doubt been benefited. I think the changes produced by X-ray must be the same as by radium. I think it is due to the effect of the ray. I do not see, though, how a single application of radium in a short time should produce changes of that kind, so that the uterus would look different from what it is when excised after operation.

One experience especially seemed to prove it—a young woman of thirty-nine was X-rayed for quite a long time. X-ray had no influence on it and I was forced to remove the uterus. Notwithstanding the X-ray treatment, the uterus showed the same changes reported by the bacteriologist as in any other uterus which was removed for bleeding, and it was my impression since that that the sole influence of the radium is merely on the ovary, and that is due to the hypersecretion which produces the intense bleeding, and the internal treatment will have a decided influence.

This idea was proposed by Schickelen, of Strasbourg, some two years ago in a very interesting paper. I was induced to try it and in the last few years have treated a number of cases with good results. There is no doubt, as far as I have seen (and I have used X-ray especially and my results have been good), the bleeding diminished, but, as I believe, not on account of the influence on the uterus itself, but the influence on the ovary by changing the internal secretion.

Dr. E. H. Skinner, Kansas City, Mo.—I have had more or less experience with the treatment of these pelvic conditions by means of the deep Roentgen therapy and feel a great deal of confidence in this method. European Roentgenologists did this same work many years ago which is now being reported upon in America, but they had to use so many tubes in doing their work in order to have the penetrating ray that few men were able to duplicate their work. Since the introduction of the new Cooledge tube, by which we can control the penetration, we can, by the addition of certain filters, get such an enormous amount of X-ray into the pelvis by the cross-fire method that these results in pelvic conditions are being reproduced all over the country. We do not repeat our treatment oftener than every three weeks. By means of the deep Roentgen therapy with the Cooledge tube we can show you a most startling array of results. We do not claim them as cures yet. One must wait a period of five to eight years before reporting them as cures; but at present we claim that they are good symptomatic results.

Dr. C. Jeff Miller Closes.—I wish to thank the gentlemen who have so generously discussed my paper and to mention in closing two or three points regarding the technique of radium applications.

In regard to the X-ray, I do not wish the impression to go forth that I am favoring the radium over the X-ray. I know very little about the practical results of the X-ray and discuss it only theoretically. I saw the use of the X-ray in Prof. Kroenig's clinic at Friburg, and also saw various post mortem specimens prepared by Prof. Aschoff, who was studying the results of intensive X-ray applications. The treatment of fibroids, malignant conditions and hyperplasia of the uterus with X-ray requires a special apparatus, such as the Gauss outfit or the Cooledge tube. This

should be thoroughly emphasized, because I believe great harm is being done by the use of the ordinary X-ray outfit in these cases. I saw four large tubes playing upon an abdomen in Kroenig's clinic, which was continued for probably four hours. The average X-ray tube would produce the most serious consequences if used for probably a third of this time. So I think the X-ray workers should call the attention of the profession to the dangers of ordinary X-ray technique as a therapeutic measure.

The effect of radium on the uterus has been thoroughly worked out upon uteri removed some time after the applications. These specimens show marked connective tissue changes and blocking up of the blood vessels of the entire area. So the effect is not altogether due to changes produced in the ovary.

In regard to the fibroids that do not decrease or change after radium application, this might be explained in several ways. It has been shown that certain fibroids will not decrease in size, and, as Burnam has shown, some of these may contain calcareous deposits and others do not react to radium. This is a phenomena not yet explained.

I usually apply about 50 m. g. of the pure radium element, well screened, to the cavity of the uterus for about 12 to 18 hours. This is usually sufficient to control the hemorrhages of the menopause and the bleeding of fibroids. Drs. Kelly and Burnam use larger amounts for a shorter period, believing that the more intense the dose the better the effect.

NEGLECTED APPENDICITIS — ITS HIGH MORTALITY A DIAGNOSTIC AND THERAPEUTIC RESPONSIBILITY.*

By F. G. DuBOSE, M.D., F.A.C.S.
Selma, Ala.

Appendicitis should rarely, if ever, be the cause of death. Immediate diagnosis and proximate operation would put the cipher in the mortuary column. If the occurrence of a preventable disease is a censure on hygienic law, then the tragedy of an avoidable death is a crime.

Operations done on acute appendicitis within twenty-four hours after the onset of the initial symptoms give a mortality greatly less than 1%. It is, therefore, obvious that the present death rate of approximately 8% is due to delayed diagnosis, errors in early treatment and deferred operation. A responsibility of more than 7% of needless deaths from

*Read in Section on Surgery, Southern Medical Association, Ninth Annual Meeting, Dallas, Texas, Nov. 8-11, 1915.

one disease deserves the most serious consideration of the medical profession.

Progressive peritonitis in 75% of all cases is due to appendicitis, the remaining 25% arising from all other causes.

An insurance company in 1914 paid twenty death claims for appendicitis out of a total of 872 for all other diseases; ninth in numerical order and causing 2.2% of all deaths, suicides and accidents excepted. This tabulation is taken from among those selected for physical well being, representing as a class intelligence and efficiency.

Detailed investigation of the fatal cases has demonstrated that the advanced stage the disease had reached before it was given surgical treatment was the one and only cause of the high mortality in acute appendicitis.

