

mer. Whether the 33 per cent. of dental sepsis in this group is significantly in excess of what might be expected in an equal number of unhealthy persons beyond middle life, I am unable to state; but am inclined to believe that it is not.

The condition of the tonsil was noted by careful direct examination and at times culture in forty-eight patients. So far as could be determined by the methods of examination, the tonsils were apparently not the seat of infection in forty-three instances. In five others, positive evidence of chronic infection was secured. The percentage is not high enough to possess great etiologic significance.

The most surprising outcome of the investigation of this series of cases was the result of Wassermann study. The blood Wassermann test was made in thirty-three patients; thirty-two of these gave negative reactions, and but one reacted positively. I confess that I was prepared for a rather different result from the one obtained. The liability of syphilis to produce vascular disease, which is one of its most fixed characteristics, and the increasing importance ascribed to it in the etiology of circulatory disease generally, might reasonably lead one to look for a more important rôle in high blood pressure disease than the results in this series would indicate. I may add as a personal note that since Schottmüller's report of a positive Wassermann reaction in over 40 per cent. of his cardiac cases taken as a whole, irrespective of the lesion, came to my attention, I have made the Wassermann test a routine part of the examination of every patient coming under my observation with circulatory disease, and my experience to date would lead me to believe that in place of syphilis being of such high incidence as claimed by Schottmüller, it is relatively uncommon. The reason for this wide divergence probably lies in the difference of material studied in this country.

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SHOULD THE COLON BE SACRIFICED OR MAY IT BE REFORMED?

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About fifteen years ago, when spending a few weeks in Paris, I learned that Metchnikoff of the Pasteur Institute had announced the discovery that the colon was a useless appendage, a vestige of a primitive state which evolutionary processes had unfortunately failed to eliminate; that the colon bacillus was the germ of old age; that, in general, long lived animals had short colons, and animals with long colons, short lives.

About the same time Mr. Lane began advocating the operation of short circuiting and colectomy. I had an opportunity to witness his operative work and to admire his admirable technic and his genial courtesy. I saw a number of the patients on whom colectomy or short circuiting had been performed. In general, the patients seemed to be greatly benefited, although most of them had been operated on quite recently.

The contention of Metchnikoff that the colon is an objectionable organ which we might do better without because of the absorption of noxious products from the putrefying materials which it harbors, and Mr. Lane's contention that the most effective method of

getting rid of colon germs and poisons would be the removal of the colon itself, seemed plausible. Having spent most of my lifetime in the study of dietetics, however, especially from the standpoint of physiology and biology, the question naturally arose in my mind whether the real cause of the objectionable influence of the colon was to be found in the neglect of Nature to remove a dangerous and useless portion of the anatomy which should have been left behind thousands of years ago in the upward climb of the race, or whether the real fault was to be found in the wrong use to which the colon has been put and the various abuses to which the organ has been subjected through neglect, ignorance and departures from biologic methods of living. The extensive character of the operation and the considerable degree of mortality which attended it led me to the conclusion that a more thoroughgoing trial of all other possible means, especially dietetic measures, should be made before resorting to so formidable a surgical procedure.

That both Metchnikoff and Lane were perfectly right in attributing to the absorption of putrefaction products from the colon a multitude of chronic ailments and morbid conditions is now pretty generally admitted, and these pioneers of medical progress are entitled to great credit for the able and courageous manner in which they defended their fundamental thesis against the bitter attacks of a multitude of ultraconservative and skeptical medical men, internists as well as surgeons.

The question which presented itself to my mind was this: Granted that the colon has "gone wrong" and has become a veritable Pandora's box of human ills, is it not possible that the offending member may be reformed, restored to biologic rectitude and thus cease to be a menace to the vital interests of the body? The thought in my mind was exactly that enunciated by the eminent English anatomist, Keith, in a discussion of the subject of alimentary toxemia by the Royal Society of Medicine, at several meetings during 1912. Said this ablest of living anatomists:

We seem drawn to the conclusion that it is not the organization of the great intestine that has failed, but that our modern dietary sets a task for which it is not adapted. In civilized modern communities the great bowel has to manipulate a dietary such as was never before prescribed to it at any stage of its long evolutionary history. If an engine runs unsatisfactorily it may not be from a fault in its mechanism, but from a defect in the fuel. Those who regard the great bowel as a useless structure blame the engine; for my part I stand by those who blame the fuel.

