absolute constipation (both inability to pass feces and gas), serves to distinguish obstruction from peritonitis, be it origin rheumatic or perforative. The course of obstruction differs particularly from the last-mentioned variety of peritonitis. Perforation produces a strikingly rapid collapse, while peritonitis, due to intestinal obstruction, has as its prodromal symptoms colicky pain, vomiting, followed by distention, tenderness, fever, and again and constantly, vomiting. The duration covers many days, but in these cases surgical interference can do but little good. That success can be expected in internal strangulation, not accompanied by peritonitis, must never be forgotten, for we are fortunately able to recognize the condition in many instances. The onset is slow and afebrile. Colicky pains and tympanites are the first symptoms. The patient, unaware of his grave condition, tries to effect a cure with household remedies. Whisky and bitters, a diaphoretic, a long walk, and a cathartic are tried in turn. The last produces vomiting, but the bowels refuse to move. The patient ascribes it all to a "spoil stomach." The colic and vomiting continue; the constipation is unrelieved. Finally, the physician is called in. "Woe betide him," says Niemeyer, "if he has failed to examine carefully for a possible hernia." We assume that he does not deserve this reproach; that he has minutely examined the belly; that he has explored the rectum for fecal impactions and other obstructions. Nothing is found. But constipation, meteorism, vomiting, can not lightly be explained away. The unmistakable picture of obstruction rapidly unfolds itself with all its sinister concomitants—a picture which Watson and Niemeyer have described classically. Such patients suffer great torture. Their abdomen grows more and more distended, till it assumes the shape of a barrel. The diaphragm is pushed upward; the intestines are seen through the abdominal wall twisting and squirming. Each rising and falling peristaltic wave produces rumbling and rolling, with colicky pains. These efforts are all in vain; the intestinal contents can not pass down, and fecal vomiting sets in. At this stage the patient's appearance is appalling; his pulse grows small; and death, from exhaustion, finally comes to his relief.

The beginner must be taught, from the outset, that not infrequently peritonitis runs its course with severe vomiting and obstinate constipation, sometimes unaccompanied by fever. Occasionally purulent peritoneal exudates produce this picture along with an astonishing degree of euthanasia. But the very condition of euthanasia, when combined with constant vomiting and moderate distention, serves to distinguish peritonitis from obstruction. In obstruction, ceteris paribus, tympanites is very marked when vomiting has grown continuous.

The actual cause of obstruction can usually not be determined. Invagination may be suspected if gas or a small amount of feces, accompanied by blood, are passed. The invagination may positively be recognised if rectal examination allows the finger to reach the obstruction, or if the invaginated gut appears at the anus. While a student at Oppolzer's clinic, I saw a case in which a piece of the intestine sloughed off, and was found in the stool.

Other conditions producing obstruction may, for the sake of convenience, be grouped as follows: 1. Causes of obstruction outside the intestine; among these are strangulation by omental bands, adhesions, holes in the
mesentery and omentum, incarceration in diaphragmatic hernial openings, and, finally, in normal fossae, such as the subcecal fossa, through the foramen of Winslow, etc. 2. Cause of obstruction situated in the wall of the gut, such as volvulus, knots, stricture, especially carcinoma of rectum. Both varieties may be acting at the same time—as, for instance, in volvulus, in which the mesentery of the affected loop may simultaneously compress another loop of gut. 3. Cause of obstruction within the lumen of the intestine: here may be mentioned obstruction due to undigested food, fecal concretions, gall-stones, foreign bodies, ascaris, etc. This variety of obstruction may occur in a loop of gut within the sac of a large hernia of long standing. Larrey operated on a hernia in which the obstruction was due to ascaris, and after the worms had been moved on by massage the symptoms of strangulation were relieved. This, and other similar symptoms, go to prove that there is a kind of obstruction found in hernies which closely corresponds to the "focal incarceration" of the elder Richter.

It is readily understood that in a given case, in which the diagnosis wavers between obstruction and peritonitis, a single loop of intestine, which is felt at the same spot at repeated examinations, may be an important landmark and aid. This is the rightly famous fixed loop, which not only decides in favour of obstruction, but also points to its site.

The scope of this book forbids a detailed discussion of the method of diagnosing the variety and site of an intestinal obstruction. In some cases the concurrence of a number of factors makes it possible to arrive at a diagnosis; in other cases the cause and the site of the obstruction remain in doubt. For instance, a patient has suffered for some time from constipation, occasional vomiting, and meteorism. All of these symptoms are increasing in severity, the fecal masses approaching more and more to the type of lead-pencil stools. In addition, the patient, who is somewhat advanced in years, notices an increasing cachexia. The diagnosis of Carcinoma must be entertained, especially if palpation detects a resistance, rectal examination reveals a stricture, or a tumour of the abdomen can be found. V. Dunreicher was called in to treat a case of incarcerated umbilical hernia. Upon examination, he found a carcinoma of the transverse colon, which was about to perforate.