Immediate diagnosis absolves the attending physician from culpability, for it is manifest that no competent medical man of this generation would fail to advise operation at once, or make the mistake of administering a purgative. The only fatal cases, then, are those wherein the physician is called late—that is, after the first thirty-six to forty-eight hours of the disease; for such as these the public needs more education in the seriousness of the home treatment of bellyache and the fatal error of not calling in early the doctor.

PATHOLOGY.

Stanton reports the results of his investigations of the gross pathology at the time of operation of over 1,500 cases, and of the microscopic findings in over 500 acutely inflamed appendices removed during the first ten days after onset of attack. He demonstrates that the so-called varieties are merely different stages or degrees of inflammation. The following gross and microscopical appearances of the inflamed appendix observed by him are given for each day during the first week:

First Day.—"Obstruction of lumen with complete distension distal to obstruction. Evidences of beginning gangrene; diffuse polynuclear leukocytic infiltration; focal areas of hemorrhage and necrosis involving all coats, with more or less extensive destruction of mucosa; fibrinous or fibrino-purulent exudate on peritoneal surface. Serous exudates were found only towards

the end of the first day, and in no cases except those given cathartics soon after onset of symptoms."

Second Day.—"Increase in extent and severity of pathological lesions found on first day. Beginning peritoneal involvement. If it is going to occur at all, gross perforation of the appendix itself, with or without gangrene, usually takes place before the end of the second day."

Third Day.—"Maximum of destructive process in appendix reached. Beginning of nature's efforts at repair, as shown by appearance of fibroblasts in all sections."

Fourth Day.—"Increased evidences of repair. Complete necrosis of the gangrenous areas."

Fifth, Sixth and Seventh Days.—"Concerned in process of repair, being almost completed by the end of the seventh day, except in the more extensive cases."

Too great stress can not be given to two of his conclusions resulting from this exhaustive analysis.

1. "That catarrhal appendicitis as a pathological entity does not exist; subacute appendicitis does occur; only three or four in the series showed an acute lesion grafted upon a subacute process."

2. "That bacteriological perforation occurs during the first few hours of the attack, irrespective of gross perforation or gangrene."

"Purgation spells perforation." Moynihan's sequence is "*pain, purgative, perforation*." He states that "perforation does not seem to occur if no aperient is given and if absolute starvation is adopted from the first." Further, that "acute general spreading peritonitis is due to the treatment by purgatives; it is a therapeutic peritonitis." In this connection paraphrasing Kipling's "Female of the Species," Deaver says: "The purgative is more deadly than the scalpel."

SYMPTOMATOLOGY.

Sudden onset, nausea, severe abdominal pain, characterized by remissions of intensity, suffered most in epigastrium, around umbilicus, in either iliac fossa, and if the appendix is retrocecal maximum point of pain is in right lumbar region. Abdominal tenderness, on palpation or pressure, greatest over location of appendix, and when made there produces either nausea or referred pain in epigastrium. Broad pressure over sigmoid and descending colon by forcing gas into

cecum cause pain at McBurney's point. Pain is not relieved after emptying stomach and large bowel. There is constipation as a rule, invariably absence of diarrhoea. Muscular rigidity of varying degree, in right rectus, or over underlying appendix. Temperature, normal or subnormal in the beginning, elevated several hours after onset. Pulse slower in rate, becoming quicker after inflammation is well advanced. The differential diagnosis in the presence of this symptom-complex lies not between appendicitis and flatulent colic, or any of the dietetic, gastric or bowel disorders, but between appendicitis and one of the several, though less frequent, abdominal diseases, generally designated as the acute surgical abdomen, in the initiation of its first expression.

There is no difference of opinion among surgeons concerning the necessity of immediate operation early in acute appendicitis. When cases are seen during the surgical danger period, which is from the third to the sixth days, inclusive, after the onset, the conception of treatment has wide variations. The dictum "Operate as soon as diagnosis is made" is not now universally accepted; this change came on account of the notoriously poorer results of operations done during the "danger period" as compared with those performed earlier or later in the course of the disease, and from the teachings of Ochsner, who demonstrated the fact that the majority of these severe cases, given a rational method of treatment, could be tided over the unfavorable surgical stage and subsequently safely stand operation.

In deciding between immediate and deferred operation, it remains largely a matter of the surgeon's personal judgment—and he is wisest who is not the follower of any one set method, but adopts that plan which seems best suited to the individual case. It should constantly be borne in mind that the operative technique and the time of its performance is but one of three factors influencing favorably or adversely the termination of these cases. The treatment administered before the surgeon is called is all-important, and that given after the operation very momentous in its influence.

WHAT SHOULD BE DONE IF DELAYED OPERATION IS UNAVOIDABLE.

Empty the stomach and keep it empty. If vomiting is ineffectual use the stomach tube. After siphonage allow nothing else to be taken into the stomach, not even water. This will relieve nausea and reduce peristalsis.

Unload the large bowel by enemata or rectal flushings. Added comfort is secured by the elimination of gas and feces, and the way is prepared for the use of proctoclysis or clysters. These two measures are both diagnostic as well as therapeutic, for by the time the stomach and lower bowel are emptied, if the nausea, pain or colic is not relieved, it is not the result of acute indigestion, but of an acute abdominal lesion.

