of the tests of their mobility, often depend upon the relaxation of the abdominal wall, and also upon the proximity of the tumor to the abdominal wall. It is therefore of advantage, as previously mentioned, to examine patients in different positions; such as the half-reclining position, with knees flexed and supported, or the knee-chest position, or with the pelvis elevated. The position of the patient should be such as to bring the organ in question as much as possible out of the hidden situation. In examining the lumbar region for suggested tumor of the kidney a patient should lie upon the sound side, while a sand-bag or firm cushion is placed beneath the unaffected loin. In this manner the ribs and ilium of the affected side are separated and the parts are rendered more accessible for examination. Examination of the epigastric and mesogastric regions is facilitated by a cushion placed beneath the lumbar vertebra while the patient lies in dorsal decubitus.

Relaxation of the abdominal muscles is facilitated if the patient breathes not too strongly with his mouth open. The surgeon should also distract the attention of the patient by conversation. Some surgeons anæsthetize a patient in order to relax the abdominal muscles, but Mikulicz has not done so for many years. There may be instances in gynecological practice in which the anæsthetic is desirable in order to spare the patient the pain and discomfort of an examination. In difficult cases an examination should be made while the patient is in a warm bath, since the abdominal muscles are greatly relaxed thereby.

The results of examination of abdominal tumors are much more striking if they are arranged in tabular form, or marked upon a diagram in different colors. The examination should show:

1. The condition of rest, the area in which pain is felt, the results of palpation, inspection, percussion, and the position of normal organs as well as that of the tumor.
2. Respiratory motions.
3. The limits of the greatest passive mobility of the tumor.
4. The results of distention of the stomach and intestine.

CHAPTER XIII.

MALFORMATIONS OF THE STOMACH AND INTESTINE.

CONGENITAL ANOMALIES OF THE STOMACH.

THE only malformation of the stomach which possesses surgical interest is pyloric stenosis. This may be slight or severe. Sometimes the stenosis is a true contraction of the orifice, and sometimes it is due to hypertrophy of the circular muscles. This hypertrophy may be so extreme that the wall of the pylorus measures 1 cm. (0.4 inch) in thickness, and the pylorus is palpable as a small tumor. This condition is quite different from complete atresia of the pylorus.

Neurath collected reports of 35 cases of congenital pyloric stenosis in which autopsy was performed. The symptoms appear either soon after birth or during the first year of life. They are similar to the symptoms produced by pyloric stenosis in later life except that the stomach does not have time to reach a high degree of dilatation before the child dies. There is intense vomiting of material which is free from bile, whereas ordinary infantile vomiting if severe is bilious. Sometimes peristaltic action of the stomach is visible, and sometimes a pyloric tumor may be felt. Under such circumstances the diagnosis is easily made. The passage of a stomach-tube will show that the motor function of the stomach is disturbed. There will be no hyperacidity as long as the child takes nothing but milk.

It is not possible to determine whether mechanical stenosis or muscular spasm exists. In the latter case internal treatment may be continued, but not too long, since so young a child sinks rapidly if the vomiting continues. The results of recent operations for this trouble are encouraging. Trautenroth collected reports of 12 cases treated by operation (1 pyloroplasty, 2 pyloric divulsions, and 9 gastro-enterostomies). Seven children survived operation.

There is another form of pyloric stenosis in which the symptoms are not manifest until some years after birth. Such stenosis may be a simple narrowing of the lumen of the bowel, or it may be of a hypertrophic character. In the present state of our knowledge it is impossible to say whether such stenosis is congenital or acquired.

