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ON THE DIAGNOSIS AND TREATMENT OF GASTRIC ULCER.

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IN considering this subject from the practitioner's point of view, I shall avoid recondite pathology as far as possible. But as an introduction to the study of the subject, it is necessary to define what may be called the coarse anatomy of gastric ulcer.

I think that all who have given attention to this matter will recognize the occurrence of at least two polar forms of gastric ulcer; possibly, quite apart from new growth, there may be other forms; but of the two I may speak with a certain amount of confidence.

The first is the deep perforating ulcer most frequently found in young women: an ulcer which typically has purely erosive characters, presenting round or oval outline, penetrating to various depths through the mucous membrane and muscular tissues, having sharp edge, undisturbed by inflammatory thickening, and crateriform shape. Such ulcer, as it penetrates through the walls of the stomach, may open vessels and give rise to hemorrhage, or may traverse all the coats, and open into the peritoneal cavity. The term "perforating ulcer" has often been applied to it, and most appropriately. The site of such ulcer varies; but, for the most part, it occupies rather the median zone of the stomach than either of the extremities; it affects the lines of the curvatures, the lesser more frequently than the greater; but it may be found more frequently on the posterior wall of the stomach. Pathological specimens show that such ulcers may heal, and leave deep, puckered scars.

The other form of ulcer is diffused, comparatively shallow, with raised

acidulated alcohol; and most soluble of all in soda solution and acetic acid. (3) A temperature of 140° C. (284° F.) to 180° C. (356° F.) so altered the blood that it ceased to be soluble in cyanide solution, as well as in water and borax solution; but it was still slightly soluble in ammonia and acidulated alcohol, and fairly soluble in soda solution and acetic acid. (4) The best solvents for heated blood-stains are, therefore, the last two named. (5) In the ease of stains exposed to the higher temperatures, the only spectrum which the investigator can rely on obtaining, is that of reduced hæmatin or hæmochromogen. (6) Crystals of hæmatin may be obtained by the usual method from all stains heated to 120° C. (248° F.), from but two-thirds of those heated to 140° C. (284° F.), and from none heated to 160° (320° F.) or higher.

ARSENICAL WINE.

DR. MARQUEZ, of Hyères, has communicated an account of the wholesale poisoning by arsenical wine at Hyères, to the Société de Médecine Légale (*Annuaire d'hyg. publ.*, sér. 3, t. xxi, pp. 74-77, January, 1889), from which it appears that, in the beginning of 1888, over 400 persons exhibited symptoms of a peculiar illness in Hyères and its neighborhood. Some were slightly affected, others more severely. In the former, the symptoms consisted chiefly of disturbances of the digestive organs, pain in the throat, a threatening of coryza, and lassitude. In the latter, the gastro-intestinal symptoms were greatly accentuated, and were sometimes accompanied by fever, vomiting, usually with a little diarrhœa or colic, preceded by dyspœa and general catarrhal discharges, resembling the symptoms of a true influenza. Pains and cramps were also felt in the limbs, especially in the feet, less frequently in the hands, accompanied sometimes by contractions of the fingers and toes. Bronzing of the skin was also observed, and erythema followed by peeling of the epidermis, with or without epidrosis, paralytic phenomena, hyperæsthetic or anæsthetic paresis, akinesia, amaurosis, anaphrodisia, metrorrhagia, etc.

The wine of the district was, after a while, suspected as the cause, and was examined, without any injurious ingredient, such as lead, or impure fuchsin, being discovered. The further progress of the illness, however, showed that it was distinctly to be associated with the wine from a particular vineyard, and a more careful analysis of it revealed the presence of arsenic to the extent of six centigrammes per litre (about one-half grain per pint). Inquiry at the vineyard elicited the fact that by accident a barrel of white arsenic, stored for seven or eight years, for the treatment of some vine disease, had been mistaken for a barrel of material of like appearance used in making wine. Dr. Marquez urges greater care in the sale and use of white arsenic.

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or overhanging edges, irregular outline, and uneven surface. It is found more commonly in the right half of the stomach, approaching, in fact, more or less to the pylorus.

