

stagnation of food and to those with perforation, peritonitis, or sub-phrenic abscess. But further experience will undoubtedly find some failures, and surgery will still find its application in a broader field in this disease than would be given to it by Lenhartz. This cure would seem to have a special use in cases with low hemoglobin, which are bad subjects for surgery, even if operative interference is needed later for continuing hemorrhages, for relapses of ulceration, or for the single indication of Lenhartz (motor insufficiency).

This series does warrant the conclusion that the original claims of Lenhartz are correct: First, that the cure is at least equally as efficient as the older method, and that it does not deplete the patient; second, that the cure is more rapid as well as more certain; third, that the vomiting and bleeding stop more quickly and relapse less frequently than in the Leube cure; fourth, that the pain ceases promptly and that morphine is never needed; fifth, that the food supply is sufficient throughout; sixth, that it is possible to treat the anemia earlier with iron and arsenic than in the Leube cure; and seventh, that it is possible to return to a full diet and to the patient's usual occupation earlier than in the older cure.

### THE DIAGNOSIS AND TREATMENT OF THE GASTRIC NEUROSES.<sup>1</sup>

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Nothing is more common among our patients than a complaint of "stomach trouble." Again and again this is the answer given when they are asked what brings them for advice. The frequency of this complaint has impressed itself upon me throughout a number of years in both private and dispensary practice. To determine more accurately the proportion of cases in which it is the chief item in the history, I have recently reviewed the records of all the cases seen in the Medical Clinic of Cooper Medical College from January 1, 1900, to January 1, 1906. During this time there came under observation 4232 cases; and of this number I find that 574 have given "stomach trouble" as the complaint that led them to seek advice. Of course it is well understood that the patient's complaint does not always indicate the site of disease; and yet it is interesting to note that a large proportion of patients are thus shown to have trouble with their digestion.

<sup>1</sup> Read at a meeting of the Nevada State Medical Society, at Reno, Nevada, October 8, 1907.

In the sifting of these 574 cases of self-labeled "stomach trouble" we have been able to distinguish four groups: (1) Cases in which the symptoms were really due to disease of other than the digestive organs; (2) cases in which the symptoms were due to disease of the digestive organs, but to organs other than the stomach; (3) cases in which the symptoms were actually due to organic disease of the stomach; and (4) cases that could only be classified as gastric neuroses.

GROUP I. In this group we found the stomach symptoms distinctly attributable to heart lesions in 10 cases, to chronic nephritis in 8, to pulmonary tuberculosis in 8, to chlorosis in 5, to arteriosclerosis in 3, to diabetes in 1, to pregnancy in 1, to secondary anemia in 1, to angina pectoris in 1, and to malaria in 1. In this group, therefore, in which the symptoms of stomach trouble were really due to disease entirely outside the digestive tract, there were found altogether 39 cases.

GROUP II. Cases in which the symptoms of dyspepsia are produced reflexly, by disease of digestive organs other than the stomach, are even more frequent than those in Group I. We found a large number of cases in which the symptoms could be best explained by the chronic constipation that accompanied them and best removed by correcting that disorder. Of such cases, in which the bowels would not move for several days in succession, and in which the chief complaint, nevertheless, was of the stomach, we found 43. In 8 other cases the stomach symptoms were distinctly due to cirrhosis of the liver; in 2 to cholelithiasis, in 1 to enteroptosis, in 1 to appendicitis, and in 1 to pancreatic cyst (diagnosis confirmed by operation). Thus, there were in this group 56 cases altogether. The most significant fact of all, which seems worthy of special emphasis, is the frequency with which complaint of "stomach trouble" has been found on examination to be associated with no discoverable change in the stomach, but disappears entirely with the relief of chronic constipation.

GROUP III. It is a matter of surprise to find that a comparatively small number of the patients whose chief complaint is of the stomach really give evidence of organic disease of the stomach when careful examination of the organ is made. We have been able, however, to make the following diagnoses with certainty: chronic gastritis 55 times, cancer 37, ulcer 10, dilated stomach 2, in all 104 cases of organic disease. In this number the diagnosis was positive; but it must be remembered that there were probably others, here classified in the fourth group as gastric neuroses, which might have proved to be organic disease of one form or other if we could have had them long enough under observation and had been able to follow their course.