Morphine hypodermatically to relieve pain, lessen peristalsis, diminish shock, retard absorption, limit tissue waste, and to favor the formation of protective peritoneal adhesions.

Put patient in Fowler's position and begin the use of proctoclysis or clysters of either tap water or preferably of a concentration of 15% glucose, 1% sodium bicarbonate, and .5 of 1% of sodium chloride.

Transport to hospital as soon as possible.

WHAT SHOULD NOT BE DONE IN UNAVOIDABLE OPERATIVE DELAY.

Never administer purgatives! Aperients increase peristalsis that every conservative force of nature is attempting to stop; they prevent adhesions and thereby cause more or less extensive soiling of the peritoneum from leaking intestinal contents in perforation or escaping bacteria in inflammation. It is certain that the preliminary purgative never tided over the immediate necessity of operation in acute appendicitis and equally true that its performance is rendered more imperative and less safe by aperient therapy. Witness the statistics of Deaver in one year's work; of those purged only 1.5% escaped perforation, gangrene or peri-appendicular abscess; and of those to whom purgatives had been given 97.5% had the most extreme types of appendiceal disease.

Nourishment by the mouth increases peristalsis; if retained, will add factors of distress and danger out of proportion

Fig. 1.—Transverse Skin Incision Modified McBurney.

in harmfulness to the nutritive benefits derived from its questionable assimilation.

To withhold the administration of morphine for fear of masking symptoms is a mistake, for it is the only drug of any benefit to the patient in assisting nature during the five-day danger period. It should be given in doses sufficiently large and at intervals repeated to maintain its physiological and therapeutic effect. It will be shown in the indications for or against operation that morphine does not mask the signs or symptoms which are determinative.

WHAT SHOULD BE DONE IN NEGLECTED CASES, THOSE FIRST ATTENDED AS LATE AS FORTY-EIGHT HOURS AFTER ONSET.

These are usually the abscessed, perforated or complicated by a diffuse or spreading peritonitis, giving an average surgical mortality of 12.5% from operations done after the first twenty-four hours from initial symptom and before the end of the seventh day following onset.

IMMEDIATE OPERATION IS IMPERATIVE.

1. In the presence of progressive exaggeration of all unfavorable symptoms following the rational starvation-rest pre-operative treatment, the Ochsner method.

2. On the occurrence of sudden relief of pain, accompanied by subjective sense of improvement with a quickening of the pulse rate, indicating the rupture of a localized abscess or thrombosis, gangrene or perforation of appendix.

3. Evidence of localization of inflammatory process by adhesions when a circumscribed area of swelling appears in right abdomen.

4. A sudden fall in a previously high leukocyte count, or a gradually decreasing leukocytosis with steady increase in the polymorphs, indicating a failing resistance.

5. When more than one week has elapsed since the beginning of the appendicitis, for by this time the acute inflammatory reaction is passed and the blood has established to a high degree protective powers.

Fig. 2.—Showing Flap Formed by Incision Along Rectus.

DEFER OPERATION.

1. From the third to the seventh day after onset, when the fury of the appendicitis is at its height, giving the Ochsner method a chance to have effect, evidenced by improvement of symptoms; in the absence of an exigency the operation should be withheld till the acute general symptoms have subsided.

2. Blood examination showing a high polymorphous count without an accompanying leucocytosis, for this is found in intense infections in subjects with little or no resistance and in one so overwhelmed that a fatal issue is to be expected under any treatment.

BENEFITS FOLLOWING DELAY.

1. The sympathetic nervous system is given a chance to recover from the shock received and to re-establish in a measure its equilibrium.

2. The vascular system is afforded time to form antibodies and increase its army of leucocytes to battle with the infection.

3. A necessary period of time is permit-

ted the peritoneum to throw out its limiting wall of adhesions.

DANGER IN POSTPONING OPERATION.

1. Further saturation of the system with toxins; especially dangerous to life are those absorbed from a gangrenous or obstructed portion of the gut. It has been demonstrated by Crile that this toxin produces a lesion in the cells of the central nervous system, and when experimentally administered to animals the symptom-complex of ileus appears with a fatal issue in five or six days.

2. Bacterial pollution of the blood stream with consequent septic thrombosis or embolism.

3. Lymphatic infection resulting in empyema, subphrenic abscess, multiple abscess of liver or cholecystitis. In this connection it should be remembered that the appendix is more richly supplied with lymphoid tissue than any other portion of the intestinal tract.

4. Progressive suppurative peritonitis, due to gross or bacterial perforation and

a dissemination of the infection from ineffectual adhesions.

FACTORS INFLUENCING OUTCOME.

Rational pre-operative treatment is the first and most important step in minimizing the existing pathology and favoring surgical success in the treatment of advanced acute appendicitis. The anesthetic should be nitrous oxide-oxygen, alone or in combination with infiltration anesthesia. Ether or chloroform seriously increase the danger by adding the toxæmia of their narcosis to a system staggering under an overload from infection.

