tom of perforating inflammation of the appendix," and occurred in eighty-four per cent of the cases analyzed by Fitz. It is usually limited to the fossa, but sometimes extends toward the navel or to the perinæum, testicle, or thigh. Fever, furred tongue, and vomiting may precede or accompany this pain. An initial chill is rare. The temperature ranges from 101° to 103°; sometimes it is higher; the pulse is increased in frequency. The patient in walking bends over, favors the right side, and has difficulty in standing straight. When in bed the patient usually lies with the right leg drawn up and complains of pain on extension. Micturition may be frequent or there may be retention of urine. Diarrhœa seems to be more frequent in children than in adults.

Physical Signs.—Tympanites may be early and interfere considerably with the examination. On the other hand, the abdomen may be flat, hard, and board-like even with diffuse peritonitis. In a great majority of the cases there is tenderness in the right iliac fossa and over the region of the appendix. McBurney has called attention to the value of a special localized point of tenderness on deep pressure situated from one and a half to two inches from the anterior superior spine of the ileum on a line drawn between this point and the navel. When firm, continuous pressure is made with one finger at this point the pain may be of the most exquisite character. Circumscribed swelling may be present, but it is inconstant and is not found in more than one half the cases. It is usually in the fossa below a line passing from the anterior superior spine to the navel and two or three finger-breadths above Poupart's ligament. In many instances it is a diffuse thickening and induration; in others a well-defined tumor mass can be detected. If there is much tension of the abdominal muscles and pain, it is best to make a thorough examination under ether. In the cases in which the abscess is large, fluctuation may be felt above Poupart's ligament or in the flank, and in some instances crepitation. Dulness is not present unless the exudation is abundant and superficial. Usually the small localized tumors are entirely masked by the distended intestines. A rectal examination should be made in every instance. When the appendix is above the brim of the pelvis it cannot be reached, but when, as so often happens, it curls over into the pelvis, it or the thickened indurated area about it may be felt. After all, the great danger is not so much in the limited peritonitis which results from the perforation, as in the extension of it to the general peritonæum. In Fitz's analysis, the second, third, and fourth days included the largest number of cases of beginning peritonitis. General abdominal pain, tympanites and an aggravation of the general symptoms indicate the onset of this serious complication.

Diagnosis.—Appendicitis is by far the most common inflammatory condition producing symptoms, not only in the cæcal region but in the abdomen, generally in persons under thirty. Laparotomy has taught us that, almost without exception, sudden pain in the right iliac fossa with

fever, localized tenderness with or without tumor, means appendix disease. Almost the only other local condition to be differentiated is stercoral cæcitis, which is characterized by less severe pain, slighter fever, and the presence of an elongated doughy mass in the lumbar region; it must be remembered that in many of these cases the appendix is probably affected.

Perinephritic and pericæcal abscess from perforation of ulcer, either simple or cancerous, and circumscribed peritonitis in this region from other causes can rarely be differentiated until an exploratory incision is made.

Catarrhal and perforative appendicitis cannot always be differentiated, as the cases which I have quoted show that in intensity of pain, severity of symptoms, and even in the production of peritonitis, the two may be identical.

Briefly stated, localized pain in the right iliac fossa with or without induration or tumor, the existence of McBurney's tender point, fever, furred tongue, vomiting, constipation or diarrhœa, indicate appendicitis. The occurrence of general peritonitis is suggested by increase and diffusion of the abdominal pain, tympanites (as a rule), marked aggravation of the constitutional symptoms, particularly elevation of fever and increased rapidity of the pulse. Alonzo Clark's sign, obliteration of hepatic dulness, is rarely present, as the peritonæum in these cases does not often contain gas.

The hypodermic needle should never be used unless there is marked tumor with dulness on percussion in the cæcal region.

Intussusception and internal strangulation may present very similar symptoms, and if the patient is only seen at the latter stages, when there is diffuse peritonitis and great tympany, the features may be almost identical. Fæcal vomiting, which is common in obstruction, is never seen in appendicitis, and in children the marked tenesmus and bloody stools are important signs of intussusception. It is not often difficult when the cases are seen early and when the history is clear, but mistakes have been made by surgeons of the first rank.

In women, disease of the tubes and pelvic peritonitis from any cause may simulate appendicitis; but the history and the local examination, under ether, should in most cases enable the practitioner to discriminate between these conditions. In neurotic patients the odd and anomalous symptoms produced by floating kidney may be thought to be due to appendicitis.

Prognosis.—If we regard every case of inflammation in the cæcal region as appendicitis, a large proportion of the cases recover. The gravity of the disease is difficult to estimate, but it certainly must be ranked as one of the most serious and fatal of the abdominal affections of young persons. Post-mortem observations show that very many instances get well, often without treatment. As mentioned, recurrence is common, so much so that over forty per cent of the cases may be spoken of as recurrent ap-

pendicitis. Sixty-eight per cent of the fatal cases die during the first eight days. Extension to the general peritonæum is almost always fatal. Perforation into the bowel is often followed by recovery. Perforation externally is still less serious. Nowadays, with the prompt surgical interference, the prognosis is very much better.

