

THE ACUTE ABDOMEN¹

By F. GREGORY CONNELL, M.D., F.A.C.S., OSHKOSH, WISCONSIN

THE acute abdomen might seem a subject, upon which, at the present time, but little remains to be said; but increasing experience seems to justify its careful consideration and division into two classes as follows:

1. Those that may be remedied by abdominal operations.

2. Those that may not be remedied by abdominal operations.

The first class is, of course, in the majority; as a general rule, it does not necessitate differential diagnosis, as it makes no difference to the patient, and it makes no difference in the first steps of the treatment, whether the cause of the trouble is a ruptured appendix, a perforation of a gastric or duodenal ulcer, a cholecystitis or one of the many other causes of such symptoms, as long as the condition is remediable by an operative procedure, subsequent to laparotomy. The symptoms call for exploratory laparotomy which is automatically followed by the proper diagnosis and in turn rational therapeutics. In such cases the problem is absurdly simple, and the fate of the patient rests not so much with the operator who repairs the lesion as with the physician who first sees the case, and suspects serious damage.

The repair of reparable damage of the abdominal viscera (granting the presence of surgical judgment on the part of the operator) is comparatively simple; on the other hand the cure of peritonitis, the result of such damage, is difficult.

This class of cases, comprising the majority of abdominal emergencies, will not be discussed, because the principles of treatment are well outlined, and the conditions are recognized and discussed freely in textbooks and current literature.

The second class demands attention, serious consideration, and emphasis, because these conditions are but rarely differentiated from class 1, with the resultant ineffectual, if not detrimental, line of treatment. The lesions

may be divided into (1) extraperitoneal which may simulate intra-abdominal disease; and (2) intraperitoneal (non-operable) which may simulate operable conditions.

The extraperitoneal lesions may include thoracic, retroperitoneal, nervous, and others.

THORACIC LESIONS

Pneumonia. Confusion between the early stages of pneumonia and acute appendicitis is not so uncommon as might be expected. The general statement is frequent that pneumonia may, in its early stages, be mistaken for acute abdominal complaints, but detailed reports of such instances are not frequent. Some cases of pneumonia, after operation for acute appendicitis, in which the operative findings are not quite characteristic, might possibly have been cases of obscure and undetected pneumonia, before operation. Post-operative pneumonia should be lobular not lobar.

One of the reasons for this confusion is that often during the first 24 hours of pneumonia the pulmonary symptoms and physical signs in the chest may be entirely absent.

Pneumonia of the right lower lobe can, especially in children, by irritating the tenth, eleventh, and twelfth intercostal nerves produce pain, rigidity and tenderness in the right side of the abdomen which accompanied by the fever, leucocytosis and vomiting of the pneumonia will closely simulate an acute appendicitis.

In pneumonia, the abdominal tenderness is less characteristic and usually situated higher, the resistance is less marked but may be the same as in appendicitis. On the other hand severe inflammation of the appendix may cause diminution of the respiratory excursion and in the breath sounds of the right lower lobe, in this way tending to make the diagnosis still more difficult.

The important point is to *think* of the possibility of pneumonia giving rise to the symptoms in question, notably in children

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with rapid respiration and pulse, high temperature and dilatation of the *alæ nasi*. Such symptoms call for a careful chest examination, not confined to the *anterior* aspect. In most cases, such an examination settles the diagnosis.

Diaphragmatic pleurisy. Capps has found that the *visceral* pleura is not sensitive to pressure or scratching of a wire, that such irritation of the *parietal* pleura produced pain, but that irritation of the outer margin of the diaphragmatic pleura supplied by the lower six intercostal nerves is followed by reflex pain in the hypochondrium, and often in the abdominal wall as far down as the navel or even the groin, and when the central portion is irritated the pain is referred by the phrenic to the neck by the third and fourth cervical nerves. Capps presents a study of 61 cases of diaphragmatic pleurisy: 39 of right side, 21 left side, 1 bilateral, in which referred abdominal pain occurred in 54 cases and there was referred neck pain in 33 cases or about 50 per cent.

While aspirating fluid from the pericardial sac in a recent case I was able to cause pain in the left side of the neck by irritating the lower portion of the pericardial sac.

The following 23 mistaken diagnoses were made in the series of 61 cases of diaphragmatic pleurisy: 9 appendicitis, 6 cholecystitis, 2 perforation of ulcer of the stomach, 2 liver abscess, 1 peritonitis, 1 renal calculus, 1 infectious lumbago, and 1 brachial neuritis.

Capps' conclusions are as follows:

The skin and muscles of the abdomen are more sensitive to pain in referred pleural pain than in visceral disease. This is best elicited by the pinching of the wall and the scratching of the skin.

The cutaneous reflexes are more lively in referred pain than in visceral disease, as a rule.

Deep pressure, with the flat surface of the fingers, is well borne in referred diaphragmatic pleural pain, while it elicits a dull, deep pain when applied over an inflamed organ, e.g., an appendix or gall-bladder.

Evidences of respiratory infection are usually present in diaphragmatic pleurisy; such as a cough, expectoration, herpes of lips, sore throat, high leucocytosis, rapid respiration, etc.

Appearance of a sharp, definitely localized pain in the neck, on the same side as the abdominal pain, often reveals the true condition, since it points to irritation of the phrenic nerve.

The referred pain in the neck and abdomen are

usually induced, or aggravated, by cough and deep respiration.

Nausea and vomiting are more constant in visceral abdominal inflammation, but may be pronounced in diaphragmatic pleurisy.

Hiccough is not a common symptom in diaphragmatic pleurisy contrary to the current belief. It was present only 5 times in 61 cases. It is more often seen in visceral disease of the abdomen than in diaphragmatic pleurisy.

CARDIAC LESIONS

Angina pectoris is characterized by epigastric pain after eating or after exertion, and is relieved by belching; because of these characteristics the milder types of the disease are frequently mistaken for attacks of acute indigestion, and more rarely, and under rather unusual conditions, the more severe attacks may be confused with acute abdominal conditions. In *angina pectoris* the pain is due to exertion, not food, the blood pressure is usually high, and the heart rarely normal. The attack is accompanied by great fear or apprehension of approaching death. The pain is usually referred to the left arm, but may be referred to the back, epigastrium, testes, leg or right arm.

The appearance of the facies is characteristic, the features are sunken, the face pale and cold, with an expression of agony, anxiety, and distress, quite similar, on superficial examination, to the "facies hippocratica."

Emphasis should be laid on the resemblance of some of these cases to surgical accidents. The sudden onset, with pain over the lower sternal and epigastric region, the nausea and vomiting, the tympany, the feeble pulse, ashy color, cold sweat and other signs of collapse, make one think of certain acute abdominal conditions.

