A METHOD OF CONTINUOUS COLON IRRIGATION.

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AND

A DESCRIPTION OF THE RUBERY HILL TABLE FOR THIS PURPOSE,

BY THE SAME AUTHOR AND

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MANY requests have been received for information concerning the table, and also as to the method for continuous colon irrigation used at this hospital. In the hope that such information may be of general service the following communication is made:

In 1927 Dr. Henry A. Cotton kindly supplied us with a photograph of the table for this purpose which he had installed at the New Jersey State Hospital at Trenton.

As such an apparatus could not be purchased in this country we decided to construct in the hospital workshops a table embodying our own ideas; improvements have since been effected, and the one to be described may be taken as a standard for some years. The principal difference between this and the Trenton table is that the former has two ordinary taps instead of one three-way tap. Each arrangement has advantages.

CONSTRUCTION OF THE TABLE.

The accompanying illustrations show the simplicity of the design of the table, which can be made by the hospital engineer or plumber. The first made here was, excepting the zinc top, constructed of material from the scrap heap, condemned steam tubing, etc. A stand of galvanized wrought iron steam tubing, with teak wood feet, carries a frame of angle iron covered with a sheet-zinc top (Figs. 2, 3 and 4).

The zinc top slopes slightly from the ends and sides to a flanged aperture situated in the right half of the table (Fig. 1). Under this aperture can be fitted a water-closet pan or a removable sanitary receptable.

Attached to the right back leg of the table (Fig. 2) is a slot through which passes the vertical rod carrying the supports for the containers.

The height of the containers is fixed by a milled edge wheel and screw made by Messrs. Charles Winn & Co., of Granville Street, Birmingham, in gun metal, 3s.,

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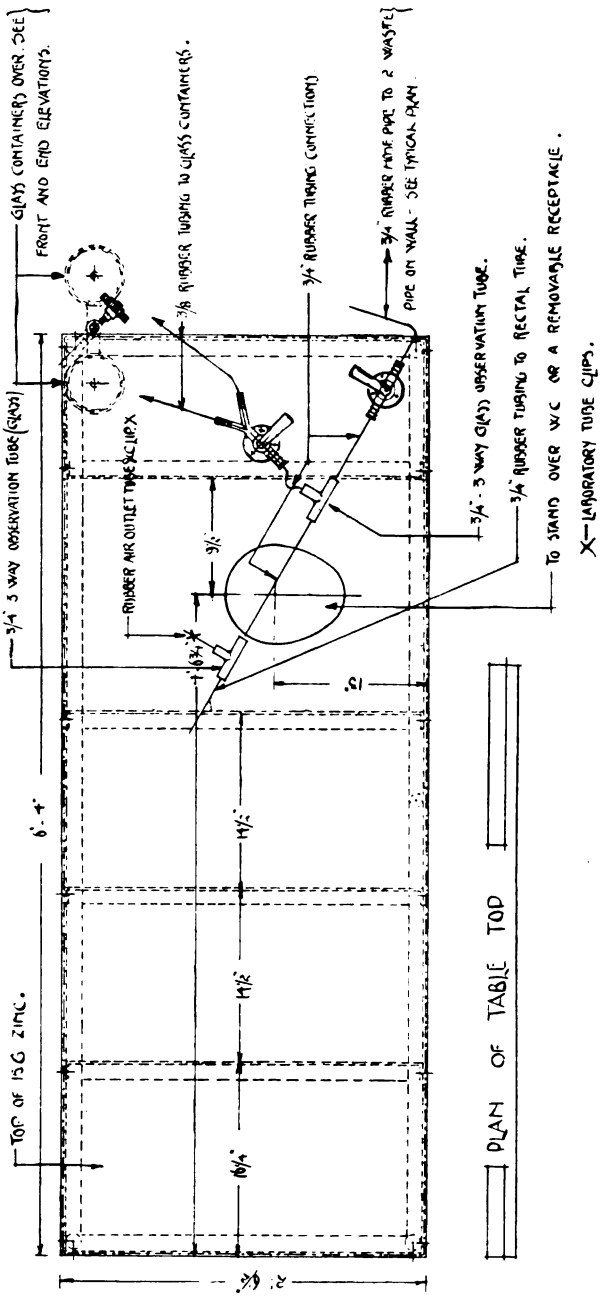


FIG. 1.