Treatment.—The studies of Pepper, Noyes, With, and Matterstock, and more particularly the elaborate and thorough study of Fitz, have directed the attention of physicians to the clinical features of the diseases in the cæcal region, but to the surgeons we owe invaluable lessons relating to diagnosis and, above all, to treatment.

The suggestion of Willard Parker with reference to early operation has been carried out and advocated by Sands, Bull, and Weir in New York, by Morton and Keen in Philadelphia, and by Treves in London.

Treatment of the Attack.—The medical treatment of appendicitis can be expressed in three words—rest, opium, and enemata. The patient should be quiet in bed with an ice-bag placed in the right iliac fossa. If there is much pain, opium should be given either hypodermically or by the mouth. Medium-sized injections of warm water may be given twice daily. I would protest most earnestly against the indiscriminate use of saline purges, which have been advocated under a total misapprehension. It cannot be too strongly emphasized that, as a rule, the initial condition, which produces the pain, the fever, and the local signs, is the establishment after perforation of a localized peritonitis. So long as the abscess cavity remains limited, resolution is possible. Saline purges mean more or less disturbance of the local conditions and a definite increase in the risk of general peritonitis. It is an entirely different matter when this is established. Salines in some instances then do good, but in appendicitis, when the general peritonæum is involved, the mischief is done, and neither salines nor laparotomy materially influence the result.

The profession has yet to learn the lesson that perforative appendicitis is in more than three fourths of all cases a surgical affection, and perhaps the most important function of the physician, under whose care the disease always comes at first, is to say whether the case is suitable and when the operation should be performed.

Operation is indicated: (*a*) in all cases of acute inflammatory trouble in the cæcal region when, whether tumor is present or not, the general symptoms are severe, as shown by tympany, spreading pain, increase in fever, and increase in the rapidity of the pulse. In so many of the cases no tumor is to be felt that stress cannot be laid upon its absence.

(*b*) When a definite tumor is present, associated with attacks such as have been described, particularly if they have been recurrent. An occasional exception may be made to this rule when, even with small tumor, the symptoms rapidly subside and the patient improves. We are here on the horns of a dilemma. On the one hand, it is in just such cases that perforation and fatal peritonitis may at any moment occur, and, on the other, the tumor may gradually disappear and the patient may have no further trouble.

(*c*) In recurrent appendicitis, when the attacks are of such severity and frequency as seriously to interrupt the patient's occupation. Is the interim operation advisable or shall the patient be advised to wait until an attack? Opinions differ on this point. It is best, I think, to wait. The operation has risks; patients have died from the interim laparotomy; and there is always a chance that the recovery from an attack may prove permanent. Both clinical observation and morbid anatomy show that complete healing is by no means rare. The physician must be guided too by the character of the surgical techinque at his command, and could hand over his patient without qualms to a modern operator whose success has demonstrated the safety of his methods.

IV. INTESTINAL OBSTRUCTION.

Intestinal obstruction may be caused by strangulation, intussusception, twists and knots, strictures and tumors, and by abnormal contents.

Etiology and Pathology.—(*a*) **Strangulation.**—This is the most frequent cause of acute obstruction, and occurred in thirty-four per cent of the 295 cases analyzed by Fitz,* and in thirty-five per cent of the 1,134 cases of Leichtenstern.† Of the 101 cases of strangulation in Fitz's table, which has the special value of having been carefully selected from the literature since 1880, the following were the causes: Adhesions, 63; vitelline remains, 21; adherent appendix, 6; mesenteric and omental slits, 6; peritoneal pouches and openings, 3; adherent tube, 1; peduncular tumor, 1. The bands and adhesions result, in a majority of cases, from former peritonitis. A number of instances have been reported following operations upon the pelvic organs in women. The strangulation may be recent and due to adhesion of the bowel to the abdominal wound or a coil may be caught between the pedicle of a tumor and the pelvic wall. Such cases are only too common. Late occlusion after recovery from the operation is due to bands and adhesions.

The vitelline remains are represented by Meckel's diverticulum, which forms a finger-like projection from the ileum, usually within eighteen inches of the ileo-cæcal valve. It is a remnant of the omphalo-mesenteric duct, through which, in the early embryo, the intestine communicated with the yolk-sac. The end, though commonly free, may be attached to the abdominal wall near the navel, or to the mesentery, and a ring is thus formed through which the gut may pass.

Seventy per cent of the cases of obstruction from strangulation occur

* Transactions of the Congress of American Physicians and Surgeons, vol. i, 1889. The percentages of his tables are used throughout this section.

† Von Ziemssen's Encyclopædia of Practical Medicine.