fatal absorption in any place in the body. He means that the defensive forces of the body are not fully appreciated.

The elements of treatment consist of, 1, closing the opening; 2, relieving the pus tension by putting in a drain; 3, getting out of the peritoneal cavity and leaving in the drain to prevent subsequent tension—no flushing, no washing, no sponging, no trauma. In following out that line of treatment we have not overburdened the patient at the time of the operation with the additional absorption of the products of infection; we have not killed him on the operating table, and these results gained in an experience of five and a half years shows what we can hope for in this disease. Salines are used in all our severer operations of every kind, whether abdominal or not.

DR. ROBERT T. MORRIS, New York: I adopt the Ochsner starvation treatment in principle, but prefer to do a three to five minute operation on a patient when I can; then leave him to his opsonins and phagocytes. The Ochsner treatment is one of the greatest points ever made in the history of appendicitis. The Ochsner treatment as comprehended by the average physician of New York is damnable. We are now arriving at the era of physiologic surgery, of leaving something for the patient's phagocytes and opsonins to do. If we leave this factory of the patient's in good condition, it can go on manufacturing these substances and cure him.

As to simple ligation, what is the difference whether the stump of the appendix lies against the parietal peritoneum or against the visceral peritoneum, the peritoneum of the meso-appendix, which is drawn up over it, or the peritoneum brought up on the stump by the infolding suture? In all these cases the stump lies against the peritoneum, and that is the essential thing if it is promptly walled in by a plastic exudate. We save time by the simple ligation, and time is the thing we must keep in mind in connection with this new principle, the new era in surgery. Dr. Ferguson is still afraid of pus in the peritoneal cavity. If we use gauze to wall off that area we are doing too much surgery. If we fill the patient with gauze, we are performing taxidermy on him. If we break down the adhesions, what will be the influence if we let a pint of pus into the free peritoneal cavity? That is an albuminous fluid, and it will furnish nourishment to the patient. You may kill him if you try to get it out. Let him get it out. He can do it better than we can. In cases of general peritonitis I believe in the three to five minute operation together with the Ochsner treatment. In the last 100 cases at the Post-Graduate Hospital, 100 consecutive cases of appendicitis, unselected, treated by the method of leaving the patient to his own opsonins and phagocytes, 41 acute cases of appendicitis and 59 interval and other cases, there was only one death. I might have presented other series of cases, but this one will suffice. I have operated on every appendicitis patient with peritonitis who was still breathing when I got to him.

Treves Commends Panama Sanitation.—Sir Frederick Treves, speaking on "Preventive Medicine at Panama," before the Royal Society of Medicine (Proceedings, June, 1908, p. 313), said: "I visited the Isthmus in February of last year and had the advantage of seeing this remarkable work under the guidance of Colonel Gorgas, the chief sanitary officer. To Colonel Gorgas is due the credit of an undertaking which in its aims and its results is not one whit less astonishing than the work of connecting by means of a canal the two great oceans of the world. Colonel Gorgas is clearing of disease one of the most pestilential spots in the tropics, and is making of the same a place where men can live in safety and in reasonable health. He is at the same time demonstrating practically the soundness and efficiency of the most recent claims of preventive medicine. . . . It will be seen, I hope, from the above brief description that the Isthmus of Panama provides at this moment an object lesson which those who control the destinies of men might study with advantage. It provides for the realization of a long contemplated and heroic ideal—the medical officer of health with a free hand."

PROMINENT SYMPTOMS IN THE DIAGNOSIS OF GASTRIC AND DUODENAL ULCERS.*

CHRISTOPHER GRAHAM, B.S., M.D.

ROCHESTER, MINN.

The accurate differentiation between duodenal ulcers and ulcers of the pyloric end of the stomach offers great difficulties. When a physician follows his patients from the examining room to the operating table he is forced to the conclusion that to locate a peptic ulcer is not only difficult but often impossible.