With this thought in mind I have labored constantly and earnestly during many years to devise and perfect methods for changing the intestinal flora, increasing peristaltic activity and overcoming stasis by removing mechanical obstacles to colon activity without resorting to operative measures having for their purpose either short circuiting or ablation of the colon. I have been much stimulated in my endeavors by the disappointing results of the operation advocated by Mr. Lane. Although cautious surgeons have been from the first slow to adopt these radical procedures, not a few surgeons, especially of the younger class, were apparently pleased to discover a new operative indication, especially when the new procedure was advocated by so eminent an authority as Sir William Arbuthnot Lane. It was not long, however, before the fact began to appear more and more distinctly that a large proportion of the patients who seemed at first to be

bettered by the operation lapsed into conditions as bad as and in some cases even worse than those which existed before the operation was done. It was inevitable that this should be the case. The short circuiting operation did not remove the colon, and hence did not diminish the size of the reservoir in which putrefying fecal matters might accumulate, but converted the colon into a blind sac, thus rendering colonic stasis more certain and the clearance of the colon more difficult; besides, the ileocecal valve was left behind. The lumen of the small intestine and that of the colon were made a single cavity with no barrier against a reflux of fecal matters from the blind end of the colon into the ileum whenever conditions might favor such a retrograde movement, such as overdistention of the colon through delayed evacuation. This difficulty Mr. Lane himself recognized, and sought to find a remedy in removal of the greater part of the colon, although the descending colon and often a portion of the transverse colon were still left behind.

The reduction in the size of the colon did not, however, remove the difficulty to any considerable degree, for the lack of a barrier against reflux at the new ileocolic junction permitted the fecal matter accumulating in the shortened colon to back up into the small intestine with the greatest facility, causing distention and intense toxemia. I witnessed an operation in one case of this sort by Mr. Lane three years after the first operation had been done. The second operation was made necessary by obstruction which developed at the sixth month of pregnancy. The ileum had been stretched until it was nearly as large as the colon for a distance of several feet from the ileocolic junction. The ultimate effect of this operation had been to add to the already overstretched colon an additional fecal reservoir so extensive that instead of 5 or 6 feet of colon the patient now possessed a fecal reservoir not less than 15 feet long.

Systematic Roentgen-ray examinations made by Case have shown that reflux of fecal material after short circuiting and colectomy is not an exceptional circumstance but is the regular rule. Case has examined about fifty cases at different intervals after one or the other of these operations had been performed, and has found the ileocolic junction incompetent in every one; in other words, neither the operation of short circuiting nor the operation of colectomy as performed by Lane permanently cures ileac stasis. Both these operations, on the contrary, by making a common cavity of the ileum and the colon, create a condition from which ileac stasis must almost certainly result. For a short time after the operation the tone of the small intestine may be sufficient in some cases to resist the reflux of fecal matters from the colon; but sooner or later, the small intestine becomes exhausted by the continual effort required of it, its lumen becomes increased, and several feet of ileum may be thus converted into a fecal reservoir, a purpose which it is poorly qualified to serve because of the active absorption which takes place from its villous surface.

It is no wonder, then, that these patients not infrequently find themselves a few months after the operation in a condition more deplorable than that which at first existed. I do not wish to be understood as maintaining that there are no conditions in which the operation of partial colectomy is indicated as a rational procedure. In cases in which the proximal colon or terminal ileum is the seat of extensive malignant or tuberculous disease, and in some cases in which the

proximal colon has been irreparably crippled by acute or chronic inflammatory processes, partial colectomy is certainly indicated; but in restoring the continuity of the intestine, the ileum should be joined close to the proximal end of the distal colon so that there shall be left no blind end in which feces may accumulate. It is also essential that the new ileocolic junction shall be protected by constructing a check valve so that reflux of fecal matters and consequent ileac stasis may be prevented.