The discriminating judgment of the surgeon in determining the extent of the operation, in the choice of technique and his manual dexterity in executing his plans are important.

In calling your attention to the modification of the gridiron incision as a routine in the operative technique of suppurative appendicitis, I hope to demonstrate by the accompanying illustrations that ample room, efficient drainage and the lessened danger of post-operative hernia are secured by this method. The base of the appendix is immediately under the transverse incision. With this guide, tracing the appendix is easy. Where more room is needed, a right angle vertical extension is made through the fused aponeurosis at the outer border of the sheath of the rectus at the inner end of the transverse incision downward for one or more inches. This downward extension gives a triangular flap which, when retracted, exposes the right lower abdominal quadrant. There is no injury to the deep epigastric vessels or to the twelfth intercostal ilio-hypogastric nerves, preserving the blood and nerve supply to the lower right abdomen. Choice is allowed for the emergence of drainage wicks at any of several points in the incision line or stab drainage may be employed. There is no chance of hernia in spite of drainage except for the one or two inches of the vertical right rectus incision, and hernia is minimized at this point on account of the preservation of the blood and nerve supply. After walling off the uninvaded peritoneum every pus pocket should be opened and drained and the appendix removed in every instance if possible without evidently interfering with the chances of pa-

tient's recovery. A fecal fistula is better than a gangrenous appendix. All thrombosed and necrosed areas of omentum should be excised. Ample rubber-covered gauze wicks or sheets of rubber tissue-filling pus cavities or infected areas are superior to the gauze or rubber tube drains. In solitary appendiceal abscess simple drainage will temporarily relieve; however, the appendix should invariably be removed before the patient is discharged from the hospital. If the appendix is gangrenous, the omental or mesenteric vessels thrombosed, or if there is present paralytic or mechanical ileus simple drainage after incision is inadequate and ineffectual surgery. If the toxæmia at the time of the operation is not of fatal amount, the only hope lies in the removal of further sources of toxin formation and absorption. The errors of appendiceal surgery today are from timidity or so-called conservatism and not as a rule from boldness in the execution of a radical and rational technique, and also from ill-timed operations due to a failure to investigate the bearing of the pathologic process on the patient's resistance. This comes as a result of the misinterpretation of the Ochsner-Murphy method of pre-operative treatment and of the lack of appreciation of the daily pathologic changes and stages as a result of the infection within the appendix.

POST-OPERATIVE CARE.

At the close or during the operation a pint or more of normal saline or distilled water should be administered by hypodermoclysis. The Murphy drip commenced as soon as the patient is returned to bed and placed in the Fowler position. Morphine in sufficient quantities to relieve pain. The more desperate the patient's condition the more imperative the need of morphine. There are two essentials—the supply of fluids to the tissues and the lessening of waste and absorption. Proctoclysis, hypodermoclysis, infusion intravenously, and morphine. Intravenously give either glucose, sodium bicarbonate or Fischer's solution to supply fluids, nourishment and to correct or diminish acidosis. Gastric lavage for excessive nausea, every four to six hours as may be required. In acute dilatation of the stomach where quantities of duodenal

fluids are regurgitated, I have found apparent benefit following the reintroduction of the siphoned stomach contents into the rectum through the proctoclysis. The rationale of this is to supply the system with the hormones otherwise lost in the lavage and vomit. Rectal flushings of essence of peppermint one teaspoonful to the quart of water is valuable in removing flatus, lessening the discomfort of distension. Pituitrin is most useful in distension to favor the passage of gas, but should not be used till after the third day, when ordinarily it is permissible to stimulate intestinal peristalsis. Milk and molasses, equal parts, afford the safest and best purgative enema. It, too, should not be given till after the third day following operation. Post-operative purgation by oil, calomel or magnesium sulphate within the first three days after operation is an abuse; failing as a rule to evacuate the bowels, they excite nausea and vomiting, accentuate abdominal pain, adding to the general discomfort of the patient and even when acting on the bowels serve no distinctly immediate therapeutic necessity.

The routine use of strychnine, caffeine, spartein, nitroglycerine and strophanthin is to be condemned. A study of the pharmacology of these drugs is convincing that they are irritants and not true stimulants which will increase the resistance of lowered vital powers tiding them over critical stages; they may whip up fagging nervo-vascular organisms and the reaction hasten the unsought end.

Morphine, atropine and pituitrin have distinct indications and are valuable when used as indicated.

Glucose and soda administered intravenously most nearly approach the ideal stimulant in restoring tone to the heart muscle, in affording energizing nutrient to the tissues and in helping elimination through the emunctories.

The post-operative care is often dramatic in bringing about a successful outcome, the operation being the initiation of the treatment rather than the master stroke which ends either the disease or the sufferer.

902 Alabama Avenue.

DISCUSSION.

Dr. Jere L. Crook, Jackson, Tenn.—Fearing that I might be late, after the very royal entertainment afforded us last evening, I prevailed upon my friend to allow me to look over his paper before it was read this morning, and I wish to say that the paper, as a whole, is so able an expression of the very best of modern thought in reference to delayed or neglected appendicitis that an attempt to add to the paper along that line would be just like an effort to adorn the lily or to paint the rose; but in the title itself there is suggested to us a very important thought, and it is to that part of the paper that I shall address my remarks.