Another case may occur without prodromal symptoms. For instance, a patient suffering from acute obstruction has had a herniotomy performed upon him at some preceding time. At the time of operation adherent omentum was found at the entrance of the hernial canal. Our first suspicions will lay the cause of the present strangulation at the door of adherent omentum. If the patient has previously had peritonitis, and now suffers from acute obstruction, we are justified in suspecting strangulation from pseudomembranous bands. A history of persistent constipation will confirm this theory, for the kinking of adherent coils would readily account for the sluggishness of the bowels.

The site of the obstruction may often be recognised by the distribution of the meteorism. Distention of the small intestine (rounded belly, the region of the colon not distended) points to an obstruction above the large intestine. If the tympanites is insignificant in
amount, look for the obstruction at the beginning of the small intestine. A generally distributed distention points to obstruction near the end of the colon. The examination per rectum by means of the entire hand, after Simon, is of especial value. As Simon has shown, the fingers may reach well into the sigmoid, and if this is raised, the belly may be palpated still higher up, even as far as the ensiform. By this method a constricting band or a hard mass may often be reached.

Sometimes an area of increased resistance may be felt by abdominal palpation. At this spot motion is less noticeable, in spite of increasing tympanites, than in the rest of the belly, through which peristaltic waves travel to and fro. The pain may have started here and have persistently remained at this site ("fixed loop").

We may hope to receive some information by injection of water through the rectum or distention of the intestines with gas. These measures, in conjunction with the other symptoms, may be of great assistance. It is evident that the obstruction may be looked for low down (let us say in the flexure), if repeated injections of water fail to force more than a small quantity into the bowel.

The above-mentioned conditions will sooner or later (depending upon the experience or inexperience of the surgeon) allow us to recognise an internal strangulation or obstruction. In an irreducible hernia, accompanied by constipation, vomiting, and abdominal pain, the conditions are different. We are here confronted by a positive, unmistakable indication—operation for strangulated hernia. The fear of cutting down upon a non-strangulated hernia restrains us from too hasty interference. The dilemma is increased if the tumour is not positively a hernia, for, by operating, we then incur the blame of having confounded a lipoma with a rupture.

We are mainly interested in finding out whether, in a given case, it is possible to say that no strangulation exists. In certain cases strangulation may be positively excluded.

Let us assume that a hernia of long duration, which had always been reducible, suddenly, for some reason, grows painful and irreducible, with the simultaneous onset of vomiting. We find an undoubted case of serosal enterocle, for the tumour gives a tympanitic note. The tension and pain on handling are quite marked. Taxis cannot be attempted on account of the tenderness. The patient receives an injection of morphia, and is placed in a proper position. Sleep follows, and next day we are informed that the vomiting has ceased and gas has been expelled. Renewed examination of the tumour shows it sensitive at all points except in the vicinity of the neck, and pain is entirely wanting above the external ring. A fine crepitation attracts our attention during this examination; this crepitation resembles the "feeling produced by squeezing soft snow." The same crepitations have been observed in other conditions—for instance, after injecting a hydrocele with tincture of iodine—and are due to an adhesive inflammation. The inflammatory exudate which covers the smooth serous surface produces the crepitant sensation. That this same process takes place on the serosa of the intestine and of the hernial sac is abundantly proved by the sacs encountered, some of which are adherent to the gut over its entire surface.
At times the adhesions form without producing any inconvenience; at other times, vomiting and pain in the hernia accompany their formation. The vomiting is not surprising, for, according to the researches of Claude Bernard and Brown-Squard, we know that irritation of the peritoneum, abdominal wall, and abdominal viscera can cause vomiting. And, in our supposition of one case, the patient vomits after the examination, but this does not disturb us. We have demonstrated inflammatory products within the hernial sac. Pain, limited to a given point—the point of strangulation—is conspicuous by its absence; the pain found is distributed over the entire tumour. We can safely wait. During the course of the same day the bowels move; the abdomen does not grow distended, and diffuse abdominal pain does not appear. The general condition remains good, but occasionally, say once a day, the patient still vomits. Gradually the crepitations within the hernia become less marked, vomiting does not recur, appetite and bowels become normal, and local tenderness is no longer felt. The hernia, however, has changed from the reducible to the irreducible variety.