I am confident, however, that cases in which colectomy is actually required are comparatively rare, provided the patient is given the benefit of rational non-surgical treatment and, if necessary, supplemented by surgical procedures of a nonmutilating and far less drastic character. The short circuiting operation is, in my opinion, not based on sound surgical principles, and involves disadvantages which forbid its use in any except rare and exceptional conditions.

In my experience, nine out of ten, or even a larger proportion of patients suffering from severe stasis involving the large or small intestine, or both, may be made well and maintained in good health by the thoroughgoing and persevering application of measures of treatment which wholly exclude surgical procedures of any sort. This statement is based on the successful treatment of several thousand cases of chronic intestinal stasis which had stubbornly resisted all ordinary measures of treatment. A few weeks is usually sufficient to bring the patient to a state of improvement in which two or three natural evacuations occur daily, and to establish a regimen, by the following of which the patient may maintain his improvement indefinitely. This, of course, must be accomplished without the use of laxative drugs and mainly by dietetic measures.

In a few cases in which stasis is due to pronounced mechanical obstruction, comparatively slight surgical procedures will accomplish all that is necessary to render the dietetic and other measures above referred to effective. In by far the majority of cases in which non-surgical measures fail, the seat of difficulty will be found to be a prolapsed and adherent or incarcerated pelvic colon. As pointed out by Case in numerous papers, adhesions may be readily shown when present by a Roentgen examination. The operative measure required is a simple one. It is only necessary to break up the adhesions by careful dissection and to prevent recurrence of the difficulty by attaching the pelvic colon to the omentum, which is in turn made fast to the abdominal wall at a point near the umbilicus. By this procedure the pelvic colon is suspended by a swinging attachment which does not interfere in the slightest degree with the movements of the intestine and does not give rise to the pain from which patients usually suffer when the intestine is attached directly to the abdominal wall.

Another operation which is occasionally but less frequently indicated is repair of the incompetent ileocecal valve. This condition, however, is practically always secondary, and is rarely found except when associated with a prolapsed and adherent or incarcerated colon or a spastic condition of the distal colon. The operation for repair of the ileocecal valve is a simple procedure and not accompanied by greater risk than the operation of appendectomy.

Within the last ten years I have performed the operation of colectomy in twenty cases.

The indications for the operation in the several cases were as follows:

In seven cases, cancer of the cecum or ascending colon with obstruction.

In one case, tuberculosis of the cecum and terminal ileum with obstructions.

In one case, gangrenous colitis of the entire colon.

In four cases, extreme colonic stasis, the result of short circuiting operations previously done elsewhere.

In seven cases, intractable stasis due to so-called Jackson's membrane or adhesions.

These twenty cases have been selected from more than 40,000 cases which have been treated in the Battle Creek Sanitarium clinic during the last ten years, or less than one in 2,000. Most of these patients have been found to be suffering from intestinal stasis, but they were relieved by nonsurgical means, or by simple restorative surgical procedures.

The nonsurgical means which I have found most effective in relieving intestinal stasis are the following:

1. A low protein, bulky diet consisting largely of fruits, fresh vegetables and whole grain preparations.

2. The free use of bran or agar-agar, or a combination of both, at every meal. From one half ounce to an ounce of cellulose daily seems to be necessary to stimulate the bowels to normal activity.

3. The use at every meal of half an ounce to an ounce and a half of liquid petrolatum. In some cases an emulsion of liquid petrolatum gives more satisfactory results, and the best results are often obtained from the use of petrolatum (which melts at the temperature of the body).