The symptoms and associations of the two kinds of ulcer differ in a marked way. The subjects of the first are young women; a very large majority of them, so far as my experience goes, employed in domestic service. As they come before us for treatment they present a curious agreement in their physiognomy. Probably the first thing attracting attention is their anæmia. It is an anæmia not by any means associated with emaciation, rarely associated with pigmentation, and on the whole associated with plumpness and transparency of the skin. A large majority of the subjects are, as regards bulk, well nourished. At the same time a large majority appear to be irregular in respect of their catamenial function, chiefly in the way of deficiency. I think we may take it for granted that menstruation is, as a rule, imperfectly established. It is not unimportant to mention that subjects such as these are, with exceeding frequency, the victims of acute rheumatism.

The SYMPTOMS presented by such subjects when suffering from gastric ulcer may be grouped under four principal heads: First, pain; second, tenderness; third, vomiting; fourth, hæmatemesis.

Pain. The pain is usually not continuous, but occurs after food-taking, sometimes immediately, sometimes after an interval of half an hour, or an hour, or even more. It is generally of a very acute kind, and recurs at a particular spot after every meal, being sometimes limited to that spot, sometimes extending in various directions. Thus, for instance, a pain regularly beginning at a point in the epigastrium will extend to the back and radiate upward over the chest; or beginning in the back may extend upward along the vertebræ, and forward into the epigastrium. During the existence of the pain there is usually much tenderness over the epigastrium, whatever part of the stomach may be exposed to pressure. Should vomiting occur, the pain is subsequently annulled or greatly mitigated.

In well-marked cases of gastric ulcer, pressure over the epigastrium and stomach-area usually produces pain at all times, increased, as has been noticed, when internal pain occurs after food-taking. We shall see presently that such tenderness may be determined by two conditions: first, by ulcer; second, by gastritis; but before going further it may be urged that the tenderness of ulcer is much more acute than that of gastritis.

The importance of vomiting as a sign of gastric ulcer has been variously estimated. Some authors would regard vomiting as a more important symptom; some would rely more upon the character and sequence of pain already described. It is certainly true that many variations in the proportion of the two symptoms are to be observed. But in my

experience vomiting, as an isolated symptom, is less decisive than pain. As a conjoined symptom vomiting has an importance often decisive. When pain has, for instance, already occurred, and has lasted for a time proper to the particular case, vomiting takes place and brings immediate relief. It is true, that there may be many variations in the severity of the pain and the persistence of the vomiting; but both symptoms being present, the meaning of the succession can hardly be doubtful.

The observation of the matters vomited is, of course, an important point in diagnosis. They may consist of food hardly altered; of food partly digested; of food mixed with abnormal gastric juice; of food mixed with mucus in various proportions; and of blood, variously mixed. In other words, we may have such irritability of the stomach as determines at once the rejection of what has been received. We may have next, owing either to the position of the ulcer or to impairment of the action of the stomach, rejection of the food at a later stage of digestion; the rejection being determined, in one case by disturbance of peristalsis, in the other, by the irritation of ill-digested matters.

The presence of much mucus in the vomit will indicate the complication of gastric catarrh, a subject of much importance in relation both to the diagnosis and treatment of gastric ulcer; a subject which we shall have to discuss more fully later.

The hæmatemesis of this form of gastric ulcer has very distinctive characters. It is very rarely continuous, very rarely small in quantity. Our general experience is that women suffering from some of the symptoms already detailed will have once, or once and again, or on several occasions, profuse gastric hemorrhage, bringing them into the jaws of death, but very seldom actually killing them. The blood thus vomited is mostly coagulated, and, by reason of its volume, little affected by the gastric juice. The anæmia of such cases very reasonably leads to the suspicion that hemorrhage in bulk inadequate to the production of vomiting may have occurred often, and may have contributed to the characteristic anæmia.

With the more decisive signs so far considered, young women suffering from gastric ulcer present many secondary symptoms, such as anorexia, excessive appetite for food or depraved appetite, particularly for acids, constipation, or, more rarely, diarrhœa; headaches, particularly frontal; neuralgia, shortness of breath, palpitation, undue pulsation of the abdominal aorta, tinnitus, giddiness, and the symptoms which are grouped under the head of hysteria.

So far we have been getting before our eyes a general view of the aggregate of symptoms. But it must be remembered that there are many variations which are to be observed in each and all of them. The pain, for instance, varies considerably as to time, position, and character. In some cases it arises shortly after taking food, or even during a meal.