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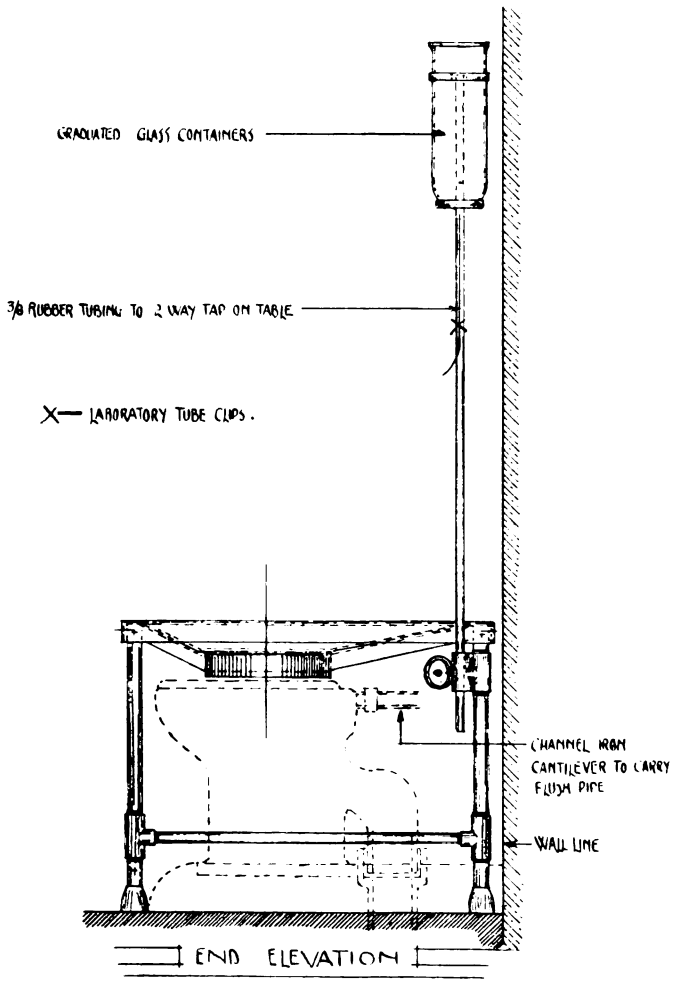


FIG. 2.

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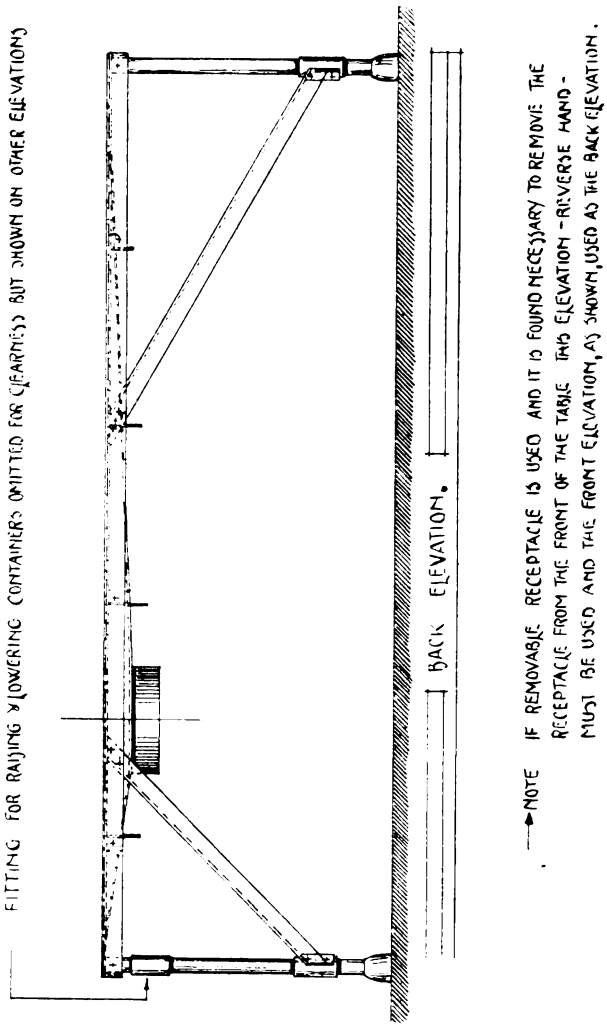


