A case of contusion and rupture of the ileum : with peritonitis, without external wound, successfully treated by coeliotomy and primary enterectomy, followed by circular enterorrhaphy (Maunsell's method) / by Frederick Holme Wiggin.

A CASE OF CONTUSION AND RUPTURE OF THE ILEUM

WITH PERITONITIS, WITHOUT EXTERNAL WOUND, SUCCESSFULLY TREATED BY CŒLIOTOMY AND PRIMARY ENTERECTOMY, FOLLOWED BY CIRCULAR ENTERORRHAPHY (MAUNSELL'S METHOD).

BY

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President of the Society of the Alumni of Bellevue Hospital; Visiting Surgeon City Hospital Gynecological Division, etc., etc.

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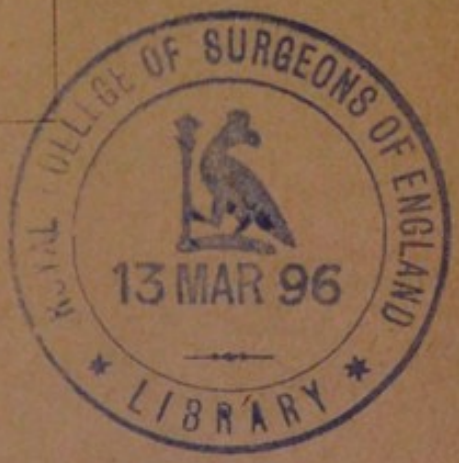

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A CASE OF CONTUSION AND RUPTURE OF THE ILEUM WITH PERITONITIS, WITHOUT EXTERNAL WOUND, SUCCESSFULLY TREATED BY CŒLIOTOMY AND PRIMARY ENTERECTOMY, FOLLOWED BY CIRCULAR ENTERORRHAPHY (MAUNSELL'S METHOD).

*EXHIBITION OF PATIENT AND SPECIMEN.**

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THE case which I desire to call your attention to this evening presents several features of interest, and some important points for reflection and discussion. The surgeon is beginning to invade, and successfully, the field which to within a short time the physician has considered entirely his own—namely, peritonitis without external evidence of injury. Cases of this nature that have been treated by cœliotomy and intestinal suture, in which recovery has followed, have been few. A careful search of the literature discloses only one recorded case of successful pri-

* Read before the Society of the Alumni of Bellevue Hospital, November 1, 1893. For a report of the discussion, see vol. lviii., page 700.

mary resection* in this class of injuries, exclusive of the one I am about to bring to your notice.

That injuries of this nature are not of great rarity is admitted as soon as the variety of accidents that lead to this condition is considered—*e. g.*, kicks, blows, falls, etc.; nor are they confined to any locality or any special walk of life. That this is true is proved by the fact that in the course of my private practice I have had two cases within twenty-eight months—one in May, 1891, and the other in September of this year. It is a group of cases that will be more carefully considered hereafter, and must be of great interest to the general practitioner, as from the absence of external wound he will be first called to such a case. On him, therefore, in the future, will the responsibility largely rest for the failure of surgical aid to end in recovery of the patient. This my cases exemplify, and the mere statement of the facts in each answers the question, Why did one patient die while the other recovered?

Case I.—Late on the evening of May 28, 1891, I was called in consultation to see H. W., fourteen years of age, whose physician gave me the following history: On the afternoon of the 23d, while feeding a calf, the boy received a kick in the right lumbar region. The pain, which was at first severe, soon passed away, and he went on with his regular vocation, not even mentioning to his family the accident that had befallen him. The following day (the 24th) being Sunday, he attended church after doing his chores as usual, and went again in the evening. While at this service, he was suddenly seized with violent colicky pains, nausea, and vomiting. On the 25th the family physician was sent for. His attention was not at first called to the accident, and the patient complaining of constipation with the other symptoms, he was given large doses of magnesium sulphate, enemata, and morphine in constantly increasing doses. Bran poultices were applied externally.

