to my inquiry as to his condition his wife said, "You have made a new man of him."

Although gastroplication has, by very high authorities, been condemned I still practice it, and I believe with good advantage. I am convinced that it adds to the rapidity with which after fixation the stomach regains its tone. The distension of any hollow organ for a long time, whether it be the stomach, the heart or the bladder, weakens its musculature. A hyperdistended bladder from obstruction may never regain its tone after the primary cause has been removed. By reducing the size of the stomach, even moderately, its motor function is facilitated and its work actually reduced in proportion to the reduced capacity of the stomach.

The procedures for fixing the stomach vary. The shortening of the gastrohepatic omentum, the operation of Beyea, has never impressed me favorably, since the function of this omentum as a suspensory ligament is negligible except so far as its right and left borders are concerned. It is only fair to state, however, that with many this is the operation of choice, and Beyea two years ago reported on 26 cases, with only two failures. Gastroenterostomy has also been performed for the relief of the dilatation, but has little to recommend it. Indeed, many of the failures of this operation can, I think, be attributed to its having been performed where ulcer was suspected, when the primary condition was a sagging of the stomach. In my judgment, then, the proper procedure for lifting the stomach, and with it in most cases the colon, is omentopexy with the details of technic to which I have already alluded. While I do not believe that the stomach should ever be directly fixed to the abdominal wall, I would consider this paper incomplete without alluding to the very large experience of Rovsing, who three years ago in *Volksman's Sammlungen* and again before the International Surgical Congress reported on over 75 cases with most remarkable results. In a recent conversation with me Rovsing stated that he had performed this operation over 150 times and that he had collected nearly 100 operations by his colleagues in Denmark. His operation consists of passing three sutures through nearly the entire thickness of the wall of the stomach, and passing them through the entire thickness of the abdominal wall.

In conclusion I beg to submit the following theses summarizing my views on the operative treatment of gastroenteroptosis.

(1) Every case of visceral sagging should be studied individually, and should not be treated in a routine way, whether conservatively or by operation.

(2) If after the removal of the normal or nearly normal appendix the patient continues to suffer, he should not be lightly classed among the hopeless neurotics. It is probable that the surgeon has overlooked some visceral displacements or adhesions which are the cause of the suffering.

(3) A small incision in abdominal work of the kind under consideration has signal disadvantages.

(4) The conclusion of the internists based on laboratory findings as, for example, after ingestion of a test meal, cannot be made the basis of the functional capacity of the stomach under everyday conditions.

(5) In many seemingly hopeless cases of gastroenteroptosis with marked neurasthenic symptoms operation promises relief. If this is the result of suggestion it is none the less valuable if the relief is permanent.

(6) While, of course, internal treatment, abdominal supports and postural treatment should be tried, operative interference should not be unnecessarily delayed lest the habitus nervosus becomes too deep-rooted to be eradicated.

(7) No gastropototic patient should be operated on unless some actual functional disturbance can be demonstrated. To relieve this must be the aim of the operation.

(8) Given a visceroptosis in which we can demonstrate distinct functional incompetence or deviations the existence of nervous phenomena does not militate against operation but may be the chief reason for performing it.

MEDICAL ASPECT OF INTESTINAL ADHESION AND PTOSSES.*

BY JAMES MARSH JACKSON, M.D., BOSTON.

In discussing the subject of adhesions, so far as they affect the intestinal tract, I can mention in the short time at my disposal only the most important points as they have presented themselves to me after a long and careful study of the subject both clinically and surgically; and one cannot discuss adhesions without also mentioning ptoses of the colon, for the one rarely occurs without the other.

In regard to the cause of the adhesions, most of my cases have been due to old appendicitis and peritonitis. In many of these cases there was no knowledge on the part of the patient of ever having had peritonitis, and yet at operation it was definitely shown that the original source of trouble was without doubt the appendix. In one case the peritonitis occurred at 13 years of age, but no symptoms of any trouble from adhesions appeared until after 60. This long lapse of time between cause and result is a very important point and has obtained in a considerable number of my cases.