FIG. 3.

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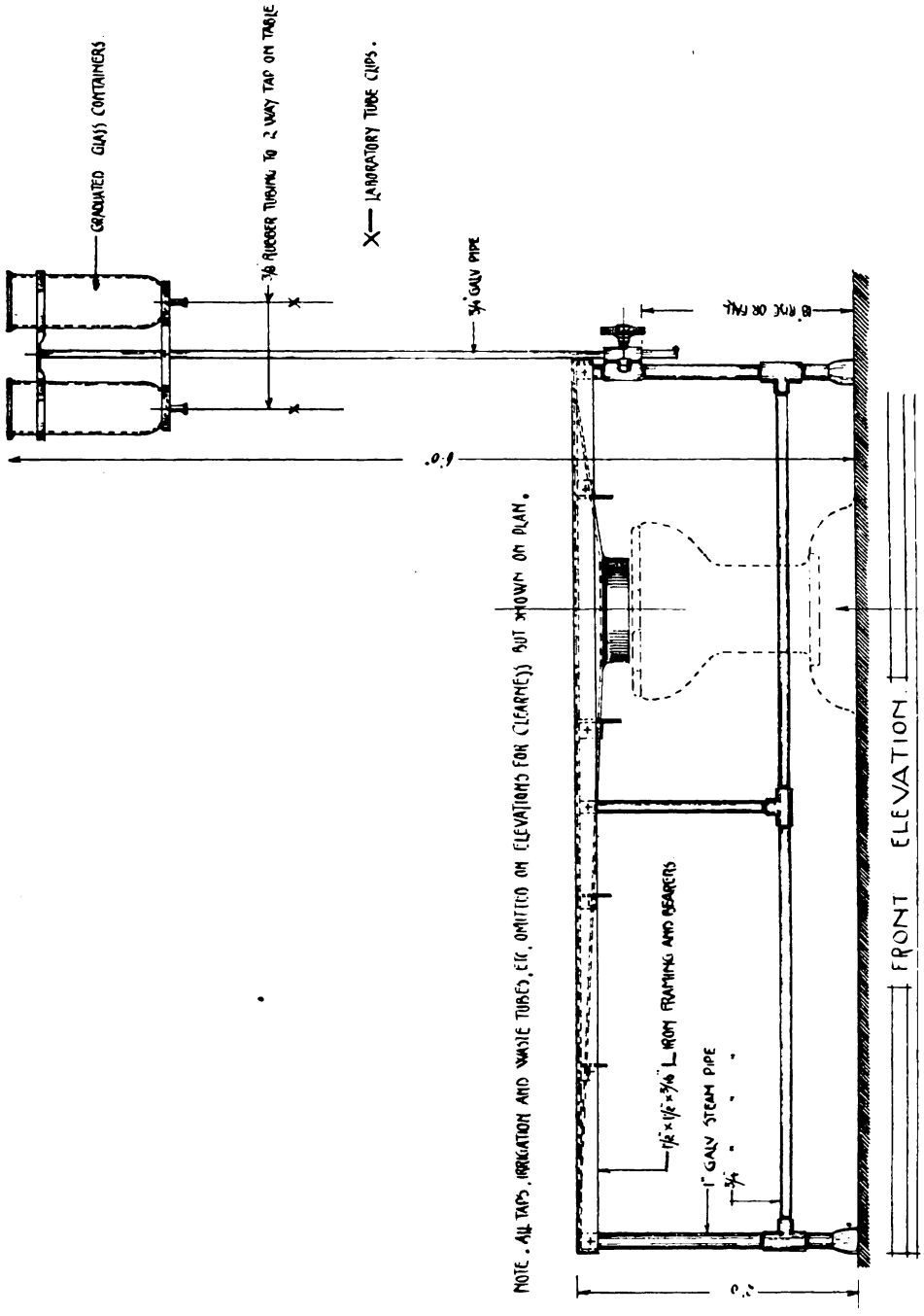