There is every probability that such sudden occurrence is induced by a definite position of the ulcer, viz., in the cardiac end of the stomach. Later occurrence of the pain in all probability marks increasing distance in the position of the ulcer from the cardiac orifice. But while inferences drawn from anatomy have a definite value, we have to take into account the conditions of the stomach generally, and also of the patient.

My experience is to the effect that in not a few cases where the localization of pain is far toward the right limits of the stomach, the ingestion of food excites at once the suffering. There is evidently a hyperæsthesia of the whole organ, which may be simple or dependent upon catarrh associated with the ulcer. Where there are much anemia and much general nervous susceptibility, we may, on the whole, regard the early occurrence of pain as a mark of simple hyperæsthesia. Should vomiting occur we have an important commentary in the character of the egesta. For instance, the absence or presence in varying quantities of stringy mucus will help us to understand the meaning of the early access of pain. I do not refer to these varieties in a spirit of curious observations. In my experience they have important relations to treatment with which I shall deal later on.

Under the head of time of pain we must include duration. In gastric ulcer uncomplicated by inflammation of the stomach the duration of pain is comparatively limited; for the most part certainly it is not felt when the stomach is empty, or comparatively empty; though I must admit there are exceptions to the rule.

A long duration of pain, particularly if it follow vomiting, and, still more, vomiting of much mucus, will mark the existence of much accessory gastric inflammation. The position of the pain varies considerably, sometimes it is in the epigastrium, where a distinct and limited tender spot can be detected by pressure. Often it is felt in the back, so that tenderness is referred to the vertebrae.

The varying conditions of the pain will be, no doubt, generally marks of the position of the ulcer. So, also, will be the attitudes of the patients during the paroxysm. We may well believe that a patient having gastric ulcer will instinctively assume such a decubitus as will obviate pressure of ingested food upon his or her tender point. Accordingly if the ulcer is, as it very commonly is, on the posterior wall of the stomach, the patient will be found lying prone or semi-prone, with the knees drawn up. I have seen several cases in which patients, complaining of violent pain in the back after food-taking, assumed such an attitude. The limits of my paper are too short to follow out other attitudes, and I will not discuss this point further.

In considering the symptom of vomiting we find, in the first place, that, as in the case of pain, the period at which vomiting occurs may, to a certain extent, indicate the position of the ulcer. Early vomiting

after food goes, as early pain, to indicate a cardiac position. Late vomiting, and, still more, vomiting occurring after several successive meals, would tend to localize the ulcer in the pyloric end of the stomach. In these latter cases the amount vomited is usually very large, appearing often to be in excess of what has been previously introduced into the stomach. To repeat, the relative importance of pain and vomiting as signs of gastric ulcer is, as I have noted, by no means uniform.

On the whole, I should be inclined to attach a higher importance to the pain than to the vomiting, while urging that every case has to be examined by itself in all its bearings.

As regards hæmatemesis, I have already noticed that in this form of gastric ulcer it occurs at long intervals and in large quantity. Here, however, qualifications are needed—hæmatemesis does not occur in all in many subjects of gastric ulcer. The non-occurrence of hæmatemesis, however, does not preclude the occurrence of gastric hæmorrhage, particularly where vomiting is less marked than pain. Several times I have been able to verify the appearance of melæna where no blood was ejected by the mouth. It appears to me probable that melæna is more frequently present than identified, and that it sometimes contributes largely to the anæmia belonging to this class of disease. The occurrence of "coffee-ground" vomiting is decidedly rare in this form of affection, but where vomiting is severe, and much mucus is brought up, streaks of blood may be observed in the mucus. These probably belong rather to gastric catarrh than to the gastric ulcer itself. In the few cases of "coffee-ground" vomiting, accessory symptoms are generally present, suggesting deep extension of the ulcer to surrounding organs after the formation of adhesions. Here generally the history of the case elucidates its meaning.

In some cases, after the persistence for a considerable time of the average symptoms, either pain or vomiting or both will become generally more constant and less definitely related with food-taking. The signs of gastric catarrh will be aggravated, and very often strange variations of appetite will obtrude themselves. These generally consist in depravation rather than loss of appetite, and lead us into new ground.