If you will observe the title as a whole, you will see the responsibility rests upon the medical profession to reduce the mortality of this dread disease. We should attempt as a profession to go further than simply to render our duty to the individual members of society whom we may be called upon to treat.

There is a higher obligation resting upon us than contained in the word "doctor"—"teacher." The vista of helpfulness to humanity stretches out before us in all lines, where we may teach the people, where we may lengthen human life and lessen human suffering. We have been eminently successful in teaching the people how to prevent and how to cure tuberculosis. We have had similar success in the line of malaria and yellow fever, but, my friends, surgeons and members of this body, we have not addressed ourselves directly to the problem of teaching the people the absolute necessity of early operation in appendicitis. That is one of the most important things that the surgeons of the world could do today, and if we would do our duty and teach the people the necessity of early operation, then it would not be necessary to have read before us the elaborate paper we have heard this morning on neglected appendicitis. Whose neglect is it? We must, as surgeons, eliminate ourselves from this problem, because we can not carry the burden of neglect. We must teach our brother physicians that they must eliminate themselves from the burden of neglect; then the only burden remaining is the neglect of the patient or of his guardian, if he be a minor. We must teach those who do not realize it as we do the absolute importance of early operation within the first few hours of appendicitis, or to operate in the interval, should the patient be so fortunate as to recover from the first attack. Instead of devoting one entire day to tuberculosis—important as that is, or to malaria—let us ask for a little part of the general program next year in order to teach the family physician, if it be necessary, and to teach the people themselves the necessity of bringing their loved ones and placing them in our hands when we have the very best chance of saving their lives. Why should it be, to our shame and disgrace, that a disease that is so well known, and the treatment, fortunately, so well known, that there should be such a mortality in cases where we can select the time for operation? If we believed we could cure a case of tuberculosis in the first days it started, wouldn't we stress the point that that patient should be brought to us? We stress the point that in ty-

phoid and other diseases the patient must be seen early—I mean to the public? We must impress upon them to bring their patients to us sooner. There is no question but what many physicians—well-informed men—are doing their duty to their patients. If they are not, doubtless it is up to us to teach them the necessity of bringing their patients to us in time.

Dr. Lucian H. Landry, New Orleans, La.—I was very glad, indeed, to see that Dr. DuBose emphasized particularly the fact that we should cut out purgatives. It has been our rule, in the last few years, to teach in our medical school to try to lay stress upon this point to the student, that if he does nothing and gives no purgatives he will be doing the best thing. Purgatives have killed more people than bullets—not excepting the present European war.

The point is made, for instance, when we see these bad cases of perforated appendicitis we do not ask them if they had a purge, but when they had a purge. Dr. DuBose said that 97% of his perforated cases are due to purgatives. I think he is correct, and, if possible, he is underestimating.

That is the point that is worthy of mention—the avoiding of purgatives.

Dr. F. L. Watson, McAlester, Okla.—I was not so fortunate as to hear the doctor's paper, but from the discussion I grasp the trend of affairs, and I desire to emphasize the point that the primary mortality of acute appendicitis should be nil.

If the family physician were called to see a case where all the clinical manifestations were those of malaria, he would, unquestionably, prescribe quinine, notwithstanding the remonstrances or the misgivings of his patient or of the family. He would be satisfied with no other prescription. When he is called to see the patient and makes a diagnosis of acute appendicitis (and it is almost classical) he should prescribe the hospital and the operation, and he should not rest at that; he should say: "That is the one and the best thing for you, and it is all that I am going to give you." He might add, then, that: "Unfortunately there are men in this community who will prescribe medicine and try to get you over this attack, but that is radically wrong;" and if he is a man conscientious in his chosen profession, he will say to the acute case of appendicitis: "Not a particle of medicine for you. You have called me here for my advice, and, if you accept it, it is the hospital for you and an operation."

Dr. S. E. Millikin, Dallas, Texas.—I regret exceedingly that a paper like this should be presented on the last day, with such a small audience. This paper should have been brought before one of our general sessions. I would say it should be where, as Dr. Crook has suggested, the layman may know the importance of this advance work. It is a matter of education.

As to the purgative, every surgeon knows what it has done, but I will have to tell a little anecdote told me by one of my surgeons in talking with an old practitioner.

He said: "Doctor, what do you think of the morphine treatment of appendicitis?" And, "What do you think of the purgative treatment of ap-

pendicitis?" That he had "discussed this thing pretty thoroughly with myself and they both seem to be good, and, as they are both good, I use both."

Dr. J. Shelton Horsley, Richmond, Va.—This paper is so excellent that it needs no encomiums, but there is one point with which I take somewhat an issue, and that is the idea of arranging an operation for some set, particular time, with reference to the clinical course of the disease.

As long as the inflammation is confined to the appendix, it is certainly safe. It is dangerous only when it filters through the appendix and reaches the surrounding tissues. Now, why does it go through? Always because of perforation. Not necessarily a gross perforation that you can see with the naked eye, but by the bacteria or the toxins. Let's bring it back so as to place similar lesions along the whole gastro-intestinal tract on the same pathological basis. If you have a perforation of typhoid ulcer or duodenal ulcer, what would you do then? You would operate. If you had a perforation from a bullet wound what would you do? Operate. You would not wait for the second, third or fourth day; you would operate as soon as possible. If you haven't got a perforation it is perfectly safe. If you have got a perforation, operate as soon as possible.