Where there is arteriosclerosis, enlarged heart, a history of previous angina, typical radiation of the pain in the neck and arm, the diagnosis will not be so difficult as where these suggestive aids are lacking.

Pericarditis. In acute pericarditis the symptoms are those of an acute infection. The disease is characterized by pain in the region of the heart. This pain may be referred to the abdomen, to the region of the stomach, gall-bladder, or appendix. A careful examination will usually reveal tumultuous heart

action: dyspnœa, cyanosis, dysphagia, friction rub, and with effusion, enlarged cardiac dullness. Fluoroscopic examination is of great value.

Fussell has seen pericarditis mistaken for appendicitis, but states that the mistake rarely occurs in the reverse way. (I have been called to operate upon a case for cholecystitis in which the examination revealed a pericarditis with friction rub.)

RETROPERITONEAL LESIONS

Renal. Among the renal conditions that might be confused with intra-abdominal lesions should be mentioned (1) stone, (2) Dietl's crises, (3) unilateral hæmatogenous infection of the kidney, the septic infarct of Brewer, (4) uræmia, (5) perinephritic abscess, and (6) pyelonephritis. The most frequent is stone. Renal colic is characterized by severe pain, usually calling for morphine, with tenderness in the loin, and vesical tenesmus, with nausea or vomiting and hæmaturia, with no increase in temperature or leucocytosis. The symptomatology of renal lithiasis has been very exhaustively studied by Braasch, who found great variations in the usually accepted signs and symptoms. For example, typical pain and tenderness in the kidney region was present in only 117, of 251 cases: in 26 pain was general abdominal; in 30, pain referred to gall-bladder; in 32, pain referred to lower abdomen; in 56, pain referred to both sides of abdomen; in 40, pain referred to affected sides of abdomen; in 16, pain referred to non-affected side of abdomen. Thus one is justified in concluding that the pain of renal lithiasis may be very atypical.

Braasch, likewise found that hæmaturia was present in 141 of 251 cases, or 56 per cent, a rather indefinite percentage, and, to make matters worse, in 500 consecutive routine examinations in cases without symptoms of renal trouble, 146 showed microscopic blood in the urine.

Cabot, in 150 cases of renal and ureteral stone, found the urine persistently normal in 14 per cent, hæmaturia absent in 32 per cent.

The presence of microscopic blood in the urine may be due to pathology in any part of

the genito-urinary tract. The mere fact that there is an acute abdominal inflammation may cause microscopic hæmaturia.

The contact of an acutely inflamed appendix with the ureter or bladder may give rise to blood in the urine. Eising reports two such cases of pericystitis complicating acute appendicitis, and I have seen two cases in which symptoms suggestive of appendicitis, with a mass in the pelvis, were relieved by the removal of bloody urine from the distended bladder. Laparotomy disclosed a gangrenous appendix in contact with the fundus of the bladder.

Such cases are not uncommon, and too much stress must not be placed upon the presence of a few red blood-cells in the urine, as indicative of renal colic.

The X-ray failed to reveal urinary calculi in 10 to 15 per cent of Cabot's and in 11 per cent of Braasch's cases.

Confusion between abdominal conditions and kidney stone was emphasized by the late Maurice Richardson who wrote an extensive article, the last before his death, on "The Error of Overlooking Ureteral Stone Under a Diagnosis of Appendicitis," and Hugh Cabot reported 157 cases of stone in the kidney and ureter, in 26 of which unnecessary abdominal operations had been performed. These operations were distributed as follows:

Appendectomy without relief.....	10
Exploratory laparotomy	7
Fixation of kidney.....	4
Operation for gall-stones.....	1
Decapsulation of kidney.....	1
Salpingo-oophorectomy	1
Suprapubic cystostomy	1
"Adhesions"	1
	26

And in a recent contribution, Braasch states that 143, or practically one-third of the total number in his series of cases of nephrolithiasis had had previous laparotomies performed elsewhere for relief of pain: 83 with stone in right kidney; 55 with stone in left kidney; 5 with stone in both kidneys; twenty-one patients with stone in left kidney had had previous operations on the appendix or gall-bladder.

Dietl's crises is characterized by symptoms that simulate renal colic, or intra-abdominal

disease, such as severe abdominal or lumbar pain, nausea, vomiting, distention, rigidity, with enlarged tender kidney, and variable bladder symptoms with a usual absence of temperature and leucocytosis. This condition is supposed to be due to an acute obstruction of the ureter by kink or torsion of a floating or wandering kidney. It was first described by Dietl in 1864, and its frequency is decreasing with more painstaking examination and more accurate diagnosis.

Acute hamatogenous infection of kidney, acute septic infarct of kidney. Brewer, in 1906, analyzed 13 cases, and found 11 in women and 11 on the right side. Chill at onset was present in 4. Sudden high temperature, 104°, at first examination was found in 12. In three cases there were marked remissions; in others, the temperature was constantly high. In all cases the pulse was rapid, over 120. In 12 the chief complaint was abdominal pain, in 4 in the right iliac region. The costovertebral angle was tender in all. Muscular rigidity was a frequent finding as was leucocytosis. Microscopic blood was found in the urine of all but one.

In these cases, with the sudden onset, severe general pain, localizing on the right side, vomiting, with profound constitutional toxic disturbances and few definitely renal symptoms, the condition is often mistaken for intra-abdominal infection.

In Brewer's 13 cases, an abdominal incision, under mistaken diagnosis, was made three times. In Cobb's 8 cases, the same mistake was made in 3 instances.

That this type of case is not as uncommon as was previously supposed, is shown by the fact that Mason in 1912 collected 28 cases, and Cunningham in the same year reported 8 additional cases.

In a personal case, 2 days after an unsuccessful abdominal operation, nephrectomy was followed by a satisfactory outcome.

Disease of the suprarenal capsule. Addison's disease, or syndrome, is characterized by (a) physical and mental inertia, (b) pigmentation, (c) gastro-intestinal symptoms.

In the last we find anorexia, nausea, vomiting, constipation and later diarrhoea, enteropos, pain in lumbar and iliac regions, with

slight rigidity and tenderness on palpation in right iliac fossa, which may, at times, be attributed to intra-abdominal disease.

Study of the suprarenal gland has taught that there is a *cortical* portion that concerns the sexual function; and a *medullary* portion that seems to have a double function; one concerning pigmentation, and the other, in the production of suprarenin or adrenalin. This medullary portion consists of connective tissue, nerves and cells, the most important is the chromaffin cell. This chromaffin is found in the medullary portion of the adrenal, in the sympathetic ganglia, in the substance of the epididymis, and all these combined constitute what is known as the chromaffin system, which seems in some way, as yet not understood, to be intimately connected, either as a hypo- or hyper-function, with these atypical abdominal complaints.

