gas also through a test tube containing the same amount of distilled water, inasmuch as a slight discoloration can be easily differentiated by comparing the two solutions

after the gas has been passed through. Five minutes is sufficient for the passage of the gas.

A great advantage of this method is that even if bismuth is present in the urine it will not interfere with this test, neither will any other substance likely to be present. By comparison with artificial lead solutions containing 1 mg., 2 mg., 3 mg., etc., of lead per liter, a simple quantitative colorimetric method can be established (One part lead acetate crystal contains 0.54 parts of lead.)

Sensitive as the reaction is, it takes but little training to perform the described determination most accurately. If 500 c.c. are taken originally the amount of lead found must of course be multiplied by two in order to get parts per liter. In the two specimens mentioned in the first part of this article I was able by this method to detect 5 mg. in one case and 3 mg. in the other.

The advantages I claim for this method are accuracy of the determination, rapidity with which the determination can be made, and simplicity of technic.

New Instrument

A TONSIL SNARE.

J. A. PRATT, M.D.

AURORA, ILL.

In presenting this tonsil snare to the profession I wish to recommend its simplicity, strength, lightness and cheapness.

The instrument consists of three parts: The shaft, with handle, the stylet and the tip. In place of the straight tip the

different size Vedder tips can be used, all of which are easily taken apart and cleaned.

Wire from Nos. 5 to 8 can be used. The instrument weighs four ounces.

After the tonsil is dissected free from the pillars and the loop is passed over it to the base, by a slight pull on the ring in the end of the stylet the loop is drawn tight and the set-screw is twirled down by the finger setting the loop. The tonsil can now be quickly and easily excised.