In reviewing the symptoms and diagnostic features of peptic ulcer I shall take the duodenal as the type. What holds good for duodenal ulcers, holds equally good for all ulcers situated in the pyloric end of the stomach. The chief difference arises from the degree in which the characteristic symptoms are manifest.

In this discussion I wish to emphasize but four points that seem to stand out prominently and clearly in the larger number of cases: First, the periodicity of attacks of gastric and duodenal ulcers. Second, the number of years through which these attacks and intermissions or remissions have run before surgical relief has been advised, or perhaps accepted. Third, the characteristics of pain, its great diagnostic significance and its place in differential diagnosis. Fourth, the ready control of all symptoms during the period of attack by the measures that control pain—as food, alkalies, irrigation, and vomiting.

PERIODICITY.

The periodicity of attacks is so constant and striking a feature of ulcer of the stomach and duodenum that one can not but have in mind this lesion when the patient complains of repeated attacks, each covering days, with an intermission of normal health of varying time. The onset of symptoms is often initiated without discoverable cause, appearing suddenly and continuing without interruption for days, weeks, or even months, each day a repetition of the former, each meal producing about the same effect; first, ease—later followed by the usual syndrome of pain, or burning distress, gas, sour eructations and vomiting of sour mouthfuls of varying quantities, all these being at their worst from two to five hours after a meal.

Following this period of attack comes an intermission of days, weeks, or months, appearing, often, as unaccountably and as suddenly as did the distressing symptoms. These attacks recur at irregular intervals, for years and continue for varying periods, increasing in intensity perhaps but slowly, the intermission shortening, until finally, the patient may fail to reach at any time that complete ease of previous years. Early in the period of disturbance and often for years, the interval is one of perfect health and, after the symptoms have disappeared, the patient soon reaches his normal condition. Yet again, it may be only a partial remission; the patient never quite attains normal, or his "good days" may be only days of moderate ease. The appetite is usually good until complications have changed the character of the symptoms, at which time it becomes necessary to examine carefully into the early history in order to arrive at a logical diagnosis.

These periods of complaint with the periods of intermission, each covering days or months, are so char-

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acteristic, that, excluding other details, this one feature is often sufficient to warrant a probable diagnosis.

However, periodicity is not of itself peculiar to ulcers of the stomach and duodenum. The character of the attack must be considered carefully. Gallstone and appendiceal colics recur irregularly, often increase in severity as attacks multiply, may, and often do appear suddenly and without known cause. All three have one feature in common; each attack is but a part of the usual round of trouble, and the intermission is but a part of the cycle. In the latter case no more than in the former may this quiescent period be regarded as that of cure.

LENGTH OF TIME THE SYMPTOMS HAVE PERSISTED.

Scarcely less prominent than the periodicity of attacks is the number of years the illness has been manifest before surgical relief has been advised, or perhaps should be advised in many cases, for at first most of these cases are medical and the conservative surgeon does not lay bold hands on them.

However, as one's experience lengthens he is inclined to the belief that error is much oftener to be laid at the door of conservative surgery than at the door of aggressive surgery, and for this reason the sufferer too often fails to get that ready and early relief which is secured only through surgery. In a series of 258 duodenal cases, there are but few with histories of duration of less than one year, and in these the symptoms were clear and often urgent. Usually the history shows that the disease has run from 5 to 20 years and not infrequently to 30 and 45, the average being just short of 12 1/2 years. Considering the facts of the long series of years with distressing symptoms always promising increase, and as years go by, with invalidism increasing, marked or complete, it seems strange, not that so many patients are urged to seek surgical relief, but rather why surgical measures are not advised sooner, or at least as soon as complications appear which indicate that the medical border line has been passed.

In the series here mentioned, this history of repetition of attacks with intermissions or remissions, together with long years (average 12 1/2 years) of trouble has been clear cut in about 90 per cent. of the cases. This should quiet the most conservative internist who feels that surgery is too "freely and flippantly" advised.

SIGNIFICANCE OF PAIN.