FIG. 4.

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white metal, 3*s*. 6*d*. For greater security two wheels can be used, one above the other.

One or two glass containers may be used as desired (Fig. 4). Where one is used the capacity is five pints. The containers are marked outside by painting lines indicating half-pints. The painting is done by the hospital painter. The containers are supplied by Messrs. Philip Harris & Co., Ltd., of Edmund Street, Birmingham, and they, or Messrs. Baird & Tatlock, of London, supply the glass ⊥-pieces.

Attached to the right end of the table are two ordinary taps, ¾ in. internal diameter, with short tubes bearing external corrugation. Each tap has a base fixed into the table into which is seated by means of a screw the body of the tap.

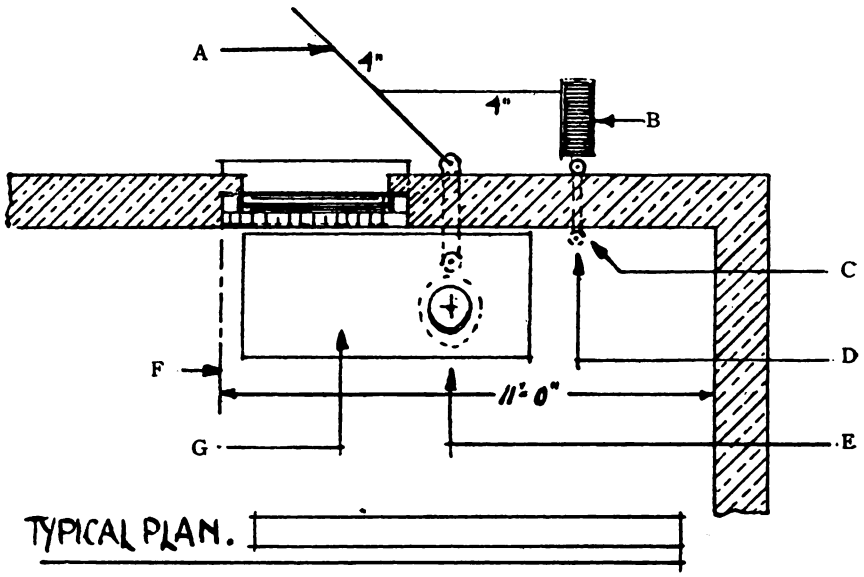


Fig. 5.—A. Connected to soil drain. B. Sykes' disconnecting slipper and trap with 2″ back inlet. C. 2″ waste pipe (9″ above floor with flap) for waste from table. D. ¾″ cold water tap (over waste pipe) with hose connection for flushing trap after use. E. W. C. under table (inserta wood rim seat) flushing cistern over. F. Wall if restricted for space. G. Table in position for use.

This seating enables the tap to be removed for sterilization. As these parts are interchangeable it is advisable to have two or three sets for each table, excluding the bases (Fig. 1).

One tap, fixed at the front right-hand corner, is the sewer tap ; the other a little distance behind it is the container tap. Their setting makes a right angle with the glass piece (Fig. 1).

Depending on whether one or two containers are used the tube of the container tap on the side towards the container rod is single or bifurcated (Fig. 1).