GROUP IV. There still remain 375 cases, not belonging to any of the 3 preceding groups, that have been diagnosticated as

gastric neuroses; and it is to this very large group, constituting the great majority of patients whose complaint is of stomach trouble, that I wish to call attention at this time.

MEANING. By the gastric neuroses are meant the cases of purely functional disorder of the stomach, without discoverable organic change. The neurosis may be secondary to organic disease elsewhere in the body, but in this review such secondary neuroses have been consigned to another group. Among the 375 cases of primary gastric neurosis here collected no organic disease could be found, either in the stomach or in any other organ. Popularly these cases are known as "nervous dyspepsia," and this designation will here be considered as synonymous with gastric neurosis. Theoretically they vary in name according to the particular function of the stomach that is found to be most disturbed, whether this be secretion, motility, or sensation. But, practically, disturbances of all the functions are found so variously combined that it is frequently difficult to decide which predominates in any given case; and from my experience with the material here reviewed, my own conviction is that too great refinement in diagnosis among these gastric neuroses is not profitable, even if it be desirable.

As regards secretion we have learned repeatedly, in dealing with these cases, that very great and persistent complaint of distress during digestion may be associated with a secretion practically normal after a test meal; while at another time, with no complaint at all of digestive disturbance, analysis may show a secretion abnormally high or low in acidity. The character of the secretion, therefore, cannot be the only factor concerned in producing symptoms.

As regards motility, there seems good reason to believe that impairment of the stomach's power to mix its contents thoroughly and to expel them promptly into the bowel may play a very important part in the production of distress during stomach digestion. But, after all, we have no reliable method of proving impaired motility, except the discovery of abnormal food particles in the test meal removed, indicating retention; and this, in my experience, if repeatedly found means almost invariably organic disease—either the changes in the stomach walls that come from chronic gastritis or cancer, or the obstruction at the pylorus that follows as a sequence of ulcer, pyloric cancer, or perigastric adhesions. For the existence of minor grades of impaired motility, such as might come from faulty innervation, we have no absolutely certain test; nor have we any way of proving, on the other hand, that moderate disturbances of motility invariably produce symptoms.

Disturbances of sensation, especially hyperesthesia, seems after all to be the most certain factor in the production of dyspeptic symptoms; for by this patients become to a greater or less degree conscious of the digestive process and restless and uneasy and distressed so long as it goes on. In no other way does it seem possible

to explain many cases of gastric neurosis that persist after secretory and motor abnormalities have been excluded so far as our methods of examination permit, and even after the diet has been carefully directed so as to prevent undue irritation. Such exaltations in the sensitiveness of the gastric mucous membrane have seemed to me to be the predominating factor in the production of symptoms in a great majority of the gastric neuroses, no matter whether the secretion was found normal, decreased, or increased, or whether the motor power seemed deficient or excessive.

To sum up the matter: By the gastric neuroses, or nervous dyspepsia, we mean those cases of stomach trouble in which there is constant complaint of varying kinds of discomfort during the digestive process, but in which careful examination shows no evidence of organic disease in the stomach itself. Probably no one function of the stomach is ever exclusively at fault, but the one most concerned in producing symptoms seems to be that of sensation.

**ETIOLOGY.** With this understanding as to the nature of the trouble, we are now in position to ask about the factors that produce it. In most cases neurasthenia underlies the gastric neurosis, and the causes of the former thus become the causes of the latter. But not all neurasthenics have stomach trouble; very frequently it is the heart, the genital organs, the eye, or some other organ that furnishes the major complaint. There must be some special influences that determine the stomach neurosis in preference to another, but the explanation of these influences is not altogether clear. However, the following factors have seemed especially to affect the incidence of nervous dyspepsia in the patients with whom we have had to deal: (1) Age, (2) sex, (3) nationality, (4) character of the food, and (5) conditions under which food is taken.

1. *Age.* Our patients have ranged as follows: Under twenty years, 14; between twenty and thirty, 86; between thirty and forty, 146; between forty and fifty, 64; between fifty and sixty, 46; between sixty and seventy, 19. Thus, while these figures show that the gastric neuroses occur at all times of life, they also show that the most frequent occurrence is in the decade between thirty and forty, and that a much larger number are found before than after forty—246 on one side as compared with 126 on the other side of this line. The gastric neuroses are certainly more frequent in early life, when ambitions are more eager, appetites more keen, emotions less under control, and excesses of all kinds more likely to occur.