In another case, the symptom-complex is identical, except for the local findings in the hernia. The contents in this case is omentum. Instead of crepitus, a disproportionately rapid increase in size occurs; the tumour fluctuates, and is translucent. Here, evidently, a rapid effusion into the hernial sac has taken place. If, in the preceding case, the inflammation was adhesive, in the present instance it is exudative. Just as the physician diagnoses an adhesive pleurisy by the pleural friction rales, a pleurisy with effusion by the flatness, so the surgeon in those cases recognizes the adhesive inflammation by the friction, the exudative by fluctuation and by the light test. In neither of these cases was the intestinal tract obstructed. The belly was neither distended nor painful; the vomiting did not increase in the ratio in which it should if the local, abdominal, and general symptoms were due to intestinal obstruction. Certain contradictions which do not correspond to the picture seen in obstruction are present.

The following is a different case. The conditions are irreducible hernia, constipation, and vomiting. We are surprised by the marked distention of the abdomen, the great care with which the patient avoids all movement, the superficial respiration, and the excessive tenderness of the entire belly. In marked contrast, the hernia is soft, and not tender; the abdominal and local symptoms disagree. If no hernia were present, we would at once make the diagnosis of PERITONITIS. The history shows that the patient has had a chill on the preceding day, and that the abdominal pain was severe without pain in the hernia itself. Gas was passed. The temperature now is 38.5° (101.3° F.). This is not the picture of obstruction. We again wait and observe. The vomiting does not recur on the same day, and on the following day free exudate can be demonstrated in the peritoneal cavity. This is the picture of an acute diffuse peritonitis. If the peritonitis is circumscribed, the symptoms of some other disease precede it—the symptoms of appendicitis, gastric or duodenal ulcer, or perforation of tuberculous or typhoid ulcer of the small intestine. We always find an entire absence of local symptoms except the irreducibility of the hernia (which we have assumed to be present from the outset), and positive symptoms elsewhere. These consist of marked
general abdominal tenderness, fever, and, at a later
stage, free exudate, in general; and severe local tender-
ness, fever, and local dulness or flatness in circumscribed
peritonitis. The process sets in not with pain in the
hernia, but with pain in the abdomen. In peritonitis,
the vomiting stops, and at least gas is passed; in ob-
struction, the vomiting increases, and becomes fecal.
We may find another class of cases in which, al-
though a tumour is found at a hernial orifice, the nature
of the tumour is uncertain. Vomiting and constipa-
tion are among the symptoms. The condition is known
as PSEUDO-STRANGULATION. A strangulated testicle
illustrates the point. It may happen that an unde-
sceded testicle within the inguinal canal grows in-
flamed and swollen, or that the testicle, as the result
of some trauma, slips up into the canal, and then
becomes painful. The scrotum should, therefore, be
examined in all cases, in order to avoid overlooking
a possible cryptorchism. As a rule, vomiting occurs,
but does not increase in severity, and never grows
fetal; moreover, the abdomen remains soft, and both
gas and feces are passed. Cases, however, are on rec-
cord in which vomiting (even fecal vomiting) and con-
stipation were present, the operator being thus com-
pelled to expose the tumour. This is entirely justified,
especially as a hernia may be incarcerated above the
undescended testicle.
Inflamed INGUINAL GLANDS produce a tense, painful,
and irreducible swelling, accompanied by the symptoms
of vomiting and constipation. As the local symptoms
are severe, we are more easily influenced to decide in
favour of herniotomy, and when we cut down, find—
inflamed glands. Our herniotomy has changed into an
extirpation of the glands. Many such cases are on
record.
Knowledge of the above occurrence has in some
cases, proved fatal to the patient. It happened to
LaHarpe that his herniotomy incision laid bare glands,
and he at once assumed that the symptoms were due
to peritoneal irritation. The autopsy showed that be-
hind the glands a small hernia was incarcerated. This
experience has been duplicated by several other sur-
geons; for instance, by Danzel.
Danzel has shown that inflammation of an empty sac
causes symptoms resembling strangulation. In these
very cases an error is more readily committed, for a
tumour is found, which, according to the patient's his-
tory, points to the previous existence of a hernia.
In all these cases the axiom, that operation is indi-
cated if constipation persists and vomiting increases,
holds good. If no hernia is found, usually some other
condition will be relieved; if strangulation is found, the
patient has been saved. Strohmeyer said to his pupils:
"If you find a strangulation during the day, it should
be relieved before sundown; if during the night, it
should be relieved before sunrise."