As the patient steadily grew worse under this treatment, five days after the accident I was sent for. On examination, no external

* Croft, Clinical Society, London, March 14, 1890.

marks of violence were found. The abdomen was tympanitic; muscular rigidity was marked and increased by pressure, and especially at a point two inches to the right of the umbilicus. There was slight dullness on percussion at this point. The general abdominal pain had disappeared, vomiting had ceased, and the constipation was absolute. His countenance was drawn and anxious; the temperature was 99·5°, pulse 130, and respirations 30.

The diagnosis was intestinal rupture and general suppurative peritonitis. Although the prognosis was very unfavorable, I advised operation as the patient's only chance. Cœliotomy confirmed the diagnosis. A large amount of pus was found in the cavity, shut off at various points by adhesions, and a rupture of the ileum, which was closed by Lembert sutures. The general cavity was washed out with a weak solution of hydrogen dioxide, the external wound partially closed, and drainage with iodoform gauze employed.

The anæsthesia was badly borne; the patient stopped breathing and was revived with much difficulty during the operation. The operation was prolonged by the great intestinal distention, necessitating several incisions to allow gas and fæcal matter to escape before they could be returned. The patient died six hours after the completion of the operation, which occupied two hours.

The chief points of interest in this case are: (1) The absence of shock; (2) the cessation of pain for twenty-four hours after the accident, although the intestine was so badly contused that it then became perforated; (3) the energetic medical treatment employed for three days, and the consequent delay before surgical interference was considered; and (4) the length of time required for the operation.

Case II.—On the evening of September 11, 1893, I was called to see A. M., fifteen years of age, a colored boy. He gave the following history: On the afternoon of the same day, while in a pasture, he had received a kick from a horse on the right lumbar region and right elbow. He was found lying on his stomach, groaning. In about ten minutes he began vomiting, and complained of continuous nausea. At first he vomited only food, but later, both before being moved and after, he vomited each time about four ounces of dark, clotted blood.

On examination at 8·30 P.M., the patient was found to be suffering slightly from shock. He lay on his back with his knees drawn up, and he complained of great pain, especially at a point to the right of the umbilicus. There were no marks of external violence on the abdomen. He had an anxious expression. Morphine, an eighth of a grain, was administered hypodermically, and a drachm of fluid extract of ergot was given by mouth. An ice bag was applied locally. At this time his temperature was normal and his pulse 80.

September 12th.—The pain continued all night, at 2 A. M. his pulse was 104 and temperature 100·5°, and soon after 3 A. M. another hæmorrhage through the stomach occurred, about eight ounces of dark, clotted blood being ejected. This was repeated at 9 A. M., his pulse at this time being 106 and his temperature 101°. Owing to a misunderstanding, I did not see the patient again until 7 P. M., when his condition was as follows: Pulse, 114; respirations, 30; temperature, 102·5°; he was lying on his back with his knees drawn up, and with an anxious countenance. The abdomen was tympanitic; there was marked muscular rigidity, increased by pressure at the point of greatest tenderness—*i. e.*, to the right of the umbilicus.

The diagnosis was traumatic peritonitis with contusion and perforation of the intestine, and an immediate operation was advised. To this the patient consented, and at midnight, with the able assistance of Dr. W. S. McLaren, of Litchfield, Conn., to whom I wish to acknowledge my indebtedness, the operation was performed. Just previous to the administration of the ether his temperature was 102·7°, pulse 116, and respirations 33.

An incision about four inches long, in the median line between the umbilicus and pubes, was made and the peritonæum opened. The transverse and descending colon were filled with hard fæcal matter, owing to the fact that the patient had a large condyloma which made defecation painful. Beginning at the cæcum, the small intestine was drawn out of the cavity and carefully examined inch by inch. It was more or less distended, and there was a fibrinous exudation and also slight adhesions, especially about the injured knuckle. A knuckle of intestine was soon discovered, which was ecchymosed, but only near its mesenteric border. It was decided, after careful consideration, that this portion would recover its circulation and tone, and it was passed by. On going higher up, near the jejunum, another knuckle of ileum was found, which was so bruised and dark in color that, although no perforation

could be discovered prior to removal, it was thought best to excise about six inches. (After removal, a small perforation was found at about the centre of the specimen, near its mesenteric border.) This was done, safety-pins being used for clamps. The vessels in the cut mesentery were ligated separately, and the edges of the mesentery united by a continuous suture of catgut. The healthy ends of the ileum were brought together, invaginated, and united

by Maunsell's method, except that the sutured ends of the bowel and the longitudinal slit in the gut were not painted with Woelfler's solution, nor were the raw parts blown over with iodoform, as advised by him.*

