

rectal irrigation every second or third morning. The quantity and specific gravity of the twenty-four hour urine are a good indication of the resorptive function of the rectum. Some surgeons prefer to give artificial foods, but Mikulicz has never found it necessary to resort to them for administration either by the mouth or through the rectum.

The diet after gastrostomy and jejunostomy has been spoken of on pages 423 and 456. After operation upon the lower bowel the patient should receive for about a week a fluid diet to which there will be very little residue. After suture of the large intestine Mikulicz recommends a cleansing enema given by the surgeon himself eight days after operation. Laxatives are given after intestinal suture only in case symptoms of intestinal paralysis appear.

When a fecal fistula is established, the patient receives his regular diet two or three days after operation; and if the bowels do not move spontaneously within a reasonable time, he is given laxatives.

HERNIA.

BY PROF. DR. E. GRASER.

CHAPTER XX.

HERNIA WITHOUT COMPLICATIONS.

SOURCE OF HERNIA AND ITS SIGNIFICANCE.

ABOUT one of every twenty to thirty individuals has a rupture of some sort. The proportion in males is as 1 is to 14.9 and in females as 1 is to 44.7. A large percentage of the cases that are seen for the first time are in children under one year of age; for instance, one-seventh of all cases of inguinal hernia. The minimum number of cases is observed about the fifteenth year of life. From this time on, the number increases, and reaches a maximum in males at about sixty-five years and in females at seventy years of age. Berger found that of 7542 cases examined with reference to heredity, 2079 were positive in this respect, the proportion being about as 1 is to 3.6. Hernia on the right side is much more common than on the left side, especially in males, the difference being most marked in the early years of life.

Several hernias may be present in one individual at the same time. Of 6220 cases of inguinal hernia examined by Berger, 1042 were simple and 4526 were bilateral. Of 829 femoral hernias in women, 506 were simple and 323 combined with other hernias; 213 were crural. There were numerous combinations of inguinal and femoral hernia on the same side (222) and on the opposite side (111).

As far as the hernia is concerned, it may be congenital, especially in the umbilical region, because of defective development. The viscera, however, do not protrude from within outward, but normal retraction has not taken place so that a certain portion of the viscera is left outside. Congenital hernia occurs also in the inguinal region because of insufficient obliteration of the vaginal process. If an oblique inguinal hernia is present at birth, there are usually other peculiarities, such as adhesions between the testicle and the intestine, which developed before the organ descended. In most of the so-called congenital inguinal hernias only the sac itself is congenital. Certain authors claim that the vaginal process is of importance in all cases of inguinal hernia, whereas others claim that it is of no importance whatever and bears no relation to inguinal hernia developing later in life. Without doubt both are in error. The degree of obliteration may vary considerably, but it is uncommon to have a free communication between the vaginal

process in the peritoneal cavity later in life. It is more apt to close at the scrotal end, and may remain patent in the region of the cord even as far as the internal abdominal ring. Knowledge on this subject is insufficient. Francke found a congenital hernial sac 18 times—*i. e.*, in 28.6 per cent.—of 63 cases operated for oblique inguinal hernia; Beresowky found a congenital sac 42 times—*i. e.*, in 35 per cent.—in 124 cases operated upon in Kocher's clinic; and Wood found a patent vaginal process in 127—*i. e.*, in 33.3 per cent.—of 370 cases of inguinal hernia. These figures express in a measure the importance of this vaginal process. The number of cases in which the vaginal process is closed below but patent above, forming a small funnel in the region of the internal abdominal ring, is probably equally large. This, of course, would be a convenient starting-point for an inguinal hernia. In females the diverticulum of Nuck is also of importance in the etiology of inguinal hernia.