2. *Sex.* Among the 375 cases 235 were males and 140 females, which makes it appear that nervous dyspepsia is more common among men. It must be remembered, however, that in any public clinic more men than women attend, which undoubtedly has some influence upon the preponderance of males among these cases. Nevertheless the fact here shown by figures corresponds with my own experience in private as well as in dispensary practice—that

gastric neuroses are more common among men, while other forms of neuroses—particularly cardiac and genital—are more common among women.

3. *Nationality.* I have had occasion previously to call attention to the cosmopolitan character of the population of San Francisco, as shown by the different countries represented in our clinic. Naturally the United States furnished the largest delegation to our aggregation of nervous dyspeptics, with 112 representatives; Italy came next with 76, Ireland third with 43, Germany fourth with 30, and Sweden fifth with 14; while Russia and England each supplied 11 cases. Besides these larger groups we had smaller ones from each of the following countries: Switzerland, Finland, Denmark, Norway, Portugal, Canada, Poland, Austria, France, Mexico, Central America, China, Japan, Scotland, Spain, Dalmatia, Wales, Belgium, Syria, New Zealand, Sbetland Islands, and Azore Islands. There are two significant facts brought out by this examination of the nationality of our cases: first, that no race of people is exempt from stomach trouble; second, that among the foreign born the excitable Italians furnished so large a proportion of our material.

4. *Character of the Food.* Much has been learned in the last few years about the influence different foods exert upon the stomach's functions; and from the facts thus ascertained we are able to see more clearly how the character of the food may influence the development of the gastric neuroses. The first information of value upon this subject was furnished by Pawlow in his book, *The Work of the Digestive Glands*; and more recently the similar work of Bickel has still further opened our eyes. In questioning our patients about their habits regarding food, the following points have seemed to have an especial bearing upon the causation of their stomach trouble:

(a) *The Quality of the Food.* It has been shown by Pawlow in dogs and by Bickel in human beings that certain kinds of food-stuffs call forth more gastric juice than others. Bickel states very definitely, for instance, from actual observation, that the following substances elicit an abundant secretion: among drinks, all alcoholic and carbonated fluids, animal broths, and meat extracts in solution; all the spices, including mustard, pepper, salt, cloves, etc.; among solid foods, red meats when cooked rare, bread and all foods resembling bread in composition, that is, in a combination of albumin and starch. On the other hand, a slight secretion only is elicited by fats and cream; by well-done meats and coarse vegetable foods like boiled potatoes, cabbage, spinach, turnips, and carrots; and by sugars and sweets. Assuming now an underlying neurasthenia, it is easy to see that prolonged indulgence in the first group of food-stuffs may gradually induce an habitual hypersecretion during digestion, with all the subjective symptoms of hyperchlorhydria; or that a similar persistent use of the kind of foods described in the second

group may lead to an habitual deficiency of secretion, with the symptoms of subacidity.

(b) *The Preparation of the Food.* It has also been shown by the work of Pawlow and of Bickel that well-cooked food, presented in an appetizing way, has much to do with exciting the secretion of gastric juice; and that the looks of the food and its odor start the secretion of the gastric glands at once, even before the food enters the mouth, provided the looks are attractive and the odor is the agreeable one brought out by proper cooking; while, on the other hand, no such secretion occurs in advance unless the appetite is so aroused. Again, it is easy to see that the food of the poor man's table, selected for cheapness, poorly cooked, served with no thought of its appearance, may lead the stomach into the bad habit of inadequate secretion and the patient ultimately into a clinic for stomach trouble.

(c) *The Mastication of the Food.* By Pawlow's experiments also it was shown that by the act of mastication the gastric glands were reflexly stimulated to secretion, and that if chewing was sufficiently prolonged the food mass when finally swallowed found an adequate amount of gastric juice waiting to receive it; but that if chewing was hasty and food was swallowed rapidly a much smaller amount of secretion was in readiness when the mass reached the stomach. Furthermore, if the food is not finely divided by the teeth, it must be more vigorously triturated by the stomach walls in order to convert it into a soft, pultaceous mass; this throws extra work upon the stomach, which may result in faulty motility in an individual whose supply of energy is in every way deficient, as it is in neurasthenia. Thus in two different ways hasty eating and improper mastication may impair the stomach's function and ultimately bring about a gastric neurosis; and hasty eating is one of the commonest vices of the day.