The great danger from stirring up and messing up things that used to obtain does not obtain now to such a large extent, because of the Fowler position and the proteolysis of Murphy have, to a large extent, done away with these dangers. The cases of appendicitis that I have lost have come to me late except in one instance—an unusual case, and the only one I have known—that was in the first six hours after the beginning of the disease.

I believe if we are going to teach the people that the patient should be operated upon early and they send us a case in three or four days and we put it off, we can not avoid criticism.

If we had a perforation in any other part of the gastro-intestinal tract, we would operate at once. Why not operate in appendicitis when the diagnosis is made?

I think the only way to count the statistics in appendicitis is to count not necessarily the cases you operate upon, but the cases that you see and that your patrons see. If, for instance, you take a case that comes in on about the third or fourth day, and it is pretty sick and gets over these three or four days, nature has helped the patient out. It is then a comparatively simple case, and on opening the abdomen ought to get along pretty well. If you operate at once you might possibly lose some of those cases; but if you compare that mortality with the mortality of those who need help the worst, when there is greatest need for it and are not operated upon, you will find in the long run that surgeons who operate carefully and gently at once will have a lower mortality rate than those who delay operation at certain stages of the game.

Dr. Fred H. Clarke, El Reno, Okla.—There is just a word of caution that we need to remember with the doctor's paper, or rather from the statements of one or two who have been discussing it.

I have gone through all that the doctor has said personally. You know no one is so foolish

about himself as the physician, and I put off the evil day until I had a ruptured appendix—so I speak with a great deal of feeling. It was pure carelessness. I was urged by my good wife to submit to operation long before I did, but because of the pressure of business and other engagements, I put it off.

The word of caution is this: The doctor has said in about 97% the perforation comes from drastic purgatives or "from purgatives," to quote him exactly. In my own case perforation came in four hours from the onset, with no purgative. In four cases that I can recall in my own mind, in my own practice, it is the same; so all practice must vary in different places and different individuals.

I think that the fatal cases that I have had (and I guess I have had my share of them) have been almost universally cases that had been moved some little distance from the home to the hospital. I have tried to remember the cases upon whom I have operated—out in the country, some of them, under conditions that were anything but pleasant or inviting, and yet I can not recall a single fatality among those operated on in the home under favorable conditions; but I have had among those that have come to the hospital, due to the fact that it takes time and increases shock to transport your case. Usually some man fifty or a hundred miles distant will be called to see the case and then it will come to you in the hospital, and the delay due to the removal of the case makes it too late for operation.

In connection with that, also, is the morbid fear many have of the hospital; so many times this causes delay. (I am speaking largely of our country practice). Sometimes these cases that are less grave and are neglected are fatal because of this very fact. I saw one just a few days ago where operation had been delayed because of that very thing. I am speaking more particularly of the severe cases and especially of the perforated cases. I do not think we ought to move them.

Of course every man bases his ideas upon his own experience, and mine have been based upon the cases that I have been able to go over in my own memory while listening to the paper this morning, and my fatal cases have been those that have been moved, and my recoveries cases of immediate operation or operation at the earliest moment. I was operated on in my own home.

Dr. J. H. Blackburn, Bowling Green, Ky.—There were just two points about which I wished to speak particularly, and the first is that of purgatives. I had a recent experience. While in the middle of an abdomen that was the result of a neglected case of appendicitis, a message came and as soon as I could get away I drove twelve miles up the country.

The little ten-year-old girl had had a stomach ache on Wednesday morning, the family physician had seen her on Thursday morning and had diagnosed appendicitis and given two grains of calomel. Friday morning at 4 o'clock she had the evidences of a ruptured appendix. The physician was called back and I saw her about noon of Friday and transported her to the hospital

in my car and opened the abdomen as soon as possible and found the ruptured appendix.

The other phase of it is the question of education. If we folks at home who do this work have done anything we have talked. We have iterated and reiterated that the patients should be operated upon early, and we do that with our medical friends, by all means. We have iterated and reiterated that they should not be given purgatives; and after a little heart-to-heart talk with this medical friend, when I said to him, without any hesitation, that his two grains of calomel had ruptured that child's appendix, he did not oppose anything that I suggested regarding the treatment of that case. He was very willing and ready to insist to the family that the child should be carried to the hospital and should have the abdomen opened immediately.

Now that is the education of the family physician as we have attempted to do it, and I have not hesitated in four or five instances to say to a doctor that, in my opinion, his purgative had been responsible for the condition of the patient, and, as a rule, they do not give the purgative in a second case.

As to the education: It occurs to me that instead of reading this paper of Dr. DuBose's over at the public meeting, as has been suggested, we might read it at the Section on Medicine. (Applause.) The practitioner is the man we have to educate.

I recently had occasion to discuss this very question with our county society, "The Causes of Death in Appendicitis," and two prominent causes that I mentioned were the family physician and the family. So in addition to the practitioner we must educate the public as to the necessity for operating in all cases if we would save the greatest number of lives.