Even if the vaginal process is not taken into consideration, certain regions of the body are predisposed to hernia, especially the regions where the abdominal structures are less resistant. These weak places are present in every individual, but are much more pronounced in some than in others. The inguinal canal is one of the weakest spots in the abdominal wall in any individual. The wider it is and the straighter its course the more readily will a hernia develop in this region. A large external abdominal ring in itself is of no special importance in the etiology of hernia. However, it frequently happens that when the external ring is large the canal itself is apt to be quite wide, although the variations in this direction are great. A wide inguinal canal is frequently associated with a lax anterior abdominal wall with considerable separation of the pillars of the external ring and with lax intercolumnar fibres. The external ring, instead of being a slit in the fascia bounded by two firm pillars, may be a round opening. The inguinal canal is abnormally wide in cases in which the cord is surrounded by a considerable amount of fat. This fat frequently forms finger-like rolls which diminish the resistance in this region. Bayer considers that complete absence of fat in the inguinal canal is characteristic of congenital hernia. In certain cases the inguinal regions appear soft, so that there is a slight bulging parallel to Poupart's ligament even when the abdominal parietes are at rest. This condition is frequently, although not always, associated with wide inguinal rings and probably develops in the early years of life.

The acquired predisposition to hernia is the result of general physical weakness, especially in young children under unfavorable nutritive conditions. Besides this there is the influence of chronic diseases associated with emaciation. The fat disappears from the meshes of the cellular tissues, which in turn become lax and movable, so that the so-called hernial openings are insufficiently plugged. The effect of emaciation is greater when the patients were previously extremely obese, because the tissues were more or less spread apart by the deposit of fat. The greatest acquired predisposition is found in advanced

years, when there is physiologically considerable diminution of tissue associated with relaxation of muscles and fascia. For this reason in senile individuals it is extremely common to have multiple ruptures develop without apparent cause. During old age or after disease the lower portion of the abdomen assumes a more or less characteristic shape as the result of relaxation of the anterior abdominal wall. The upper portion of the abdomen is flat, and in the lower portion of the linea alba and on both sides above Poupart's ligament there is a rounded bulging of the thinned-out abdominal wall. Berger describes another variety in which the lower portion of the abdomen is distended and the upper flattened out. The parietes are thin, and at times the intestinal loops may be distinctly seen and felt through the skin. The abdominal wall may be so distended as to hang down over the pubes onto the thighs like an apron. This apron, to be sure, consists only of skin, but the condition is associated with stretching and relaxation of the muscular portion of the wall. Individuals with abdominal walls of this sort, especially old women that have borne several children, not infrequently have several large hernias, and there is apt to be ptosis of the abdominal viscera, such as prolapse of the uterus, of the vagina, or of the rectum, or floating kidney and enteroptosis.

The conditions associated with extreme distention of the entire abdominal cavity and stretching of the abdominal wall have an especially deleterious influence. Pregnancy heads the list in this direction. The stretching affects the portions of the abdominal wall that are non-muscular just as much as if not more than the muscular regions. After delivery these regions are overstretched and relaxed. In healthy individuals they regain their normal consistence after a sufficient rest, but if disturbances occur before the region is restored to its former state, it is evident that severe damage may result. When an individual becomes pregnant in rapid succession, the abdominal walls do not have time to regain their normal resistance. These remarks are well illustrated by the separation in the umbilical region and in the linea alba between the rectus muscles during the last stages of pregnancy. The reason why a hernia does not develop more often immediately after pregnancy is probably due to the facts that most women take especial care of themselves after delivery, and that the amount of interabdominal pressure during this period is slight. Besides, the effect of abdominal straining, which is of etiological significance in many cases, is much diminished during the puerperium.

Certain individuals have an abnormally long mesentery, and it may be that the pressure of a dependent and filled portion of intestine weakens the lower part of the abdominal wall. Radical operation, however, shows good results in these cases, so that the significance of a long mesentery does not appear to be great. Subserous lipomata, especially if they tend to wander, form another predisposing cause. Pelletan and Cloquet called attention to the fact that certain cases of hernia were not the result of a protrusion of the peritoneum, but that the peritoneum was pulled out after a lipoma. Contracting lymph-

glands are also supposed to exert similar traction upon the peritoneum, just as traction diverticula of the œsophagus are the result of cicatricial contraction in the vicinity. The lipomata are found especially in the femoral region. They tend to exert traction on the peritoneum and form a funnel into which the viscera later are forced. It is also possible that the abdominal rings may enlarge as the lipoma increases in size, and that they therefore offer less resistance. This etiology does not apply universally, although Roser and Linhard claim that femoral hernia is due to one or the other of these causes. These authors claim that when the lipomata could not be found, they were present in the early stages but later disappeared.