Addison's syndrome, because of the gastrointestinal symptoms, in which the pain at times may be severe, may be confused with intraperitoneal disease.

The symptom-complex characteristic of Addison's syndrome is not uncommon. The pigmentation will be found very frequently with the other two, if it is intelligently looked for. One meets this syndrome frequently in cases that come under observation with a diagnosis of chronic appendicitis, but one hesitates to diagnose Addison's disease.

That there may be *acute* pain in this class of cases is beyond question; and Tice cites a case in point. The diagnosis of Addison's syndrome and *appendicitis* was made. In a "subsequent note" it is stated that there was exacerbation of the appendicitis which led to transfer to the surgical service and laparotomy was performed, at which the findings were negative, except for "an old adherent appendix" which was removed. Death occurred the following day and an autopsy was not permitted. This "exacerbation of the appendicitis" was evidently a misinterpretation of the symptoms.

Brodnitz calls attention to the "violent intestinal colic occurring in attacks, failure of the peristalsis, and isolated intestinal distention." And Ebstein says that in the terminal stages there is excessive vomiting.

abdominal pain and constipation, the abdomen is retracted and the walls tense, the pulse becomes small and there exists *in toto*, the picture of peritonitis.

Hæmorrhage, or suppuration, may lead to sudden destruction of the suprarenal glands. This condition is but rarely recognized, was first described by Virchow, and is characterized by very severe symptoms together with peritonitis which ends rapidly in death.

Uremia. In certain cases of uræmia, acute abdominal pain, distention, with severe vomiting and fever may be present. Differential points are urine examination, blood pressure, hypertrophy of heart.

The acute abdominal pain of nephritis particularly of the hæmorrhage type, has been emphasized by Osler.

Perinephritic abscess. Perinephritic abscess may simulate peritoneal disease, but careful history and examination will usually prevent confusion.

Pyelonephritis. Pyelonephritis is undoubtedly a cause of pain in the right side of abdomen, that may lead to erroneous diagnosis. In 90 cases of proved pyelonephritis entering Cook County Hospital, in 1917, Culver found that the entrance diagnosis included almost every possibility. In two personal cases in which symptoms persisted after appendectomy, catheterization of the ureter showed a pyelitis of the right kidney.

Genito-urinary tract in the male. Inflammation of the epididymis, prostate gland, or the seminal vesicles may cause pain and tenderness in the right iliac fossa, as likewise may small hernia.

Orthopedic conditions. Orthopedic conditions such as caries, spondylitis deformans or hypertrophic arthritis of the vertebræ, subluxations of the sacro-iliac or lumbosacral articulations, or the presence of an abnormal transverse process of the fifth lumbar vertebra, are all of importance in a consideration of atypical abdominal pain. They usually give rise to chronic symptoms but, occasionally may cause acute pain, and other symptoms that may simulate intra-abdominal lesions. They may be suspected by limitation of motion of the spine, with local tenderness over vertebræ or lumbar regions.

R. C. Cabot reports 17 cases of vertebral tuberculosis (Pott's disease) that came to autopsy; only 4 were recognized in life. He says that knuckle in the spine, pressure signs, muscular rigidity, limitation of motion, and secondary abscess are not common.

The important diagnostic point is X-ray examination which may show erosion, arthritis or deformity; but these roentgenograms must be given careful study before arriving at conclusions, as the normal X-ray picture is not yet definitely accepted.

Cotton in a very concise article on "Fractures of the Transverse Processes of the Vertebræ," makes the statement that, "within a year a certain amount of loose literature has appeared concerning fractures of the transverse processes of the vertebræ. It does seem to me that we should refrain from diagnosis, or at least from prognosis and cures, and even from expert testimony until we have more facts."

In 22 cases classed as fracture of the transverse process of the vertebra, in the X-ray Department, of the Boston City Hospital, Cotton was able to find a fracture in only 12, and after briefly abstracting these cases and presenting outline drawings of the roentgenograms in 6, of which the traumatic origin was doubtful, concludes that "anomalies in this region are frequent; often ill shown by average routine X-ray plates, are not always properly interpreted, and are apt to be called fractures."

"More than that, it is suggested that real fractures of the transverse processes may not improbably unite by fibrous union without persistent symptoms, and be chanced on later."

"There is no doubt that real fractures of the transverse processes of the vertebræ in the lumbar region do occur; probably not very infrequently. How important they are, does not yet appear, nor will their importance be manifest until other series are studied, and some of them carried on, to investigation of end-results."

Subperitoneal or retroperitoneal cellulitis or infection. Acute abdominal pain in the right lower quadrant, rapidly spreading and becoming general, with tenderness, rigidity,

increased pulse rate, elevation of temperature often with a chill and leucocytosis, during the course of an attack of influenza with pharyngitis or tonsillitis, may be streptococcal infection of the subperitoneal areolar tissue, secondary, or metastatic, to a primary focus in the pharynx or tonsil, in which the appendix is invaded merely as an incident in the course of the general infection. As the appendix, in these cases, is not a causative factor its removal will have but little influence upon the course of the disease. Such cases call for careful differentiation; if they are retroperitoneal streptococcal infections, appendectomy is not of much avail. Many such cases continue to death after operation by general bacteræmia, pneumonia or nephritis.¹

As radical an operator as Murphy was, he advocated a non-operative treatment, noting that such cases fared better without operation, that the resistance of the patient was lowered by futile operation, and that a fatal termination was liable to follow instead of cure. He says: "The greatest stress should be laid on the differential diagnosis between intra- and subperitoneal infections, and in addition, the fact should be forced on the profession that subperitoneal cellulitis is not in the range of operative treatment, and that the proper treatment of intraperitoneal peritonitis is, primarily, a surgical one. Cases of subperitoneal cellulitis are not remedied at all by opening and draining of the peritoneal cavity, as this does not attack the field of infection, namely the subperitoneal cellular tissues."

Anderson cites a number of cases of acute appendicitis as a sequel of tonsillitis and he emphasizes the fact that this type of case is prone to be atypical.

A personal case of this type, in abstract, is as follows:

A. R., servant, female, single, age 17 years. The patient had always had "stomach trouble" but it was never sufficiently severe to warrant consulting a physician.

On April 9, 1911, she had tonsillitis, with the usual symptoms; onset of menses the day before. On April 11, she had pain, swelling and tenderness of

the right knee. On April 12, the knee became worse and she had the same symptoms in the right ankle and both wrists, which necessitated her ceasing work, going to bed and calling a physician. Dr. Neil Andrews made a diagnosis of polyarthritides secondary to tonsillitis. On April 13, the joints improved, but she complained of abdominal pain, nausea and vomiting. These symptoms with temperature persisted and on April 16, the pain and tenderness in the abdomen became localized in the right iliac fossa. Examination revealed tenderness and rigidity of right rectus. The thigh was flexed and extension caused pain in the right iliac fossa. Pulse 130 and temperature 103° F. Leucocytosis 20,000. Diagnosis: acute appendicitis.