5. *Conditions Under which Food is Taken.* The fact has long been recognized from experience that the circumstances surrounding the taking of food have much to do with its digestibility; and that emotional disturbance during a meal, such as vexation or anger, may make the best food disagree. Recently this fact has received a scientific explanation, through one of the experiments of Bickel. He found that if a dog, just before its feeding, was angered by a cat, the stomach secreted only about 9 c.c. of gastric juice, whereas ordinarily it secreted about 67 c.c. Furthermore, if the cat was brought into the room at a time when gastric secretion was at its height, the latter suddenly stopped, dropping from a rate of 28 c.c. every five minutes to 8 c.c. in the same length of time. This explains the common observation that food taken under disagreeable conditions so frequently gives rise to distress. No doubt many times the gastric neuroses owe their origin to such a cause. Meals eaten habitually in the midst of wrangling and dispute, or while the mind is occupied

with recalling disagreeable incidents of the day's work, or under the influence of worry about the cares of the household or the family, can scarcely fail to derange the stomach's functions and thus bring about a chronic state of nervous dyspepsia.

**CLINICAL HISTORY.** The symptoms of nervous dyspepsia are manifold and include every complaint about digestion that has ever entered into the mind of man. The story most often heard has been one of distress after food, described as a discomfort, a burning, a sense of weight, a load, a heaviness; this distress varying in severity in different cases until it becomes in some actual pain, as unbearable as that produced by true organic disease. Next in frequency comes the cry about "gas" on the stomach, flatulence, belching, a sense of distention, rumblings, and internal explosions. Third in order of frequency comes a sense of nausea while digestion is in progress, frequently persisting until the stomach is emptied by vomiting, which terminates the discomfort until food is taken again. All sorts of variations of these cardinal symptoms have been met with in the cases reviewed. No two patients tell their story just alike, and the most diverse combinations of minor and major items occur. There is, therefore, no characteristic clinical history that makes us certain we are dealing with a gastric neurosis. Every history of "stomach trouble" may mean serious organic disease, and no diagnosis ought ever to be made on subjective evidence alone. Two points in the story, however, always make us suspicious that gastric neurosis is the real condition present: (1) The long duration of dyspepsia, in many of our cases amounting to months or even years; and (2) in spite of this long duration, no particular disturbance of nutrition or of strength. As regards the various forms of gastric neurosis, only one, hyperchlorhydria, seems to have a fairly constant history. Here the patient's story is of a burning pain, with belchings and sour eructations, coming on two or three hours after food is taken, persisting until the next meal, which relieves the discomfort entirely, or until vomiting occurs at the height of the distress, emptying the stomach of its very acrid, irritating contents. These cases can usually be recognized by the account the patient gives of them, but not always; and a diagnosis should never be made of the form of neurosis, any more than of a neurosis itself, on subjective evidence alone. Except for hyperchlorhydria, there is no other neurosis that gives a history even fairly constant.

**STOMACH ANALYSIS.** From what has already been said, it will be understood that the conception of a primary gastric neurosis excludes all organic disease; and that physical examination of other parts of the body shows no lesion to account for the gastric symptoms. There still remains, however, the investigation of the stomach's functions, and this we accomplish by the analysis of a test meal. In our series of cases the meal employed has been the Ewald test breakfast of toast and water, removed after one hour. We have taken phenol-

phthalein as the indicator and titrated with the decinormal sodium hydrate solution to determine the total acidity; and, following the lead of most authorities, have accepted 40 and 60 as the lower and upper limits of a normal total acidity. Out of the 375 cases diagnosticated as gastric neuroses, 284 had such analyses made, in the great majority a number of different times. Of these cases 136 showed a subacidity, 133 a hyperacidity, while in 15 the degree of acidity fell within normal limits, even though there was constant complaint of "stomach trouble."

There remain 91 cases in which no stomach analysis was made, but in which the history of long-continued dyspepsia, the absence of any evidence of organic disease, and the well-preserved nutrition made the diagnosis of gastric neurosis the only one possible. These cases in which no analysis was made divide themselves into three groups: (1) The patients who positively refused to take a test meal, a rather large group among the ignorant class with whom we have to deal in a dispensary clinic; (2) those who took the test meal and were willing to have it removed, but in whom we found it impossible to pass the tube because of the struggle that the attempt caused; and (3) those who took the test meal and had the tube passed at the end of one hour, but without our obtaining any stomach contents—cases described as hypertonia, a neurosis of motility, by which the stomach is emptied prematurely.

