FOOD STAGNATION FROM ALL CAUSES.*

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When the stomach fails to empty itself within a reasonable time after the taking of food, this condition is termed food stagnation. It differs in degree, depending, in part, on the character of the food taken, still more on the morbid state giving rise to the condition. Semi-liquid or pultaceous food should leave the stomach in four or five hours, and if it is retained longer there is a certain degree of stagnation. An ordinary meal composed of a variety of foods is the proper test for food stagnation. With this meal the stomach should be emptied, according to Riegel, within seven hours, and the presence of contents beyond that time is evidence of food stagnation. There are conditions, however, in which the liquid food is retained for a much longer period than five hours, and solid foods are retained for twenty-four hours or longer. Under such circumstances, we have to deal with more serious cases.

ETIOLOGY.

Food stagnation is one of the most important of the gastric disturbances. It invariably gives rise to symptoms both local and general. Locally, the patient experiences distress and a sense of weight, sometimes pain, together with eructations of gas, regurgitation of the stomach contents, and often vomiting. In certain cases the stomach behaves in a lifeless, inactive manner; in other cases it takes on violent movements which the patient may feel and which the observer may perceive through the abdominal parietes. Constitutionally, there are usually found evidences of autointoxication and starvation. These symptoms vary widely in different cases, depending on the degree of stagnation and on the character of the fermentation that may be present. The nature of food stagnation differs, as does its cause, and many conditions may lead to it. Cases may be roughly divided into two classes: First, those in which stagnation results from depression of the motor function of the stomach, without the presence of any actual obstruction. The stomach walls are simply too feeble to overcome the slight retention, or holding back, exercised normally by the pylorus. Second, those in which there is actual obstruction to the outflow of stomach contents, regardless of the kinetic energy of the gastric walls. There are certain cases in which we have to deal both with atony of the gastric walls and with obstruction at the pylorus. More often these cases begin with obstruction and the atony appears as a secondary matter.

Food stagnation is often associated with dilatation of the stomach, but on the other hand, there may be a large stomach without stagnation, and there may be very marked stagnation without gastrectasis. It is for this reason that Einhorn prefers to use the term isochymia in the description of many cases formerly classified as ectasy, and it is this view which has led to the discussion of food stagnation as an entity; whereas, it was in former times almost invariably spoken of as an attribute of dilatation of the stomach.

Of the cases of the first class, anything which leads to the weakening of the muscular layer of the stomach may act as a cause. It, therefore, follows some cases of gastritis when the inflammation has invaded the muscle layers. It results from degeneration of the gastric mus-

cle from any cause, and, therefore, occurs in grave anemias, inanition, severe intoxications and infections. It occurs in cases of great depression, more often when this is prolonged, sometimes when it is brief, but acute, as in surgical shock, even though the stomach itself is not involved in trauma, or operation. I have known it to occur in acute illnesses without previous history of stomach trouble. Occasionally it appears to be congenital, and there are instances which seem to be hereditary and in which it occurs in a number of individuals of the same family. It may follow from adhesions to the stomach, thus making expulsive efforts ineffectual. It may result from imperfect innervation, and this may occur in consequence of general or local nervous depression. It most often results from overtaxation of the stomach; for instance, from eating or drinking excessively, especially the former, or from eating very coarse foods. This cause is naturally most operative when the functions of the stomach are depressed and systemic energy is on a low plane. The condition is, therefore, not infrequently induced by feeding abundantly too coarse food to convalescents. I have known it, for instance, to occur from overfeeding during or after typhoid fever. I knew a fatal case which followed the taking of a Christmas dinner by a convalescent from pneumonia. In every-day practice we most often find this type of food stagnation developing in people of lowered energy, such as is produced by overwork, mental or physical, excessive venery, etc., who at the same time are indiscreet in the quantity and quality of food taken.

As to the second class of causes of food stagnation, the most common is cicatricial pyloric stenosis, secondary to gastric ulcer. This sometimes arises from healed and sometimes from active ulcer, and chronic irritation or inflammation at the pylorus occasionally leads to the same result without the intervention of ulcer. There are a few instances in which we have to deal with benign hypertrophy of the pylorus with exaggerated action of the pyloric sphincter, giving rise to a palpable tumor and to disharmony between the detrusor and the sphincter apparatus of the stomach, the nature of which hypertrophy is not well understood. In some there is a congenital hypertrophy of the pylorus which may lead to fatal vomiting in the new-born, or later in life may develop into incoercible vomiting. A frequent form of obstruction is found in pyloric spasm, the result of oversensibility of the pylorus, either from erosions of the mucosa or simply from nervous hyperesthesia, more often associated with hypersecretion and hyperacidity of the gastric juice. In other words, the condition is found in gastrosuccorrhea and in hyperchlorhydria. The trouble may result from perigastritis with contracting adhesions, from band-like adhesions constricting the pylorus or duodenum, or from pressure exercised by tumors, or other processes, on these parts. The obstruction may occur some distance below the pylorus, thus giving rise to stagnation of the duodenal contents, as well as the contents of the stomach. Cancer of the stomach is a common cause of the conditions. Before a palpable tumor appears, there may occur spasm of the pylorus arising from its irritability. This may at first be transient in character, thus misleading the clinician. Gastropexia, with the sharp bend in the pylorus or duodenum, is sometimes a cause, but its actual occurrence must be very rare.

