

fluid speaks strongly for a hydronephrosis but not positively, for these substances are found in the fluid contents of other cysts—the ovarian cysts, for example—and may be absent in the fluid of hydronephrosis.

The recognition of a possible cause for a hydronephrosis is always an important item in the diagnosis. Thus, a nephrolithiasis, a movable kidney, a tumor in the abdomen or pelvis which might compress one or both ureters, a bladder tumor, an enlarged prostate, or a urethral stricture, in a case which might be a hydronephrosis, is a fact which strongly favors this diagnosis.

The differentiation between hydronephrosis and ovarian cysts has been sufficiently considered. The presence of echinococcus hooklets or scolices in the aspirated fluid would prove the existence of an echinococcus cyst. The differentiation between a cystic kidney and a hydronephrosis is often impossible. The absence of a demonstrable cause would speak against the hydronephrosis. Early life speaks for the cystic kidney.

Pyelonephritis.—The important symptoms in this disease are alterations in the character and quantity of the urine, pain and other signs of local inflammation, tumor, and the constitutional disturbances of suppuration. The quantity of the urine varies from complete anuria to polyuria, the latter being the more common. The urine contains in varying quantities blood, mucus, pus, crystals, bacteria, sometimes bits of kidney tissue, sometimes casts. Albumin is always present, the specific gravity is lowered, and the reaction varies from acid to alkaline. Catheterization of the ureters or the separate collection of the urine is a valuable aid in the diagnosis, especially if carried out early in the course of a unilateral pyelonephritis. Exploratory puncture is an aid, but it is not often necessary and is more dangerous in this than in other renal affections.

Peri- and Paranephritis.—The important symptoms of these processes are the local pain, fever, and tumor. Of these the tumor is the most important, but requires time for its development, during which pain and elevated temperature are present, but do not make a diagnosis possible. The tumor increases steadily, often rapidly, in size and presents the characteristics of tumors of inflammatory origin. It is painful, tender, usually not sharply defined, is not movable, often fluctuates, and when sufficiently superficial is accompanied by an edema of the skin. The urine is not changed by a primary paranephritis, but when the latter is secondary to suppurative processes in the kidney, as it often is, the urine shows changes because of the primary process.

The rules given for the differentiation of renal tumors from tumors of neighboring organs apply here also, so far as the localization of the process is concerned. The nature of the process is usually at once apparent from the combination of the local and constitutional disturbances of inflammatory origin. If there is still doubt, an exploratory puncture, by demonstrating the presence of pus, will settle the question. It is often difficult or impossible to learn whether the paranephritis is primary or secondary, but the chances are very decidedly in favor of the latter as a rule. If the urine contains pus, a pyelonephritis is probably the primary process. The paranephritis may be secondary to appendicitis, parametritis, or some other suppurative process in this region. Sometimes the gravitation abscess from a tuberculous spine is taken for a paranephritis, but usually an examination of the spine and the nervous system will enable one to make the differentiation readily.

Tuberculosis of the Kidney (Chronic).—The most important symptoms are the changes in the urine, the pain, and the tumor. The urine contains blood, pus, mucus, and cells in varying amounts. The pain is in the region of the kidney, but may radiate to the bladder, to the genitalia, and to the thigh. Sometimes the pain is distinctly that of a renal colic. The tumor presents the usual characteristics and relations of a renal tumor.

The diagnosis rests not on these symptoms, but upon the demonstration of tubercle bacilli in the urine or in the pus obtained by exploratory puncture of the tumor. This

demonstration requires much patience, but it has been rendered decidedly easier by the introduction of the centrifugal machine. Another important item in the diagnosis is the demonstration of tuberculosis in some other organ, especially one of the sexual organs.

The tuberculosis of the kidney must be differentiated from nephrolithiasis and carcinoma of the kidney, both of which cause hæmaturia, pain, and renal tumor. The absence of renal colic, and of gravel in the urine, together with the presence of evening fever and of tuberculosis in some other organ, usually excludes the renal calculus. The absence of cachexia and leucocytosis and the presence of pus in the urine exclude the cancer. In cases which are still doubtful, an injection of the Koch tuberculin, by exciting a violent reaction, will remove all doubt. The important question as to whether one or both kidneys are tuberculous may require cystoscopic examination or the collection of the urine from each kidney separately.

Carcinoma and Sarcoma of the Kidney.—These will be considered together, for the clinical differentiation between them is never certain, and practically it is a small matter whether the tumor is carcinoma or sarcoma. Here again we find the combination of pain, hæmaturia, and tumor. The pain appears early, as a rule, but is in no way peculiar. The hæmaturia is present in about one-half of the cases, and may be an early symptom or it may be delayed until late in the course. It differs greatly in amount and frequency in the individual cases. The tumor resembles the other tumors of the kidney, but in some cases it presents an expansile pulsation and hum exactly like those of an aneurism. Cachexia and anemia with leucocytosis appear sooner or later. The diagnosis is based mainly upon the exclusion of other renal tumors, the absence of fever, and the presence of cachexia. Both carcinoma and sarcoma are especially common in young children, at which time of life tumors such as hydro- and pyonephrosis and tuberculosis are exceptional. In adults the differentiation is more difficult and errors are not infrequent.