Adhesions may be in the form of a membrane cementing, or rather binding, the coils of intestine together and to other organs or to the abdominal wall, or they may occur as bands, which may in time (possibly many years) cause kinks, as described by Lane, or partial or total obstruction.

* Read at the meeting of The Massachusetts Medical Society, June 11, 1912.

Now what are we to look for as our guide posts in such cases?

First is chronic constipation. This is relieved to some extent by diet, but we find drugs very necessary if regularity is to be established. The intestines have to be forced to do extra work in order to overcome the extra resistance which becomes more and more marked as time goes on, until we reach a time when the bowel tires out, and then comes atony or rather a debility of the bowel and the case becomes extremely obstinate. We must then resort to operation, and when this time comes we find an extensive freeing of the adhesions is necessary.

This explains many cases of chronic constipation, and consequent toxemia from absorption, as evidenced by frequent attacks of migraine and sick headache which we attribute to "torpid liver," hereditary sluggishness of the bowels and other such evasive diagnoses.

And now comes the most important part of my talk and the part that I wish to lay particular stress upon, namely, colitis, as an important symptom of adhesions. From my studies of the last three years I am ready to say that I do not believe there is any such thing as hysterical colitis. This may seem very radical, but in my last twenty-five cases of colitis which have been diagnosed as nervous or hysterical by competent observers the true cause was found to be adhesions.

Case 10.—A woman of 40 who had always been well and strong except for puerperal fever when 30 years old became involved in a very disagreeable law suit. Within a short time she began to complain of severe abdominal pains coming in attacks every few days. The pain usually lasted for several hours and ended with the discharge of clear mucus. This condition persisted for about six months and practically disappeared with the clearing up of her domestic troubles.

Several months later she began to have a feeling of general discomfort in the abdomen and a tendency to constipation. Mucus appeared again in the movements, stringy in character, and occasionally in the form of a cast. In spite of all treatment she grew gradually worse until finally operation became necessary. A large number of adhesions were found, especially in the region of the cecum and transverse colon.

Since the operation conditions have been much improved but the colon has never entirely regained its tone. The nervous strain under which she labored at first undoubtedly had a great deal of influence in bringing on her colitis, but my contention is that this would never have occurred had it not been for the partial obstruction of the bowel due to adhesions.

This is only one example of many and I beg all of you to consider this before you make your next diagnosis of hysterical colitis. The textbooks have called this ailment "mucous colic," "membranous" or "mucous diarrhea," "nervous colitis," and by many other names and

have advised alkaline laxatives, olive oil, diets ranging from nothing but hot milk to bran bread and coarse vegetables, massage, irrigations and innumerable other things. In a certain number of cases these methods of treatment have been successful but in a great many instances the trouble is due to definite pathological conditions of the intestine causing various degrees of obstruction, and it is to these cases that I wish to call your attention particularly, since by definite surgical measures the trouble can be corrected.

Diarrhea has been subdivided into various groups, but clinically the fine distinctions of duodenitis, jejunitis, ileitis, colitis and proctitis cannot always be made, and we must be content with a division into catarrh of the large and catarrh of the small intestine. Naturally these two conditions often coexist, but one will usually predominate and it is the involvement of the large intestine that I shall consider especially.

We may pass over in a few words the various theories of the etiology of mucous colitis. Nothing held from the beginning that it was a secretory neurosis without local lesions and that it was dependent on a neurasthenic condition of the patient, and many have shared his opinion. On the other hand good observers hold that the condition is a primary disease with definite lesions in or around the colon. Furthermore, if the former assumption were true we should expect to find many cases among persons afflicted with nervous disorders, but my inquiries at several hospitals for the insane have proved that this is not the case.