All of the above-mentioned factors are predisposing causes, while the actual appearance of a hernia is due to some accidental impulse that as a rule increases the abdominal pressure. Straining at stool, coughing, lifting, or a blow or fall upon the abdomen, are factors to be mentioned in this connection. Individual anatomical peculiarities are of considerable importance, because certain people do the hardest kind of work and are subjected to all kinds of accidental influences without ever having hernia, while others develop several hernias at one time as a result of insignificant accidents. Occupation is of considerable etiological significance, and those that follow an occupation which tends to increase the muscular power, combined with considerable strain on the thoracic viscera, are especially prone to hernia. An occupation which necessitates standing predisposes much more than sessile work, and occupations which require the use of considerable muscular force with the body bent forward favor the occurrence of hernia. Berger's statistics illustrate those occupations which are most conducive to hernia and those with which a hernia is not so common. The repeated increase of pressure associated with continuous coughing in chronic diseases of the respiratory organs, such as bronchitis, emphysema, and tuberculosis of the lung, is of especial importance. Certain authors claim that diseases of the nose and nasopharynx are of etiological importance, and it is quite certain that chronic constipation must be a predisposing cause, although there are no statistics in this direction. Difficult urination, such as is observed in connection with stricture of the urethra or hypertrophy of the prostate, is also of importance. Ravoth, Schmid, and Karewsky claim that phimosis is a predisposing cause in young children, whereas Englisch, B. Schmidt, and others deny any connection between the two conditions. Personally the author believes that phimosis does have some influence, and before fitting any appliance he always recommends circumcision in children with phimosis. It is not the obstruction to the passage of urine, but the irritation to the glans and prepuce which is associated with the desire to pass urine and straining when there is very little urine in the bladder. Several factors favoring the development of a hernia may be present at the same time. There may be some peculiar inherited shape of the abdomen, or wide rings, extreme mobility of the peritoneum, insufficient fixation or ptosis of the viscera, frequent sudden increase

of the abdominal pressure, and when there is marked predisposition a very slight accidental cause may be sufficient to produce a hernia. On the other hand, there may be no predisposing factors whatever, but a combination of accidental causes may be followed by the development of a hernia. There is considerable discussion as to whether a hernia can appear suddenly in all its component parts. The majority of authors believe that this is an extremely rare occurrence, although it is not uncommon to have patients state that the condition appeared suddenly while at work.

Kingdon's statement, that a hernia is a disease and not an accident, a pathological condition and not merely a mechanical lesion, applies to most cases of rupture, for if the condition appeared suddenly the physician seeing the case immediately would usually find evidence of more severe traumatic injury. It is perfectly possible that a hernia may have been gradually developing for some time, and that owing to some accidental cause it suddenly increases rapidly in size and becomes evident on inspection. It is quite common in young boys to have a loop of intestine come down suddenly in a vaginal process that has been open since birth. It is not uncommon, also, to have recurrence after a radical operation appear all of a sudden, although this is not the usual procedure. The vast majority of acquired hernias in adults develop very gradually.