MORBID ANATOMY.

The morbid anatomy of motor insufficiency of the stomach varies according to the nature of the case. In

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the early stages of gastric atony no change will be found in the structure. In advanced cases the stomach is likely to be found dilated, with more or less thinning of and, perhaps, fatty or fibroid degeneration of the muscle walls. The mucous membrane frequently shows the evidence of chronic gastric catarrh, with fatty or fibroid changes. When the stomach dilates, it is not always in the same direction, but is in the line of least resistance. More often the enlargement occurs around the greater curvature and fundus, although it may be at the antrum pylori or even upward toward the diaphragm.

DIAGNOSIS.

The diagnosis of stagnation is not difficult; it may be suspected when patients complain of eructations of food taken a long time previously. It can be demonstrated only by the use of the stomach tube. If the greater part of an Ewald test breakfast is found present three hours after eating, a moderate insufficiency is present, or if the stomach is not emptied seven hours after a hearty mixed meal the same conclusion is reached. The degree of food stagnation may be inferred from the amount of food found present; that is to say, if the stomach is found nearly empty, the insufficiency is small in degree; if, however, the greater part of the meal remains, the extent of the disability should be measured accordingly.

It is a good plan to examine the stomach in the morning, fasting. If the usual evening meal has been taken, and the stomach is found empty in the morning, the stagnation is not great. In most cases, in addition to the estimation of the motor insufficiency of the stomach, one passes to an examination to determine the size and position of the organ and to ascertain the state of the gastric chemistry. These features, while having an important bearing on the individual case, are not necessarily related to the food stagnation. Nevertheless, every case in which food stagnation occurs should have the most complete examination, not only in reference to the stomach, but to the organism as a whole. There is a very close relation between the systemic and gastric conditions.

TREATMENT.

The treatment of food stagnation or motor insufficiency is a broad subject and can not be fully discussed at this time. There are some principles which are so important that they should receive attention to the exclusion of details. In the first place it must be remembered that gastric atony may be but a part of a general atony, and gastric weakness but a part of general weakness. On the other hand, there are cases in which the organism seems strong, but in which the motor power of the stomach is insufficient, and this without any unusual obstruction. Whether the atony is limited to the stomach or but an expression of the general debility, it is always of the utmost importance to manage the organism as a whole so as to increase energy and prevent its dissipation. In those cases where the stomach seems alone involved in the muscular weakness, local attention is, of course, especially demanded. The motor power may be assisted by certain mechanical measures, especially by really skillful massage over the region of the stomach, by trunk rotation and flexion, and by the alternate hot and cold douche over the epigastrium, and by external and internal faradization. The alternate hot and cold douching through the stomach tube has seemed sometimes to do good. As for drugs, undoubtedly benefit follows the use of the simple carminatives, bitter infusions, and temporarily the diffusible stimulants. These measures must be modified according to whatever other

condition may be associated with the motor insufficiency; as, for instance, catarrhal gastritis, carcinoma, ulcer, ptosis, etc. It should here be reiterated that failure or success depends more on general management of the patient, on proper rest, exercise, recreation, diet, mental state, etc., than on the mere local treatment of the stomach. Of course, both must receive consideration.

Surgery has little place in this form of motor insufficiency. As for those cases depending on obstruction, surgical intervention is often of the utmost value; yet I can not agree with the dictum that all such cases are suitable to surgical relief. Where it depends on spasm of the pylorus from overirritability of tissue, whether from hyperchlorhydria, hyperesthesia, or simple erosion of the pyloric mucosa, surgery ought not to be considered; yet I have known these cases sent to the surgeon. There is no artificial drainage of the stomach which compares in efficiency with the normal. The proper treatment consists in lowering the acidity of the gastric secretions, soothing the gastric mucosa and the selection of an unstimulating liquid or very soft diet which is free from all irritating particles. Lavage followed by soothing lavements of the mucous membrane is of great assistance. I have seen cases, which at first suggested serious organic disease of the pylorus, improve promptly under this treatment and know that the patients have continued without disturbance for years afterward. When there is ulcer at the pylorus, the question is more difficult. The present tendency, of course, is to operate at once, and ulcer of the pylorus is an ugly affair; yet in some cases in which the ulcer is small and yields readily to treatment it is probably wise to follow the conservative method, keeping the case for a while under observation before resorting to a gastroenterostomy. We are beginning to find out that a stomach on which a gastroenterostomy has been performed is by no manner of means as good as a normal stomach. If, however, the ulcer continues to give trouble, if pain and spasm frequently recur, I would recommend pyloroplasty (if the ulcer can be safely excised), otherwise gastroenterostomy. In benign hypertrophy of the pylorus without ulcer, I advise operation, preferably pyloroplasty. When there is cancer of the pylorus, excision followed by gastroenterostomy is probably, on the whole, the wiser course. If there is extensive involvement, gastroenterostomy alone often allows a year or more of comparative comfort to the patient. I have seen some brilliant results, but more depressing failures. Of the latter, it is only fair to say that by the operation there is little to be lost and possibly a year to be gained. In atonic cases, especially when associated with ptosis, some benefit follows from change of posture; and at times Rovsing's or other operations that raise the distended fundus, thus enabling the organ to drain, are of use.