Pain in gastric ulcer is the most constant symptom and perhaps the most characteristic in its manifestations. Not the kind of pain, not the location of the pain, but the time of the pain is the distinguishing feature. It varies from mild distress to that of great intensity, and, unless complications have introduced great modifications, its appearance, control and disappearance, are almost if not quite the final evidence required for a correct diagnosis. The pain appears sometime after meals; oftener it is as nearly exact to say before meals. Usually in from two to five hours after a hearty meal the burning, gnawing feeling begins, increasing in intensity until vomiting or irrigation has removed the acid-offending material. Food eases the pain, the heartier the meal the longer the relief. Especially is this true in the history of duodenal ulcer. Gradually, however, this relief lessens, until late in the history and after the patient has been long a "surgical case," food eases but little. When complications (per-

forations, adhesions, obstruction) are far advanced, food gives no ease and distress follows its ingestion. At this stage relief comes only after ridding the stomach of all offending material by irrigation or forced vomiting.

The pain comes, then, in definite periods of attack; comes daily, or two or three times a day, during this period; comes from two to five hours after meals and is therefore premeal as often as it is after-meal in time. It is epigastric, radiating seldom to other areas, and, except in the later stages is relieved in part, at least, by food, drink, alkalies, vomiting and irrigation. The kind of pain depends on the pathologic condition. It may be burning, gnawing, lancinating, boring—cutting (apple-core sensation) or the felling pain of perforation.

Locating an ulcer of the peptic tract from the area of pain as given by the patient is perplexing and often very uncertain. Most of the pain is epigastric, let the lesion be where it may, but the lower the lesion, the oftener is the sensation of pain to the right of the median line, and some ulcers, especially the duodenal variety, give characteristic findings. The longer food gives comfort, other things being equal (as duration of time of disease, extent of trouble, obstruction, etc.) the farther down is the ulcer situated, so that in duodenal ulcer, especially in the early days of its history, food gives relief for a longer time than when the ulcer is located higher, i. e. in the stomach proper. Following this period of ease, the characteristic ulcer symptoms return, of gnawing, boring even to extreme pain, with gas, sour eructation, vomiting of various amounts and intensity, dependent on obstruction and extent of lesion.

There is, however, a pain of the cardia comparable to the boring of a bared apple core, very distressing, foreboding and sickening which may be present when the lesion is purely pyloric or duodenal, and is doubtless present at times when acidity is high but purely a functional disorder or due to dietetic error. This pain is brought about by reverse gastric peristalsis, acidity, ulcer, then spasm of the pylorus followed by reverse peristalsis. If the sufferer belches or vomits with difficulty the annoyance amounts to real pain, and fear of cancer is prominent. These pains come in wave periods of a few moments, and relief follows suddenly and completely at each wave if gas and sour eructation be copiously raised, or the pain gradually recedes to almost quiet, if belching, eructation or vomiting is impossible. These wave pains repeat until the stomach is relieved by measures that empty it, or they yield readily to sufficient alkalies.

It is seen, therefore, that difficulties arise, and that the most careful attempts at ulcer location fail, but until obstruction is advanced or the lesions large, the best evidence for ulcer localization is the length of time that food gives relief.

Most of the ulcers of the stomach and duodenum (and this is true independent of location) have a longer or shorter spell of relief from food, until late in the disease, at which time the early history is necessary both for diagnosis and localization of ulcer.

There are to-day clinicians who persist in the idea that if ulcer of the stomach is present, food gives immediate pain, or at any rate, no sense of comfort even for a short time. This is not true in the great majority of peptic ulcers, let the lesion be where it may.

The great number of ulcers are in the pyloric end, and in this region the symptoms are usually typical until complications arise. We then have to consider the

conditions that alter the character of the pain. They are: First, large areas (saddle ulcers); second, ulcers well toward the cardia; third, cases in which obstruction is advanced; fourth, hour-glass stomach; fifth, perforation; sixth, adhesions to the gall bladder or other organs when these adhesions cause obstruction, immobility, or deformity. In many of the above conditions the patient rarely has any perfect relief, and if there is a brief period of relief it is so soon followed by greatly exaggerated distress that the interval of ease is lost to most of them.