I may quote a case in point. A lay-sister in a home presented, for several years, recurrently the ordinary signs of gastric ulcer. At length the pain became persistent, and had constant tenderness associated with it. Vomiting became exceedingly frequent, and blood was often present. The patient steadily developed an inordinate appetite, and a curious predilection for one kind of food. For several years she took nothing but mashed potatoes freely enriched by butter. Feeling pain and craving, she would call for this. She would partake of it freely, and feel, for an hour or so, comforted. No other food and no medicine afforded any similar relief. She was in the habit of rejecting this

magma between an hour and two hours after taking it. Her distressing conditions at once returned, and she promptly took another instalment. The process was repeated from eleven to fourteen times in the twenty-four hours. Seeing that this patient had, in the earlier stages of her illness, the ordinary signs of gastric ulcer, and investigating her later symptoms, I came to the conclusion that the ulcer or ulcers had penetrated deeply, and had led to adhesions between the stomach and adjoining organs, with the result that the walls of the stomach were prevented from collapsing when that organ was empty. Perhaps one of the uses of a paper such as this is to raise side issues of interest.

Physiological observations and general experience go to show that when the walls of an empty stomach are prevented from coming into contact, sensations of extreme hunger arise. A converse practical illustration is afforded by the fact that a tight girdle placed over the stomach diminishes the intensity of hunger in people who are not able to obtain food. I have seen one remarkable case, illustrating, to all appearances, the effects of impossibility of the stomach to contract inducing excessive hunger. An elderly gentleman was under my care for several years. He was literally the shame and opprobrium of his family by reason of his vast and inconsiderate appetite. He was accustomed to eat voraciously of whatever was set before him, with a special selection of the richest possible dishes. That he vomited freely after such indulgence made no difference to him. His one object in life seemed to be to fill his stomach, and to clog it with what might seem to be most oppressive. I had the opportunity of making a "post-mortem" examination, when it appeared that, as a result of an old abscess connected with the gall-bladder, adhesion had occurred between the stomach and all surrounding parts. When the abdomen was opened, the stomach was found to be not a movable viscus, but a large, permanent cavity, firmly bound to the adjacent organs, as if nothing like a peritoneum had ever existed. The smallest diameter of the cavity was at least two to three inches, and no pressure could have brought the mucous surfaces into contact. In the case of the lay sister I have mentioned as "post-mortem" was permitted; but the two cases were so parallel in their symptoms that I think there can be little doubt of the application.

DIAGNOSIS.—In the differential diagnosis of this form of gastric ulcer, at least three or four conditions, producing somewhat similar symptoms, have to be excluded. First, gastritis, acute and chronic; second, malignant disease of the stomach; third, the functional disorders of the stomach comprehended under the term dyspepsia; and, lastly, in a few cases, the acute dyspepsia or gastric crisis of locomotor ataxy.

To compare, in the first place, the signs of gastric ulcer with those of gastritis, acute or chronic, we may notice important differences in the character and duration of the pain. In gastritis we find an epigastric

distress of a constant character, markedly contrasted with the evidently induced pain of ulcer. The distress consists in a sensation of oppression, distention, and heart-burning, of course more pronounced in acute gastritis, the subjects of which complain of a feeling which they describe as "bursting." In addition to these sensations, pain belongs to all three conditions; constant and grinding in acute gastritis, more or less constant in chronic gastritis, though here the milder form of the pain enables us to see that it is aggravated by food-taking. But in either case it is not relieved by vomiting. Vomiting is present in all three; constant in acute gastritis irrespective of food; frequent in chronic gastritis, usually some time after food-taking; present or absent in ulcer; when occurring therein, giving a relief far more marked than in the inflammatory conditions. The character of the matters vomited will be, in the case of acute gastritis, inflammatory. There will be little food, much tenacious and adhesive mucus; streaks of blood; and as the process advances an intermixture of pus. In chronic gastritis still much mucus, not adhesive, yellowish or opaque, this either alone or mixed with food. Mucus occurring in the vomit of ulcer will generally indicate the existence of chronic gastritis.

Palpation enables us to recognize very different forms of tenderness; this is considerable and constant in acute gastritis, very light pressure over any part of the stomach-area producing great distress. In chronic gastritis there is diffused but dull tenderness, brought out only by comparatively deep pressure, but sufficient to make the wearing of a closely fitting dress a cause of considerable discomfort. The more acute and localized tenderness of gastric ulcer has already been noticed.