Operation revealed visceral and parietal peritoneum congested, blistered, swollen, oedematous; straw colored free fluid; pelvic and abdominal viscera negative; appendix congested, similar to other peritoneum with no adhesions, mesenterium infiltrated, mesenteric glands enlarged and a pericolic membrane. Typical appendectomy was performed, followed by the closure of the abdomen without drainage.

The convalescence was very stormy; for four weeks the temperature remained high, with elevation to over 103° F. with new joint manifestations. The abdominal wound healed *per primam*. Since then the patient has been in perfect health, and examination in December, 1916, confirmed the report. In my opinion the recovery in this instance was in spite of, and not because of, the removal of the appendix.

J. S. Evans presents the result of observation upon the relationship between pyogenic infections of the upper respiratory tract and the morbidity curve of acute appendicitis, during fifty-nine months, among the students of the University of Wisconsin and evidently encountered no such cases. During this period there were 236 cases of acute appendicitis in over 16,000 students, 214 of which were primary attacks. In 86 per cent there were observed definite primary infections of the upper respiratory tract. The primary respiratory infection preceded the acute appendiceal attack on an average of 16 days, the minimum interval being 1 day, the maximum 60 days.

In studying the morbidity curve of appendicitis from month to month we find that at eight periods during the six years there were marked increases above the expectant rate. Since similar increases above the expectancy of acute upper respiratory infections attended these same periods, we consider the evidence

¹The above was written before the recent pandemic of influenza and subsequent experience has seemed to emphasize the importance of this point.

of an etiologic relationship between the two diseases the more definite. The total number of cases in these eight periods was 113 and the total number of days involved was 226, or an average of one case of appendicitis every two days. This is in such sharp contrast to both the average monthly rate and to the expectant rate for each of the 59 months that one is justified in considering each group of cases as a definite epidemic.

Evans suggests: "In this group of 113 cases we were dealing with micro-organisms of the streptococcus group possessing a definite tropism for the appendix."

The condition of subperitoneal inflammation subsequent to puerperal infection of the uterus, and designated as "dry-peritonitis," has been recognized for some time.

Peritoneal operations and radical procedures in such circumstances have been so unsatisfactory that they are no longer considered, and conservative measures are now indicated.

Enlarged mesenteric lymph glands, usually tubercular, as in "tabes mesenterica" or abdominal Hodgkin's disease, in the right iliac fossa at the lower end of the root of the mesentery, may be palpable through the abdominal wall. Such a finding on palpation, in conjunction with acute abdominal symptoms and temperature may lead to confusion with an acute appendicitis.

Carson, in a consideration of "The Clinical Aspects of Tuberculous Mesenteric Glands," recommends the removal of any caseating or calcareous glands, which he admits may be rather a tedious procedure; and that it is not devoid of danger is shown by a personal case.

Exploratory laparotomy was performed upon a child of 6 years with a temperature, right iliac mass, pain and tenderness, and a history of so-called "chronic appendicitis," to settle a diagnosis of tuberculosis or appendicitis. At operation the appendix was found to be normal and was not removed. The mesenteric lymph glands were enlarged and one was removed for diagnosis. This was followed by meningitis and death.

Enlarged mesenteric lymph glands are frequent in cases of so-called chronic appendicitis, but in a careful histologic study of many such glands, I have been unable to find any evidence of tuberculosis.

NERVOUS LESIONS

In a study of *abdominal* pain, it may be of interest to make a comparative review of pains within the *cranial* cavity.

According to Fussell, headaches may be due to (a) reflex irritation; (b) toxæmia, infectious or chemical; (c) circulatory disturbances; (d) neuroses; (e) organic diseases of the brain, its membranes, or skull (the brain is insensitive and pain is due to involvement of the meninges either actually or by pressure); (f) indurative or muscular, due to the pressure of rheumatic nodules in the muscles of the scalp or neck; (g) neuralgia or neuritis.

With this formidable and confusing array of possible causes of pain in the head, one might well pause and consider before jumping at a conclusion without careful investigation of the possibilities in cases of pain in the abdomen.

The nerves of the abdominal wall are as follows: anterior divisions of the lower six intercostal (dorsal) nerves, called the abdominal intercostals. (The twelfth dorsal is larger and communicates with the iliohypogastric branch of the first lumbar, and the hypogastric branch of the first lumbar nerve.)

The *twelfth dorsal* nerve leaves the spinal canal below the last dorsal vertebra and rib, running at first behind the psoas muscle and in front of the quadratus lumborum. It pierces the transversalis and passes between it and the internal oblique, *two inches above the iliac spine*, in a downward and inward direction to the edge of the rectus, where it pierces the sheath and runs behind it to about the middle of the belly of the muscle. It pierces the muscle and the anterior rectus sheath, some branches becoming cutaneous and supplying the skin below the umbilicus. It also supplies branches to the transversalis, the internal and external oblique, the rectus and the pyramidalis muscles.

The *hypogastric branch* of the first lumbar nerve, runs between the transversalis and internal oblique, *about an inch above the crest of the ilium*; it continues downward and inward parallel to the twelfth dorsal, pierces the internal oblique about an inch in front of the anterior superior iliac spine and lies about

half an inch above the inguinal canal under the aponeurosis of the external oblique; pierces the aponeurosis of the external oblique an inch and a half above the external inguinal ring, becomes cutaneous, and supplies the skin above the pubes below the level of the twelfth dorsal. It gives off branches to the transversalis, oblique, and pyramidalis muscles.

Neuritis and neuralgia. Neuritis and neuralgia are differentiated clinically, but most neuralgias are probably due to a mild perineuritis.

In neuralgia, the pain is sharp shooting and paroxysmal limited to the course of a nerve, and is made worse by peripheral irritation. In neuritis, the pain is constant, burning or boring, and worse at night; with tenderness over the course of the affected nerve and aggravated by pressure; there may be trophic changes, with anæsthesia, paralysis or atrophy.

A localized neuritis or neuralgia of one or more of the nerves of the abdominal wall might be characterized by pain, varying in intensity of boring or stabbing character along the course of the nerve and its distribution, with local tenderness and pain on pressure or motion. Elevation of temperature is rare, and constitutional symptoms slight. There may be anæsthesia, tactile sensation lessened though pain sense increased; paræsthesia with numbness, tingling or formication; atrophy or paralysis, with absence, exaggeration or diminution, of reflexes.