It is a matter of indifference whether the pressure in the abdominal cavity is perpetually positive or not. (Braune, Schatz, Schwerdt.) The pressure is increased normally only when the abdominal muscles contract all together. Under the influence of abdominal straining the space is considerably diminished and the movable viscera will escape toward the regions that are not diminished in size by the muscular pressure. This sliding away of the intestine will be more forcible the more sudden the muscular contraction; for instance, in attacks of coughing. This is illustrated while watching a hernia come down during an attack of coughing, or by placing the hand within the vagina or rectum. The effect of increased abdominal pressure depends largely upon the position of the body and the degree of contraction of individual groups of muscles. Certain individuals assume a position which places the minimum amount of tension upon weak spots, and they also avoid certain harmful influences. The accidental force is applied as a rule in an unexpected and uncertain way, while the body is in an unprepared and awkward position. The uncomfortable feeling in the lower portion of the abdomen while lifting with a fixed diaphragm heavy objects is not so much due in all probability to muscular strain as to the pressure and stretching of the peritoneum. The influences that result in a hernia may be minimal at the time, but repetition finally results in hernia. A harmful cause may act many times without damage. Eventually, however, the peritoneum may be loosened, and if sufficient time does not elapse to have the former condition restored before the cause becomes operative again, then a slight bulging in the region will result. Once this is present, the slight

amount of force which in former times did no harm whatever is effective in distending the pocket more and more. In a fully developed hernia the same loop of intestine appears again and again in the sac, and although it is difficult to prove, the same loop was probably effective while the hernia was developing. The fact that most individuals are not aware that a hernia is developing is greatly in favor of the theory that the early stages appear very gradually. Of 1042 subjects that presented themselves for examination because of an inguinal hernia, there were only 12 that appeared in the very early stages, and only 48 where the inguinal hernia was not complete, which would tend to show that the early stages of the hernia are overlooked by the majority of individuals, and that the patients are not aware of the condition until the hernia is perfectly evident to everybody. There are certain cases, however, in which the hernia is forced down suddenly (*hernie deforce*). Of the 4621 cases examined by Berger, 30.8 per cent.—*i. e.*, 1427—attributed the condition to violence; and of these, 1350 were inguinal hernias and 38 were femoral. Only 6 to 7 per cent. of hernias due to violence appear immediately after an accident. A slight pouch in the peritoneum may have been present for some time, but in 90 of 100 cases the bulging will take place gradually, in 9 it will come down in more or less abrupt stages, and in 1 case it will come down suddenly as the result of some applied force. A workman in lifting a weight experiences a sudden sharp pain in the inguinal region and appears for examination with a small hernia containing intestine. Practical experience and scientific investigation show that this workman would not have had a hernia as the result of lifting the weight provided there had been no hernial sac, which reached down almost to the external abdominal ring. This bulging of the peritoneum as far as this region is not the result of one sudden accident, but is the result of predisposition and a series of greater or lesser accidental causes. The final appearance of an inguinal hernia that can be appreciated on inspection is the result of a sudden exertion, but only after the way has been prepared in the above described manner. From a medical standpoint no objection can be raised to this view, although the legal side is quite different.

A hernia is a condition which not infrequently interferes largely with the earning-capacity of an individual, even if the rupture is held in place by a suitable truss. Generally an individual with a hernia that can readily be retained in place by a truss can perform only 85 to 90 per cent. of the work he was formerly capable of doing; and when the hernia is difficult to hold in place, his wage-value may be lessened to the extent of 50 per cent. Only a very small percentage of hernias are the immediate result of accident. The physician on the first examination should question the patient carefully to determine whether the cause as given by him can be classed as an accident. A blow or a fall upon the abdomen, slipping or falling while carrying heavy weights, with the body in an awkward, unnatural position, especially with the legs spread apart, inordinate taxing of the physical strength

while lifting, especially when several workmen are carrying a load and one or more drop the weight or cease to apply any force so that the strain falls upon the remaining individual, all of these conditions come under the head of accident. If physical work is given to an individual disproportionate to his strength because of his age or because of some usual occupation, this cause should also be considered under the head of accidents.