There are one or two more signs of minor importance. In acute gastritis we may expect to find marked rise of temperature, headache of considerable intensity and constancy, mainly frontal in locality. Thirst as of the desert, a very foul and usually dry tongue, and a fetor of breath almost as proper to the affection as the scent of a particular flower. In chronic gastritis there is rarely pyrexia, headache is common but intermittent, and the other symptoms cannot be spoken of seriously. In gastric ulcer all this group, except headache, are usually absent, and headache, if occurring, is frontal, and coincides in time with the other symptoms.

We may next contrast gastric ulcer with the graver malady, malignant disease of the stomach. Pain is, of course, a very frequent symptom of this affection; pain mostly increasing in severity as the disease advances, and comprehending many varieties from dull to acute. It may be aggravated after meals, or it may attain its greatest intensity when the stomach is empty. But its extension is usually much larger than that of gastric ulcer. Vomiting is common, and while having a certain relation to food-taking, occurs at all sorts of intervals. There

is very often ineffective retching when no food has been taken. In considering the characters of the matters vomited, we cannot avoid thinking most of the symptom of hemorrhage, but in the first place we may notice that the vomit, whenever occurring, is usually of a strong acid reaction, and that, besides mucus, there is generally a considerable quantity of fluid, evidently a secretion of the stomach. As in the case of ulcer, the position of the new growth goes far to determine the period at which vomiting takes place; and I think it cannot be doubtful that the character of the ejecta is very much determined by the position and character of the new growth. What we see thrown up by a patient having an ulcerating new growth in the middle of the stomach, is assuredly of a very different matter from what is observed in scirrhus of the pylorus. I think, though I should not like to be too dogmatic on the point, that the acidity in both cases is excessive.

The elements of this acidity have attracted a good deal of attention of late in France and Germany. It is asserted that the acidity in cases of malignant disease is due to other substances than the hydrochloric acid which, as is generally believed, forms the main sourness of the gastric juice, various organic acids taking the place of the inorganic. And there are many who to-day believe that the existence of malignant disease, as opposed to non-malignant disease, may be fairly well recognized by studying the reaction of the gastric juice. The test most in vogue is the tetraethyl-dimido-triphenyl carbinol-oxalate, or vivid-green salt, a crystalline substance of a brilliant green color, which yields, when dissolved in water, a blue solution. Hydrochloric acid being added to such solution, effects a distinct color-change to the green. The organic acids fail to produce such a change. In applying the test, a solution of hydrochloric acid, of the strength found in gastric juice, is first applied to some of such solution in a test-tube; next, to an equal quantity of the same solution, contained in a test-tube of equal size, an equal quantity of the fluid filtered from the vomit or withdrawn from the stomach is added. A comparison of the contents of the two tubes will determine the comparative amount of hydrochloric acid present in the secretion of the stomach under investigation. It is strongly urged that a marked failure in the production of the green change is indicative of malignant disease.

During the last year, I have submitted this test to observation wherever it was possible, and have certainly obtained some interesting results; but not uniform enough to justify me in accepting the reaction as decisive, and these were cases of short previous duration, which got well under treatment, and went out without any other sign of malignant disease.

One of the difficulties of color-tests and solutions is, that the vomit in cancer very often contains blood; when this addition occurs, it is usually constant, and while, of course, varying in quantity, is not generally large.

It is mostly in the "coffee-ground" form, but sometimes in the form of small, variously colored clots. This, of course, stands in great contrast to the large hemorrhages at long intervals occurring in gastric ulcer of the young adult female.

To revert here in greater detail to an interesting point relating to the quantity of matters vomited: As in ulcer, where the malignant growth is at the cardiac end or the middle of the stomach, the intervals are short, and the amount brought up is comparatively small; but in growths near the pylorus or involving it, intervals as long as twenty-four hours, or more, are observed. The amount when vomited is very large, and the matter consists of a thin fluid with a sediment of digested matters, having a reddish-brown color. Such a vomit is generally teeming with *sarcina ventriculi*.