**DIAGNOSIS.** Before making a diagnosis of gastric neurosis in any patient complaining of stomach trouble, a great many precautions must be taken. Subjective symptoms alone mean nothing. A thorough physical examination of the heart, lungs, blood, and urine comes first, to eliminate what has been classified as Group I among the cases of dyspepsia. Then the history and physical examination must be directed to the liver and gall-bladder, the intestines, and rectum, before we can exclude these and decide that disorder of the stomach itself is really the cause of the so-called "stomach trouble." Finally, we must determine whether organic disease of this organ is present or whether the symptoms are due solely to functional derangement; and this is the hardest task of all.

Of course, if the symptoms have lasted for months or for years with variable intensity; if the patient is still well-nourished and strong in spite of persistent dyspepsia; if besides the stomach symptoms there are other evidences of a neurasthenic condition but no evidence of the presence of a tumor in the stomach, or of dilatation or bleeding, it then becomes easy to conclude that the case is one of gastric neurosis, even without the aid of stomach analysis after a test meal. But if, on the other hand, there has been loss of weight and strength coincident with the "stomach trouble;" or if the symptoms have persisted in spite of intelligent treatment directed to a supposed gastric neurosis; if still there is no tumor demonstrable, no hemorrhage, either outspoken or occult, and no evidence of food retention;



then, in spite of every effort, we are often left in doubt as to whether or not organic disease exists, even though repeated stomach analyses have been made. What we most desire is an early recognition of organic disease, before it has advanced to the stage of gross changes, such as a palpable tumor or an open vessel with free discharge of blood. In this early stage there is a chance for cure, but there is also a chance for serious error, because we cannot attain certainty in diagnosis and must be satisfied largely with probability, even after every ordinary method of investigation has been employed. Not a few of the cases that seem to be simply gastric neurosis when first observed gradually prove themselves something more serious as the months go by; and in the group here recorded as gastric neuroses I have no doubt there were some incipient cases of ulcer and of cancer that might have been ultimately recognized if we had had our cases long enough under observation. My conclusion about the gastric neuroses, therefore, is that they constitute, undoubtedly, the largest group of stomach disorders with which we have to deal; but that this diagnosis, no matter how honestly made, often masks a primary organic disease of whose existence time will gradually unfold the conclusive proof.

It seems to me very important, therefore, to emphasize the necessity for constant vigilance, repeated investigation of all kinds, and close attention to the results of therapy in these cases of gastric neurosis; with a keen realization that the diagnosis first made may later have to be revised; that the case of persistent hyperacidity ought to be given routine medical treatment for gastric ulcer long before hematemesis and attacks of gastralgia make the diagnosis certain; and that the case of persistent subacidity, with or without the evidence of chronic gastritis, ought to be submitted to the surgeon for diagnostic incision without waiting too long for a palpable tumor or for coffee-ground vomitus to convince us that cancer is the real disease present.

**PROGNOSIS.** Gastric neuroses do not kill, but they render life exceedingly unpleasant—for the physician oftentimes as well as for the patient. It is best not to be too positive about promising rapid cure just because we do not find organic disease. My own experience is that these cases are usually protracted and obstinate, yielding for a time to treatment, only to recur; though it is possible to cure them entirely with persistent repetition of our instructions and with intelligent cooperation on the patient's part in carrying them out. Two points are especially to be borne in mind when giving an opinion as to outcome: (1) The possibility, just mentioned under diagnosis, that what seems clearly at first to be a gastric neurosis may prove later to be ulcer or malignant disease; and (2) that in order to effect a cure we must depend more than anything else upon a change in the patient's habits of living and upon his compliance with restrictions that are not always acceptable. For these reasons the prognosis

should always be guarded, so that physician and patient may equally avoid disappointment if progress is slow.