Something should be said as to vomiting in this condition. It is often a most conspicuous symptom, but varies much in its characteristics in different cases which appear to be of the same kind. Occasionally vomiting occurs only when the stomach is overdistended; at other times there are periods of great gastric irritability, with retching, even when the stomach is empty. In obstructive cases the nausea and vomiting often depend on yeast fermentation, and, with the exception of lavage, nothing gives so much relief as salicylic acid, which overcomes the yeast fermentation. Even when lavage is indicated, the relief afforded is greatly enhanced by the addition of this drug.

In closing this question of treatment, may I reiterate

the feeling, which grows stronger the wider the experience, that it is impossible to expect the best results in dealing with this, as well as other stomach diseases, from purely special methods of treatment. The debt which we owe to those who have specialized in gastric diseases is immense, but the long-continued study of cases shows that, while we should avail ourselves of the art of the specialist, we can not dispense with the wide knowledge of general pathology and therapeutics which is the possession of the high-class general practitioner.

DISCUSSION.

ON PAPERS OF DRS. BILLINGS, DOCK, MUSSER AND STOCKTON.

DR. RICHARD C. CABOT, Boston, asked Dr. Stockton on what grounds he would be willing to state, in any case, that there is an abnormal amount of mucus in the stomach contents. He also asked Dr. Musser if he could give any figures showing what proportion of all cases coming to him with stomach symptoms really have stomach disease.

DR. G. W. McCASKEY, Fort Wayne, Ind., declared that to say that in a certain sense the disorders of the stomach are fundamentally more important than those of other organs of the body is to utter the merest platitude. Gastric disease frequently stands in causal relationship to a large group of diseases, renal disease being among them. It is true that perhaps in the majority of such cases the intestines are the organs directly at fault; but if one traces the causes further back the ultimate cause will frequently be found to arise in gastric disease. Dr. McCaskey believes this to be true in a very large proportion of the cases. Abnormal gastric conditions may lead to imperfect intestinal function. He emphasized in particular the necessity of a thorough comprehension of the physiology of the stomach before attempting to understand its diseases. This is not peculiar to the stomach, but in no other organ is it more fittingly illustrated. If, for instance, certain well-known facts regarding the physiology of the stomach had been taken into consideration, the dictum that the presence of hydrochloric acid excluded cancer would never have been made. There can be advanced cases of cancer of the pylorus (in which there are no acid-forming cells) without any diminution of the secretion of hydrochloric acid; in fact, it is liable to be increased at first as a result of the stimulation of the organ by the neoplasm. Many such cases have been reported, and Dr. McCaskey added one to the list within the last few months.* It seems to him that exaggerated conclusions have been drawn during the past few years in papers which have appeared on the subject of food stagnation. In one, for instance, an attempt was made to set the limit of twelve hours beyond which limit if food was found it indicated organic disease, in which operative interference was to be considered. In Dr. McCaskey's opinion much severer grades of gastric myasthenia are amenable to medical treatment. He is in accord with the conservative position taken by Dr. Stockton. Dr. McCaskey has found in a large proportion of the cases that intragastric cold douches do not agree with the patients. He does not know precisely why, but possibly it is because of the close proximity of the stomach to the solar plexus, or perhaps some peculiar susceptibility of the nervous organization of the stomach to the depressing action of cold. The importance of stomach analyses appears to him to be very great, and he endorsed and emphasized practically all that Dr. Dock has said. The recent attempts to belittle gastric chemistry are not well founded and are greatly to be deplored. He differed with Dr. Dock in the use of the Gunsberg reagent as a qualitative test for free HCl. He considers a 1 per cent. solution of resorcin much preferable because of its greater stability. Its delicacy is precisely the same, but no greater than that of the Guenzburg reagent. The questions of general nutrition discussed by Dr. Billings are of vital importance from the practical quite as much as the theoretical point of view. The problems of proteid metabolism are exceedingly difficult, and as yet are impossible of full solution. It seems quite probable that the existing dietetic standard with relation to proteid intake is somewhat too high, but just how