Other forms of renal tumors, such as the cystic kidneys, fibroma, lipoma, myoma, etc., need no consideration here. **Movable Kidney.**—This is one of the most common pathological conditions affecting the kidney, and it renders a kidney otherwise normal easily palpable. In a large percentage of the cases there are no subjective symptoms, and the condition is discovered accidentally during an examination made for some other purpose. In some cases there are subjective symptoms which vary greatly in the individual cases. These are: pain of varying character and site, gastro-intestinal symptoms, symptoms due to pressure upon gall duct or intestinal tract, periodical hydronephrosis. These symptoms occur in many combinations and degrees and present nothing characteristic.

The diagnosis must be made by the palpation of the kidney. Usually the peculiar bean shape of this organ is readily recognized. The hilus can be located and sometimes the renal artery palpated. The kidney feels smooth, firm, and of a normal size in most cases. It is not especially tender, but when it is firmly compressed a peculiar sickening pain is produced. The degree of motility varies from a minimal amount which just permits palpation of the lower pole of the kidney, to such an amount that the kidney can be displaced beyond the median line. In most cases the kidney can readily be returned to its normal location. In some cases the movable kidney comes to lie within the circle of the colon, and, when it is fixed here, the diagnosis is a very difficult matter. As a rule, however, the diagnosis is easily made.

The characteristic shape and size of the tumor and the ease with which it can be returned to the normal location of the kidney furnish sufficient evidence. Sometimes highly movable tumors of the intestines, omentum, gall bladder, and pylorus, when their size is about the same as that of the kidney, are mistaken for a movable kidney, but usually attention to the history, to the subjective and objective symptoms, and especially to the relations of the tumor to the colon, will remove all doubt. Some

times it is rather difficult to distinguish between a movable kidney and a tongue-like projection of the right lobe of the liver. Such a projection is often quite freely movable, so that it can be pushed backward into the location of the kidney. Usually, however, it has a different shape, and careful palpation will show it to be in connection with the liver. The colon lies behind instead of in front of it. Sometimes differentiation is aided by the demonstration of the kidney in its normal location. This may be done by percussion of the back, which procedure shows a small area of dullness on each side of the spine, continuous above with the liver or spleen dullness and bordering externally upon the tympanic area of the colon.

TUMORS OF THE SMALL INTESTINES.

These tumors are rare, but almost any kind of tumor may appear in connection with the intestines. The symptoms, which are mainly those of more or less complete intestinal obstruction, vary somewhat with the site of the tumor. The commonest tumor of the small intestines is carcinoma of the duodenum. This causes the anemia and cachexia which commonly accompany all carcinomata, and at the same time pain in the right hypochondriac region. In favorable cases a tumor develops deeply in the abdomen and shows only slight motility or none whatever. Because of the obstruction to the onward movement of the intestinal contents gastric symptoms due to dilatation of the stomach are prominent. When, as may easily happen, the common duct or at least its orifice is narrowed, we find jaundice and the results of lack of the pancreatic digestion. Ascites may result from compression of the portal vein.

When the tumor is situated lower down in the jejunum or ileum, the gastric symptoms, jaundice, and ascites are less common, and we find the symptoms of gradually increasing intestinal obstruction. The tumor when felt is characterized by extreme motility. The lower the tumor the more marked the effect upon the bowel movements and the more easily blood, pus, and the like appear in the feces. The lower the tumor the greater the distention of the abdomen with gas and material accumulated above the tumor. The collection of the gas is centrally located in the neighborhood of the umbilicus.

It is only in rare cases that the intestinal crises of locomotor ataxia cause localized spasms of the intestinal walls, and give rise to hard masses that may easily be mistaken for multiple tumors. However, if the other symptoms of tabes are carefully sought for, it is not likely that an error in diagnosis will be made.

When the small intestines are filled with gas, and especially when onward movement of the gas is prevented by an obstruction of any sort, such as an intussusception, volvulus, or internal strangulation, they are often visible as tumors. They differ from other tumors in their spontaneous motions, which in these cases are exaggerated beyond the normal, even to the point of being felt as well as seen. In some cases of intussusception the invaginated portion of the small intestines can be felt as a sausage-shaped, motile tumor. Such visible peristalsis is often an aid to diagnosis in cases in which other symptoms point to an intestinal obstruction.

When the amount of gas is very large, the abdomen as a whole is greatly swollen, the skin being tense and shining, and often showing the blue veins through. The general appearance is like that of ascites, but percussion will at once show the difference. The shape of the abdomen differs somewhat from that observed in ascites, for the anterior portion about the umbilicus bulges prominently, while in ascites this part is flattened and the flanks bulge. The degree of distention depends mainly upon the amount of the gas, but in part also upon the tone of the intestinal walls. If this is lessened, as by a generalized peritonitis, the distention is much greater. The liver and spleen with the diaphragm are pushed upward, thus displacing the heart and lower pulmonary borders. The area of dullness corresponding to the liver may be obscured by the intestines rising over this organ in front.