CONTROL OF SYMPTOMS.

All symptoms are usually controlled by the measures directed toward pain. When pain is at its highest, so also is gas, eructation and vomiting. By removing, neutralizing or engaging the acid in the process of digestion, the pain stops, gas no longer forms, vomiting and eructation cease and the patient enters a period of calm, to return to his former distress sometime later. The degree of discomfort depends on the extent of the lesion, the kind of food taken and the care in its mastication. Until complications (obstruction, perforation, adhesions) have advanced, the pain and other symptoms seem chiefly due to increased acidity and spasm. Reverse gastric peristalsis adds to the discomfort. Later, when complications enter for consideration, the real symptoms are obscured, and the physician is often obliged to grope in the dark for an exact diagnosis, unless the patient has a judicial mind and can relate accurately his earlier symptoms.

Again, the course of ulcer, like cancer, may be long latent, and be diagnosed only when some threatening symptom like perforation, suddenly prostrates the patient. If the perforation is not complete, or if only a small amount of septic material escapes, the pain may be of short duration, but intensely sharp and lancinating, simulating so closely gallstone colic that such diagnosis is the only logical one to make. If the perforation is free and the fluid septic or large in amount, the pain is much more intense than in gallstone colic. There is exceeding great shock, much morphin is required to control the symptoms, and early the appendiceal region will be the center of the pain. Later, if the patient survives, the pain will creep to the duodenum and gall-bladder area. Under such conditions one should think of perforating ulcer rather than gallstones or appendicitis.

When, therefore, there are attacks of stomach trouble that run in continuous periods of days or months, with intermissions of days, weeks, or months with more or less freedom from symptoms, these periods recurring and occurring over years of time gradually deepening, the symptoms bearing close relation to food and being controlled or modified greatly by dietetic measures, food, drink and alkalies, we may justly look for ulcer of the stomach or duodenum in a large number of cases.

Purely functional hyperacidity may give symptoms difficult or impossible to differentiate from early ulcer. Appendicitis and more often cholecystitis may run a train of symptoms that will mislead the most painstaking clinician, but these cases are as purely surgical as are typical ulcer cases. Comprehensive surgery finds the source of the trouble and relief is the result. If a mistake is made it should be that of diagnosis only.

DISCUSSION.

DR. WILLIAM J. MAYO, Rochester, Minn.: Acute ulcer is not of itself a surgical condition. It is only when such complications as perforation, hemorrhage, or obstruction occur that the physician should call the surgeon. In regard to chronic ulcerations, while the improvement between the attacks, which may last for days, weeks, months and even sometimes for years, is not by any means complete, it is sufficient to give the internist a wrong idea in regard to the cure of the patient, just as in the early days of appendicitis or gallstone disease. The surgeon considers chronic ulcers only those ulcers with thick callus which can be demonstrated to the bystander within a distance of six or eight feet from the operating table. As a result of operations it has been shown that chronic ulcers are more frequent in the duodenum than in the stomach, and that at least two patients out of three operated on are males. I do not believe that a large percentage of these patients with chronic ulceration will recover permanently under medical treatment. The preoperative stage depends largely on the length of time the patients are able to get along on a reduced selected diet; but among the laboring people one must face the conditions as they exist. The patient must not be cared for medically too long and made to live on insufficient food and ill-prepared food, such as his situation in life affords. Such a patient is disabled when living on a restricted diet, and can be restored to his full capacity for work only by enabling him to live on what he is able to pay for, and to do this operation is often necessary. In 187 resections for cancer of the stomach 54 per cent. of the cancers originated in ulcers. This does not mean, however, that most ulcers undergo cancerous degeneration. Cases with a long history of ulceration more often result in obstruction on the development of cancer than primary malignant disease of the same stage, and it is this early obstruction and not the cancer itself which sends the patient to the surgeon. Chronic ulcer existing over a period of years is, however, a grave menace to the patient because of the possibility of malignant disease grafting on ulcer base. Many people suffer severely from symptoms that may point to ulcer for which they have received no relief; these patients pass from one physician to another, to quacks and "patent-medicine" vendors. In a number of such cases one-half will be non-surgical and can be placed in three groups, namely, cases of atonic dilatation, cases of prolapse of the stomach and cases of gastric neurosis. In examining cases of atonic dilatation on the operating table one finds no obstruction and the wall of the stomach is quite flaccid. Apparently it has not sufficient power to push on the food. Atonic dilatations are not often benefited by surgery. In cases of prolapse of the stomach the x-ray plates look like works of art when bismuth is used to map the organ out. Such a prolapsed stomach, however, empties itself quickly; there are no mechanical conditions actually present. I do not know the definition of gastric neurosis. Some of those cases called neurotic years ago have since been relieved of gallstones, appendicitis, etc., and in the future more will be relieved. This "I do not know" group is a large one. The picture is that of a patient with gas, changing secretions, dyspepsia, indigestion, and the stomach will be found thin-walled, dilated, and the duodenum and pylorus dilated as well. It is said that many of these cases are due to pressure of the superior mesenteric vessels on the third portion of the duodenum; but this has not been found true on exploration; as a rule the jejunum and transverse colon are also dilated. At any rate they should not be subjected to operation. In the above series, one-half of all the stomach cases that come to us can be placed.