much does not seem to Dr. McCaskey to be established. There is no doubt, however, that the nitrogen balance can be maintained and the organism kept in good working condition on much less than that indicated by the Voit standard, but it seems that we are not at present justified in accepting a standard less than 80 grams of proteid per diem for the average individual of about 150 pounds weight. The investigations of Richardson and Folin are suggestive in the highest degree, even if their conclusions are not final, as it seems to Dr. McCaskey that the time over which the experiments ranged, even though of several months' duration, is not long enough to give final results. Even though body weight is maintained at a slightly lower level than before, and the working capacity of the individual remains up to the average, there are still other questions unanswered: the resistive power, for instance, of the individual to morbid influences; and the problem may even go further and be racial in its character. One fact should be clearly emphasized, and that is that the proteid intake should not vary with muscular exercise to the same extent as the carbohydrates. The latter are the force-producing, dynamic portion of the diet, and the quantity should rise and fall with the amount of muscular work done. The laboring man needs more starch and sugar and fat, but not necessarily a great increase in meat or other proteid foods.

DR. MORRIS MENGES, New York, said that the average general practitioners do not make extensive use of the valuable means of diagnosis at their disposal. Again, when such attempts are made, often the method is at fault, and especially is this true when an attempt is made to pass the stomach tube. Very often failure results because of the nature of the tube; the majority of these tubes are soft, and really can not be used by any one, and are often provided with a bulbous funnel at the ends. Another point is the awkwardness of the manipulator, possibly from lack of practice. As a result of all this, the general practitioner believes that these various methods of diagnosis and analyses of stomach contents, are too complex, though they are even simpler than the methods employed for urinary analyses. One need not bother with percentages; one only requires average figures. We must know relatively the presence or absence of free hydrochloric acid, etc. Another point Dr. Menges believes to be of importance is that what little of the stomach contents is found on the end of the tube can be utilized for diagnosis; no matter how small, strips of testing paper can be used by applying them to the end of this tube, and a complete analysis can be made. The futility of making one analysis should be emphasized. If we are dealing with organic disease the variations presented can only be appreciated by those who have worked with these tests; the use of one test breakfast will not do. It is positively absurd, he said, to depend on the results of one examination. By gross examinations of specimens one can determine a great deal in the vast majority of clinical cases.

DR. S. P. BLACK, Pasadena, called attention to an important point brought out by Dr. Billings, i. e., the question of proper mastication. We all know that mastication is improperly performed by all of us; if more time were devoted to proper mastication there would be far less bolting of food. When exercise is taken a meat diet is needed. It is necessary that mastication should be so complete that the gastric and intestinal juices may gain ready access to all particles of the food. If mastication is properly and thoroughly done, the appetite can be satisfied with a less amount of food. More that is taken in can be utilized and less will be excreted. The amount of food taken depends on so many conditions that it is difficult to state exactly the amount necessary for each. This varies with the period of life and many other factors. For instance, an old man can not take the same amount of food that a younger man can. It should be borne in mind that the majority of cases of chronic rheumatism are due to a toxemia from the decomposition of proteids. The excess of proteid material appears not only in the form of urea and other products, but also as ptomaines which when absorbed give rise to chronic joint affections. The relation, therefore, between proteid intake and mastication can readily be seen and its importance recognized. Dr. Black quoted Dr. Stengel as saying that there exists a feeling among the profession that the examination of the secre-

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tion of the stomach is becoming of less and less importance and that an examination to determine the motor function of this organ is of prime importance. The papers read in this symposium place more reliance on the physiology of the stomach and a study of the stomach secretion. The laboratory is essential for a proper understanding of abnormal gastric diseases.

DR. JOSEPH L. MILLER, Chicago, asked what results Dr. Dock has had with Weber's test for blood in the stomach contents and what value he places on it. While it is true, Dr. Miller said, that in cases in which hydrochloric acid is present it is not absolutely necessary to test for pepsin, still in those cases in which there is an absence of hydrochloric acid it is necessary to determine whether pepsin is absent as well. He asked Dr. Dock if he resorts to this test. Dr. Miller believes this test should be in more general use. He believes that we should simplify exact qualitative determination more than we at present do. On the other hand, he also believes that a quantitative determination gives very valuable information. With Ewald's aspirator it is very easy to obtain all the contents of the stomach, and the use of this instrument simplifies the methods very much. When sarcinae are associated with a marked increase in the hydrochloric acid, it is important as indicating a benign stenosis of the pylorus.