ANEURISM OF THE ABDOMINAL AORTA OR ITS BRANCHES.

In emaciated individuals the abdominal aorta may often be felt, and its pulsation is occasionally visible. This visible pulsation, however, must not be interpreted as indicating the existence of an abdominal aneurism, unless an expansile tumor is found. The indications that such an aneurism exists vary with the site and size of the tumor. They consist in part of pressure symptoms and in part of the physical signs of an aneurism. The pressure symptoms are too numerous to mention, for any organ or nerve in the abdomen may be compressed. The essential and peculiar characteristic of these tumors is the expansile pulsation. No other tumor shows this except under extraordinary conditions. Solid tumors about large vessels—for example, tumors of the retroperitoneal lymph glands—sometimes show expansile pulsations and may for this reason be mistaken for aneurisms. Very vascular neoplasms may show pulsation and murmurs. Motile spherical tumors resting upon large vessels often show a transmitted pulsation, which, upon careless examination, may be mistaken for an expansile pulsation. The auscultation of abdominal aneurisms is of less value than might be expected, for murmurs in the abdominal vessels, both veins and arteries, are not uncommon. Aneurisms of the aorta itself lie to the left of the median line and because of their deep location often enlarge backward, thus causing bulging and pulsation posteriorly. Because of the close relation of the aneurism to the nerves of the lumbar plexus, symptoms of pressure on the nerves (neuralgia, anaesthesia, paralyses) are often early and prominent symptoms. Aneurisms of the celiac axis tend to enlarge forward, and because of their close relation to the vena portae they often cause jaundice and ascites.

TUMORS OF THE RETROPERITONEAL LYMPH GLANDS

occur both as primary and as secondary processes. There may be several small tumors or one or more large ones. They present the usual characteristics of tumors of lymph glands, being round or egg shaped in some cases, and somewhat nodular in others. They lie deep in the abdomen, behind the intestines, and show neither passive nor respiratory motility. When resting on the aorta they may show a transmitted pulsation, or when surrounding it they may show even an expansile pulsation.

There are numerous pathological processes which can cause such enlargements of the retroperitoneal lymph glands, viz., tuberculosis, leukæmia, pseudoleukæmia, and lymphosarcoma. They may represent metastases from malignant tumors located elsewhere in the body. The diagnosis of the nature of the tumor is based mainly upon a consideration of the history and upon the constitutional disturbances which may be present. The absence of anything pointing to disease of other organs in the abdomen often aids the physician in making a correct diagnosis. Finally, it may be found impossible to learn the exact situation and true nature of such glandular tumors except by means of an exploratory operation.

TUMORS OF THE PERITONEUM AND OMENTUM.

These occur either in the form of a solid tumor (tuberculous, carcinomatous, or sarcomatous in its nature) or in that of a circumscribed exudate of one sort or another.

Tuberculous peritonitis shows itself in a variety of ways: it may cause diffuse enlargements of the abdomen, or localized fluid exudates, or separate tumor masses. The diffuse enlargements have been considered in the paragraphs upon ascites. The localized fluid exudates and the tumor masses may occur anywhere throughout the abdomen and may be single or multiple. It is usually more difficult to make a correct diagnosis when one such focus of disease is present than when there are several. Because of the fact of their varying locations nothing can be said as to their relations to the other abdominal organs. Either of the two conditions named may occur separately, but in many cases there is a more or less generalized affection of the peritoneum accompanied by a fluid exudate

which lies free in the peritoneal cavity and which is often sufficient in amount to cover up the localized process. When there is such a collection of fluid, sufficient should be withdrawn to enable one to determine its character. If it is an exudate, as shown by its high specific gravity and percentage of albumin, the case is one of chronic peritonitis. In some cases, although not many, its tuberculous nature can be shown by the demonstration of the tubercle bacilli or by inoculation of a guinea-pig. In most cases, however, this fails, and the diagnosis must be made by a close scrutiny of the other organs of the body. The demonstration of a tuberculous process elsewhere in the body, as in the lungs, lymph glands, bones, or testicles, speaks strongly for the tuberculous nature of the process in the abdominal cavity. A coincident inflammation of one or more other serous surfaces, such as the pleura or pericardium, also speaks for the tuberculous nature of the process. The absence of symptoms pointing to carcinoma of any organ, especially any organ in the abdomen, such as the stomach, uterus, or rectum, is an additional fact in favor of the tuberculous nature of the chronic peritonitis.

In some doubtful cases the tuberculin test may aid. A positive reaction in the absence of manifest tuberculosis in some other part of the body, speaks strongly for the tuberculous nature of the abdominal process, but the absence of the reaction does not exclude tuberculosis. The blood should be examined, and the absence of any increase in the number of leucocytes speaks for tuberculosis, because it speaks against the other common cause for chronic peritonitis, viz., the neoplasms.