From personal observation I can say that one meets many difficulties in coming to a conclusion. My experience leads me to believe that while there can be no doubt that periodical membranous dejections are frequently observed in neurasthenic and hysterical women, yet—and this is the distinguishing characteristic—they scarcely ever occur without simultaneous habitual constipation. When the constipation is well marked mucous colitis occurs and it ceases only when the constipation is corrected.

With the greater attention now being devoted to this condition, and the improved methods of diagnosis, such as the x-ray used after ingestion or rectal injection of bismuth, and the scholarly researches of Cannon on intestinal action, we have recently learned a great many new facts regarding the bowels. With this valuable information at our disposal we are now able to understand and therefore to cure cases that a few years ago we should have been obliged to go at blindly. Now we are often able to recognize, and by surgery to relieve, anatomical abnormalities, either congenital or acquired, which are causing the trouble.

Mucous colitis is seen most commonly in women between the ages of 25 and 40, though it is by no means confined to that sex or to those age limits. As may be judged from its name the

most characteristic symptom is the presence in the stools of mucus in varying amounts. The mucus may be thin and glairy, or of a heavier consistency and nearly white, and may even closely simulate a membrane whence the name "membranous colitis" that is so often heard. At the same time chronic constipation of a severe character is always present.

We next come to cases of stasis. The diagnosis of these cases is always "intestinal indigestion," etc., but if you will take the trouble to have x-ray plates taken you will find that digestion is impeded by actual obstruction to some degree or lack of tonicity of stomach or intestine. With the new controls at one's command there is no need of working in the dark and groping about with idiopathic diagnoses to explain what is now a most apparent condition.

In typical cases of stasis we always find a definite group of symptoms. Following a period of constipation with more or less attendant indigestion, anorexia, hyperacidity, bloating and feeling of pressure, all of which grow steadily more severe, the patient begins to have abdominal pain which may be described as dull and dragging or colicky or merely a constant sense of discomfort, relieved only by lying down. It is usually worse when standing or walking or riding in a train or automobile. The colicky attacks may come on without apparent reason, and may or may not be accompanied by nausea and occasionally by vomiting, even of the most marked propulsive type. Distension is usually present, and may come on with great suddenness and severity. These attacks are relieved by morphia and belladonna, high enemata and cathartics, and are followed immediately by a copious discharge of mucus,—even as much as a quart at one defecation,—and in smaller quantities usually for several days. Following this "clearing out" the patient is apparently well for a time varying from days to weeks, when the cycle begins over again.

The severe acute attacks may simulate an acute intestinal obstruction, with increased peristalsis, violent pain, nausea, vomiting, anxious fancies and at times a small pulse, but there is *rarely* the prostration which we find in that condition, and furthermore the obstruction can be relieved by the measures which I have mentioned.

All these phenomena are brought about by intestinal stasis or, as I prefer to call it, "delayed traffic," which at times reaches an actual stop, with a resulting "smash-up." The passage of fecal matter through the colon being impeded by atony, kinks, adhesions or constriction bands, the colon fills up more and more, and we can readily understand the dragging pain, the headache, anorexia and distension that follow as a result of the fecal accumulation and the resulting auto-intoxication.

The location of the pain may vary with the situation of the "block." For instance, when there is obstruction at the splenic fixture the pa-

tient usually complains of griping pain in the region of the left upper quadrant, particularly when standing. If the cecum and ascending colon are particularly affected the pain is on the right side or even in the pelvis, which may in women give rise to the assumption of uterine malpositions, or of pelvic adhesions.