DR. J. M. ANDERS, Philadelphia, said that it is a well established fact that physiology has a direct bearing on practice of medicine and is a most valuable aid in recognizing and treating diseased conditions. The only defect in this symposium is that the physiology of digestion has not been included. The distribution of copies of papers such as presented by Dr. Billings would have a decided effect on medical progress in America. What Dr. Billings has given us is beyond dispute, and these things are most useful to the practicing physician. Dr. Anders was glad to hear him mention and emphasize the fact that the average amount of food ingested is at least twice as much as required to maintain complete physiologic efficiency. The minimum amount of alimentation necessary under the many varying conditions of life, including the ages of patients, is as yet imperfectly understood. The physician should be able, instead of as at present estimating empirically how much food is necessary, to determine this scientifically. The medical profession certainly owes much to the observations of Chittenden, Voit, Atwater and others. The determination of the amount of creatinin excreted daily is sufficient for the determination of the nitrogen balance of the body. Dr. Anders believes that up to the present time, and in the future as well, the most important advances will be those made as the result of analyses of food ingested and the urine, the feces, etc., excreted. In addition, it is necessary to take into consideration other factors, such as the influence of exercise, sleep and baths. These problems of nutrition seem somewhat complex, more than certain observers would have us believe. Dr. Musser has presented a long list of factors in which gastric symptoms are present, but Dr. Anders would be glad to hear more regarding acute symptoms that occur in chronic affections and which are apt to mislead us. Recently Dr. Anders saw a patient suffering from acute articular rheumatism, in whom the joint condition was held in abeyance with the distension of the stomach. It was thought that gastric trouble had developed, but the physical examination revealed the presence of a pericarditis. He has seen several similar instances with pain in the epigastrium. He was very glad to hear Dr. Dock emphasize the variability which resulted from an examination of the gastric contents. It should be borne in mind, however, that no organic affection of the stomach exists, but that it presents certain variabilities, although such changes are by no means pronounced in all instances.

DR. F. C. SHATTUCK, Boston, declared that there is too much theory regarding this matter. He believes that medical men are in danger of running after false gods. There are, he believes, but two conditions in connection with ulcer which call for surgery. The first is perforation; the other, obstinate cicatricial contraction of the pylorus.

DR. JAMES J. WALSH, New York, said that in stomach medication the nostrums have even a larger field than in any other disease. Judging from the number of varying remedies for

stomach symptoms of all kinds that are fairly pushed on the doctor by the advertising agents and the large amount of printed matter with regard to them that comes to his table, there must be an immense amount of medicine for stomach symptoms prescribed in this country. All sorts of ferments have been introduced and all the vegetable kingdom has been rifled of precious treasures in order to provide new stomachics. The more distant the country and the more unusual the plant from which they come the more grandiloquent the advertising and the greater the promise of efficiency. Josh Billings once said that it is not so much the ignorance of mankind that makes them ridiculous as the knowing so many things that ain't so, and there is no doubt that with regard to our knowledge of the stomach this is truer than with regard to almost any other department of medicine. Each individual is absolutely a law unto himself as regards his tastes and his capacity for digesting various articles. The distinguished Russian physiologist, Pawlow, has demonstrated that in animals at least a special kind of gastric juice is secreted for each kind of food that the animal takes. If to this be added the individual tastes in human beings and the psychic influence on the stomach, then the problem of stomach digestion becomes the most complex we know. Fortunately physicians do not have to bother much about the variations in the chemism of the stomach. So long as the stomach will pass on the food that is furnished it digestion will go on and will maintain nutrition. In cases of gastric cancer, for which the whole organ is removed, it is a common experience that the patients gain as much as 30 or 40 pounds in weight within a few months after the operation, in spite of the complete removal of their stomachs. This, however, is only a confirmation of what was known otherwise as the result of stomach investigation. Not a few persons suffer from achylia gastrica, that is, a condition in which there is no secretion of gastric juice in the stomach and no process of digestion carried on there, yet suffer very little from digestive symptoms and do not lose in weight. In more recent times the practice of jejunostomy has demonstrated the same thing. When there is a cancer of the pylorus and the patient has lost seriously in weight, digestion proceeds very happily and nutrition begins at once to improve when an opening is made by which food is allowed to pass on immediately to the intestines. Gastric motility, then, is more important than gastric chemism. If physicians can only switch the food past the stomach, the digestive system will continue its work. As a matter of fact, most of the tonics that do good in digestive disturbances influence the motility of the stomach rather than its secretory activity. That is why strychnin is so useful. The most serious difficulty that hampers stomach motility is the lack of proper mastication. Meats must be chewed, but still more must vegetables be chewed. It is the vegetable-eating animals that ruminate. It is in this line and not in trying to help gastric chemism and the ferments that therapeutics are effective.