The remaining one-half of apparently serious gastric diseases belong to the surgeon. One-fifth are cases of gastric cancer; the internist has no business with them. One-fifth are cases of chronic ulcer, and the majority of these belong to the surgeon. Two-fifths are made up of a peculiar and most interesting group of cases in which ulcer has been suspected, but could not be demonstrated on exploration. Gastroenterostomy has occasionally been done and found to be harmful. Later these patients have been found to be suffering from gallstones or an inflamed appendix, tuberculosis or tumor of the

intestines, etc., giving rise to the stomach trouble. The embryology of the intestinal tract explains this; the maintenance of the body is a primitive function which existed before the development of the nervous system. The cerebrospinal system does not control the primitive function, which is still cared for by the internal secretions, etc., which cared for it before the nervous system developed. The acid in the pyloric end of the stomach controls the output from the stomach. The acidity in the duodenum is the more powerful and controls the opening and closing of the pylorus. The stomach in the storage end is a later evolution and a convenience, enabling its possessor to place rapidly a quantity of food into this receptacle for the slower process of digestion, but its control is vested in the parts to be conveniently lying beyond the pylorus, which have the work to do, all derivatives of the midgut. Therefore the control of the pyloric apparatus lies not in the stomach itself, not in the cerebrospinal system, but in the intestinal tract lying beyond the pylorus and between it and the splenic flexure of the colon, which marks the beginning of the primitive hindgut. Therefore, gallstone disease, appendicitis, tumor and disease of the intestinal tract cause closure of the pylorus, and symptoms referable to the stomach arise which in our ignorance we have hitherto treated as diseases of the stomach. The cases comprised in the remaining fifth are surgical, but not fully worked out.

DR. FENTON B. TURCK, Chicago: In carrying out experimental research on dogs I have found it necessary to see the opened abdomen and the evidences of ulcer in order that I might know that the feces used in investigation were actually from an ulcer case. Therefore, the observations of the findings, in connection with the symptoms in these cases, have given me some idea of the existing relations and I have not yet found that the clinical symptomatology of the patient helps a great deal in diagnosis. I have seen a great many cases of ulcer of the stomach without any symptoms of pain whatsoever; I have seen cases of hypoacidity and cases of total absence of hydrochloric acid (achylia gastrica). Likewise in experimental animals with induced ulcer more frequently no evidence of pain can be elicited by pressure and there is frequently no increase of acid in the stomach—often a greatly diminished amount. In the patient the feces many times show no evidence of hemorrhage, no occult blood. These conditions I have found paralleled in the dog.