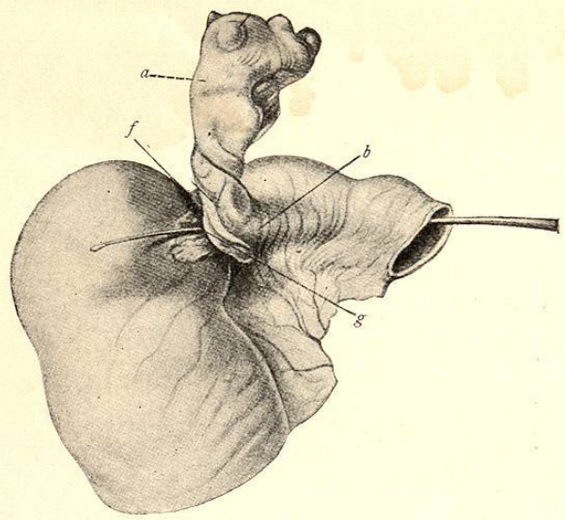
There is also a congenital stenosis of the stomach itself (hour-glass stomach); or a transverse partition of the stomach may exist.

MECKEL'S DIVERTICULUM.

The commonest congenital anomaly of the intestine is known as Meckel's diverticulum. It is described as a form of incomplete obliteration of the vitello-intestinal duct. (Page 139.) Meckel's diverticulum is found in about 2 per cent. of subjects, according to English

anatomists. It is a blind appendage of the lower portion of the ileum. It is attached in adults from 50 to 60 cm. (20 to 24 inches) above the ileocæcal valve, although the point of attachment varies from 30 to 130 cm. (12 to 52 inches). It is usually opposite the mesentery. Its tip may be free or united to the umbilicus by a solid cord. It varies much in length and diameter, and in shape may be cylindrical, conical, or club-shaped. At the point where it joins the small intestine there is usually a valve.

FIG. 67.



Obstruction and perforation of the intestine by a twist of *a*, Meckel's diverticulum; *b*, its insertion into the intestine; *f*, gangrenous wall of intestine; *g*, perforation through which a probe is passed. (Hilgenreiner.)

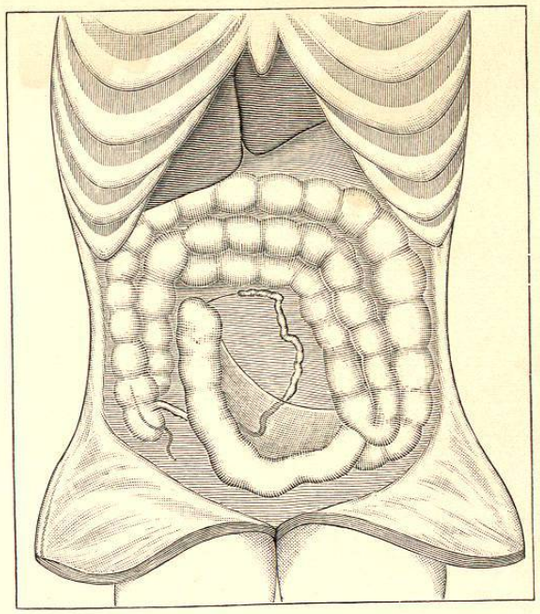
Under certain circumstances Meckel's diverticulum becomes of clinical importance: 1. It may enter a hernial sac. If it becomes strangulated, it will give rise to the usual symptoms of strangulated hernia. 2. It may produce ileus by acting as a band to obstruct a coil of intestine. 3. A foreign body may lodge in it. 4. It may be the seat of an attack of inflammation similar to inflammation of the vermiform appendix. Such attacks could only be differentiated if the diverticulum and appendix were widely separated. It is, however, to be borne in mind that the location of the cæcum itself is somewhat variable.

When Meckel's diverticulum is found to be the seat or source of disease, it should be removed in the same manner as the appendix vermiformis. If it is found accidentally during operation and its condition is not such as to suggest future trouble, it should not be disturbed. The removal of this diverticulum is a simple operation. It lumen is closed at the base by a purse-string suture. (See page 401.) Only in rare cases in which the lumen is large is it necessary to close the gap in the intestinal wall by a double row of transverse stitches.

CONGENITAL STENOSIS AND DISPLACEMENT OF THE INTESTINE.