DR. JOHN A. LICHTY, Pittsburg, believes that gastric atony due to organic obstruction is the crucial point in this symposium and that it will assume the same position in the next few years in the deliberations of this section that appendicitis did some years ago. After a rather extensive experience in the treatment of these conditions, he has found that in many cases he might have easily dispensed with mechanical devices, such as intragastric electricity, massage and lavage. Simply advising the patient to masticate his food more thoroughly and to refrain from drinking at meals and for an hour or two after seemed to be all that is necessary in many cases. Food not properly masticated must be ground up in the pyloric end of the stomach, and such extra work is likely to produce atony, erosion, ulceration or other gastric disturbances. Dr. Lichty did not mean to say that we should not use these agents in selected cases, for they are often absolutely essential to bring about a cure. In the treatment of gastric atony due to organic obstruction, the internist and surgeon must come together and understand each other. The earlier this is done the better for the patient's welfare. With the present methods of diagnosis physicians are not yet able to make a definite diagnosis in the earlier stages of some of the most important gastric lesions. The effect of rational treatment and the

course of disease must be observed at times before a diagnosis can be made. Now and then it may be necessary to do an exploratory operation before a diagnosis can be made. Such an operation is not always a serious undertaking and may frequently reveal important conditions. Dr. Lichty recently saw a case in which he was positive that there was a gastric ulcer; the patient suddenly had an attack of jaundice and then he was positive that he had to deal with a case of obstruction of the gall ducts. There was found at operation a band of adhesion which interfered with the pyloric entrance and also with the gall duct. No amount of treatment would have relieved this patient, though she had received treatment from different physicians for a year or more for gastric ulcer and for gall-stones. The tendency of the internist too often is to be satisfied to have patients in a chronic condition come to the office day after day until they are entirely dissatisfied and discouraged and ready to desert to the quack. There is still too wide a space between the internist and the surgeon, and in this space the quack and unscrupulous doctor find a rich harvest. The internist and surgeon must co-operate.

DR. C. M. COOPER, San Francisco, said that Dr. Billings' paper should have been read before a conjoined section, inasmuch as the subject matter is unwisely neglected and its importance to all branches is equally great. It is not necessary to tell the patient to limit the intake, as the muscular movements associated with thorough chewing plus the better digestion of the food chewed induce a feeling of satisfaction which in itself tends to diminish the amount eaten. Further, it must be remembered that a thorough clinical examination should come before a chemical analysis of the stomach contents. On the Pacific slope aneurism is so common—abdominal aneurism as well as thoracic—that such an inverted order of examination might lead to serious trouble. Moreover, frequent chemical examinations are just as important as frequent stomach-content analyses. If prior to the passing of the stomach tube the patient suck a strong English peppermint the throat is partially anesthetized and the proceeding is rendered less difficult in sensitive patients. Though, of course, periodic gastric crises may occur in locomotor ataxia and be due to that alone, sometimes there is a local trouble underlying or complicating the nerve storms, as in two cases which Dr. Cooper recently saw. In one there was stenosis of the pylorus; in the other, a band binding down the first part of the duodenum was demonstrated by operation. The great majority of physicians refer their gastric patients too late to the surgeons and terminal infections occur. Patients should be referred back to the physician; otherwise the primary constitutional tendencies which have led to secondary lesions necessitating surgical interference will often remain uncorrected.

DR. NORMAN BRIDGE, Los Angeles, Cal., said that one important point in the physiology of the stomach has been omitted in this discussion, and that if physicians could keep this point in mind it would simplify the subject very much. The stomach is not useful in absorption. The important thing regarding this organ is its motility, and the purpose of the stomach seemed to be to act as a reservoir to receive and to retain food for a variable period of time and to deliver it slowly to the intestine. The stomach could be left out of consideration for the business of digestion. If we could get the food out of the esophagus, through the pylorus, it then would be possible sufficiently to nourish patients. The absorption of water even does not take place to any extent from the stomach. It is a convenience to mankind to take food into the stomach at certain intervals and to go on about the business of life. If one takes too much food and absorbs too much, it is the intestines that do it and not the stomach at all. Dr. Bridge thinks that it can be shown that the stomach may directly cause such systemic diseases as Dr. McCaskey has referred to.

DR. FRANK BILLINGS, Chicago, stated that carbohydrates and fats furnish the animal body fuel. The proteid food furnishes the defect due to waste of the muscular system and other organs which perform the work for the body. The amount of carbohydrates and fats necessary for fuel for an adult will depend on the character of the work. A laboring man will require more than a man who leads a sedentary life. The amount of proteid necessary to repair the waste from muscular exertion,

etc., has been found to be only about one-half that which has been advocated for years in the standard dietaries. With this one-half the amount of proteids a nitrogenous balance may be maintained. There are fanatics on all subjects, and in this particular one those who advocate a very low proteid intake and over-mastication, as compared with ordinary chewing of food, may do things which appear ridiculous. Nevertheless, the action of these men and what has been written on the extreme side of the question by them has brought the attention of the public to the subject and in this way has been of great benefit. The lay public and many of the medical profession believe that all strength, nutrition and force comes from the proteids and especially from the albumin of meat. The fact is that the proteid is simply a tissue builder, and growing individuals, therefore, may require a considerable amount of albumin, but when the growth is once attained only that amount of proteid will be necessary to maintain good health and strength which will furnish food to take the place of the waste produced by muscular and other bodily activities. The amount of proteid necessary for each individual may differ, but only that amount will be required which will maintain a nitrogenous balance, as evinced by the nitrogenous output in the urine, feces, etc. Dr. Billings mentioned an error which may occur from the use of bread in a test meal. Sponge bread so used, even after twenty-four or more hours old, will show yeast cells in the stomach contents and may, therefore, be misinterpreted as indicating stasis of the stomach contents.