There are no symptoms characteristic of a hernia due to accident, and the author has never been able to trace a case in which there were signs of acute trauma, such as cedema and ecchymosis. A case reported by Stucki is interesting in this connection, and the recent work of C. Hägler treats of the question of traumatic hernia. The bruising of the abdominal wall, of course, has nothing to do with the hernia, and personally the author believes that a rupture may be pushed down by a sudden increase in abdominal pressure without shock or severe symptoms. Pain is usually present, and is due to stretching and traction upon the parietal peritoneum. If there has been a sudden jerk which pushes the hernia down for some distance at a time, the patient feels more or less nauseated and quits work for the time being so as to consult a physician. After several days, or even weeks, it is practically impossible to tell how a hernia appeared, whether it was due to accident or whether it appeared gradually in the usual way. It is possible that a hernia may be the result of accident in these cases if the outside portion is small and the hernia cannot be reduced immediately only after prolonged pressure and reappears on coughing. A small inguinal ring and unilateral hernia are also somewhat in favor of a traumatic origin. Against a sudden development of the hernia would be the size, so that the hernia reaches down into the scrotum; also considerable mobility, perhaps so much that the hernia can be reduced while standing up and easily while lying down, and reappears immediately. If other ruptures are present at the same time, this does not exclude a sudden appearance of the condition because of the possibility of individual predisposition, but is more in favor of gradual development. If the patient comes under observation several weeks after being attracted by the condition, the chances are that the first symptoms noted by him were slight, because if they were violent and due to accident, he would in all probability have applied to a physician immediately. Not infrequently a hernia is claimed to be the result of violence, such as a blow upon the stomach or a kick. This is, of course, possible, but an examination of these cases immediately after the injury is of extreme importance, as are also the peculiarities of the individual's abdomen. In Russia it is not uncommon for young men who wish to escape military service to enlarge the inguinal canal and stretch or rupture the external ring, which favors the development of a hernia. These cases are easily distinguished from hernias that develop in the usual manner, because the external ring is usually irregular, jagged, and infiltrated, with signs of inflammation or unusual openings in the aponeurosis of

the external oblique. These cases add in no way to the knowledge of the manner in which the usual forms of hernia may develop.

PATHOLOGICAL ANATOMY OF HERNIA.

A hernia consists of a ring, a sac, contents of the sac, and overlying tissues.

Hernial Ring.—Although a rupture may occur in any part of the abdomen, as a rule they are found in certain definite regions. Hernial rings do not exist in normal individuals and are always pathological. The reason why certain regions of the abdominal wall are more liable to hernia is that the tissues in these regions are not firm and are more liable to give way to applied force. Every individual has weak places of this sort, although they vary greatly in different persons. They have been divided into two groups:

1. The regions of the abdominal wall that are weakened by the vessels or other structures leaving the parietal cavity so as to reach the surface of the body. To this group belongs the place of exit of the cord or round ligament, the femoral vessels, the umbilical vessels, the obturator vessels, and the gluteal arteries.

2. Regions of the abdominal wall where certain layers are absent, or at least weaker, such as the internal inguinal fossa, the linea alba, the spaces between the muscles of the lumbar region, on the floor of the pelvis, and along the outer margin of the rectus abdominalis. All of these places are more or less pliable, and sometimes they are abnormally so. While a hernia is developing, the canal may at first be of considerable length, so that one is justified in speaking of a hernial canal; but as the opening decreases in size this canal becomes shorter and shorter, so that finally there remains a more or less circular opening in the abdominal wall, which is spoken of as a hernial ring.

Hernial Sac.—The immediate covering of the structures contained in the hernia is called the hernial sac. It consists of a bulging outward of the parietal peritoneum without solution of continuity. The peritoneum bulges outward and displaces the surrounding peritoneum from the immediate vicinity because it is only loosely connected to the parietal wall proper. If a rupture takes place through a small opening, there are, of course, folds at the mouth of the hernia which smooth out when the hernia is reduced. With recent hernias these folds are sometimes quite distinct; but when the rupture has existed for some time, the approximated surfaces become united and the folds are no longer to be detected. This alters the sac in the region of the hernial ring in such a way that it becomes thicker and more resistant than the remaining portion of the sac and retains its shape even when the sac has become completely free. This portion is called the neck of the sac. In addition, surgeons speak of the mouth and the fundus of the sac. In recent hernias the sac may be dome-shaped, especially in the inguinal region, with the base toward the mouth. Later it becomes

cylindrical, sacculated, or irregular, and sometimes there are subdividing bands that start from the apex of the hernia.