The elongated cecum, or even the most dependent part of a greatly elongated transverse colon, may occupy the true pelvis, giving rise to a dull heavy pain or feeling of weight in that region and in the region of the sacro-iliac joints. On account of pressure on the rectum these sensations are much increased on defecation, the patient feeling as if there were a mass in the bowel which cannot be moved. Furthermore, straining at stool merely increases the trouble, the abdominal muscles driving the large, engorged and perhaps inflamed bowel deeper into the pelvis.¹

On evacuating a long-blocked-up colon in one of these cases, we not rarely find in the overpowering stench evidence of the putrefaction that has been going on, and so we are not surprised to find the group of symptoms of toxemia from absorption that we frequently see. Lack of energy, progressive loss of weight, and increasing staining of the skin are the most noticeable features of this poisoning. The skin becomes thin, wrinkled, abnormally dark and "muddy" and the patient is said to look "bilious." At first this is a transitory condition, passing off with free purgation, but after a time it persists. The discoloration appears early, and is very marked in dark persons, and in such instances we may, together with certain of the symptoms, sometimes feel justified in making a diagnosis of Addison's disease. Besides the general "dirtiness" of the skin, we find areas of greatly increased pigmentation at the axillary and elbow folds, the eyelids, the groins, the labia and the inner surface of the thigh and in regions that are exposed to friction or pressure, as around the waist in corset-wearers and over the iliac crests and spines.

Another and almost constant symptom of the auto-intoxication is the marked mental depression and depreciation. The patients show all grades of neurasthenia, some becoming the typical "neurasthenic wreck," unable to concentrate the attention on anything, querulous, and a burden to themselves and everybody else. As the neurasthenia may appear before any identifiable symptoms of colitis are evident the colitis has been erroneously thought by some to be the result of the nervous condition, and thus the disease has received the opprobrious name of "hysterical colitis."

There is often noticeable about these patients, especially when the traffic is particularly delayed or a block has taken place, an unmistakable odor, hard to describe but suggestive of filth and similar to that noticeable in epileptics during a seizure.

Arthritis of varying grades from a slight

"rheumatic tendency" to the severest incapacitating variety is seen not infrequently in these cases as a result of the auto-intoxication, and is relieved by restoring the proper functions of the bowels. Furthermore, the toxemia may be shown as an irritation of the kidney, with slight traces of albumin, and renal casts in the urine.

The ptoses of the cecum, transverse colon and sigmoid are all characterized by similar symptoms due to their weight and abnormal positions and to partial obstruction. In prolapse of the cecum a kink is sometimes formed in the ileum near the ileocecal valve. As this dams back the contents of the ileum fermentation takes place there and the entire small intestine may become distended with gas, producing discomfort, distress or severe pain. The tenderness in these patients is quite characteristic. It extends from the umbilicus downward and slightly to the right and is easily distinguished from the tenderness over an inflamed appendix. The pain, too, varies with the time of day, being worse when the abdominal wall is fatigued and lax, and increasing usually after the ingestion of food. It is also increased by any movement that brings a strain on the affected region, such as riding, running and going up and down stairs.

When the sigmoid is at fault, either through dilatation and stretching, or adhesions or constriction bands, it is often very tender on pressure and can be felt through the abdominal wall. If it is adherent or constricted the passage of feces through it may cause severe pain, and not infrequently it is this pain that brings the patient to the physician.

The embryology of the large intestine gives us some clue to certain abnormalities which we find. At birth the hepatic flexure is not yet formed, for the cecum lies in the right hypochondrium. It later descends and this descent may be too slight or too great. In the latter case it may go even into the true pelvis, thereby forming a reservoir hard to empty. If it reaches Douglas' cul-de-sac it may give rise to the pressure symptoms of which I have spoken, and also it is very apt to become kinked, causing acute symptoms. Again, during this descent of the cecum in infancy, the appendix or lower end of the cecum may become adherent to the posterior abdominal wall, giving rise to a retrocecal appendix and kinks in the cecum. If a cecal kink occurs in this way we are not unlikely to get a familiar group of symptoms, pain in the appendiceal region from distension of the appendix, together with headache, nausea, vomiting and general malaise from the attendant delay in the colonic traffic, of which the distended appendix is merely one element.