The general or systemic condition of the patient permitting ulceration to take place has not been presented sufficiently. I think that the emphasis placed on a local condition does not represent the true pathology of ulcer. Ulcer of the stomach is not found in those countries where the inhabitants eat rice. It is evidently a meat-eater's disease; the zone of ulcer is in the meat-eater's zone. Ulcer is not found among the natives of China, Japan or India, except in the seaports, which the foreigners have brought into the meat-eater's zone. Certain observations which I made with extract of meat and the colon bacillus to determine the etiology of ulcer were tabulated over a period of ten years. The attempts made on the local mucosa to produce ulcer were negative, while those made in the feeding experiments were positive. I was able to induce numerous ulcers in the duodenum at a point just beyond the pyloric region, and also in the stomach, with perforation and chronic ulceration. The question is, How does the ulcer become chronic? In the production of the acute ulcer I found the autolysis to be continuous and at times anaphylaxis, with no round-cell infiltration (chemotaxis); but in the making of the chronic form, by carefully adjusting the feeding experiments so as to bring about an alternate mild anaphylaxis and chemotaxis, I produced a condition resulting in the chronic ulcer.

DR. J. M. ALLEN, Liberty, Mo.: Seventy-two cases of ulcer of the duodenum are on record. In 1886 an article appeared in the *Kansas City Medical Journal*, in which were reported 86 cases of ulceration of the duodenum and one case of ulcer of the stomach. It is fair to assume that ulcerations in the duodenum can be controlled better than ulcerations in the stomach. By starvation the function of the duodenum can be arrested, but this will not arrest the function of the stomach. Besides, ulcers in the stomach do not come from the same

source as ulcers in the duodenum. Ulcers of the stomach depend on an embolus or thrombus of the gastric artery or on an arteriosclerosis; whereas ulcers of the duodenum originate in the results of the passage of acrid, irritating substances through the stomach. Anemia is a predisposing cause of peptic ulcer; so are exanthemata, or anything that causes an acute inflammation of the duodenum. Again, there exists a condition of acute inflammation of the duodenum which passes into the chronic form in which the inflammation passes to the duodenum through the common duct.

I believe that it is a mistake to recommend operation as soon as ulcer of the stomach is diagnosed. In ulcers of the duodenum up to the point that evidences of obstruction from the formation of new tissue or induration occurred, I do not recommend operation unless there is vomiting, especially vomiting of blood. If regurgitation from the stomach is present, then one can say that the ulceration is from one to one and a half inch from the stomach; if beyond this point, evidences will be found in the stools. Blood found in this way points directly to the necessity for operation without delay. So one can reach some conclusion regarding operation. The symptomatology of ulcer of the stomach and duodenum is quite clear. In 1872 investigations were made and a paper written in 1886 was based on clinical histories. A feature connected with this is of great importance, namely, the progressive emaciation always present, the cause of which is the failure to digest the elements necessary for fat and growth—the fats, carbohydrates and sugars. Pain begins two or three hours after the taking of food when the stomach begins to force the food out of it. I think that the duodenum is the great center, the brain as it were, of the abdominal cavity and is associated with a great many reflexes.

DR. BERTRAM W. SIPPY, Chicago: There is an apparent disparity in the statistics of Robitanski, Mayo, Moynihan and others, in regard to the relative frequency of ulcer of the duodenum. I believe that the disparity can be explained thus: Duodenal ulcer is relatively more severe than gastric. The danger of perforation and hemorrhage is greater and the symptoms are more striking and more severe; as a result these cases appear before the surgeon more frequently than do the cases of gastric ulcer, which heals under treatment, or under no treatment. The cases reported by these men include those described as fresh ulcers. It is possible that ulcers in the duodenum might be overlooked; but it is not necessary to assume that all are overlooked. The disparity between the statistics of the surgeons to-day is attributable to the fact that the duodenum is more in the domain of surgery than is the stomach.