Certain hernial sacs have constrictions with intervening dilated portions. This variety develops when more resistant portions of the sac alternate with pliable regions that are distensible on pressure. In congenital hernias there may be circular constrictions that are considered to be due to points of partial obliteration of the processus vaginalis. In other cases the entire sac with the neck is displaced farther downward. The original neck remains tight and a new neck with an intervening distended portion develops.

The sac itself, consisting of parietal peritoneum, has all the peculiarities of any serous membrane, is always smooth, shiny, and covered with a slight amount of moisture. It consists of a connective-tissue base with numerous elastic fibres covered with a single layer of squamous endothelium. This endothelium is subject to all the specific peculiarities of these cells and shows a tendency to secrete an excess of serum, to form fibrinous deposits, and to become united and adhere. In old sacs the primary nature of the hernia may be difficult to recognize, although any changes present should be explained as modifications of the primary membrane.

In recent hernias the internal surface resembles normal peritoneum. In old sacs the color is usually grayish and the serosa is more or less fibrous in nature. Certain regions show grayish-black points indicating old hemorrhages. Sometimes portions of the sac become as hard as cartilage and calcium salts may be deposited, erroneously considered to be ossification. Besides these changes there is thickening due to chronic inflammation or there may be a fresh fibrinous deposit which is either absorbed or becomes organized in time to form a pseudomembrane. A fibrinous deposit of this sort may be followed by adhesions between the sac-walls and complete obliteration of the cavity. In other cases the sac contents become so firmly adherent that it is impossible to separate the sac from the contents without injuring the latter. Adhesions of this sort may with time be drawn out so as to form long, thin strands, while in other cases the structures may remain adherent over large areas.

When the hernia is kept reduced, the sac may be obliterated by adhesions, the entire structure being changed to firm connective tissue. In other cases only the neck of the sac becomes shut off and the fundus fills with serous fluid, giving rise to so-called hernial cysts. Sometimes a fresh hernia takes place above a cyst of this sort and the relations become considerably complicated. The new hernia may settle down into the cyst, which surrounds it, and the condition is then called encysted hernia, a name applied by Cooper.

Not infrequently sacless hernias are reported. These may occur under two conditions. If the external covering and the sac itself have become destroyed, the contents may be covered with scar-tissue, which can be the only covering of the hernial contents. Again, a fresh hernia might develop should the suture in the peritoneum after a

radical operation tear out, in which case the new hernia will have no peritoneal covering. Special attention will be given to those hernias containing viscera that are not freely movable in the abdominal cavity, but are partially fixed. These reach the hernia when the sac becomes larger and larger, and drags down with the parietal peritoneum organs that are partially covered by this and firmly attached to it. If the cæcum, for instance, is found in a scrotal hernia, it is usually possible to reach the gut directly without opening the sac. This can usually be done from behind. The same applies to the ascending colon, the descending colon, and to the bladder. These organs maintain the same relation in the hernia to the peritoneum that they normally have in the abdominal cavity. It is possible even in a normal cæcum to open the intestine without opening the peritoneum; but if one intends to open the surface of the cæcum covered by the peritoneum, it is necessary to open the peritoneal cavity, and in a rupture, of course, the hernial sac. There is really no sacless hernia, but some organ is included in the rupture which is only partially covered with peritoneum. The sac may lie to one side or behind. W. Koch considers that all of these cæcal and large intestine hernias are really congenital. It may happen that the peritoneum forms a rupture without there being any hernial contents. To this group belong the patent vaginal process in males, the diverticulum of Nuck in women, and the prolongations of the peritoneum connected with a subserous lipoma. Rokintansky and Lainhart have described congenital diverticula of the peritoneum in the inguinal and crural regions. Englisch has described pouches of peritoneum varying in size and found in individuals well advanced in years in the region of the internal inguinal fossa.