Furthermore the colon shows great variations in length, particularly in the transverse portion. Treves found that it varied from 12 to 33 inches and in one-quarter of the cases he found that its most dependent part lay below the level of the iliac crests.² A festooned colon such as this must necessarily be sluggish in action, particu-

larly in the presence of exaggerated hepatic and splenic angles which are very often found. These kinks obstruct the progress of the feces and thus harmful stasis and fermentation take place.

The sigmoid also is very variable, as its length has been found to run from 7 to 27 inches.³ An abnormally redundant sigmoid found together with sufficient symptoms is an indication for resection, but a long sigmoid without symptoms does not demand surgical interference.

Bands about the cecum may occur as a result of prolapse of that organ through the pull on strands in the peritoneum which attaches the cecum to the parietal wall, and at times these may make furrows in the cecum or even bring about kinks in it and the appendix.

Where the descending limb of the transverse colon comes in contact with the ascending colon and cecum adhesions arising from the inflammation following the fecal stasis at the kink may unite them directly to one another. This may also occur on the other side of the abdomen, between the ascending limb of the transverse colon and the descending colon. This already great obstruction to traffic becomes increased by the accumulation of feces in the transverse colon which drags it down and accentuates the kinks.

As regards the etiology of the inflammatory adhesions a single band is usually the result of some local inflammatory lesion, such as an ulcer of the colon, inflamed glands, perigastritis over a gastric ulcer, or inflammation around an appendix or a gall-bladder or a diverticulum. All these things with more widespread peritonitis may cause multiple adhesions and bands, as may also perityphlitis in typhoid, or pelvic inflammation. An inflamed appendix may be so long as to form adhesions between itself and other portions of the colon, most frequently the sigmoid. Extensive adhesions may usually be traced back to a general peritonitis, but there are cases in which there is no satisfactory explanation.

In one of my cases to which I have already referred the etiology of the adhesions was traced back to an attack of peritonitis in the patient's childhood, fifty years ago. Until shortly before operation there were no symptoms, then suddenly, probably on account of a gradual wearing out of the muscular coat of the intestines and further contractions of the adhesions, colitis appeared with extremely severe symptoms. In fact most of my cases have been in adults beyond middle life in whom the original inflammation took place in childhood. The manner in which the adhesions and bands cause the colitis is probably by giving rise to fecal stasis with consequent local irritation and inflammation of the mucosa.

As I said at the beginning of this paper, adhesions and ptosis go hand in hand, for dilatation and elongation of the proximal intestine are the natural result of long-continued effort to force material past an obstruction. This, how-

ever, is by no means the only cause for ptosis, for we find it not infrequently in persons who have lost much weight, and in women whose abdominal walls have been made flaccid and nonsupporting by pregnancies.

After visceroptosis has existed for a considerable time changes occur in the transverse colon. We find the normal pouches or sacculations between the longitudinal muscle bands become larger, the whole bowel is stretched and more capacious, and the muscle coats atrophy, resulting in atony and inability of the colon to do its work. In such cases chronic inflammatory changes in the mucous membrane giving rise to symptoms of mucous colitis are common.⁴

When we find that a patient must continually resort to severe purgatives and drastic enemata, particularly if there is also tympanites and painful peristalsis, we must consider the presence of some serious anatomic or pathologic defect.⁵

Mummery collected twenty-four cases of "angulation or kinking of the colon causing severe chronic constipation or complete obstruction and in each the condition was verified by operation or post mortem." He says further that "unless an angulation is suspected and carefully sought for it may easily be overlooked, even at operation, when the abdomen is explored. The kink often occurs only when the patient is standing and the force of gravity can pull down the pelvic colon deeper into the pelvis. When the patient is recumbent, as he naturally will be during the operation, no kink may be seen."⁶

And *à propos* of this, Lane says "the conditions presented by the viscera of a patient properly prepared for operation give one as little idea of those which exist in ordinary circumstances as do those shown by a case of varicose veins of the leg similarly prepared."⁷

These abnormalities of the intestine are very clearly shown by the x-ray, but it is not safe to rely *entirely* upon x-ray plates, for we may find very marked malpositions of the colon and a very large sigmoid without any interference with function. Operation is demanded only in the presence of marked symptoms, for probably it is only the exceptional case of coloptosis that gives trouble—and in this connection Ochsner says that he finds in 25 per cent. of his cases operated on for other conditions, marked ptosis of the colon which has never given trouble.⁸

And now we come to a most distressing class of cases: those of atonicity of stomach and intestines.