Tenderness is mostly found in malignant disease of the stomach. It may be acute or dull, and I believe that the intensity is very much determined by the position of the growth as well as by its nature. I believe that the ulcerative forms are the more tender, and I have certainly felt many pyloric tumors which were almost insensible to pressure. On the whole, however, tenderness, when existing, is much more diffused than that of gastric ulcer.

If we review what has so far been stated in the point of diagnosis between malignant disease of the stomach and gastric ulcer, save and except the chemical action of the gastric juice, nothing actually decisive has been put forward. The real test is the presence or absence of tumor, and the true method of diagnosis is to examine the epigastrium with the greatest care. As far as experience goes, tumor, if existing, can be felt in about seventy per cent. of the cases. The existence of a well-defined tumor, in association with more or less of the symptoms enumerated, will enable us, for the most part, to make a definite diagnosis. The tumors which escape manipulative detection are doubtless such as are situated on the posterior aspect of the stomach. Though they may here elude direct recognition, they still produce many of the symptoms described, and by pressing on deep-seated structures will introduce new signs enabling us to recognize their position.

In the final diagnosis, we have to remember that the simple gastric ulcer affects, for the most part, young women who are anæmic, but not cachectic; that cancer affects older persons of both sexes, who are generally cachectic in appearance, and have pigmentation of the skin as well as anæmia. It may be noted also that, in malignant disease of the stomach, variations in the size of that organ are much more common than in ulcer. The importance of such variations, however, will be better seen when we come to the consideration of the diffused gastric ulcer.

The various functional disorders of the stomach, comprehended under

the term dyspepsia, often simulate gastric ulcer. The two symptoms, pain and vomiting, may, in functional disorder of the stomach, be conspicuously present, but they are rarely present together. When present individually, they rarely have the same marked relation with food-taking as is observed in gastric ulcer, and if any tenderness is observed, it is not localized, and is associated with general hyperæsthesia. There is, of course, no tumor, no hemorrhage, and no fever; moreover, there are usually present associated conditions of general nervous debility, or local irritations, which may favor or determine disordered action of the stomach.

Let us turn now to the diffuse form of gastric ulcer, observed more particularly in middle-aged persons of both sexes. The symptoms here again are mainly pain, tenderness, vomiting, and hemorrhage. But the subjects are no longer simply anæmic, and, on the other hand, well-nourished; but are often cachectic and wasted. The pain is, as a rule, much less acute than in the other form of ulcer, and the vomiting much more frequent and distressing. Tenderness in the locality of the stomach and in the whole stomach-area is generally present. The matters vomited are generally intensely acid, and very frequently contain blood, either in the "coffee-ground" form, or as soft clots of various color from pink to black. Such cases present, indeed, the strongest appearance of the existence of malignant disease of the stomach, and the more favorable diagnosis can be determined only by the absence of tumor, and the favorable results of treatment.

In illustration, I may quote two cases. The first was that of a gentleman, aged sixty-four, who consulted me for a pain in the epigastrium which made his life miserable. It came on at all times, had no relation to food-taking, and when it came took, as he said, "all the life out of him." He had no vomiting, and no other symptoms of dyspepsia, and had no tumor or tenderness. I prescribed many remedies calculated, as I thought, to relieve pain; but he was no better for any of them; so I took him to Sir Thomas Watson, who prescribed citrate of iron, regarding, apparently, the symptoms as neurotic. Under the citrate of iron he speedily obtained relief, which lasted for nearly a year. Then a relapse occurred, and to pain was added vomiting, occurring at intervals, large in quantity, and with evidences of the presence of blood. Although no tumor could be detected, more than one physician came to the conclusion that he had malignant disease. His sufferings lasted several years. Eventually he died, after an operation for stricture of the urethra; and on post-mortem examination a large, shallow ulcer, presenting no signs whatever of malignant disease, was found at the pyloric end of the stomach, but not involving the pylorus. The case has been, for me, always most instructive.