Dr. F. M. Brown.—I have been in the Surgical Section the last few days and have heard a great deal about the country doctor, the family physician, etc., and I represent that type of doctor here today. Living in the small towns where we have not the facilities of a hospital like you men in the larger places, as a country doctor I want to endorse the paper of Dr. DuBose.

I wish also to endorse the doctor in regard to transporting these patients from the country home to the hospital. We all know that the hospital is the proper place to operate upon a case of appendicitis, if it is recommended, and we can go there without any trouble to our patient, but my observation and experience have been, in my cases of suppurative appendicitis transported to the hospital, my mortality has been much higher than the cases operated on in the home.

I think the continued vibration of the train causes a continual jostling of those intestines, and will cause more perforations than the chances we take in opening those cases right out in the home under the best sanitary facilities we have.

It is customary in my part of the country, and had been for years before I went to practicing medicine, when they saw a case of appendicitis to give a big dose of magnesium sulphate, but I have discontinued giving any purgative at all, thinking that the best thing to do was to empty the stomach and keep these patients absolutely quiet.

Morphia has been my sheet anchor, and so many physicians and surgeons have discussed the matter of its masking the symptoms, but I do not know of a case that it has masked the symptoms for me. If we know what he has, why let him suffer when morphia will relieve it?

A Member.—The question has come up in my mind if it would not be better to let the surgeon do his operation in the home rather than subject the patient to a trip of several miles in a train. We have been taught to administer opiates to keep them quiet, and it occurs to me that transporting them and making the railroad journey predisposes to the danger of perforations, and I would like to hear several others, to whom this has been a question, discuss that point. It has been quite a question with me, and I was never sure whether I was doing right in advising this patient to go to a hospital or whether I would do better or the patient's chances would be better if he were kept at home and the operation done under more favorable circumstances.

Dr. J. S. Ullman, Natchez, Miss.—In the first place I feel as Dr. Horsley does in the matter of time as when to operate. We have all been taught as surgeons, and it is our practice, in every condition where there is pus suspected to open, disinfect and drain. In a condition such as obstruction of the bowels, if we can not go any further, our duty is to open that abdomen and get up a loop of intestine and evacuate its toxic contents. We can content ourselves with that much if we have not the opportunity to do more. It seems to me that no matter how grave the patient's condition may be, we can certainly, with very little risk, and especially if we can follow out Crile's masterly technique of Anoci-association (I do not mean to say we are every one of us Criles, but we can follow his teaching) and by opening the abdomen and working gently and carefully down to the pus and putting in a tube, and being brave enough to stop at that point, we can do much for our patients' welfare.

The second point is in regard to the question of morphia. One of the gentlemen who preceded me a moment ago had something to say about the masking of symptoms. The point is this: After you have given your morphia you never know what symptoms have escaped you, what symptoms you have masked, or anything else, and of course if you are trying to save your cases for later operation, you may feel reasonably certain that you are going to have perforation whether you give your morphia or not. Then, if you can content yourself to look at it from that standpoint, well and good, give your morphia. But it seems to me poor surgery to use morphia and jeopardize your patient's condition, because we are taught by hard experience that a perforation in any condition, in any part of the abdomen, should be handled, preferably, within the first six hours. But after your morphia has been given you can not tell whether you are going to get at that perforation within six days or six hours. It will surely be overlooked in a large percentage of cases during the narcosis.

Dr. R. C. Dorr, Batesville, Ark.—I think it is wrong to lay all ruptures to the country practitioner giving cathartics. This often happens in

a girl sitting on a bench in the school house, or a man walking around. The pathology is what causes the rupture 90% of the time, and while I condemn cathartics as well as any one else, to my mind to say that it is solely cathartics is nothing but want of knowledge.

You say he is better off if operated on at home. No doubt about it. I have operated at the home, with the kettle for a sterilizer, with just as good outcome as I have in the hospital. It is not where, but when you operate; and the idea that none but those taking cathartics rupture is wrong, and the germ producing that disease has much to do with that rupture, because twenty years ago when we gave cathartics, many of them got well, and my ideas are that a small percentage of ruptured appendices—unless you take Dr. Horsley's view that they all leak—that is true. But we find a very small percentage, and I do not think there is so much in saying wholesale that it is the practice. Then, it has a death rate from its pathology, and from anaesthetics, and it is dangerous to tell people that he would not have died if you could have seen him at the right time. I do not believe that that is so.

Dr. DuBose Closes.—Replying first to my friend, Dr. Dorr, the statistics given were not mine. They were Dr. Deaver's and others', representing the leaders in the surgical world. When a man says it is "tommymrot" in commenting on these statistics, he is reflecting on the compilations of the greatest men in the surgical world.

Dr. Horsley has touched on one of the most difficult things—the matter of decision as to when to operate when the patient is not seen until after the third day. I, for one, believe it is most advantageous to operate at once during the first three days. It should be remembered that operations done on the third day are less safe than those on the second day, and those on the second day less safe than those on the first day of the attack. The speaker expects the doctors in country and town alike to make the diagnosis when the case is seen, and it can be made in six hours after it is seen. If any physician can not make a diagnosis of appendicitis within that length of time he should go back to school, for by the time he has emptied the stomach and the lower bowel by an enema, if the pain is not relieved, it is not bellyache, but an acute condition requiring surgical interference. A blood examination will give additional confirmative information.