In a given case the following should be considered: Is an ulcer present? What complications are present? Is it possible that there is malignant disease at the pylorus? Is there obstruction at the pylorus? Are there perigastric adhesions? Is the pylorus open? Is the gastric secretion present? Is the motility of the stomach interfered with? All these points should be determined in a given case. Then the possible location of the ulcer should be made out. An old ulcer would be indurated. After a careful analysis one should be able to make a diagnosis of the presence or absence of an ulcer and, if any complications exist, whether or not surgical treatment should be instituted. Surgery should be invoked when perforation is present, when a carcinoma is engrafted on the seat of an ulcer, or when medical means have failed to cure. When the motility of the stomach is disturbed by perigastric adhesions or by the hour-glass constriction, one must resort to operation; in certain cases of hemorrhage also. In 15 per cent. of the cases death occurs during the first hemorrhage. In 35 per cent. death occurs within twenty-four to thirty-six hours. Some patients could be saved by surgical interference. I advise against waiting.

DR. ELLIOTT P. JOSLIN, Boston: Dr. E. A. Codman recently published a paper in the *Boston Medical and Surgical Journal*, in which the possibility of the root of the mesentery pressing on the duodenum was discussed and considered as an etiologic factor in the production of gastric and duodenal ulcer. Dr. Codman's evidence was obtained by injections in the cadaver, observations at operation and clinical studies. In animals the

mesentery hangs vertically, so that there is no obstruction, but in human beings in the erect position the mesentery hangs along the spine and thus could easily compress the duodenum where it crosses it. Statistics on sex and age in gastric ulcer, I believe, should be modified. It is commonly considered that gastric ulcer occurs more frequently in women than in men, and particularly of women of the chlorotic type. During the past few years chlorosis has become a rather rare condition. Coincident with the diminution in cases of chlorosis it is a question whether there will not be a simultaneous disappearance in the disparity of the preponderance of gastric ulcer in the female sex.

DR. G. W. McCASKEY, Fort Wayne, Ind.: The point brought out by Dr. Graham as to the extreme chronicity of the disease should be recognized. I have seen in consultation a very severe case of hemorrhage which proved to come from a gastric ulcer, and in getting the history the fact was brought out that the first attack had occurred twenty-five years ago. During this interval of twenty-five years there had occurred six, eight or ten attacks. Another patient seen seven or eight years ago had a distinct palpable tumor, and the question arose whether it was a cancer or a central ulcer. The diagnosis was made of an ulcer. The patient is alive and well to-day. I am inclined to believe that we should attach some value to the time of the appearance of pain in making a differential diagnosis between gastric and duodenal ulcer. When food passes from the stomach into the duodenum, then pain was supposed to occur in cases of duodenal ulcer, and I attach much diagnostic importance to this point.

Dr. Mayo, in his discussion of acute gastric ulcer, spoke of hemorrhage as being an indication for surgical interference. I understand that surgical interference in cases of acute hemorrhage is a most hopeless proposition. The great difficulty is to find the bleeding point. The best treatment, in my opinion, would be rest, and not surgical interference. Carcinomatous degeneration of the ulcer, cancer, might attack these indurated ulcers and they should be excised whenever possible. Gastro-enterostomy should not be done in these cases.

We should consider chronic ulcer of the stomach as serious as acute ulcer. A certain amount of healing takes place after the occurrence of the indurated scar tissue which is so characteristic of some of the cases. Nothing short of excision will cure them.

DR. JUDSON DALAND, Philadelphia: In chronic ulcer, the one requiring surgical interference, we are often deceived by an apparent recovery—an important point for the internist to consider. A few months ago I had a patient under my observation who presented symptoms of ulcer, but he apparently recovered. In spite of the fact that no symptoms existed, an operation was performed and an indurated ulcer found. There are many such cases of latent ulcer that call for surgical interference. I recall another patient who died from an initial hemorrhage. This case was looked after by a skilled specialist who thought the patient was cured of his ulcer, as there were but few dyspeptic symptoms. The patient was on his way around the world when he was suddenly taken with a hemorrhage and death quickly followed. At autopsy a gastric ulcer was found. The point that I wish to emphasize is that there are many cases of chronic gastric ulcer diagnosed as acute ulcer, the symptoms appearing for a brief time only, but the ulcer remaining for years.