While the ileum was being excised the patient came out from the influence of the ether, strained and tried to vomit, and a quantity of blood and fæcal matter escaped into the peritoneal cavity. This accident was due to the large size of the safety-pins. A liberal quantity of a fifteen-volume solution of hydrogen dioxide was poured

* *Am. Jour. of the Med. Sciences*, March, 1892.

into the cavity, and allowed to remain while the ends were completely joined, when more hydrogen dioxide was poured over them. Some time was allowed to elapse before the resulting foam was washed off and the cavity flushed with normal sterilized salt solution (0·6 per cent.). Then the intestines were returned to the cavity, which was freely irrigated and left full of hot sterilized salt solution. The wound was closed, no drainage being employed. The operation from the time of beginning the anæsthesia occupied an hour and a half, and was concluded at 1·30 A. M.

13th.—At 4 A. M. the patient's pulse had risen to 130, and the temperature had fallen to 99·5°. During the night there was very little nausea. At 10 A. M. his pulse was 114, temperature 102·4°; and at 9 P. M. the pulse was 136 and temperature 102·2°. Morphine was given in one-eighth-grain doses every three hours, beginning at 4 P. M. At 11 P. M. he was comfortable, and retained peptonized milk.

14th.—At 2 A. M. his pulse was 118 and temperature 100°. At this time gas escaped from the rectum (twenty-four hours and a half after the operation). The patient slept well, retained peptonized milk and beef peptonoids during the day, and complained of no pain. Gas was freely passed from the rectum, and he had a desire to have a movement. At 8 P. M. his pulse was 104, and his temperature 101°.

There is little of further interest to report. The patient's bowels moved without aid on September 15th at 2 P. M. (sixty-one hours and a half after the operation). During the ensuing twenty-four hours (September 16th) the patient had five large movements, and the morphine was stopped. On September 17th the patient had five movements. He had complained of no pain. His pulse was 98 and his temperature 99·5°. After this the temperature and pulse became normal and remained so. The bowels moved every day or every other day without aid, and on September 21st he was allowed ordinary diet. He has remained in good health, and now awaits your inspection.

The points of interest in this case, aside from its successful termination, are: (1) The hæmorrhages, which in recorded cases, successful and unsuccessful, that I have found, occurred only once—in Croft's case, and this was very slight; (2) the slight amount of shock when the

patient was first seen, four hours after the accident, the temperature and pulse being normal; (3) the excision of the contused and perforated portion of the ileum, and the end-to-end union by Maunsell's method, which is comparatively new, and has not been employed many times; (4) the use of hydrogen dioxide in full medicinal strength for the purpose of disinfecting the general peritoneal cavity, this being the second successful case in which it has been used, the other being one of my own a few days previously; (5) the closing of the abdominal wound, leaving the peritoneal cavity full of hot, sterilized salt solution, the object of this being to lessen shock, to prevent adhesions, to aid in the readjustment of the intestines and omentum to their proper positions, to lessen the danger of septic peritonitis,* and to aid by osmosis the action of the bowels; (6) the shorter duration of the operation; and (7) in the after-treatment the early administration of peptonized food.

In the first case the operation was performed after five days' delay, having thereby been rendered more difficult, and requiring prolonged anæsthesia, which the large doses of morphine rendered more dangerous. The patient was exhausted from pain, constant nausea, and want of proper nourishment, and was septic. In the second, the early recognition of the condition, the comparative promptness with which the operation followed, its shorter duration, the use of hydrogen dioxide in full strength, the filling and closing of the peritoneal cavity with hot sterilized salt solution, made the difference between failure and success.

A careful study of all the recorded cases, successful and unsuccessful, and my own, show the causes of failure of surgical measures to be (1) delay, which has been

* *British Medical Journal*, 1892, Max Withard's experiment.

responsible for by far the greatest number of deaths; (2) hæmorrhage; (3) failure of the suture and septic peritonitis.