These taps have been supplied by Messrs. Chas. Winn & Co.—gun metal 12*s*. 6*d*., white metal 15*s*. 6*d*. each.

Attached to the right end of the sewer tap is thick rubber hose-pipe, which passes to the waste pipe (see Fig. 5).

This pipe is a short length, of 2 in. internal diameter, sufficient to permit the thick rubber hose-pipe to fit into it easily but not too loosely. This waste pipe,

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fixed in wall or floor, passes to a Sykes' disconnecting slipper and trap, and so to the sewer drains.

A water tap can be fixed above the waste pipe for flushing purposes, or it can be constructed with a funnel end in the room for flushing by means of jugs of water.

If it is decided to instal a water-closet pan under the table, the necessary arrangements and outflow can be linked to that from the waste pipe as in Fig. 5.

However, to limit the expense a removable sanitary receptacle containing disinfectant can be used.

Experience shows that for cases with relaxed sphincters the aperture in the table and a receptacle or pan beneath are necessary. For the same reason padding the surface of the table is not desirable; a loose mattress and pillow, with mackintosh covering, for the patient to lie on is preferable. Such articles can be sterilized. The zinc top can be washed down with disinfectant, and the washings pass down through the aperture into the receptacle. The mattress is placed at the left end of the table and reaches to about 9 in. of the aperture. Turning to Fig. 1, it will be seen that there are two glass pieces, of $\frac{3}{4}$ in. internal diameter throughout, on either side of the aperture in the table. Corrugation or roughening of the outer surface of the ends of these pieces is an advantage. The glass piece to the right of the aperture is connected fairly rigidly by short lengths of pressure rubber tubing to the two taps. The remaining end of this glass piece is connected to the glass piece on the left of the aperture by a longer piece of tubing, enabling this glass piece to be moved freely as may be desired. The first glass piece lies wholly flat on the table; the second is arranged so that its short limb can be placed in the vertical position by standing against a bowl or kidney dish.

To this short limb is attached a short length, 6 in., of pressure tubing, which is controlled by a strong laboratory clip. To the remaining end of this glass piece is attached the rectal rubber tube, also provided with a strong laboratory clip.

We have found that 2 ft. of pressure tubing of $\frac{1}{2}$ in. internal diameter, shaped at the end and with two lateral apertures, serves the purpose of a rectal tube, and is economical and strong. It can be marked at 4, 6 and 9 in. from the nozzle.

Many modifications can doubtless be made in this arrangement of the table as ingenuity and financial resources dictate, but this description fulfils the requirements of economy whilst providing a simple, effective apparatus.

A three-way tap can replace the two taps and the first glass piece, but the two-taps arrangement we employ appears to permit of better control and variation of the inflow from the container.

The first glass piece can be replaced by a similar piece in rubber. It is, however, important to have the second glass piece for observation, liberation of gas from the tubes by release of the clip on its rubber attachment, and for taking off samples of the outflow through the rubber attachment.

Additional modifications are: arrangements for warming the table, as for an operating table—this is a refinement which can be met in other ways; the zinc top may be replaced by more costly material, etc.

The approximate cost of the materials enumerated below is £4 10*s*.

	£	*s*.	*d*.
Steam tubing and fittings to make stand	1	5	0
Angle iron and round iron		7	2
Sheet zinc		12	6
Two taps	1	11	0
Wheel and screw		3	6
Bolts, nuts, screws and solder		3	8
Four teak wood feet		2	0
Paint and enamel		3	0

Add cost of containers, tubing, glass pieces, receptacle or closet-pan, etc. If a succession of patients are to be treated, several sets of rubber tubing and glass pieces should be provided.

Irrigation Room.

The room in which the treatment is given should have adjoining it a water-closet for patients' use before and after irrigation.

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The room should have heating arrangements, *e. g.*, a radiator with a metal shelf above, enabling jugs of prepared saline solution to be kept warm ; a sink and taps with hot and cold water, buckets or a small enamelled bath for disinfection of the rubber and glass tubes. The metal taps are sterilized by boiling.