Tuberculosis affecting the omentum often causes it to shrink up into an elongated, sausage-shaped tumor lying transversely across the upper part of the abdomen. Such a tumor is so peculiar that its origin is at once manifest, but other processes than the tuberculosis can cause the same deformity of the omentum. Attention to the points mentioned above and the exclusion of cancer of the organs commonly affected will usually establish the nature of the tumor.

Localized fluid tuberculous exudates have often been mistaken for ovarian cysts even by experienced observers, but attention to the points given above, especially to the character of the fluid obtained on aspiration, will usually make the correct diagnosis possible.

Localized suppurative processes in the abdomen, such as an appendicular abscess, often produce a well-defined tumor. The accompanying constitutional symptoms—irregular fever, chills, sweating, leucocytosis, etc.—together with the local pain and tenderness, are usually sufficient to show the nature of the process, and careful attention to the history will show the probable point of origin. Such abscesses may occur anywhere in the abdomen, but there are certain sites of predilection. For example, they are common in the neighborhood of the appendix, but the appendicitis can cause abscesses in other parts of the abdomen remote from the appendix. They also often arise from various infective processes in the female genitalia. Perforating ulcers, especially those of the stomach and duodenum, may also furnish a considerable number of these cases. Infective processes in the liver and bile passages do the same thing.

Neoplasms of the peritoneum are far more frequently secondary than primary. They are oftenest secondary to carcinoma of the abdominal viscera, but the primary tumor may be remote, as in the breast. The clinical manifestations are almost exactly the same as those of tuberculous peritonitis—viz., vomiting, hicough, and intestinal disturbances—together with the development of tumor masses, usually multiple and often accompanied by large amounts of fluid exudate, either lying perfectly free in the peritoneal cavity or partially encapsulated. The effects on the omentum are often exactly like those produced by tuberculosis. The fluid obtained by puncture has the characteristics of an exudate, is often hemorrhagic, and may be fatty. In these respects it is exactly like the tuberculous exudate. It never contains tubercle bacilli and does not excite tuberculous peritonitis

in the guinea pig, but sometimes it contains cancer cells either singly or in groups.

If the primary tumor is discovered, the diagnosis of the nature of the process is easily made. When no such tumor can be found, the diagnosis will rest upon the exclusion of tuberculous peritonitis.

Other peritoneal tumors, such as lipoma, fibroma, cysts of the mesentery, and chylous cysts, are so rare that they need no consideration, and, in fact, are seldom diagnosed except by the aid of an exploratory laparotomy.

TUMORS OF THE BLADDER.

The true neoplasms of the bladder are quite rare and they do not cause palpable abdominal tumors. There is practically only one condition which renders the bladder palpable, and that is the retention of urine. This causes a long oval tumor which rises upward from the pelvis to almost any height, even beyond the umbilicus. It is rounded, smooth, tense, and usually not tender. It lies as a rule exactly in the median line and is dull on percussion. The patient may or may not pass any urine.

The diagnosis is manifest when the patient is passing no urine, but it is not always so clear when the urine is constantly dribbling away. The introduction of a catheter and the disappearance of the tumor upon the withdrawal of the urine make the diagnosis plain. The discovery of the cause of the retention is a different problem.

ILIO-PSOAS ABSCESS.

This variety of abscess appears as a tumor on one side of the spine or in the iliac fossa. Its size and shape vary greatly. It lies deeply behind the intestines. It is painful and tender, but not to an extreme degree, for most of these abscesses are of tuberculous nature. The thigh is flexed and rotated outward. Usually the nature of such abscesses is at once manifest because of the deformity of the spine and of the disturbances in the function of the spinal cord. This, however, is not always so, and therefore whenever an abscess is found in this region, or, for that matter, in any region in which such a gravitation abscess may occur, the spine and the areas supplied by the spinal nerves should be carefully examined. Such an examination will exclude the appendicular abscesses or an abscess arising in this region secondary to suppuration in the pelvis.

TUMORS OF THE UTERUS.

There is usually not much difficulty in recognizing a tumor of the uterus as such. Its situation low down in the median line, its evident origin in the pelvis, the ease with which motion is transmitted from the tumor to the cervix, and *vice versa*,—these, together with the alterations in the genital functions usually found, are sufficient in most instances to show that the tumor does arise from the uterus. A diagnosis of the nature of the tumor is a far more difficult matter, and even the most expert often err in their judgment as to the nature of a tumor which plainly arises from the uterus.