On account of chronic obstruction the digestive tract becomes tired out and unable to perform its functions normally, even with the aid of diet, drugs, electricity and massage. It has been whipped and stimulated, but now at last "lies down," tired out and thoroughly beaten. It ceases to respond to stimuli of all sorts, and it is then that we are forced to resort to surgery, but alas! too late in many cases, for although

we seek to remove the obstruction and in every way make it easy for the bowel to work the reaction time has passed. The muscular coat of the intestine has become worn out and although we take off the load the poor intestine has no "kick" left. You may take out the colon, free adhesions, do a hammock operation on the colon, but it will not work, for the "gimp" has gone and no power on earth can bring it back.

These are sad cases and we are only too apt to blame the surgeon because his operation fails to relieve. The real trouble lies with us because we have not made our diagnosis early enough and called in the aid of surgery while there was yet life and strength in the intestine.

I speak freely on this point for in the past year I have seen several such cases for which there was no help and no relief except death.

Fortunately in many of the milder cases we can bring relief by medical means. What, then, shall be our treatment of them?

Laxatives. It has been my experience that licorice powder is of the greatest service, especially in conjunction with a diet largely of vegetables, as is also the use of agar-agar. Small doses of real cascara (and I say *real* cascara because I believe that most of our so-called cascara is of little use) given three times a day are valuable, or if the case responds better to salines, the use of sodium phosphate three times a day. Where colitis is present small doses of salol and castor oil are of the greatest service, and where toxemia exists great help is afforded by the exhibition of calomel once a week. High irrigations, oil,—either by mouth or by enema,—a coarse diet (vegetables, fruit, bran biscuits, coarse cereals), exercises and abdominal massage may also be employed to advantage.

In the acute attacks, however, simulating intestinal obstruction nothing gives relief except the administration of morphia and belladonna. This relaxes the spasm and allows the passage of mucus and feces often in enormous amounts shortly after. Following this, irrigation of the entire colon—which can be done only by an expert—accomplishes a thorough cleansing of the bowel.

Recurring attacks of this sort, however, point to an obstruction to the permeability of the bowel, and if nothing else can be found to account for the symptoms, operative interference is indicated. In some cases an appendicostomy may suffice since in this way through-and-through lavage of the colon may be effected whenever there is apparent any tendency to stasis. In the more severe cases nothing will do but an exploration of the whole abdominal cavity, and the freeing of adhesions, division of bands and stitching up of a prolapsed cecum or transverse colon, or resection of a portion of a redundant sigmoid.

These measures sometimes bring complete relief, but in some cases the colon has lost so much of its muscle coat and has become so stretched and atonic that months of treatment by strychnine

nia, laxatives, massage and warm irrigations of salt solution may be necessary to restore the tonicity and bring the bowel back to something approaching its normal condition.

REFERENCES.

- ¹ Lane: Operative Treatment of Chronic Constipation, p. 49.
- ² Treves: Brit. Med. Jour., 1880, p. 108. Quoted by Clark, Jour. Amer. Med. Asso., Aug. 6, 1910, p. 449 ff.
- ³ *Ibid.*
- ⁴ Mummery: Diseases of the Colon and Their Surgical Treatment, p. 108. New York, 1910.
- ⁵ Clark: Jour. Amer. Med. Asso., Aug. 6, 1910, p. 449 ff.
- ⁶ loc. cit.
- ⁷ loc. cit.
- ⁸ Ochsner: Jour. Amer. Med. Asso., Nov. 26, 1910.