**TREATMENT.** Nervous dyspepsia constitutes the paradise of the fakir and the patent medicine man. It is the great frequency of "stomach trouble" that calls forth the immense crop of digestive tablets and elixirs, advertised to the public in street-cars, on billboards, in the newspapers, and on trees, cliffs, and hillsides. As a matter of fact, however, these much-vaunted remedies do no more than relieve symptoms temporarily, and do not always do that; for the cure lies not so much in drugs as in reformation of the habits of life. The rational treatment of the gastric neuroses looks less to the outward manifestations than to the conditions and surroundings that have called them forth, and the details that must receive consideration are the following:

1. *The Underlying Neurasthenia.* This in general calls for a return to "the simple life," with less stress and strain. Excesses of all kinds must be sought out and stopped, of whatever nature they may be—in study, in business, in society, in household duties, or in sexual affairs. Without such investigation and correction of our patient's occupations and surroundings, habits, and ambitions, we cannot hope to accomplish much; for people with stomach trouble need intelligent directions as to rational living far more than they need prescriptions. No doubt the systematic rest cure in a sanitarium, or travel, with the diversion and change of scene it gives, are valuable adjuncts to treatment; but for the majority they are simply out of the question because of limited means. On the other hand, it is always possible to insist upon regular hours for meals; regular hours for sleep; a daily bath; systematic outdoor exercise, even if it be no more than a walk to and from work or business; and the avoidance of introspection, self-examination, and self-pity. Such advice, however, is only too often utterly rejected by the ignorant, who have no use for any remedy that does not come out of a pill-box or a bottle.

2. *The Way Food is Taken.* It has previously been shown how much this has to do with the production of dyspepsia. People must be taught that food eaten rapidly always digests slowly and often with distress; and inadequate chewing of food is one of the most common causes of stomach trouble. Again, rest for a short time after meals, before mental or bodily activity is resumed, is often all that is needed to make digestion go on unawares. Excitement, worry, and annoyance while at table are a common source of trouble, and often their elimination suffices to overcome the long-standing digestive distress. All of these matters must be carefully explained to the patient, no matter how trivial they may seem; for upon such apparent trivialities success in treatment often hinges.

3. *Quality and Quantity of the Food.* Habitual overeating is a frequent source of dyspepsia, for continued overwork induces exhaus-

tion in the stomach as in the brain or any other organ. Hence, reduction in the amount of food taken is in some cases the most valuable therapeutic resource. Consciousness of this fact has recently led to the adoption of certain popular fads for the cure of dyspepsia, such as the "no breakfast" cure or the "no lunch" cure. They are not altogether fads, though the mistake made is in adopting them promiscuously without previous investigation of the true nature of the "stomach trouble."

Habitual overindulgence in certain kinds of food is also a matter for investigation and correction. Any of the food-stuffs may thus cause offence if repeatedly taken to excess. It may be the starches, the sugars, the fats, or the proteids; it may be coffee, tea, or alcohol; it may be acids or condiments. The particular kind of food that is being taken too freely can best be found by questioning the patient regarding his habits and his preferences; and such questioning should form a part of our routine examination as a preliminary to advice.

But our best guide as to the quantity and quality of the diet to be prescribed is furnished by the analysis of the test meal; for this tells us what particular function is at fault and how it is deranged. If the condition proves to be one of hyperacidity, the essential feature of which "consists in an abnormal irritability of the secretory apparatus of the stomach during its time of labor," then food should not be given too often and not of such kinds as especially stimulate secretion. Three meals a day are usually enough and a mixed diet has proved most useful. Fats, cream, and butter; well-done meats of all kinds; milk and cocoa; vegetables like boiled potatoes, cabbage, spinach, turnips, and carrots; sugars and sweets—these are the foods especially indicated; while spiced, salty, and sour articles of diet, coffee and alcoholic and carbonated drinks, ordinary bread-stuffs, and rare meats must be excluded.

If the condition is found to be one of subacidity, exactly the opposite course is indicated. The food should be taken in small quantities at short intervals, for there is no stimulation to secretion equal to the act of eating. Meats cooked rare; bread-stuffs, crackers, zwieback, and toast; condiments, spices, salt foods; alcohol in moderation and carbonated waters; animal broths and meat extracts—these are the foods that should be given; while fats, sweets, and coarse vegetables are contra-indicated and should be omitted. In subacidity especially the value of attractive preparation of food and of thorough mastication as stimulants to secretion must be impressed upon the patient.

If there is faulty motility, as found by food retention and delay in emptying the stomach, then the quantity at each meal must be small, especially the fluids. The food must be finely divided—meat in a minced or scraped condition, vegetables in the form of purees, and cereals in gruels. Crackers, crisp bread, zwieback, and toast must

be thoroughly ground by the teeth, and all coarse foods with much bulky residue—as beans, corn, spinach, etc.—must be avoided.