Delay must be obviated by a fuller knowledge of the meaning of the symptoms by the general practitioner. The important factors in the diagnosis are: The history of injury, persistent nausea, hæmorrhage, prolonged shock, rise of temperature, increasing rapidity and weakness of the pulse, increased frequency of respiration, rigidity of the abdominal muscles, persistent pain, with or without pressure, and the facial expression. Hæmorrhage can be avoided after operation by greater care in tying the blood-vessels in the mesentery, singly and not *en masse;* failure of the suture by better technique and the employment of Maunsell's method for end-to-end union; septic peritonitis by the liberal use of hydrogen dioxide where infection is known to exist, and leaving the abdominal cavity full of sterilized salt solution.

Finally, it may not be out of place to utter a word of caution as to the administration of the anæsthetic. It is generally intrusted to the least experienced, and therefore the least competent, assistant, and little attention is paid to the quantity employed. Operations of the character we have been considering must often of necessity be prolonged. It has been my custom when possible, since my experience in the first case, to have the anæsthesis in the hands of a thoroughly experienced and competent assistant. This lessens the mental wear and tear of the operator, and allows of more rapid work. By the use of Dawbarn's modification of the Clover inhaler, patients have been anæsthetized and kept unconscious for an hour with but four ounces of either. They regain consciousness rapidly, have little or no nausea, and the danger of nephritis, which is getting to be a very frequent cause of death after operation, is materially lessened. With closer

attention to details, quicker recognition by the general practitioner of the wisdom, at least, of early surgical advice, and, when doubt arises, giving the patient the benefit of it by an exploratory cœliotomy, success will, in these cases, cease to be the exception.

Discussion.

Dr. CHARLES PHELPS said that he could only speak in approbation of the paper, for few surgical papers presented more of value and novelty than this one. So far as he knew, there were only two recorded cases, the one just reported being the second one of intestinal resection, in which Maunsell's method had been adopted in New York or its vicinity. The first operation had been done by another member of this society, Dr. Hartley. The cumbersome and tedious methods hitherto employed had rendered the usual operation of intestinal resection very uncertain in its results ; hence an operation which could be performed with so much rapidity and ease must be regarded as an exceedingly agreeable surgical revelation. Personally, he thought that no other device was likely to supersede this new operation. With this method at his disposal, he would now be willing to operate on many cases where formerly he would have hesitated or refused to operate.

The use of dioxide of hydrogen in the peritoneal cavity, and leaving this cavity filled with hot salt solution, he believed to be new points in the technique. The knowledge that one could successfully use the dioxide of hydrogen in this way made the prospect of success much better, and the leaving of the hot solution, he thought, from theoretical considerations, must prove an effectual measure for the treatment of shock. Intestinal resection was a much more facile and a much more promising operation than it had been heretofore.

Dr. FREDERIC S. DENNIS said that he had been much interested in the paper and in the case, which he had seen before from time to time. So far as he knew, there had been only one case besides the author's, in which a diagnosis of rupture of the gut had been made, and laparotomy with end-to-end suture of the gut after resection performed ; hence Dr. Wiggin should be warmly congratulated on the success of so brilliant an operation.

There is another point of interest in the case—namely, that the patient had come to this city with a large ulcerating tumor at the

verge of the anus, which had looked very much like an epithelioma, but, on examination, had been found to be a condyloma. This the speaker had removed by the application of an ordinary elastic band, a procedure described by the late Dr. Nathan Smith, of Baltimore. The mass had been, without exaggeration, of the size of one's fist, and bleeding, ulcerating, and foul. In less than twenty-four hours after the application of the elastic ligature around the pedicle of this mass it had sloughed off, and had now entirely disappeared, although only five or six days had elapsed since the operation.

Dr. J. W. S. GOULEY thought that Dr. Wiggin should be congratulated upon the success of this case, which was owing, first to the early surgical interference, and, secondly, to the measures adopted in the after-treatment. With respect to the first, he would say that there was usually too much delay; even in this case the operation might have been performed many hours sooner.