Such disturbances, if they exist in the nerves of the abdominal wall and there is reason to believe that they do, have been given but little consideration, and demand study, because they have undoubtedly led to erroneous diagnosis. Such a group of symptoms with a crop of vesicles is classic in herpes zoster. Head and Campbell conclude that herpes zoster is a specific infective disease in which the virus has an affinity for the nervous system, particularly the ganglia, and considers the disease as an acute posterior poliomyelitis, in contradistinction to acute anterior poliomyelitis. Rosenow concludes that this disease is due to a streptococcus having elective affinity for the ganglia and posterior roots.

Herpes zoster of the face and upper intercostals is recognized, and comparatively frequent; but, of the lower intercostals and the first lumbar, if as frequent, is but rarely recognized. The location of the pain and symptoms often lead to a diagnosis of intra-abdominal disease and the hot applications which are frequently applied may cause one to misinterpret the presence of vesicles. Such cases have undoubtedly been operated upon for acute appendicitis. The occurrence of "zoster" of the viscera may no longer be questioned, as such cases are cited in the literature, and the knowledge of such a possibility adds greatly to the difficulties and uncertainties of proper interpretation of the significance of acute abdominal pain.

A local neuritis near the abdominal wall, which, if imitated in the nerves of the right iliac fossa, would cause great confusion is the "meralgia paræsthetica" which is well recognized, and a definite clinical entity. It was described first, by Bernhardt in 1895. In 1900 Musser and Sailer collected 99 cases; and W. J. Rutherford reports a dozen cases in the last ten years. The symptoms are caused by a mononeuritis of the external cutaneous nerve of the thigh. (A branch of the second and third lumbar nerves.) There is a local paræsthesia of which the cause is unknown and the treatment unsatisfactory.

Other forms of neuralgia or neuritis which lead one to admit the possibility of a local right side abdominal painful affection of the nerve are: occipitocervical neuralgia with induration and tender spots. If such areas of induration occurred in the abdominal wall near McBurney's spot erroneous conclusions might be drawn.

Pain such as that of tic douloureux, or intercostal neuralgia if occurring in the distribution of certain abdominal nerves might lead to unnecessary laparotomy. Migraine, sciatica, or lumbar neuralgia, coccydynia, pododynia and other similar affections, if appearing in different locations, might give rise to confusion.

Myositis and myalgia. The fact that localized pain, tenderness and rigidity may be due to pathological conditions within the substance of the abdominal wall seems to

have been consistently overlooked. A myositis in a certain location in the abdominal wall, if unrecognized, might readily be confused with intra-abdominal lesions.

The myalgias, rather loosely defined as painful affections of the voluntary muscle, fascia or periosteum to which they are attached (many authorities claim it to be a neuralgia of the sensory nerves of the muscle) are recognized in certain anatomical locations as lumbago, torticollis, pleurodynia.

Pain is the prominent symptom. The constitutional symptoms are mild, there is no fever and no leucocytosis. An abdominal type of this condition is admitted but it has not been given due attention, and if unrecognized would lead to confusion and error.

The headaches that are accompanied by areas of "induration" usually at the origin or insertion of muscles in the scalp and neck, might well be studied more carefully, and the occurrence of similar phenomena in the abdominal wall might clear up some of the uncertain cases of abdominal pain.

Lead colic. The colic of lead poisoning has frequently led to unnecessary laparotomy because of its very close simulation of intra-abdominal disease. The abdominal pain is general and associated with marked muscular rigidity, noteworthy in being relieved by pressure. Vomiting and constipation are present, the pulse is slow and of high tension with an absence of elevation of temperature. The blood count shows anæmia with stippled red cells and usually no leucocytosis.

Characteristic Burton's lead line, unfortunately is present in only half of the cases, but if discovered the diagnosis is confirmed. A false lead line may be found on the gums of any person working in dirty metallic dusty surroundings. This may be removed by cleaning the mouth and teeth. The true lead line is not *on* the gum, but is *in* the gum, and in its incipency is not a line, but a series of dots, the result of chemical changes between the lead and sulphur of decomposing particles of food, and will not be removed by cleaning. It is best seen with the aid of a magnifying glass.

In securing the history, it is well to remember that plumbism may occur in occupations other than that given as painter.

Tabes. Nuzum has made a most important contribution to the literature of tabes, in which he quotes from the classic description of this condition by Charcot as follows:

"But of all the visceral symptoms which may display themselves from the period of lightning pains, one which is at once the most remarkable and the least known, if I mistake not, is that which I have proposed to designate by the name of gastric crises. Very often their real signification remaining misunderstood, they are the occasion of grave errors of diagnosis.

"But it is time to tell you in what these gastric crises consist. Suddenly and generally at a period when a paroxysm of shooting pains has seized upon the extremities, the patient complains of pain which, starting from the groins, seems to ascend both sides of the abdomen and to become fixed in the epigastric region. At the same time they complain of pains situated between the shoulders which radiate around the base of the trunk in a lightning-like manner. Then the pulsation of the heart commonly becomes violent and precipitated. Rapidity of the pulse without fever is, in truth, a very common incident. Almost incessant and extremely distressing vomiting is often associated with gastric crises. Food is first ejected, then a mucous, colorless liquid sometimes mixed with bile or tinged with blood. An intense feeling of sickness and vertigo are superadded to the vomiting and cardialgic pains. Many a time I have seen this symptom diverting the attention of the physician and causing him to misapprehend the real nature of the disorder. I also have several times fallen into the snare in other days."

The gastric crises of tabes has, until very lately in the minds of many physicians, been considered a rare, unusual, and late manifestation of cerebrospinal syphilis.

That many cases of gastric crises have been mistaken for acute abdominal lesions has been more or less imperfectly realized, but Nuzum's article entitled, "Needless Surgical Operations from Failure to Recognize Tabes Dorsalis," is of great value in attracting attention to the frequency of the slipshod or careless methods taken to arrive at a diagno-

sis. Nuzum collected and analyzed the records of 1000 cases of tabes treated in Cook County Hospital during the four years, 1910-1915. In these 1000 cases, 97 needless operations had been performed upon 87 patients.

"In estimating the number of operations, only those have been included in which the patients were told by the surgeon that nothing wrong was found, and in which the old symptoms returned following the operation. Cases have been excluded when scars of previous operations were found in the epigastrium, kidney or appendix region, with no record of what was found or done at the operation, recorded on the history sheets, or when this could not be learned from the surgeon.