4. *Drugs.* The use of these is constantly necessary to combat disagreeable symptoms, but it must be understood that they are only adjuvants and not the main resource in the treatment of the gastric neuroses. The useful ones can best be considered under the head of each important type of neurosis:

*Hyperacidity.* In hyperacidity drugs help us (a) by checking gastric secretion and (b) by neutralizing excessive secretion. To check secretion our best drug is belladonna, given in doses of  $\frac{1}{4}$  grain of the extract a half-hour before each meal, the efficacy of which has been proved both experimentally and clinically. To neutralize excessive acidity, bicarbonate of sodium is the popular remedy, and a useful one; but a formula learned originally from Stockton has been used in our clinic for a number of years past, with most satisfactory results; it consists of cerium oxalate, 2 drams; bismuth subnitrate, 4 drams; and the light carbonate of magnesium, 1 ounce; of which powder 1 teaspoonful is given one or two hours after meals, when the symptoms of excessive acidity appear.

*Subacidity.* In subacidity drugs come to our aid (a) by stimulating secretion and (b) by supplementing deficient secretion. To stimulate secretion the bitter tonics have proved most satisfactory; and of these we have employed with greatest frequency the tincture of nuxvomica, in doses of 10 to 30 drops before each meal. To supplement deficient secretion we employ dilute hydrochloric acid in doses of 10 to 30 drops, well diluted, after each meal.

*Faulty Motility.* For this neurosis, strychnine has been found our most reliable drug, given before or after meals, in doses of  $\frac{1}{16}$  to  $\frac{1}{8}$  grain. As disturbances of motility are usually found combined with secretory disturbances, the state of the secretion must also be carefully considered before drugs are prescribed.

*Hyperesthesia.* In cases in which symptoms of dyspepsia persist in spite of normal analyses and negative findings as regards disturbed motility, we have had excellent results in our clinic from sodium bromide and valerian, given in the following formula: Sodium bromide, 20 to 30 grains; elixir of the valerianate of ammonium, 1 dram—such dose given in water after each meal, continued for several weeks or a month.

5. *Physical Treatment.* The various physical methods suggested for influencing secretion, such as intragastric galvanization or faradization, intragastric douches and sprays with various medicated solutions, or abdominal packs and hydrotherapeutic applications, have never seemed to me to yield satisfactory results. Even the value of gastric lavage is probably overestimated and, in my opinion, it should not be employed as a routine measure day after day. It has its value in the relief of symptoms, to remove hyperacid gastric

contents to stop distress, or to remove retained or fermenting material when motility is deficient; but it is doubtful whether it can influence the secretion of the stomach in any way. All of these measures do harm by keeping the patient's attention directed to the stomach and reminding him of its delinquencies; and in the neuroses this is a distinct hindrance to recovery.

THE DIAGNOSIS AND TREATMENT OF INFECTIONS OF THE  
BILIARY PASSAGES, WITH SPECIAL REFERENCE TO  
CHOLELITHIASIS AND CHOLECYSTITIS.

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THE work of such men as Kehr and Riedel in Germany, Mayo, Robson and Moynihan in England, and Richardson, Mayo, and others in America, has of late years placed the surgery of the biliary passages, and especially of cholelithiasis, upon a firm footing. The actual work at the operating table has been the prime factor in elucidating the very obscure facts in connection with the etiology, pathology, and diagnosis of these conditions, assisted though it has been by many brilliant researches and careful postmortem pathology. As in appendicitis, so in gall-bladder disease, it remained for the surgeon to show how different is the process in life from the end result as shown at the necropsy.

I shall report herewith the results of my own work in a series of 217 cases of gall-bladder surgery, more especially in reference to cholelithiasis and cholecystitis. This includes 182 cases of calculous cholecystitis, and 35 of non-calculous cholecystitis.<sup>1</sup>

There is no doubt that cholelithiasis, cholecystitis, and all their results, near and remote, should be really classed as consequences of infection. The infection may not always be demonstrable in its results, the causative factor not always to be found when the damage has been done, yet in my opinion the inflammatory factor is the important one in all but the malignant diseases of the biliary tract.

While there is still some divergence of opinion concerning the exact method of the formation of gallstones, all authorities seem agreed that a bacterial invasion of the gall-bladder is a necessary factor. The effects of stasis of bile, peculiar chemical composition of the bile, and of the condition of the gall-bladder mucosa are not so well understood.

<sup>1</sup> These comprise the cases operated upon between January 1, 1903, and April, 1907.