An adjoining room, or the one provided with a water-closet and furnished with a low bench enables enemata to be given separately from the irrigation room.

Method of Irrigation.

Fluids employed.—The fluid usually employed is the simple saline, a teaspoonful of common salt and half a teaspoonful of sodium bicarbonate to a pint of water at about 100° F. Hydrogen peroxide may be added to this simple saline, an ounce (20 vol.) to the pint, or potassium permanganate, in weak solution, just definitely colouring the water.

Preparation and position of the patient.—After the bowel has been cleared by a soap-and-water enema the patient lies on the left side on the table with knees drawn up. When two or three hundred ounces have been used the patient turns onto the right side without removal of the tube from the rectum.

Filling the apparatus and introduction of the rectal tube.—The essential point in the irrigation is to prevent, as far as possible, the introduction of air into the bowel, and to effect the removal of any bowel gas from the system of tubes as soon as possible. The slow introduction of large quantities of water causes little inconvenience, but pain is experienced when gas is formed in or introduced into the bowel.

The containers are filled with the selected fluid, the sewer tap is closed and the container tap opened. By relaxing the clips air is eliminated from the tubes. The rectal clip is clamped at about 4 in. from the nozzle end of the rectal tube. Some air will inevitably remain in the space between the nozzle end and the clip, and will pass into the bowel when the irrigation commences. The container tap is opened about a quarter of its bore. The nozzle end is lubricated with vaseline and introduced into the anus. When the sphincters have been passed the rectal clip is released ; the rectal tube lying then in its ring, the fluid flows into the rectum, as determined by the extent of the opening of the container tap.

While the fluid is gently flowing in and dilating the rectum the rectal tube can be passed further into the bowel to a distance of about 6 to 9 in.

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The Continuous Irrigation.

The irrigation now commences. Fluid flows in slowly until half a pint to a pint has entered. Then the container tap is closed and the sewer tap opened. Fluid should now flow backwards and bring with it any air which has entered the bowel at the nozzle end. Air or bowel gas thus returning passes along the tubes, and perhaps passes the sewer tap; if it does not it can be trapped in the upright of the rectal ⊥-piece, and is liberated by releasing the clip on the rubber attachment when the pressure is raised in the tubes by opening the container tap. Trapping gas in the tubes is further facilitated by elevating the rectal glass ⊥-piece from the table.

It is important at this commencing stage to make sure of a satisfactory return of fluid and gas. The commonest hindrances are blockage of the nozzle by fæces, or of the openings by mucosa or Houston's valves, gripping of the tube by the contracting rectal wall, or its kinking in the rectum.

To obviate these the tube should be moved up and down or rotated until a satisfactory return flow does occur. If fæces are blocking the tube the patient should be removed from the table and sent to the closet.

When a situation is found at which inflow and outflow are satisfactory, it is desirable to retain it during the subsequent irrigation. When the outflow current has ceased, more fluid is run in by opening the container and closing the sewer taps. The amount run in will depend on the patient. In some cases not more than 10 oz. are tolerated at a time; in other cases two or three pints may be accepted at one inflow.

When the co-operation of the patient can be secured by the use of words, he is instructed to call out "Pain" as soon as he feels discomfort. Instantly, then, the sewer tap is opened and container tap closed. Before the next inflow he is instructed to say "Pain gone."

In those who are unable to co-operate by the use of words the amount of inflow should be restricted and watch kept for any indications of discomfort, such as flexing the toes, ankles, knees or other movements, which experience may show to be characteristic of the individual patient.

The total amount of fluid used will depend on circumstances. At the first of a course of irrigations the amount should be small, say half a gallon, so as to gain the patient's confidence. The usual amount used here is 4 gallons for an irrigation. Ten gallons have

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been administered in some cases without removal of the patient from the table.

The character of the return is noted, especially its rapidity and content.