Pregnancy.—This causes a progressive enlargement of the uterus, and it has been a fruitful source of errors in diagnosis. The resulting tumor is smooth, round, and not tender; menstruation ceases; the breasts undergo changes; and in course of time the fetal heart tones and movements appear. The commonest difficulty is that of distinguishing pregnancy from uterine fibromata. These cause enlargement of the uterus, often associated with irregularity in the menstruation, less often with cessation of this function. The enlargement of the uterus is not so symmetrical as it is in pregnancy, and the rate of growth is not so rapid. In pregnancy the size of the tumor shows a nearly constant relation to the duration of the period during which menstruation ceases. It is not permissible, under these conditions, to resort to a measurement of the uterine cavity by means of the uterine probe. The diagnosis becomes still more difficult when the two conditions (pregnancy and a tumor) are com-

bined, but attention to the shape of the uterus, the rate of enlargement, and the ordinary signs of pregnancy will usually enable one to arrive at a correct conclusion. If any doubt remains, the diagnosis must be reserved until the time arrives for the appearance of the sure signs of pregnancy.

When the pregnancy occurs in one horn of a bicornate uterus, the resulting tumor differs so much from the ordinary tumor of pregnancy that error may arise. The usual symptoms of pregnancy are present, and the diagnosis of pregnancy can be made as early here as in a normal case. Careful bimanual examination will usually make the correct diagnosis possible. Such a tumor may be taken for an ovarian tumor. Ovarian tumors, however, are usually farther removed from the median line; there is no relation between their size and the duration of the disturbances; the signs of pregnancy are usually entirely absent; and the motion of the tumor is not transmitted so completely to the cervix.

Fibroid Tumors of the Uterus.—These are very common, especially in women past the middle point of life. They cause a greater or less increase in the size of the uterus, which may even reach such a bulk as to occupy the main portion of the abdomen. They cause irregular and often profuse uterine hemorrhages, and are associated with irritability of the bladder and rectum, with pain in the pelvis and legs, and often with edema of the latter. The enlargement of the uterus is usually very grossly irregular and nodular. The tumors feel hard, and in rare cases they may, from cystic degeneration, yield fluctuation. They vary greatly in size and shape, being often sessile or hemispherical. Sometimes they are pedunculated and show considerable passive motility. The uterine cavity is lengthened and irregular. These tumors lie in front of the colon, sigmoid, and small intestines.

In cases such as we are now considering, the diagnosis is difficult only when the tumors are so small that they cannot be felt from above. The main point of differentiation between the fibromata and pregnancy have been already mentioned. In the case of movable, subperitoneal, and pedunculated tumors of the uterus, the diagnosis is sometimes quite difficult, especially when the tumor is single. Fortunately this is exceptional. Such movable tumors may be taken for an ovarian cyst, for a movable kidney, or for a tumor of the intestines, but attention to the history and a careful examination will enable the physician to distinguish between them.

Cancer of the Uterus.—The primary uterine tumor rarely attains sufficient size to present itself as an abdominal tumor, and in these rare instances the condition of the patient is such that the diagnosis is manifest from the cachexia, anemia, and profuse, fetid, bloody vaginal discharge. The metastases of uterine carcinoma frequently present themselves as abdominal tumors of either the liver, the peritoneum, or the lymph glands, and since the secondary tumor may far exceed the primary tumor in size, these metastases may be mistaken for primary tumors. It is therefore wise to examine the uterus in all cases of abdominal tumors of obscure origin. If such tumors may by any possibility be secondary to a uterine carcinoma, and the uterus is found enlarged, or a fetid discharge without enlargement of the uterus is found, scrapings from the uterus should be examined microscopically.

Retention of Menstrual Fluids.—This may cause very great enlargement of the uterus. The diagnosis is usually simple. The cervix is found obliterated, there is no menstrual flow, but the patient suffers at regular intervals from the other symptoms of menstruation.

OVARIAN CYSTS.

The diagnosis of this common disease of the ovary is based almost entirely upon the results of physical examination, for such cysts bring about no characteristic alteration in the function of the genitalia. Cysts which are so small that they remain within the pelvis do not call for any special consideration in this place.

Confusion between an ovarian cyst and such conditions as collections of gas in the intestines, an over-distended bladder, accumulations of feces in the colon, pregnancy, fat abdominal walls, and moderate-sized collections of free fluid in the abdomen can persist only when the examination is incomplete. Careful palpation, percussion, and auscultation in a patient properly prepared for examination by complete evacuation of the bladder and rectum will prevent such errors. The differentiation between ovarian cysts and localized collections of fluid in the abdomen, cysts of other organs in the abdomen, and certain tumors of the uterus is far more difficult, and sometimes is impossible without exploratory incision.

Encysted peritoneal exudates, usually of a tuberculous or carcinomatous origin, may very closely resemble the ovarian cyst. In many of these cases the results of the physical examination are such as to fit as well with one condition as with the other, but in general the outlines of the ovarian cysts are sharper and more distinct, and the tumors themselves are often more motile in response to the changing position of the patient. Usually there is no fluid free in the peritoneal cavity, in the case of an ovarian cyst, while this is quite common in both the tuberculous and the carcinomatous varieties of peritonitis. In many cases light may be obtained from other sources—the history of the case, the body temperature, the patient's general condition, her behavior under Koch's tuberculin test, and an examination of the other organs of the body. In still other cases it is necessary to make an exploratory puncture in order to ascertain the character of the fluid. If the fluid is an exudate, it will present the characteristics described above. The fluid of different ovarian cysts varies considerably in specific gravity, from 1.007 to 1.020 or more. In one case it is a thin serous fluid; in another, a gelatinous material. It contains considerable albumin and paralbumin. Microscopically there is nothing peculiar to these cysts except the cylindrical epithelium occasionally found.