Hernial Contents.—Viscera, fat, and cysts. A hernial sac becomes a rupture as soon as it contains viscera. Almost all of the abdominal viscera have at one time or another been found in the sac. One or more viscera may be contained in the sac at the same time. Sometimes the majority of the abdominal viscera are contained, a condition known as eventration. According to the seat of the hernia, there is considerable variation in the contents, but it is far more common to find intestine or omentum. As a rule the same piece of intestine probably always comes down in a hernia that can be reduced, but with time changes are apt to take place that fix this piece of intestine. Maydl found that in 283 inguinal hernias intestine alone was present 149 times, the omentum 77 times, and both 34 times; 123 femoral hernias contained the intestine alone 86 times, the omentum alone 19 times, and both 14 times. In 11 umbilical hernias the intestine was found alone twice, the omentum alone 3 times, and both 6 times. It is therefore much more common to have intestine in a hernia, and in the majority of cases the small intestine, because it is much more movable. The mesentery is longest about one-fourth of a metre (10 inches) above the ileocæcal valve, and in the region of the cæcum the mesentery is much shorter. In most cases a loop of intes-

tine will be found in the sac with a portion of the mesentery. Sometimes there are several loops, and when gangrene occurs four or more open ends may be found. If a portion of the intestine has remained in the hernia for a considerable length of time and tends to become lower and lower, the mesentery lengthens, and in certain cases of inguinal hernia the sac reaches as far down as the knees. Sometimes the sac does not contain a complete loop of intestine, only a portion of the gut-wall. The following types of lateral intestinal hernias should be sharply distinguished:

1. **Congenital Intestinal Diverticula (Meckel's Diverticulum).**—At the seat of origin this structure is usually covered with all the normal intestinal layers and is about the same size as the ileum. It is a remnant of the communication between the intestine and the vitelline duct, and can be found therefore only in one place and is always single. Littré first described a hernia of this sort, and the term "Littré's hernia" should only be applied to this variety, although it has been used in connection with almost all parietal hernias.

2. **False diverticula**—*i. e.*, a bulging forward of the mucous membrane through the muscular layer—is a condition found frequently in the small and large intestines. These bulging areas are usually found in the lateral portion of the intestine near the mesentery. They have erroneously been considered to be due to this portion of the intestine being forced down into a hernial sac. These false diverticula, however, are often found in great numbers even without any hernia.

3. **Hernia of the Intestinal Wall; Lateral Hernias.**—In these cases the sac contains only a portion of the intestinal canal, usually the convex portion—*i. e.*, the part farthest away from the mesentery. If a piece of intestine of this sort has remained for a considerable time in the hernia, it may become constricted and leave a permanent bulge, which appears to be completely tied off. This condition may closely resemble a true diverticulum. The latter condition will be considered in connection with strangulations. The transverse colon, when contained in a hernia, presents conditions that resemble the small intestinal conditions quite closely. This portion of the large intestine frequently has a very long mesentery, and forms a loop which is V-shaped or M-shaped and may reach down as far as the symphysis. It is very movable, as is also the sigmoid flexure, which is also frequently found in hernial sacs. Portions of the large intestine that are more firmly fixed can reach the sac only when there are abnormal relations of the parietal peritoneum. Maydl found 22 hernias of the large intestine in 443 cases, 11 of which involved the cæcum.

It is, of course, evident that the appendix may be in the sac alone or with the cæcum. Even the stomach has been found in large umbilical hernias and in inguinal hernias, and it is not uncommon to have a small corner of the stomach in an epigastric hernia. Thoma reported 22 cases of stomach hernia in 1885; 15 of those were epigastric hernias, 3 umbilical hernias, and 4 scrotal hernias; 6 of the number had become strangulated.