The surgeon's diagnosis in these cases was as follows:

Gastric ulcer	19
Gall-stones or cholecystitis	19
Appendicitis	18
Salpingitis	13
Exploratory laparotomy	9
Renal calculi	7
Postoperative adhesions	7
Tumor of cauda equina	1
Sciatica (nerve stretching)	1
Meningocele	1
Ectopic gestation	1
Peritonitis	1
Total number of operations	97

The occurrence of real bona fide abdominal pathology in conjunction with tabes must not be lost sight of. Nuzum recognizes this fact and excludes such cases, and reports a case of perforation of a duodenal ulcer in a tabetic that was discovered, at autopsy, by LeCount.

Just because a person has tabes it in no way eliminates the possibility of an acute abdominal emergency, or any other type of an emergency, and it is just such possibilities that make the personal equation of the diagnostician of so much importance. A study of the cerebrospinal fluid is of value, as an increase in the cells is quite a constant finding, even in the early stages. A positive Wassermann is of great value but is not conclusive, as there is a percentage of error variously estimated from 1 per cent up. False positives may occur in cancer, tuberculosis, scarlet fever and Hodgkin's disease; 25 per cent to 30 per cent of luetics are negative in

tertiary stages, as also are the so-called "parasyphilitics."

A provocative dose of antiluetic treatment will reduce this percentage of error materially. In all doubtful cases, both the blood and the spinal fluid should be examined.

Cabot summarizes the matter by saying: "What we are learning in the last few years, since lumbar puncture and Wassermann reactions in the blood and spinal fluid have become matters of routine in doubtful gastric cases, is that any type of stomach trouble, acute or chronic, mild or severe, sharply painful, or merely distressing, may be due to cerebrospinal syphilis. Until within the last few years, one was on the lookout, if he were conscientious, for so-called gastric cases in tabes. What we have learned lately is: (a) That we must suspect the possibility of tabes even when the pupils are normal and must investigate this possibility by means of spinal puncture; (b) that any sort of gastric abdominal pain or distress may be due to tabes."

I shall merely present Nuzum's conclusions, which represent the consensus of opinion on the subject at this time, and urge that this article be not only read, but carefully studied, by every one who presumes to perform laparotomy:

It is believed that with a careful examination to exclude tabes, in the future more tabetics will be spared useless surgical operations, and more acute abdominal symptoms will be proved of spinal origin.

1. Of 1,000 tabetics, 8.7 per cent have been subjected to laparotomy under mistaken diagnosis one or more times.

2. The "crisis" of tabes has largely influenced the surgeon in his decision to operate. This statement is supported by the fact that 65 per cent of the 87 patients operated on presented visceral crisis. In 17 per cent of these the "crisis" was the initial symptom of their disease.

3. Mistaken diagnosis and resulting operations occur chiefly through failure to examine the nervous system.

4. Gastric ulcer, gall-bladder disease, and appendicitis are the diagnoses most frequently made.

5. Tabetics subjected to several successive laparotomies have, as a rule, been operated on by as many different surgeons.

6. A history of paroxysmal attacks of vomiting, rheumatism, paræsthesias, bladder disturbances, or fractures without physical violence, should excite interest to exclude tabes dorsalis.

7. The cytodiagnosis of the cerebrospinal fluid, together with the Wassermann reaction with the spinal fluid, are of inestimable value in doubtful cases.

Hysteria, with its protean manifestations may, of course, be mistaken for intra-abdominal lesions. *Clavushystericus*, so well known, if transferred to the right iliac fossa would many times be operated upon with a diagnosis of appendicitis. Still there is no reason why the same severe pain may not occur in the abdomen, instead of the head.

Such tender spots do occur in the hysterogenetic points, viz., the breast, trunk, spine and upper and lower abdomen, and it is the type of painful spot in the lower abdomen that has been responsible for the ovariectomy furor, and now the appendectomy craze.

Tympanites or phantom tumor may likewise confuse the issue.

Careful history taking and complete examination with the discovery of anæsthetic areas, or superficial tenderness greater than that elicited by deep pressure with an absence of temperature or leucocytosis will usually prevent error.

INTRAPERITONEAL LESIONS

Intraperitoneal lesions that may simulate surgical conditions may include: cardiospasm, cirrhosis of liver, acute dilatation of stomach, acute gastritis, acute enteritis, ptomaine poisoning, typhoid fever, angioneurotic oedema, gastroparesis, mucous colitis, chronic intestinal stasis, salpingitis, dysmenorrhœa, pregnancy and others.

Cardiospasm. It is but a comparatively few years since abdominal operations were performed for various conditions in which undetected and unsuspected cardiospasm was the real cause of the symptoms. Smithies reports 34 cases, in but 5 of which had the possibility of cardiospasm been considered. X-ray, careful history, and examination will prevent such error.

Cirrhosis of liver. Biliary or hypertrophic cirrhosis (Hanot) is characterized by jaundice, an enlarged liver, attacks of pain in the region of liver, that may be severe and associated with nausea and vomiting, possibly with slight fever, and leucocytosis. The nega-

tive features are absence of ascites and dilatation of the blood-vessels.

Because of the gastric attacks, jaundice and enlargement in the region of the gall-bladder, this condition is not infrequently confused with cholecystitis.

Portal or atrophic cirrhosis (Laennec) is characterized by small contracted liver, ascites, and portal obstruction manifested by the caput medusæ, hæmatemesis or melæna.

According to Rolleston, and confirmed by Cabot, acute symptomless hæmatemesis occurs in 20 per cent of gastric and duodenal ulcer and in 20 per cent of cirrhosis of liver.

"Dyspepsia" is a common symptom as is the "hepatic facies," viz., eyes sunken, conjunctiva watery, nose and cheeks showing distended vessels and the complexion muddy and ichteroid. Cerebral toxic symptoms may develop any time and are usually mistaken for uræmia. The ascites may lead to a diagnosis of tuberculosis of the peritoneum or malignancy. The disease is not rare.

The Talma-Morrison omentopexy has not been accepted as superior to tapping, and the establishment of Eck's fistula, i.e., portocaval anastomosis has met with little favor since its first performance on man, by Widai, in 1903.

Mayo states that his experience with splenectomy in cases of splenic anæmia has been such as to encourage him to splenectomize in suitable cases of portal cirrhosis, especially when the spleen is enlarged.

Acute dilatation of the stomach may be mistaken for peritonitis or ileus. Laparotomy is rarely indicated, as gastric lavage will not only make the diagnosis, but will serve as a very effectual therapeutic measure.

"Acute indigestion" is a term used rather loosely to indicate a condition in which the usual gastric symptoms present, but this name can, consistently, be applied only to those in which the symptoms end by the emptying of the stomach.

In acute gastritis there may be temperature; the usual absence of a leucocytosis will aid in differentiation. The abdominal pain may be intense, and the attacks may be confused with cholecystitis or appendicitis. This differentiation may be at times extremely difficult.

Acute enteritis may be accompanied by abdominal pain; but a temperature and leucocytosis is usually absent. The pain and tenderness are not localized.