Localized purulent exudates may present the same physical signs as an ovarian cyst, but the constitutional disturbances and blood changes are so marked, and the history of the onset shows such an acute beginning, that it is not often that any confusion arises between the two conditions. Exploratory puncture will remove the doubt, if any exists.

Echinococcus cysts developing in the peritoneum or tissues near the ovaries may in some respects resemble ovarian cysts. The discovery of the thrill peculiar to the former cysts, or the finding of the hooklets and scolices in the fluid evacuated by exploratory puncture, would naturally remove all doubt.

Hydronephrosis is at times confused with the ovarian cyst. It presents, however, this distinguishing feature: it lies behind and to the side of the colon and small intestines, while the ovarian cyst forces these upward and backward. The ovarian cysts rise out of the pelvis, while the hydronephrosis comes forward and downward from the lumbar region. Many cases of hydronephrosis present urinary changes, and in some cases the differentiation can be made certain by the demonstration, by palpation, of normal ovaries. Puncture of the hydronephrosis may yield a fluid containing urea.

Pancreatic cysts can almost always be distinguished by the fact that they displace the colon downward.

The recognition of pedunculated fibroids of the uterus, when the uterus is otherwise free from fibromata, is a very difficult matter, and in many cases the differentiation can be made by exploratory incision only.

Cystic fibromata of the uterus may very closely resemble ovarian cysts, but usually they are of slower growth and excite less constitutional disturbance.

Tumors of the liver and spleen can be differentiated by the signs described in the paragraphs devoted to these subjects. Tumors of the omentum, mesentery, and peritoneum are not always easily distinguished from ovarian cysts, but in most cases they can be shown to arise above instead of in the pelvis.

Ascites and cysts of the ovaries have quite often been

confused, but this error is possible only when the cyst is so large as completely to fill the abdomen or the ascites is so great that there is no central area of tympany. In other cases the error arises from carelessness. The history of an ovarian cyst is far longer than that of an ascites. If the fluid in the abdomen is a transudate, it is a symptom of some disease which ought to show other symptoms as well. Usually the primary disease is of the liver, but it is possible for either a heart or a renal disease to cause an ascites without producing any oedema of the legs. The various forms of chronic peritonitis may give rise to as large collections of fluid in the abdomen, but the history is usually brief, and the constitutional symptoms of tuberculosis or carcinoma, the two common causes of chronic peritonitis, are either present already or soon develop. Exploratory puncture is a valuable aid and should be employed.

Solid Tumors of the Ovaries.—There is a large variety of these tumors, none of which presents anything especially characteristic in its clinical course. The most important are the carcinomata, the sarcomata, and those tumors which result from tuberculosis. The carcinomata grow rapidly, producing irregular nodular tumors in the pelvis and lower part of the abdomen, and accompanied by the symptoms of a chronic peritonitis, by cachexia, and by anemia. Carcinoma and sarcoma cannot be distinguished clinically. The differentiation of these from the tumors produced by tuberculous disease is often very difficult, especially when the patient is of such an age that either might be present. A positive reaction to the Koch tuberculin test speaks for tuberculosis, but the failure of such reaction does not exclude it. Leucocytosis speaks for cancer. Before a correct diagnosis can be made, it may be found necessary to resort to an exploratory operation.

There are still other pathological conditions in the pelvis which manifest themselves as abdominal tumors; such are, for example, a collection of fluid in a Fallopian tube, a pelvic abscess, and an extra-uterine pregnancy. The resulting abdominal tumor may be of considerable size. In such instances, however, the history of the case and the existing symptoms and evidences usually render the diagnosis plain.

TUMORS OF THE COLON.

These tumors, irrespective of their nature, induce alterations in the character and frequency of the movements of the bowels.

Fecal Tumors.—These are very common, especially in women, and have been the source of many embarrassing errors, all of which could have been avoided if a thorough evacuation of the bowels had first been secured. The fact that the patient's bowels have moved daily should not lead to the neglect of this precautionary measure, for the feces may accumulate in large masses even when the bowels move daily.

The feces tend to accumulate in the flexures of the colon—the sigmoid, the splenic, and the hepatic flexures—and in the cæcum, but they may accumulate anywhere in the course of the large intestine. The resulting tumor may be of large size, and its outlines are usually of irregular shape. While it possesses a certain degree of solidity, it can generally be moulded into a different shape, and this new shape will remain permanently. These tumors may possess considerable motility. According to the different sites which they occupy they may simulate a great variety of pathological conditions, but in all such instances the simple evacuation of the bowels will quickly clear up the diagnosis.