In some cases the rate of return is very slow, in others it is rapid. The rate of return affords an index of the muscle tone of the bowel.

Slow returns may be noted to increase in rate with improving general health of the patient. The contents will vary, dependent on the state of the bowel. Some may give clear returns consistently. In such cases, after two or three irrigations, unless other reasons obtain, no further irrigations need be given. At the other extreme are cases where masses of thick muco-pus or even pus are seen in the first return.

It is not uncommon to find that the first few returns at a first irrigation are relatively clear, but as the irrigation proceeds, the returns contain increasing amounts of muco-pus, indicating that there is present higher up in the bowel a chronic inflammatory process which has not yet reached the descending colon. Relaxation of the sphincters may be met with, indicative of diminished muscle tone, leading to leakages at the side of the rectal tube. Inability to hold the inflows may also be due to fæces or gas-formation, the latter especially when peroxide or permanganate are used. Small nflows should be used when these agents are employed.

Permanganate and peroxide irrigations should be preceded and followed by a saline irrigation. Diminution in character and amount of muco-pus, in and increased rate of, the outflows indicate an improving state.

Temporary increase in the amount or re-appearance of muco-pus may be associated with the pre-menstrual phase, with non-specific protein treatment or with an exacerbation of a catarrhal state of the mucosæ in the head, "a common cold." Following treatment of a septic state in the head soiled returns become less muco-purulent and eventually clear.

It has been stated that colon irrigation produces or increases a mucous colitis. That cannot be said to be our experience, and it is not improbable that in cases where such an observation is apparently true the explanation is that a septic state higher up the alimentary or respiratory tracts has not been adequately treated. Irrigation should be instantly stopped if blood appears in the returns. Worms have in one or two cases been noted in the outflows.

Removal of the tube.—When it is decided that the irrigation is to be terminated, the outflow currents should be allowed to cease

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gradually; the rectal tube is removed inch by inch. If peristaltic waves re-appear, withdrawal should cease until the currents have stopped. Withdrawal of the nozzle through the anal sphincter should be very gradual. On removal of the tube the patient is sent to the closet. All the tubes are now flushed out with saline and removed from their connections on the table, thoroughly cleansed, immersed for a period in antiseptic and again washed with water before use. Meanwhile another set of tubes is fitted to the table and another patient can be treated.

Care of the Patient in General.

Before, during and after the irrigation the patient should be kept warm, and in winter especially it is desirable that he should go to bed for the remainder of the day after an irrigation. A warm drink after an irrigation is also an advantage. Rectal prolapse and hæmorrhoids, when due only to toxic loss of tone of the sphincters, have been observed to improve after colon irrigation. In such cases, and even when such local conditions do not obtain, the most painful part of the proceedings is the passage of the tube through the anal sphincter. This should be done gradually but firmly. Fearful subjects should be reassured on this matter and on the incidence of leakage from the anus alongside the tube.

Advantages of the Method.

The advantages of this method of mechanical and antiseptic treatment of intestinal toxæmia over the ordinary, non-continuous irrigation are many. In the ordinary method either only a limited amount of fluid can be introduced or the tube has to be inserted several times, and insertion and withdrawal of the tube are the most painful parts of the proceedings, owing to sphincter stretching and recoil.

By the continuous irrigation method large quantities of fluid can be used following one insertion of the tube. Observations of the content and character of the return flow can be made with ease. The quality of the peristaltic waves of the bowel are transmitted along the length of water. Air and gas are easily eliminated and samples of the return are easily obtainable.

Above all, except in those cases where sphincter tone is weak,

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the whole irrigation can be carried out with absolute cleanliness and complete absence of foul odour in the room. The patient is recumbent during the whole of the proceedings, and need not be placed in the vertical position when the bowel is filled with a large quantity of fluid. The quantity eventually used may be large, but the individual inflows can be small and are easily regulated. On the slightest indication of discomfort the sewer tap can be opened, thus releasing the pressure, and the container tap immediately closed.

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