In ptomaine poisoning, there is no fever and no leucocytosis; but there is abdominal pain, cold sweats, vomiting, continued diarrhoea and subnormal temperature.

As a general proposition, with infection, there is fever; but with poisoning there is no fever. Many "gastritis," "enteritis," and "ptomaine poisoning" cases are gastric ulcer, gall-bladder or appendiceal infections.

An acute abdominal pain in the course of typhoid fever must always be given serious consideration. A coincident appendicitis is not rare. Perforation varies greatly in frequency but it has been estimated to be the cause of death in about 12 per cent of the fatalities. Perforation occurs in about 3 per cent of all cases; 80 per cent in the lower ileum and usually during the second and third week. Characteristic of perforation, we find acute abdominal pain, rise of blood pressure, increase of leucocytosis. This may be a comparative increase and still be below normal; therefore the necessity of a close observation of the blood during the course of the disease.

With these symptoms exploration is indicated. They may be found to be due to conditions not remediable by operation, but to await more conclusive signs of peritonitis is to await a time at which treatment is usually unavailing.

In the literature we find many cases in which exploratory laparotomy was not followed by disastrous consequences. The diagnosis is most difficult because, to quote Remsen: "The unraveling of such a complication involves some of the prettiest diagnostic problems in acute abdominal surgery, for it involves, not merely the diagnosis of an acute abdominal condition *per se*, but rather its diagnosis through the veil of signs and symptoms pertaining to another existent acute abdominal condition, if we may class typhoid fever as such."

Typhoid fever must always be excluded in doubtful cases. Of great value is a history of temperature previous to the attack of pain.

The enlarged pericæcal glands may simulate an appendiceal abscess and may give rise to pain and tenderness.

The leucopenia, the Widal, and the other typical signs of typhoid or paratyphoid, should be looked for.

Angioneurotic œdema. The appearance of this disease in the skin has been well known since Quincke's description of it in 1882, at which time it was known by his name.

It is only recently that attention has been drawn to the fact that visceral occurrence of exudative phenomena similar to those observed upon the visible surfaces of the body, such as urticaria, erythema, purpura, all belong to the angioneurotic group, an angioneurosis, that may give rise to abdominal pain which may cause even experienced observers to open the abdomen in the belief that some acute surgical pathology exists.

This condition may be due to chemical or toxic irritation, to faulty metabolism or to anaphylaxis. William Osler has given this subject considerable attention and in a report of 29 cases cites Henoch's purpura in which intense agonizing attacks of colic have occurred with no cutaneous manifestations. The decrease in red cells and hæmoglobin in these cases is most striking, though there may be elevation of temperature and increase in leucocytosis. Because of the variability of the skin lesions, and of their absence in some attacks, patients rarely associate the skin conditions and the abdominal symptoms. In children particularly, careful history taking should attempt to bring out previous attacks or lesions of the skin, inflammation of joints, or abdominal colic or crises. In adults, one is often struck by what may be called a neurotic tendency of the patient and one will note the indefiniteness of the nature of the abdominal pain, which does not conform to the type found in the usual surgical lesions.

There is one type which lasts a few hours. This may be mistaken for gall-stone colic, or, with hæmatemesis it may be confused with gastric or duodenal ulcer. Another type of longer duration, is frequently associated with a swelling in the right iliac fossa, and may suggest appendiceal abscess.

Such cases have been frequently operated

upon, and a brawny induration of the entire cæcum, appendix, and lower ileum is encountered. The appendix does not show sufficient change to be the primary cause of the condition. Harrington cites 1 case of this type, Osler 3, Riggs 4, and Mayo 3.

In cases seen for the first time, in which there is large tumefaction of recent duration in the cæcal region, severe pain without local peritonitis and with the patient in good general condition, out of all porportion to the suspected lesion, a history of previous swelling should be carefully sought, and, if found, watchful waiting is good surgery.

Crispin, in an article entitled "Visceral Crises in Angioneurotic Oedema" considers this subject *in extenso* and cites cases from the Mayo Clinic. His conclusions are as follows:

"When a history of severe abdominal pain is given which does not conform to true surgical types, careful inquiry should be made as to the presence at any time of urticarias, erythemas, purpuras, and swellings of angioneurotic oedema types."

A history of recurrent severe abdominal pains with constancy in the nature and duration of the attacks with skin manifestations of any of the exudative erythemic forms, with or without noticeable association with the abdominal pains, should excite suspicion as to the presence of crises of angioneurotic type.

A diagnosis of visceral crises of angioneurotic type should not be made until careful examination has excluded or made independent surgical causes. In this, roentgenologic examination of the gastro-intestinal tract is valuable negative evidence. Syphilis and tuberculosis should be excluded.

The constancy in the recurring attacks of the pain, not conforming to surgical types, in patients who have had skin manifestations of the exudative erythema group and whose general condition does not account for the suffering they have had to bear, will warrant a diagnosis of visceral angioneurotic oedema.

Repeated, or even single attacks, of intestinal colic with tumefaction in which the patient's general condition is too good for the extent and severity of the trouble, and in which history of the swellings can be obtained,

may be of this type. To wait is good surgery. The rapid return to health is strongly suggestive of visceral angioneurosis.

Having determined the medical nature of these angioneurotic visceral crises, we should endeavor to work out the sources of toxæmia. There may be foci of pus in the upper respiratory tract and sinuses; bacterial absorption, idiosyncrasies to heat, cold, chemicals, parasites, carbohydrates or proteins that are the causes for anaphylaxis.

Removing the cause for anaphylaxis, whether it be idiosyncrasy in one patient for ice cream, some constituent, such as cold bananas in another, alcohol in a third or any anaphylactic base or source of exogenous or endogenous irritation or poison, may give the patient relief that the advised surgery would not have given him.

Appert, from France, likewise calls attention to this pseudoperitoneal syndrome due to urticaria-purpura or polymorphous erythema.

Since the work of Richert, and others, Appert considers urticaria to be an anaphylactic phenomenon, and that the cutaneous troubles are only the outward and visible manifestations of sudden changes in the blood called by Widal a "hæmoclassic crisis."

Visceroptosis. The important phase of surgery in which visceroptosis has caused symptoms leading to unnecessary abdominal operations has been handled in a masterly fashion by Albert J. Walton. Thirteen cases were operated upon under the impression that the condition was an acute abdominal lesion—appendicitis, the remainder of the total 67 were mistaken for chronic abdominal disease—chronic appendicitis, gall-bladder disease or gastric ulcer or cancer. Differing from appendicitis one finds a previous history of repeated attacks of a mild character and short duration. There may be a slight increase in temperature and slight rigidity. Walton well says, "If in doubt always better to diagnose appendicitis and operate."