DR. M. MILTON PORTIS, Chicago: The dangers of gastro-enterostomy are so great that I believe that one should hesitate a long time before advising such an operation. Two years ago I published a paper in the *Annals of Surgery*, in which I had collected both the medical and surgical results following a gastroenterostomy. I had been stimulated to do this because of a few cases that fell under my observation. There is no doubt at all that serious dangers follow gastro-enterostomy. Jejunal ulcers occur and severe diarrheas which lead to death. There are many other disturbances. Pawlow's and Starling's work throws much light on the disturbances noted. But the strictest indications must be present before one should resort to surgical interference. In case a medical man did not want to attend the case alone, let him call in the surgeon in consultation and thus reduce the danger.

DR. CHRISTOPHER GRAHAM, Rochester, Minn.: In differentiating between gastric and duodenal ulcer a good point is that in duodenal ulcer the food gives relief for a longer time. The degree of acidity, rather than the length of time the symptoms have been manifest, determines the severity of attack. The higher the acidity, other things equal, the greater the pain and the shorter the period of food relief.

CLINICAL OBSERVATIONS ON ABSOLUTELY IRREGULAR HEARTS.*

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The recent advances in our knowledge of the cardiac irregularities have enabled us to define their character and trace their inter-relationship with far more exactness than was ever possible before. The absolutely irregular heart,¹ in which all semblance to regularity has ceased to exist, is clinically the most important of the cardiac arrhythmias. It is less common, indeed, than are respiratory irregularities or extrasystoles; but it represents a far more serious condition, and James Mackenzie estimates that over 50 per cent. of all serious insufficiencies are associated with this irregularity. It is very important, therefore, that we should become acquainted with its characteristics, its clinical significance, and its relationships.

The distinguishing characteristics of the absolutely irregular heart will be discussed under three headings: (1) Absence of normal auricular contractions; (2) the irregularity itself, and (3) its permanency.

ABSENCE OF NORMAL AURICULAR CONTRACTIONS.

This is by far the most important characteristic of the absolutely irregular heart and one that denotes a fundamental change in the heart's activities. Our clinical evidences of auricular contractions, according to Mackenzie,² consist of (a) an auricular wave in the apex tracing just preceding the ventricular wave, (b) an auricular wave on the jugular and liver pulsations, and (c) the presystolic accentuation of the murmur of mitral or tricuspid stenosis. To these might be added (d) the presence of an auricular wave on the cardiogram obtained from within the esophagus,³ and (e) the auricular wave on the electrocardiogram.⁴ By none of these methods of examination has it been possible to demonstrate that the auricles contract before the ventricles in absolutely irregular hearts. Mackenzie was the first to insist on this fundamental fact. It is probably to be interpreted as a total auricular paralysis or at least as an auricular asthenia of such a grade that the contractions of this chamber are no longer demonstrable.⁵

The Venous Pulse in Absolute Irregularity.—In the normal tracing taken over the jugular vein the so-called

* Read in the Section on Practice of Medicine of the American Medical Association, at the Fifty-ninth Annual Session, held at Chicago, June, 1908.

1. This irregularity has been variously designated as the ventricular rhythm, nodal rhythm, rhythm of auricular paralysis, rhythm of the first Stannius ligature, perpetually irregular rhythm, etc.

2. Mackenzie, J.: *Abnormal Inception of the Cardiac Rhythm*, *Quar. Jour. of Med.*, 1, 39.

3. Young and Hewlett: *The Normal Pulsations within the Esophagus*, *Jour. of Med. Research*, xvi, 427.

4. Kraus and Nicolai: *Ueber das Elektrokardiogramm unter normalen und pathologischen Verhältnissen*, *Berl. klin. Wchnschr.*, 1907, 811.

5. Hewlett: *The Interpretation of the Positive Venous Pulse*, *Jour. of Med. Research*, xvii, 119.