DR. GEORGE DOCK, Ann Arbor, said that he considers visible masses of mucus in the stomach contents as abnormal, but one must be sure this mucus does not come from the respiratory tract or from the mouth or be the result of awkward manipulation of the tube. On the other hand, a small amount of mucus which is visible may be present, and yet one can not say from this alone that the patient has chronic gastritis. Though the physician can not draw the line anywhere, Dr. Dock would say that in general more than from 3 to 5 c.c. is abnormal. He agreed that resorcin is an excellent test, but he likes Günsburg's better. He also agreed that not too much time should be spent in working with the decinormal solutions, etc.; but, on the other hand, a physician should have had practice with these before doing more rapid work. The examination of the vomitus he believes to be very important, but he sounded a note of warning against the use of this method as a substitute for the tube; it is a dangerous one. A patient can vomit a large quantity and yet the stomach contain still more important material. Dr. Dock has been using tests for occult blood in the laboratory, and with satisfaction. He has also looked for occult blood in the stools after excluding any bleeding points in the rectal mucosa. Delicate reactions for blood in stomach contents are easy, but one may meet with many instances in which there is no distinct lesion of the mucous membrane. He agreed with Dr. Miller regarding the test for pepsin and also for rennin. They are useful, but one can very often get along without either of them. The presence of sarcinae gives valuable information in many ways. Sarcinae are rarely found in malignant disease of the stomach. If found in large quantities it is sufficient to say that the patient has not malignant stomach disease. On the other hand, yeast is often found in gastric cancer when hydrochloric acid is still present. He is not so enthusiastic with regard to the surgery of the stomach as Dr. Walsh. He agreed that cancer should be operated on if possible. In cases of ulcer, also, he has had patients operated on and with good results. But doing a gastroenterostomy in case of ulcer does not make the patient normal. In a large number of patients, 16 or 17, who have been reported as being operated on for gastric ulcer, peptic jejunal ulcers have developed which were even more dangerous than the original gastric ulcer. This ulcer tendency can not be cured by operation, and so it is with functional disease and stagnation of food; it has not been demonstrated in cases of gastroenterostomy or pyloroplasty that the stomach is as good as before. Therefore, he thinks, physicians should take the middle ground between what Dr. Walsh has given us and those who take the gloomy aspect or conservative aspect in regard to this subject.

DR. CHARLES G. STOCKTON, Buffalo, thinks that lack of success is often due to the way in which cold is employed. If too

cold, or if too much force is employed, depression is likely to follow. Sometimes benefit is to be obtained by alternating the cold with the hot douche. He also emphasized what Dr. Manges said regarding the importance of selecting a proper stomach tube. This is a point that is often overlooked. He also agreed with Dr. Lichty that in the treatment of stagnation, which depends on atony rather than on obstruction, much can be accomplished in attention to mastication and the withholding of liquids at meals. In any case of atony of the stomach reaching to stagnation, without obstruction, one should not forget what can be accomplished through the general management of the case and general measures. He advised physicians not to overlook general innervation. On the other hand, he said one often fails to obtain success because of overlooking local treatment. He disagreed with Dr. Bridge that the stomach is practically unnecessary. Physicians are too prone to say that certain organs are unnecessary to-day. He does not believe that one can get along without the stomach, even if anastomosis is practicable. In some cases of achylia gastrica the stomach will empty itself quickly, within ten minutes after a meal is taken, thus showing an enormous motor activity. This state may be compared to that of the patient without a stomach. Yet these cases of achylia gastrica have general and local symptoms and the victims are not well people.

A CASE OF HEART GUMMATA, WITH SUDDEN DEATH.*

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On Jan. 10, 1905, Professor Dittrich, head of the Department of Legal Medicine in the German University in Prague, performed an autopsy on a woman aged 25, who had died suddenly during the night of January 8. The report from the police department stated merely that the woman had "heart disease" for some time. The heart revealed such an interesting condition that Professor Dittrich at once sent it to the pathologic institute for further study.

AUTOPSY REPORT.