This method of operation, which he had seen Dr. Wiggin demonstrate before, impressed him very favorably. It had been objected that the longitudinal incision of the intestine below was an unnecessary complication; but since such a wound could be so easily closed, and since any flatus would be apt to collect above, the objection did not seem to him to be valid. The absolute peritoneal contact secured by this method of suture seemed likely to render the end-to-end operation safer than even the Murphy button. The latter might become a very dangerous foreign body in the intestine, although it was a very pretty operation, and was even more quickly performed than Maunsell's.

He had been greatly interested in the washing out of the peritoneal cavity with dioxide of hydrogen; he was glad to know that the peritoneal cavity would tolerate this agent so well. It was well borne by connective tissue, and tolerably well by the buccal membrane, even when used in its pure state; but certain other mucous membranes, such as those of the bladder and urethra, did not tolerate it. Such rapid oxidation was produced that the pain was unbearable—worse even than that produced by the use of strong solutions of bichloride of mercury.

The filling of the abdominal cavity with warm salt solution had been resorted to two years ago in this city by Dr. Baldwin in a case of abdominal section for a very large uterine myoma—a tumor at least six inches in diameter and almost globular. The operation had been difficult and tedious, and the patient had been in collapse, so the operator filled the abdominal cavity with as much very hot

Thiersch's solution as it would hold. He had looked upon this as a very important factor in the recovery of his patient, and he had thought the large volume of the fluid, as well as its heat, was important.

The author of the paper had also introduced another very important point which could not be too often repeated, and that was that as little time as possible should be lost in the performance of abdominal operations. It was a potent element of success. Every year, every month, almost every week, did his dread of ether increase, especially in connection with the way in which it was given in our large hospitals, such as Bellevue. In private practice among healthy subjects it was perfectly safe. He had had very few deaths from ether, but he could never forget the first case. It had occured at the time when Dr. Polk was house physician, and, he thought, Dr. Bryant was house surgeon—as far back as 1870. The patient had been brought to the hospital with luxation of the hip. He was a stalwart but drunken fellow. He had first been placed on the table and the usual quantity of ether given. Attempts had been made by several surgeons to reduce the dislocation of the hip, but these had failed. Then some of the medical staff had tried, and had also failed. The man had then been put to bed for two days, and at the end of this time he had again been etherized. The speaker had tried, then the house surgeon had tried, and then Dr. Smith and Dr. Sayre, but all had failed. There had been almost total suppression of urine following this etherization, and two days later the man had died. The autopsy had shown the contracted kidney so commonly found among drunkards. Ever since that time he had been afraid of ether. In private practice he has given as little as possible, sometimes giving chloroform to young subjects, but as far as possible using the nitrous oxide. Many years ago Dr. James R. Wood had used it in an amputation of the thigh, but his apparatus had been cumbersome, and the method had not been generally adopted. In the last few years, in nineteen out of twenty cases, he had used nitrous oxide in preference to ether, on account of the evil effects which many had observed from ether.

Dr. W. R. Townsend said that he had had the pleasure of listening recently to a paper on peroxide of hydrogen as a hæmostatic in cases of epistaxis. The author had found it even better than plugging of the nostrils. In the discussion of this paper several others had spoken of having had good results from it in this direction. In view of this, it might be that peroxide of hydrogen would prove

especially useful when there was troublesome oozing in the abdominal or pelvic cavity. Certain experiments which he understood were now being carried on by Professor Thompson, of the University, went to show that peroxide of hydrogen had a special tendency to produce coagulation of the blood, both in the veins and in the arteries.

Dr. W. Evelyn Porter said that he was inclined to believe that if the dioxide of hydrogen had been used without simple water irrigation it would have caused irritation, and even adhesions. On this account, in advocating its use, it would be wise to recommend in every case that the cavity should subsequently be irrigated with normal salt solution. He believed this should be used very generally in abdominal work, not only in acute cases, but in the more chronic ones, especially those found in women.

He thought that, in addition to Maunsell's method, the use of a single row of sutures, either continuous, or Lembert's interrupted sutures, around the outer layer, uniting the peritoneal surfaces, would be a very great safeguard, as we all knew in any case of intestinal suture, unless there was very little distension, there was apt to be leakage of the contents of the bowel. He did not like the form of ether inhaler exhibited and recommended by the author. One modified by Dr. Wyeth, with an opening for entrance of air, he considered very much better.