4. Abdominal massage and special exercises for developing the abdominal muscles.

5. In very obstinate cases the patient takes, three or four times a day, a couple of tablespoonfuls of bran and as much fruit as he can eat. Fresh and stewed tomatoes are found to be especially useful. Lettuce and celery may also be used freely. The patient is allowed to take fruit between meals or whenever he feels inclined to do so. For persons suffering from hyperacidity, nonacid fruits, like bananas, pears, white cherries and melons, are used. Occasionally it is found advantageous to make the diet consist wholly of green vegetables, raw and cooked, with bran or agar-agar. This regimen will usually clean off the tongue and get the bowels moving three or four times a day within four or five days. Occasionally the regimen must be continued for a week or ten days. When mechanical obstacles to bowel action, such as prolapse of the pelvic colon and adhesions or other obstructive lesions, are not present, this method will very rarely fail.

6. At first it is occasionally necessary to use an enema at 80 F. once a day. The patient should be required to go to stool on rising in the morning and after each meal.

7. In cases of colitis with a spastic condition of the descending and pelvic colon, the colon is treated by means of hot saline enemas, and afterward there is introduced into the colon, with the patient in the knee-chest position, several ounces of a liquid culture of *Bacillus bulgaricus* and *Bacillus bifidus*, to which is added a small amount of malt sugar and boiled starch, the purpose being to change the character of the bacteria growing in the colon and thus encourage the healing of the infected mucous surface.

8. In cases in which the lower colon has lost its normal sensibility, various stimulating applications are made, among the most useful of which the electricity applied to the upper part of the rectum or pel-

vic colon by a bipole electrode; very weak solution of hydrogen peroxid (0.25 per cent.); solution of citric acid (from 0.25 to 0.5 per cent.), and a mixture of equal parts of carbon dioxide and pure oxygen gas (from 200 to 500 cm.).

9. In cases in which the mucous membrane is atrophied as the result of chronic proctitis, it is found very advantageous to introduce into the lower colon at night 3 or 4 ounces of a preparation of petrolatum which melts at the temperature of the body. Such a preparation may be made by melting together equal parts of liquid petrolatum and paraffin.

10. The wet girdle worn at night and a variety of other hydiatic procedures are also found highly useful in dealing with stubborn cases of constipation.

Too much cannot be said in favor of bran and liquid petrolatum used in combination. One supplies bulk, which is necessary to stimulate the sluggish colon, and the other furnishes lubrication which is required on account of loss of the normal mucus due to degeneration of the mucous membrane which results from chronic infection.

The last ten years will be known in medical history as the colectomy era. The introduction of the Roentgen ray has opened the way for exploration of the colon, as well as the stomach and other viscera. The time has come to call a halt on colectomizing and short circuiting operations. Many hundreds of stomachs and colons have been "fixed," "pleated," "suspended," "short circuited," "resected," etc., in many cases only because the Roentgen ray showed prolapse or "kinks," or "folds," or suspicious shadows of some sort. Larger experience is making clear the danger of too much intermeddling with Nature's cunningly contrived and delicately constructed mechanism. The Roentgen ray has demonstrated that prolapse of the stomach and colon are not indications for surgical intervention. Lane's kink is definitely proved to be a consequence of intestinal stasis and not the cause of this condition. The movable cecum is not a pathologic state but a condition essential to the physiologic functioning of the colon.

Except in cases in which actual and severe mechanical obstruction exists, surgery is not indicated. By the liberal use of bran and liquid petrolatum in conjunction, not in succession, and the skilful use of a "fruit regimen" followed by a properly regulated low protein dietary, practically all cases of intestinal stasis may be cured, excepting only the rare cases in which Roentgen examination shows actual mechanical hindrance.

I am convinced that the sober second thought of experienced surgeons, by which the value of every new surgical procedure must sooner or later be determined, will demand such modifications of the Lane operations, short circuiting and colectomy, as will relieve them of their most objectionable features and will restrict the use of these surgical measures to extremely rare and exceptional cases.

Untrained Health Officers.—Here is a place where the trained officer shows his value. An untrained man cannot initiate, cannot lead. He will follow and copy. He is likely to be forced by well-meaning people outside the department to give undue prominence to things not at all of first importance—to "swat-the-fly" campaigns, fights on food adulteration and white-washing dairy barns, instead of attending to such unexciting features as birth registration, sewage disposal and a pure water supply.—Alice Hamilton, *Survey*, Jan. 20, 1917.