Let me quote another case. About two years ago, a man was admitted

into St. Thomas's Hospital for gastric hemorrhage. He was a horse-keeper, and had had a severe jerk from the ground, when putting a bridle on a horse. The jerk was followed by severe pain in the region of the cardiac end of the stomach, and by frequent but small hemorrhage. He had suffered from gastric distress and occasional vomiting for some time previous. When I saw him, he had pain after food and subsequent vomiting. Blood was always present in the matters vomited, but not in large quantity; there was tenderness over the whole stomach-area, but no tumor could be felt. He was sent to me with a diagnosis of cancerous disease of the stomach. He was emaciated, anxious-looking, but not cachectic; nevertheless, on the whole, all his symptoms suggested malignant disease. But as I could feel no tumor, I ventured to hope that he had only gastric ulcer, and not the more serious malady. I treated him on this basis, and in three weeks he had lost all his local symptoms and had gained flesh. It is not necessary, at this moment, to enter into the details of treatment, inasmuch as I shall presently deal with them; but it may be said that he became well nourished and strong, and has frequently presented himself since, in all respects fit for work.

In many cases of this form of ulcer, gastric hemorrhage presents itself as a very serious symptom. It goes on from day to day, in addition to other symptoms and has a distinct and dangerous importance of its own. The blood often has a bright color and a spongy consistence. The reaction of the vomit is generally intensely acid. In some cases I have been inclined to associate, with the hemorrhage, the idea of an erosive action exercised by an intensely acid gastric juice. In two cases of the kind, under my care in St. Thomas's Hospital, the exhibition of alkalies has been followed, first, by cessation of the hemorrhage; second, by the disappearance of the symptoms of gastric ulcer.

PROGNOSIS.—Dr. Brinton, writing about thirty years ago, calculated from the statistics available at the time, that perforation occurred in between 13 per cent. and 14 per cent. of the cases of gastric ulcer.

There can be no doubt that his book on the subject led to a more general recognition of the disease than had before existed. Whether it be, that, instructed by his writings I, for one, have been more ready to recognize the symptoms of the affection, or, that the character of the affection varies in successive decades, I am bound to say that comparing the number of cases presenting the symptoms of gastric ulcer and the number of deaths recorded, the proportion of deaths is much smaller than that arrived at by Dr. Brinton. This perhaps is what might have been expected. When Bright made his first great generalization, everybody who had albuminuria was condemned to death. We have learned in later years to make very different estimation of the symptom of albuminuria. And I think I may safely say of the patients who come

under our care with such signs of gastric ulcer as Brinton and his contemporaries described, very few die.

TREATMENT.—We may now turn our attention to the subject of treatment, which seems to me to be of the highest importance in gastric ulcer. The people who die of the disease are generally such as have been pursuing their occupations in spite of suffering and without precaution. Here and there, I think very rarely, one will die of hemorrhage; now and again one will die of the signs of perforation. But I think that if we can once bring a patient under thorough hospital treatment, such dangers may be averted; although in advanced conditions we can never overcome the adverse influences of adhesion of the stomach to other parts, and deep ulceration.

My experience of the treatment of gastric ulcer leads me, in the first place, to attach great importance to simple physical rest. A physician is commonly called upon to deal with two very distinct classes of cases: first, those occupying beds in hospital; second, those consulting him at his own house, or coming as out-patients. The in-patients, kept in bed, and debarred from all movement that can be avoided, make much better progress than the others who are moving about. I must admit that, in private practice, I have experienced great difficulty in keeping patients as completely at rest as I could wish, and that the results of treatment of them are far less satisfactory than those obtained in hospital. I commend this point to general practitioners, who have much greater opportunities of following the patients' symptoms from day to day, than are open to the consulting physician. In practice, I hold it to be right that the consulting physician should always advise the patient to secure the care of a medical man near at hand, and under his guidance to carry out the first principle of treatment—physical rest.

Next comes physiological rest. No one can doubt that all mechanical indigestibles must be forsworn. All experience shows that, in relation to the comfort of the patient, meats, uncooked food of all kinds, all mechanical indigestibles, and stimulants must be forbidden. After this large excision, idiosyncrasies of the patient have to be considered. Some can take milk and eggs, and soft farinaceous foods with impunity, while meat juices irritate them. Some can take the meat juices and not the milk food. Some can take nothing whatever without great suffering. Those who can take the milk and egg foods may leave us easy on the subject of their nutrition. Those who can take only the meat juices have but imperfect sources of nourishment, and in these cases, as well as in those cases wherein no aliment can be taken without pain, we are compelled to administer aliment by the rectum.