DANGERS INCURRED AS A RESULT OF THE NON-RECOGNITION OF ACUTE AURAL INFECTIONS, WITH STATISTICAL DATA.*

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THIS paper is read with a feeling of hesitancy for two reasons; first, because of its seeming egotism in that the writer is compelled to compare the work done in his immediate vicinity with that of other sections of his state; second, the paper may be deemed critical of the work of others. It is not, however, presented with any purpose of criticism, but to call attention to thoughts that have suggested themselves as a result of experience in southern New Hampshire.

The same criticisms undoubtedly would apply to any one of our group of states, more particularly to those sections away from the metropolitan centers where people have the privilege of free dispensaries and do not hesitate on account of expense to apply for aid for what they consider minor ailments.

In the record of deaths made by the New Hampshire State Board of Health for the years 1906, '07, '08 and '09 there were eight hundred and fifteen (815) deaths from simple meningitis and thirty-six (36) from encephalitis. These cases were about evenly divided between each of the four years. Those diagnosed as cerebro-spinal or tubercular meningitis were not included in the eight hundred and fifteen (815) mentioned. Deaths from brain abscess were reported under diseases of the brain, and those from septic meningitis were listed as simple meningitis.

In the records published for 1908 and '09 a summary for twenty-six (26) years is given of the deaths in New Hampshire, a state of about 400,000 people at the present time. There were during that period five thousand one hundred and forty (5140) deaths from simple meningitis. It is interesting to compare this number with deaths from other causes for the same time.

From diphtheria and croup.....	2,510
From pulmonary tuberculosis.....	17,122
From scarlet fever.....	675

* Read before the New Hampshire State Medical Society, May 9, 1912.

As you will note there were twice the number dying from so-called simple meningitis as from diphtheria and croup, and nearly half this period was before the use of anti-toxin, when diphtheria was extremely fatal; over seven times the number of deaths from meningitis as from scarlet fever; and about one-third as many as from pulmonary tuberculosis.

I have no record as to ages for the twenty-six years, but for the four years from 1906 to 1909, inclusive, there were 815 deaths from so-called simple meningitis.

Under one year.....	244
From one to five.....	234
From five to ten.....	71
From ten to twenty.....	93
Over twenty.....	170
Unknown	3

Of these 450 were males and 365 females. The number in strictly rural communities was a little less in proportion to the population than in the cities of the state. Over two hundred deaths a year from meningitis, not including cerebro-spinal or tubercular meningitis, seemed surprisingly large to me.

There are no means of determining the cause of infection in these cases or the character of any individual case but, as it is a well established fact that suppurative disease of the ear is by far the most frequent cause of septic meningitis, it is fair to assume that a large number of these cases were due primarily to middle ear infection. If this assumption is correct it would follow that many of these deaths were preventable had timely aid been sought and given to eradicate the cause.

From my own experience in brain abscesses and other intra-cranial complications arising from middle ear sepsis I was led to wonder if they were as common in other parts of the state as in the vicinity where I reside. All the hospitals in the state, of which record could be found, twenty-five in number, were communicated with and inquiries made as to the number of mastoid cases operated upon and the number of brain abscess cases recorded from January 1, 1906, to January 1, 1910. All but two small hospitals in the northern part of the state replied. There were ninety-four operations for mastoid disease reported for the four years. Thirty-five (35%) per cent. of that number were operated upon in the two hospitals where I reside, drawn from a comparatively small proportion of the population of the state.

To support my belief that many of these deaths from meningitis might have been due primarily to septic middle ear trouble and mastoid disease, I wish to compare the number of mastoids operated upon in the two hospitals with which I am connected, during the four years under consideration, with those of two other places and also to compare the number of deaths from meningitis in the same places.

During the four years mentioned, in Nashua, a city of between twenty-five and thirty thou-