Archibald MacLaren in a consideration of "Chronic Appendicitis and Visceroptosis," says: "The neurasthenic or visceroptosis case sometimes simulates the *acute* but usually is mistaken for *chronic* appendicitis."

Constipation-stasis. This subject, despite its enormous literature, is still unsettled and obscure. It is more intimately connected with the chronic than with the acute abdomen, but as these cases are being operated upon and are being advised to undergo operations for acute abdominal conditions, it must be mentioned at this time.

This error in diagnosis also occurs in other countries; for example, in London, as shown by the report of Walton; in Germany, by that of Wilms; in Amsterdam, by that of Laewen, in Norway, by that of Widore. The latter reports 23 cases of intestinal stasis occurring in 1912, in 16 of which the family doctor had sent the patient to the hospital urging immediate operation, but in all the trouble was merely intestinal stasis.

In view of the above citations, from England, Holland, Germany, Norway, and I suppose a search would reveal similar reports from other countries, it would seem that some reason for this diagnostic error must be looked for, that is general, geographically, and that may be effective in all communities regardless of the type of education or the traditions, and customs of the profession.

And such a cause will be found, it seems, in nothing more obscure than sheer laziness, in which acceptable diagnoses are made without sufficient data, the so-called "snap shot" diagnosis, which it seems is quite universal; an international and not a national failing.

Mucous colitis. Colica mucosa of Nothnagel is such a large and little understood subject that I shall not attempt to present a consideration of the topic but merely call to your attention the fact that this disease is quite common, though frequently unrecognized, that it is characterized by attacks of very severe abdominal pain with great tenderness that has many times been mistaken for intra-abdominal inflammation. The condition is associated with neurasthenia. The relation of one to the other like that of the chic to the egg, is not as yet determined.

In mucous colitis there are localized spots of cutaneous hyperæsthesia.

"The areas of cutaneous tenderness pointed out by Head as corresponding to disease of internal organs have been verified in most

particulars by subsequent observers. Those which correspond to the intestines as far down as the upper part of the rectum, are the ninth, tenth, eleventh, and twelfth dorsal segments. Their respective positions are: left costal margin above the center and one inch from the end of the rib; just to the right of the umbilicus; just above the left anterior superior spine; and just above the middle of the right Poupart's ligament."

The presence of one of these spots last mentioned has been sufficient many times for the removal of an unoffending appendix. There is likewise a tenderness with rigidity on palpation along the course of the colon. There is in conjunction, a gastropptosis, enteroptosis, nephropptosis, a so-called "habitus enteropticus." Constipation is usual; though diarrhœa may alternate with constipation. At times, usually before evacuation of the bowel, there is a colic which may be very severe. The passage of thick glairy mucus in variable amounts is characteristic. This mucus may be rolled into worm-like masses that may be looked upon, by the patient, as worms.

This condition is a neurosis and not an inflammation; consequently there is usually an absence of leucocytosis and temperature.

Van Norden and Nothnagel have described the condition, and Henschell and Abraham have published a large monograph, Spitzig of Cleveland has considered the subject and Capperoani in a recent article dwells particularly upon the pseudo-appendicitis attacks that may occur in this condition.

This is a very obscure question and greatly in need of elucidation. Therefore it will not be considered further than merely to mention the fact that it is a frequent source of error in hasty examination and hurried diagnoses.

Salpingitis may be confused with appendicitis but a vaginal examination, with careful history, will usually clear up the diagnosis.

The question of the advisability of delaying operative interferences in acute pelvic infections until the acute inflammation has subsided, has, it would seem, been definitely settled by the observations of Simpson.

In but very rare instances is surgery indicated, danger to life is slight, the danger of

non-operative treatment is largely one of continued morbidity and recurrent infections. A coincident acute appendicitis should, of course, be treated by accepted radical measures. Simple dysmenorrhœa may be mistaken for acute abdominal inflammation. The history and close observation will prevent such confusion.

During the course of pregnancy there is sometimes a tendency to complain of pain and tenderness; sometimes a severe colic, in the right iliac fossa, which has been responsible for operation with a diagnosis of appendicitis, in which the findings did not coincide with the subjective symptoms.

An explanation has been offered by DeLee as follows: "This pain is almost always in some relation to McBurney's point, and is due to the dextrotorsion of the uterus, throwing the right tube and ovary forward, with a resultant compression of these delicate organs between the utero-abdominal walls."

But, whether or not this is the proper explanation, the clinical fact is well worth remembering. The frequency of appendicitis in pregnancy has been variously estimated, but I shall merely quote from two prominent obstetricians in a recent discussion. R. W. Holmes says, "I wish to take issue with Dr. Beck in his statement that appendicitis in pregnancy is very common. It naturally falls out that the findings of the general surgeon on this question will give a higher proportion than would be the case of the obstetrician. I have repeatedly had women complaining of right-sided pain, *but that is not appendicitis*, although I am sure many a pregnant woman has had her appendix removed hurriedly on account of such pain."

Dr. DeLee says: "I am quite confident that many a so-called appendicitis in pregnancy is merely a mild toxæmia of pregnancy: the physiologic leucocytosis of pregnancy, coupled with nausea. Epigastric, or perhaps right-sided pain, misleads one into operating erroneously for an appendicitis which does not exist."

CONCLUSIONS

These remarks have been rather brief and sketchy; in fact a mere running commentary upon a certain phase of surgery that is becoming more and more important. Other confusing conditions should have, in all probability, been included; differential points may not have been sufficiently and properly emphasized but the effort has been to direct attention to the fact that these various conditions may simulate intra-abdominal lesions; some of which may have slipped your mind; and that a diagnosis to be worthy of the name, must be based upon a careful history of the case, complete observation, and accurate interpretation of the data so acquired.

As showing the importance of careful history taking, Behlow says: "From a careful history one can make a positive diagnosis of the primary or major conditions in 53 per cent of the cases."

The same care in taking a history will make possible a positive diagnosis of the secondary condition in 41 per cent of the cases.

If the above possibilities are kept in mind and each case given careful study, our unsatisfactory results will decrease. This fact has been well recognized for centuries and has been consistently neglected, as has been shown by DaCosta in an article on "Principles of Surgical Diagnosis," in which he quotes Benjamin Franklin: "Want of care does more damage than want of knowledge"; and Sir William Gull: "We make more mistakes from not looking than from not knowing."

The coincidence of curable surgical lesions in individuals afflicted with non-surgical and incurable disease must be recognized, and the fact anticipated, that the cure of a definite surgical disease in a chronic neurasthenic does not necessarily mean a cure of the neurosis. Or in the trite words of Deaver: "The abdomen will be found to be a veritable Pandora's box of troubles, which do not, however, always fly away when the box is opened."