Dr. R. A. Murray said he thought that the fatal result in these cases was due most often to delay in operating, and this delay occurred usually because the profession at large believed that if there was any septic trouble in the abdomen, there was always high temperature, pulse, and respiration. This was a very great mistake. We should call the attention of the profession generally to the fact that more was to be learned from the facial appearance and the condition of shock than from the temperature, pulse, and respiration. For instance, two weeks before he had had a patient with irreducible crural hernia. Two days before he had seen her this time she had complained of moderate pain, and as she had been warned about this pain, she had immediately applied an ice bag, and had sent for him the next day. She had vomited once, but the matter ejected had not been greenish; the abdomen had been flat; the pulse had been 72, and the temperature normal. The next day she had vomited once; the abdomen had been flat; there had been no impulse in the tumor, although there had been a slight impulse on the previous day; the pulse had been 72, and the temperature had been still

normal. The patient had been informed that the hernia was strangulated, and that an operation was necessary. The case had then been transferred to the New York Hospital, and that evening there had been still no change in the pulse and temperature, but there had been a peculiar facial expression and a smallness of the pulse which was suggestive. There had been some very slight pain. Dr. Bull had operated, and had found six inches of the gut strangulated and almost black, and the sac filled with bloody fluid. He had seen puerperal septic peritonitis with almost no rise of temperature, yet with a small pulse. He believed that a wiry pulse, even though slow, the condition of shock, and the facial expression were better guides than the thermometer—in fact, the thermometer was quite misleading. If we waited for the occurrence of abdominal distention, the result was almost always fatal.

Dr. Syms thought the case reported in the paper should be considered as one of the triumphs of modern surgery, and he hoped it would lead to very many more cases of this kind being recorded. He thought that most surgeons now agreed that the existence of peritonitis was an indication for operation. About three weeks ago he had made an appointment to operate on a case which he had diagnosticated as probably tubercular peritonitis. To his surprise, a consultant had advised waiting, because there had been evidently peritonitis present, and he had looked upon this as an indication against instead of for an operation.

Perhaps the most important part of the paper was the calling attention to the necessity for an early diagnosis of peritonitis, in cases where there was injury to the abdomen, without external marks of violence. Perhaps, as the preceding speaker had said, the pulse was the most important sign ; certainly the temperature was no guide whatever. In some cases which he had seen, the advance of the peritonitis had been announced by a fall of temperature below the normal. The facial expression was fully as important as the pulse—perhaps even more important. The symptom of hæmorrhage from the intestinal tract, which had been present in the author's case, would seem to indicate injury to the intestine, and this should in itself be sufficient to indicate the necessity for at least an exploratory operation. He had no doubt that Maunsell's method of intestinal suture was the method of the present and the future. Intestinal anastomosis by means of Senn's plates and their various modifications had been almost abandoned; it was very difficult, and required special apparatus which was not always readily attainable. More-

over, the lateral anastomosis was an unnatural method of joining divided intestine, and the contraction which took place threatened the patient with intestinal obstruction. At post-mortem examination he had seen this contraction so great that a pencil could hardly be passed through the aperture left in the intestine. Maunsell's method produced such perfect coaptation of the peritonæum that it seemed hardly possible to excel it. The suggestion of Dr. Porter to make an overhand Lembert suture, after the Maunsell suture had been made seemed to him an excellent one. In the first case of operation here by Maunsell's method—Hartley's—he believed this plan had been adopted. The portion of suture which was most difficult to make perfect, and where most end-to-end sutures had failed, was at the intestino-mesenteric junction, and this was the portion especially well closed by Maunsell's method.