Any portion of the intestine may be congenitally absent or its lumen may be wanting. This is especially true of the anus and rectum. Gärtner, who in 1883 collected reports of 65 cases, exclusive of rectal affections, found that the most common seat of atresia is in the neighborhood of the attachment of the vitello-intestinal duct. (Fig. 68.)

FIG. 68.



Congenital occlusion of 15 cm. (6 inches) of ileum. (Martens.)

Atresia of the duodenum is somewhat less frequent. The seat of the trouble in the duodenum is usually above the papilla of Vater. If the papilla itself is involved, the biliary and pancreatic ducts may be distended so as to form large cysts.

The large intestine is seldom the seat of congenital stenosis. Sometimes the sigmoid flexure is found bent at such a sharp angle as to interfere with the passage of feces. This produces secondary hypertrophy and dilatation. Stenosis in different portions of the intestine may coexist.

The symptoms due to congenital intestinal stenosis are similar to those of acquired stenosis in the same portion of the intestine. (See page 295.) If the lumen is nearly or completely occluded, surgical treatment alone can be of benefit. The operation may be either a plastic one or an anastomosis, or the establishment of a fecal fistula.

As far as known, all the patients operated upon have died except those suffering from obstruction due to a kink of the sigmoid flexure. This condition has been successfully relieved by the establishment of drainage through the anus.

The intestine or a portion of it may be congenitally misplaced, or it may be abnormally long or abnormally short. These abnormalities of themselves do not produce serious symptoms, but they may predispose to volvulus, etc. They may also lead the operator into mistakes in diagnosis.

Complete situs inversus is a well-recognized anomaly. There are also partial degrees of the same malformation. Thus the small intestine may be situated on the left side and the large intestine on the right, or this relation may be reversed; or the large intestine may be situated behind the small intestine so that the transverse colon lies between the duodenum and the vertebral column.

The cæcum may be abnormally long and variously misplaced. Under such circumstances the appendix is also misplaced. The transverse colon may be elongated so as to form a V, and it may even have more than one loop. The same is true to a still higher degree of the sigmoid colon. Such conditions predispose to volvulus. The ascending colon may be wanting, so that the cæcum joins the hepatic flexure; or the cæcum may be wanting and its site be marked by a rudimentary appendix. Other portions of the large intestine may also be absent.

An abnormal length of the whole intestine is sometimes attributed to a coarse vegetable diet during the period of most rapid growth.

The mesentery of the upper portion of the jejunum may be wanting, so that this small intestine is as closely attached to the posterior abdominal wall as is the duodenum. The lower portion of the ileum may present the same condition. The ascending or descending colon may have so complete a mesocolon as to resemble the small intestine. The muscular bands of the colon may be continued in the wall of the ileum. Portions of the intestine may be double and variously connected with one another.

ACQUIRED INTESTINAL DIVERTICULA.

There are intestinal diverticula which are said to be acquired, although their origin is somewhat in doubt. They may occur singly or in small number, or they may occur in large number—four hundred or more. They may be of any size up to that of an apple. These diverticula if small possess no surgical interest. They may be either true—that is, involving all layers of the intestinal wall; or false, in which case the muscular layer is not involved, but the mucous membrane projects through an opening in it like a hernial sac. Congenital diverticula are of the true type, while those which are acquired are for the most part false. Acquired diverticula may be due to ulceration, foreign bodies, constipation, or external traction the result of adhesions or

tumors. A diverticulum is prone to form in some portion of the intestinal wall which is weak on account of the presence of a vein or other vessel, or the biliary or pancreatic ducts.

Small diverticula usually give rise to no symptoms. They may, however, lead to chronic inflammation of the submucosa and subserosa, and may even set up adhesions between the intestine and surrounding parts. Such a condition is easily mistaken for a tumor. Larger diverticula may compress some portion of the intestine or interfere with the function of other abdominal organs. Fecal concretions may form in them, and they may also give rise to ulceration and adhesions or perforation into the peritoneal cavity.