Gas in the Colon.—This may cause a great distention of the abdomen, and this enlargement, at least at first, is limited to its outer and upper portions, the central portion being left free. The fact that the swelling is due to gas is shown at once by percussion. These accumulations of gas are often of great significance in cases of intestinal obstruction, giving as they do some clew to the site of the obstruction; it being evident that the

lower the obstruction the greater will be the portion of the colon distended. The degree of distention depends mainly upon the amount of gas, but the resistance of the intestinal walls is also important, and when they are weak and have lost their tone—as, for example, in cases of generalized peritonitis—the distention is often extreme. Usually this distention of the colon with gas is accompanied by a like condition in the small intestines.

Cancer of the Colon.—The clinical picture includes pain, which is both localized and radiating, and which often occurs in the form of attacks of colic. In most cases there is constipation, which may gradually increase even to the point of complete obstruction; but in some cases there may be diarrhoea. The stools usually become small and ribbon-like, and are often mixed with mucus, blood, and pus, and sometimes contain fragments of the tumor tissue. These local symptoms are accompanied by the secondary anemia and cachexia which are common to carcinoma, no matter what organ it may involve.

The presence of a tumor which can be felt is by all odds the most important symptom; and while it does not exist in all cases, it certainly does in the great majority of them. The size of the tumor varies, and may reach that of an adult head. It is hard, irregularly round or cylindrical in shape, and furnished with a smooth or nodular surface. As a rule it is moderately tender, but it may be extremely tender in certain cases.

The tumor is generally very movable, especially when it involves the sigmoid flexure or the transverse colon; but it may also be movable when it involves the cæcum or either of the longitudinal portions of the colon. Such tumors may be moved by the hand of the examiner, by the peristaltic movements of the intestines, by the force of gravity, and by the respiratory motions. The passive motility is most marked in the case of tumors of the sigmoid flexure and of the transverse colon, on account of the greater length of their mesocolon. The displacements due to the force of gravity are often considerable and may render the diagnosis quite difficult, for the reason that the tumor may be found occupying a position remote from the normal site of the colon. Thus, for example, a tumor of the transverse colon may lie at the pelvic inlet, or one of the sigmoid flexure may lie close to the cæcum.

The accumulation of the feces above the point where the lumen is narrowed by the carcinoma leads to frequent errors in the matter of estimating the size of the new growth. These fecal masses may feel as hard, firm, and irregular as the cancer itself, and the palpating finger may not be able to distinguish the one from the other. In such cases, as in those in which it is necessary to distinguish between the fecal mass and other forms of tumor, vigorous and repeated purgation, and flushing of the colon, must be practised.

Peritoneal exudates, especially those about the appendix, may be extremely difficult to distinguish from carcinoma of the cæcum. They may form hard and irregular tumors, which may obstruct the intestinal canal and may cause bloody and purulent stools. The presence of fever and an oedematous condition of the skin, taken in connection with the history of the case, will point to peritonitis.

Tumors of the transverse colon, because of their close anatomical relations to the stomach, duodenum, and pancreas, may be confused with tumors of these organs. The symptoms of tumors of the colon are chiefly disturbances in defecation, such as constipation or diarrhoea; bloody, mucous, or purulent stools; and ribbon-like form of the latter. These tumors are also more movable than are, as a rule, the tumors of neighboring organs. Distention of the colon from below with gas or fluid can be followed upward to the tumor mass, where it is stopped or retarded. Inflation of the stomach throws the tumor downward and forward.

In cases in which the tumors have migrated from the normal location of the viscus, their relations to the colon can be demonstrated by inflation of the colon.

Tumors of the sigmoid flexure may be confused with

tumors arising from the ovaries, tubes, and peri-uterine tissues, but the symptoms of intestinal disturbances are more marked here than in the case of tumors situated higher up. A careful physical examination will reveal differences between these different conditions.

Tumors situated lower down, as in the rectum, are not abdominal tumors, but they have so important a bearing upon them that it should again be stated that in all cases which are in the least obscure, even when there are no symptoms pointing directly to the rectum, the latter should be examined.

APPENDICULAR ABSCESSSES.

These are often of large size. Disease of the appendix may cause an abscess to form not merely in the immediate vicinity of that organ, but also in some remote part of the abdomen. These more remotely situated abscesses have been considered in the paragraphs devoted to localized and encapsulated peritonitis, but it still remains to mention the abscesses in the region of the appendix. While it is true that the diagnosis of appendicitis previous to the formation of a tumor is often difficult, after this has happened the diagnosis is easy. The size, shape, and exact location of the tumor are subject to wide variations, but the history of a sudden onset and the existence of localized pain, associated with gastrointestinal disturbances, with a chill, and with elevated temperature, suffice to show the nature of the process.

Abscesses in this region arising from other structures are encountered, but they are decidedly less common than the appendicular abscesses. Those which develop in the female genitalia are frequent, but the history shows disturbances in the functions of these organs and opportunities for their infection. These facts, taken in conjunction with the results of the pelvic examination, suffice for making the differential diagnosis. Sometimes gravitation abscesses due to disease of the spine are mistaken for appendicular abscesses, but this error may be avoided by examining the spine and by noting the absence of the usual history of appendicitis.