The findings at the autopsy, according to the data kindly furnished by Professor Dittrich, were, briefly, as follows:

General Appearance.—The body was of medium height, stout but well built and well nourished. The brain was normal, somewhat anemic. The lungs were perfectly normal, no sign of tuberculosis being found; some of the bronchial lymph glands, however, showed the presence of calcified nodules. The liver and spleen were hyperemic, otherwise normal. The gastrointestinal tract, pancreas, adrenals, and the bones were normal.

Kidneys.—The right kidney likewise showed no pathologic changes. The left kidney, which was received with the heart, presented two deep cicatricial depressions. One of these embraced the posterior surface and outer border near the lower pole, and measured 4 cm. by 2 cm. On section, a mass of firm gray scar-like tissue was seen extending deep into the substance of the kidney. This mass appeared to consist of numerous distinct nodules of varying size, the largest 6 mm. in diameter. These tended to form a conglomerate and, on the other hand, were not very sharply separated from the kidney substance. Near the conglomerate, but separated from it by renal tissue, were several small nodules. The second depression was situated on the posterior surface of the kidney near the upper pole. It was much larger, measuring 6 cm. in each direction; but it did not extend deeply into the kidney, and showed no nodules.

Pelvis.—The urinary bladder was normal. The vagina and the somewhat enlarged uterus contained a small amount of white tenacious mucus. The uterine adnexa were firmly adherent to the surrounding tissues, and both tubes were dilated

with a watery fluid to the size of a little finger. The ovaries contained a number of cysts, some of them filled with a bloody fluid.

Heart.—The pericardial cavity contained a small amount of clear serum. Over an area of 6 sq. cm. on the anterior surface of the lower third of the left ventricle the two pericardial layers were adherent. Otherwise, the pericardium was normal with the exception of a thickened and reddened area over the left auricular appendix. The heart was markedly enlarged, especially the left ventricle. The cause of this latter was discovered on opening the heart, for practically the entire wall of the left ventricle was infiltrated or substituted by a huge mass of firm grey white tissue similar to that seen in the kidney. This mass, projecting far into the lumen of the ventricle, presented an irregularly and coarsely nodular surface.

In the opposite direction it extended in some places as far as the pericardium, in others it was separated from the latter by the hypertrophied muscle, which averaged 14 mm. in thickness. Only one area of the left ventricle was free from this tumor mass, a space measuring irregularly 6 by 2.5 cm. embracing the lower part of the septum and the adjoining portion of the anterior surface. The entire ventricle was over 10 cm. in length and 7 cm. in lateral diameter. The thickest part of the wall along the left border measured 4 cm., of which 2.5 cm. was composed of tumor. The growth had completely infiltrated the papillary muscles as well as the lateral half of the auriculoventricular ring, where a nodule of 4 cm. in diameter projected into the left auricle. In the left auricular appendix were several smooth, grayish white patches. Furthermore, the tumor extended from the upper part of the ventricular septum into the lumen of the right ventricle. The latter had in addition several small nodules in the myocardium of its right border. The right auricle was not affected, and all four of the valves were normal in appearance. The foramen ovale was closed. In the heart cavities only fluid blood was found. The aorta was in general normal; only just above the aortic valve and in the arch were minute grayish yellow thickenings of the intima.

HISTORY OF CASE.

These findings appeared to justify a tentative diagnosis of a gummatus affection of the heart and kidney. Consequently, investigations were promptly begun as to the history of the case, and for the success of these researches I am indebted not only to Professor Chiari, who gave me most valuable assistance and advice throughout, but also to the painstaking investigation of privatdocent Dr. Ferdinand Pecirka, *Polizeiarzt* in Prague. Further information was kindly furnished by Prof. Filip Josef Pick of the German dermatologic clinic, and Professor Janovsky of the Bohemian dermatologic clinic.

The history of the case is as follows:

Patient.—K. Z. was born in 1880. Her father is still living at the age of 62. He was formerly a soldier, has always been healthy though not robust, and has had numerous children from two marriages. The mother was an illegitimate child, had five children, and died at the age of 36. Further details about her are not known. The patient had none of the important diseases of childhood. On March 26, 1896, she applied for a license as prostitute. As, however, she had not at that time had any venereal trouble and further had not practiced prostitution regularly, her application was refused. On May 5, she again applied with the statement that she had been treated for gonorrhea and a soft chancre. The license was then granted. Her statement was accurate, since she had actually been in Prof. Janovsky's clinic from April 4 till May 5. The diagnosis was *Ulcus molle commissuræ. Blennorrhæa chronica urethræ et cervicis*. Gonococci were present. There were no general symptoms.

Clinical History.—On Oct. 9, 1896, she entered Professor Pick's clinic with the clinical diagnosis "*Lues condylomatosa*." At that time she presented a general maculopapular skin eruption; squamous eruption on the palms; ulcerated mucous patches in the mouth, on the palate, and tonsils; syphilitic

* From Professor Chiari's Pathologic Institute in Prague.