Of late years a good many nutrient suppositories have been invented, and have been much vaunted. They have a certain advantage in being more easily retained than fluid enemata, when the rectum is irritable.

But, in a general way, I believe that fluid enemata are much more effective. They should consist of from four to six ounces of beef-tea and milk in equal proportions, with a drachm of Berger's "liquor pancreaticus," and should be prepared at a temperature of about 98° Fahr. Egg may be in certain cases added, and, where there is great exhaustion, a small proportion of brandy. In more than one case of gastric ulcer with severe symptoms, I have used such enemata for a month, allowing nothing to be taken by the mouth save water, with the result that the nutrition of the patient has actually improved.

As regards treatment by drugs, I venture to say that generally very good results may be obtained. The treatment must be a good deal determined by the proportion between the symptoms of gastric ulcer and of those symptoms supplemented by gastric catarrh. Supposing that we have the symptoms of gastric ulcer without gastric catarrh, I am in the habit of giving twenty grains of carbonate of bismuth with ten grains of carbonate of soda, and ten drops of tincture of belladonna, three times a day. If there be much sign of gastric catarrh, what I am accustomed to call Brinton's mixture, viz., ten grains of bicarbonate of potash, three grains of iodide of potassium, and three drops of dilute hydrocyanic acid in infusion of gentian, three times a day, is prescribed. The use of this mixture for a week or a fortnight will generally subdue the catarrh, and the subsequent use of the bismuth mixture rarely fails, in uncomplicated cases, to effect a cure.

Complicated cases will be generally much relieved by this, but rarely cured. By complicated cases I mean those to which I have already alluded, in which there are signs of adhesion or of deep ulceration. We must not forget the acute complication of hemorrhage and perforation. In the treatment of persistent small hemorrhage, I am not inclined to the use of astringents. As a rule, I should rely on a careful examination for the symptoms of the case, and should direct treatment to the removal of the causes of hemorrhage, rather than use astringents in a blind way. I should use methods for the reduction of gastric congestion, for the neutralization of the excessive acids of the gastric juice, for the relief of hepatic congestion.

In the large hemorrhages of the simple ulcer, the whole business is generally over before treatment can be instituted. But this does not mean that treatment is unnecessary. A large quantity of blood will have generally made its way into the intestines, where it proves a source of great irritation demanding instant relief. It is my practice to administer, according to the needs of the case, sulphate of magnesia, or sulphate of soda, with dilute sulphuric acid—a hinderer of decomposition—at intervals of two or three hours, until free evacuation has been obtained. These alkaline sulphates appear to me to be the most suitable purgatives in all cases of gastric ulcer complicated by constipation.

Given early in the morning in warm water, they lead effective aid to the operation of the mixtures already mentioned.

In what I have said I have given from individual experience. There are some physicians who advocate the use of caustics, such as sulphate of copper and nitrate of silver. There are others who advocate the use of opium and nstringents; but all I can do is to tell what, in no considerable experience, has appeared to me to be the most effective mode of treatment.

I should like to add a few words on the value of iodide of potassium in the treatment of gastric catarrh, whether simple, or complicating ulcer, or complicating malignant disease. Administered with the addition of some bicarbonate of potash or soda, it is, in my experience, a drug of inestimable value. It speedily removes a simple catarrh. It thereby removes the primary obstacle to the treatment of ulcer; and, in malignant disease, it will often, for a time, so far mitigate the symptoms as to make the patient think he is being cured. I have often found it in malignant disease relieve the patient for a time, and, I think, prolong life, with marked diminution of suffering.

It will be observed that I have dealt with gastric ulcer clinically, as I undertook. The subject of the diagnosis of gastric ulcer must be constantly in the mind of the practitioner of medicine. It has been much in my mind for years. And what I have put on record here, crude and elementary as it is, represents much careful thought and long observation.

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STUDIES ON THE ETIOLOGY OF THE PNEUMONIA COMPLICATING DIPHTHERIA IN CHILDREN.¹

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THE classification of the inflammations of the lungs has assumed a new phase since the improved methods of studying the bacteria have become definitely formulated and widely practised. While formerly morpho-

¹ The statistical data on the frequency of the disease, the clinical history of the cases, and most of the children's lungs made use of in these studies have been furnished by Dr. Northrup. The microscopical and experimental work was done by Dr. Prudden.