About the time of the author's operation he had done the same operation for carcinoma. A Kraske operation had been attempted for the removal of the carcinoma, but the conditions had been such that the tumor could not be reached posteriorly, the adhesions being too dense and the tumor too high up. It had therefore been considered advisable to perform laparotomy, so this resection by Maunsell's method had been done subsequently, when the patient had rallied sufficiently from the first operation. The man had done very well for a few days, but had suddenly developed an extensive slough at the seat of the Kraske operation, which had infected the entire posterior wound, and he had died of sepsis. There had been much shock at the termination of the operation, so the abdomen had been filled with hot normal salt solution, with very excellent results as to the immediate improvement in his condition. He regarded it as nearly equal to infusion.

The care necessary in the administration of ether was a very important element of success in all operations. These abdominal operations should be done as speedily as possible. This was one of the great advantages of Maunsell's method, for with good assistance it could be completed in twenty minutes.

Dr. Syms exhibited an ether inhaler which he had had made, and which he considered more convenient than the other inhaler shown by Dr. Wiggin.

Dr. M. D. Field said that some years ago a man had been injured on the elevated railroad by a "buffer accident." He had made his way from New York city to Brooklyn, walking altogether several blocks without assistance. The accident had occured on Sunday

afternoon, but nothing serious had been observed until Wednesday morning, when he had been taken with stercoraceous vomiting. A diagnosis of intussusception had been made after a hasty consultation and injection *per rectum* had been attempted. The speaker had arrived just after this had been done, and had found the patient in collapse. He had died shortly afterward. The autopsy had shown that the man had received a wound across the abdomen, and although there had never been anything more than a slight discoloration on the skin, the areolar tissue had been severed. On opening the abdomen, it had been fonnd that the mesentery had been torn away for nearly half an inch, and that gangrene had resulted in nearly two feet of intestine. This evidently had accounted for the inaction of the bowels and the stercoraceous vomiting. In addition to this, the intestine had been found to have been torn in three places, and every one of those wounds had healed, and there was nothing in the abdomen which had not been absorbed except a little of the injection fluid, which was found on one side nearest to the lowest wound in the intestine. He would have recovered from the three lacerations of the intestine had it not been that they were complicated by tearing up of the mesentery, which had caused gangrene of the intestine.

The PRESIDENT said that he agreed fully with Dr. Gouley that the operation should have been done earlier: it should have been done the first night he saw the patient. When he had first seen him he was seven or eight miles from his office, with many other engagements which would have made it impossible for him to operate for a number of hours. A medical student, who was living in the house, had been asked to report the patient's condition to him. Receiving word over the telephone subsequently that the patient was "all right," he did not see the boy until the following evening.

He had used the dioxide of hydrogen three times in laparotomies where patients had recovered, and there had been no sign whatever of intestinal obstruction or of inflammation. The first case had been that of an old lady upon whom he had operated in September for purulent ovarian cyst. The tumor had filled the pelvis, and had reached half way to the umbilicus. The fluid could not be removed by simple tapping, and in breaking up the adhesions with the hand, some of the remaining contents had burst through the sac at a weak point. The dioxide of hydrogen had been immediately poured in, and allowed to remain for some time, The tumor had then been removed and the cavity flooded with hot salt solution. The temperature had never risen above 100°.

About a week after the operation described in the paper, he had operated on a case of pyosalpinx following abortion. The case had been rather septic, the temperature varying between 101° and 102·5° F. In breaking up the adhesions surrounding the ovary, the sac had been ruptured. Here also the dioxide of hydrogen and saline solution had been used. The temperature had reached normal forty hours after the operation. There had been no trouble with the movements of the bowels in these cases ; in fact, he found that the bowels usually moved earlier, after the saline solution had been used. The use of morphine was desirable, and this he thought could be safely done when the salt solution had been employed, because this counteracted the tendency to constipation.

He did not think it necessary to use the additional row of sutures ; he thought there was some danger of strangulating the circulation through the intestine. This was the great danger in the first operations of end-to-end suture where a double row of sutures was used. In his case an eighth to a quarter of a grain of morphine had been given every three hours to prevent a movement of the bowels, yet they had moved repeatedly in the course of the first few days.

He had been very much interested in the remarks of Dr. Murray about the misleading character of some of the symptoms. He thought that temperature was no guide at all ; the pulse and facial expression were the real guides to the diagnosis.

55 West Thirty-sixth Street.

Note.—In these cases the Dioxide (medicinal) of (Marchand) was used.