TUMORS OF THE ABDOMINAL WALL.

All forms of tumors may occur in this part of the body, but their relations to the abdominal walls are so manifest that they need no consideration here.

Robert B. Preble.

ABENAKIS SPRINGS.—LOCATION.—Near St. François du Lac, Quebec.

POST-OFFICE.—Abenakis Springs, Quebec.

HOTEL.—The Abenakis House.

ACCESS.—From Montreal, by Richelieu and Ontario Navigation Co., by Grand Trunk and South Shore railways to Sorel, thence by boat to the springs. For the season of 1900 the South Shore Railway will be running direct to the springs.

ANALYSIS (J. Baker Edwards).—Total saline solids, 110.3 grains to the pint. These are chiefly chlorides of sodium, magnesium, calcium, and potassium, with traces of lithium. The water also contains traces of bromides, iodides, and phosphates. It is very lightly carbonated.

A second spring is mildly sulphurated. These springs are pleasantly situated on the west bank of the St. Francis River, near its confluence with the St. Lawrence, sixty miles east of Montreal. The surrounding country is elevated and dry and well settled. The hotel is new and well ventilated, possesses all modern conveniences, and is well managed. Hot and cold baths are supplied.

Beaumont Small.

ABERYSTWITH.—A much-frequented seaside resort on the coast of Wales. The town of Aberystwith lies on the shore of Cardigan Bay; its population, in 1890, was 6,650, it possesses a fine beach; has excellent hotel accommodations; and, situated as it is in the midst of some of the most attractive scenery of Wales, the excursions into the surrounding country are very enjoyable. Con-

cerning the climate of Aberystwith, the writer is unable to present accurate data for the place itself, but the subjoined table, copied from Hann's "Handbuch der Klimatologie," may serve to give some idea of its temperature during the colder months of the year. Llandudno lying some 75 miles north of Aberystwith, and Barnstaple lying about 125 miles to the south, both of which places have a similar exposure to that of Aberystwith, it is fair to assume that the temperature of the latter place differs but little from that of either of the above-mentioned towns, whose average temperature is given by Dr. Hann. It would therefore appear that the winter temperature of Aberystwith must be little colder than that of Ventnor in the Isle of Wight, the figures for which latter resort are also quoted from Hann's table for purposes of comparison.

Name of Place.	N. Lat.	Nov.	Dec.	Jan.	Feb.	Mar.
Llandudno	53° 21'	44.96°	42.44°	41.72°	42.44°	43.70°
Barnstaple	51° 5'	45.50°	42.62°	42.26°	43.34°	44.96°
Ventnor	50° 35'	46.22°	43.16°	41.72°	42.62°	44.24°
Aberystwith	53° 25'					

Huntington Richards.

ABIETIC ACID (C₁₉H₃₁O₂).—An organic acid, which, in its anhydrous state, chiefly composes common rosin. It also occurs in many other coniferous plants.—H. H. R.

ABORTION.—While most Continental writers apply the term abortion to all cases in which the product of conception is expelled from the uterus at any time preceding the period at which the fetus becomes viable, that is to say, before the seventh calendar month of gestation in the human subject, many American and English writers make a distinction between abortion and miscarriage, restricting the former term to the expulsion of the ovum prior to the fifth month, and applying the latter to such expulsion between the fourth and the seventh months. This distinction, although more or less arbitrary, has some practical justification, inasmuch as abortion, thus defined, differs notably in several particulars from the process of parturition at term—a difference that becomes trifling in the case of miscarriage. It is well for the practitioner to use the word miscarriage when talking to patients, for women seem to have an aversion to the term abortion. Certain qualifying words are occasionally added, such as "ovular," "embryonal," and "fetal," but they are of little real significance.

Causes.—These attach either to mechanical injuries to the ovum or its uterine attachment, to morbid conditions of the ovum, or to diseases of the maternal organism. Under the first head must be included not only direct traumatism, but also hemorrhages between the fetal and the maternal layers of the placenta, whether due to violence, such as falls, blows, and the like, or to a diseased state in either the mother or the ovum; the latter, of course, falling also under one of the remaining heads. Strictly speaking, indeed, the immediate cause of almost every abortion is some abnormal state of the ovum resulting in the death of the embryo, but this in turn may be due to some defect in the maternal organism, or, for that matter, to disease in the father, as exemplified by the frequency with which abortion takes place as the result of syphilitic contamination of one or the other of the parents. Habitual abortion, it is well known, raises the presumption of syphilis. As regards pathological conditions of the ovum, it is generally to disease of the placenta, or a crippling of its respiratory and nutritive functions by effused blood, that the death of the embryo is to be traced, although cases are not wanting in which the circulation in the umbilical vessels has been so interfered with as to produce the same result.

In so far as the mother's system is at fault, much stress was laid by the older writers on the "habit of abortion." It was taught that when several successive pregnancies