My living is dependent upon the country doctor. My father was a country doctor, and I take off my hat and bend my knee to the country doctor and to the general practitioner. (Applause.)

Dr. Brown made a splendid statement when he said: "Unload the stomach, give an enema and then morphia, if not relieved," for he believed then that the patient had appendicitis and he transported him to the hospital.

To withhold morphia because it masks the symptoms is withholding from the patient with appendicitis the one and only drug that helps the condition. It does nothing against nature unless it helps to befuddle an already befuddled diagnostic mind.

I believe that every patient with an acute abdominal pain, as soon as he is seen, should have

a blood examination made, and most of the doctors in Alabama are able to do it, and are doing it. During the past few years the physicians who have referred these patients to me are sending them in early, and it is rare, indeed, that any are brought in during the last stages of the disease. I have seen people brought in and die within a few hours without operation, their condition being so extreme when they reached the hospital. And they are dying now from purgatives, and we know it. When a man says it is a baby act to say that purgatives produce peritonitis, he is contradicting the statistics of the best observers in the world. The figures show that only 3½% of those who were given purgatives escaped perforation, and they also show that less than 1½% of those who had the Murphy-Oschner treatment from the inception of their appendicitis had either a perforation or a peritonitis. (Applause.)

Monihan says that spreading peritonitis is an aperient peritonitis. The purgative makes the pathology. Without purgatives, but with a morphine, peristaltic rest treatment from the beginning of their attack, they do not have perforation.

In the twenty-two and a half years that I have been doing surgery, my appendicitis cases have run into the thousands, perhaps. I have seen only one case that had a perforation without a purgative being administered previously. He was operated on within eleven hours from the onset of his first pain, and he had a perforation. This was the only one that I have seen who did not have a purgative and who did have a perforation.

The fact is that 75% of all the cases of peritonitis that come into the hands of the surgeon are due to appendicitis—the 25% remaining arising from all other causes. Eight per cent of the people who are attacked with appendicitis die under the present regime, when not 1% ought to die. I did not say that the general practitioner was responsible for it. Ill-timed operations will add to the pathology, not only in point of time, but in extent of operation.

The principal thing that this paper has dealt with is prophylaxis of peritonitis from appendicitis. The imperative thing to do is to give the patient the advantage of the present-day scientific knowledge, and if he will not accept the advice given as a result of using all of the means indicated to help his condition, in that he should be operated on immediately, then turn him over to some doctor who believes in calomel and salts (if there be any in this day and generation) and let him sign the death certificate.

We hear about drainage, tubes and gauze. I wish to warn against the use of either tubes or gauze. The ordinary dental dam will get out more fluid from the abdomen than any other form of drainage, and will be conducive of fewer post-drainage adhesions. There is less liability of fecal fistulae or pressure necrosis than follow the use of drainage tubes.

There is something I want to say about the post-operative treatment of these cases in closing.

In these septic conditions there is a drying up of the tissues and an acidosis that hastens death. To combat these an intravenous solution of saline and the hypodermoclysis of distilled

water should be used. I have tried the distilled water under one breast and the normal salt solution under the other, simultaneously, and the distilled water has been absorbed twice as rapidly as the saline. In desperate cases the hypodermoclysis should be started as soon as the patient is brought to the operating table.

With reference to the anesthetic: Infiltration anesthesia and nitrous oxide narcosis should be used. The severer cases should have the major part of the operation done under infiltration anesthesia, which can be employed without any trouble to operator, or pain to patient, if you have given him previously a masking symptom dose of morphine. (Laughter.)

In the presence of post-operative ileus, the doing of an enterostomy under local anesthesia is frequently a life-saving proceeding and should under no circumstances be neglected.

CONCLUSIONS IN THE STUDY OF INTESTINAL STASIS.*

BY JOSEPH E. JOHNSON, M.D.
Memphis, Tenn.

To develop into an intestinal surgeon is a process of evolution. We begin by removing the appendix for all pains in the right side, and feel ourselves quite a surgeon. As we pursue our practice longer with the same clientele, we see a goodly number returning with no relief. We begin to observe more closely, we discover adhesions with which the appendix is blamed. Later, we learn to diagnose the different ptoses of the viscera and in these cases we note the obstinate constipation and the violent toxemia. After a futile attempt to relieve these patients by medical means, we advance into the next stage, the mechanical stage. Then we attempt to correct the ptoses by suturing the stomach and colon to the parietal wall, to hold them near their normal position. Dr. Morris says that by the time he learned to do the operation well he discarded it, and his observation has been that of most surgeons who have given this subject serious consideration. In my early replacing or hitching up operations it was unsatisfactory to do it through a median incision, so I conceived the idea of making a large transverse incision down to the rectus muscles and, by raising these from their sheath, continue through the

*Read in Section on Surgery, Southern Medical Association, Ninth Annual Meeting, Dallas, Tex., Nov. 8-11, 1915.