way of reacting to stimuli by environment and training, and not because there is any actual change in the structure of the nervous system, but there are certain predispositions towards activity which can best be expressed physically, but which are not dependent upon real innate structural bases. The fact that many so-called neuroses occur after infections or injuries or physical disturbances is due to the fact that that patient has already in himself a mental disposition to the kind of thought which we call a neurosis. When we detect, for instance, a man with general paresis who reacts in the same grandiose fashion, it is because the nature of the reaction is being overclouded by his educational attainments, which makes him behave in this improper way. His cortical control is diminished by disease. He acts in a grandiose fashion. If a man engaged in business gets arterio-sclerosis of the cerebrum, what happens? He loses the power of decision. Why? Because of the elaborate processes necessary for decision. That is not a neurosis at all. These conditions are merely expressions of the physical condition of the nervous system at the time, made possible by the dispositions of the individual gained by his training in the first place.

Again, pain in the epigastrium or uterine disease is not a neurosis. It is a referred pain.

As to a heart lesion causing neuroses, we all know how very closely associated with a general falling tone is the integrity of the cardiac force. We know of the anxiety and of the feeling of impending death when the cardiac muscle suddenly ceases to perform its work properly. Toxins often have that effect on the heart.

Dr. J. Allison Hodges, Richmond, Va. (closing the discussion): My purpose in bringing this subject before the meeting was to stimulate the younger members of the profession to greater faithfulness, if possible, and accuracy in diagnosis. It was my wish to be suggestive only, and to put all of us, as it were, under suspicion when we see such cases in our offices and be ready to value these cases properly, and remember that when it comes to the treatment, we are to consider not only the disease, but the patient plus his individual disease. I wish to say this, that a correct and proper definition of neurosis is an academic question which should be discussed among ourselves here. It is almost impossible of definition, and yet I believe that there is such a condition existent in many cases, but my object was to suggest that we are not to make it the dromedary to carry the burdens of our unscientific diagnoses. I wish to say to you that this whole question is of the greatest importance, because Dr. Gordon has brought out the point that if infections are the source of neuroses, either of psychogenetic or somatogenetic origin, there was a time when these infections were acute and might have been throttled and these neuroses thus prevented. Furthermore, I wish to say this, as Dr. Clark has brought out, that it is of great importance for us when we have a case, to decide definitely, if it be possible, whether the neurosis was inherent or whether it is simply coincidental or resultant from the infection that may be present. I might mention to you a case of melancholia I saw not long ago for which I could find no tangible reason or cause, either in

heredity or environment or otherwise, and yet three months later I found that there was infection of the frontal sinus which unquestionably was the point in that case that I should have determined earlier. It is for this reason that I have called attention to this subject, in order, if possible, that we may be more accurate and more scientific, and that the future shall limit the neuroses even more than has been done in the past, because of accurate observation and scientific treatment.

DUODENAL ALIMENTATION.*

BY CAMP STANLEY, M.D.,
Washington, D. C.

Perhaps the greatest field for duodenal feeding is in those cases of gastric ulcer which have not yielded to medicinal treatment and where the indications for surgical intervention are not clearly defined. The direct aim of this method is to relieve the stomach of all work, and to remove the mechanical irritation to a sensitive and disorganized mucous membrane, which under ordinary circumstances is the case when the patient is put on an ulcer diet and food allowed to pass through the stomach. It also obviates the stimulation to gastric secretion which in a large percentage of cases has an excess of HCL, the food, in the tube cases, passing directly to the duodenum, into alkaline reaction. The simplicity in passing the tube into the stomach which in turn passes it to the duodenum without any further effort on the part of the physician, makes it a method which commends itself for its simplicity, comfort to the patient after the first twenty-four hours, and accomplishing absolute rest for the stomach, maintaining the body weight, and relieving the gastric distress. We often see in these cases a definite and particular aversion to food. With the tube in place we have the patients at all times ready for nourishment independent of their personal wishes, and frequently I have seen them receiving

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nourishment while asleep. There are two methods of carrying out this treatment. In one the patient feeds himself with the aid of a small glass syringe. The second is a method which depends upon gravity and is a modification of the Murphy drop method. The former method has many admirable points, chief among which is, that in those cases where the symptoms are of a mild character with only a very faint stain on the thread and no occult blood in the feces, in these cases where the complete rest of the patient is not so essential and it is unnecessary to put the patient in bed, the treatment can be carried out while the patient is up and around the house; while in the latter method, which is more applicable to the cases of a severe type, where the symptoms are more pronounced, and it is essential to have complete rest, the drop method is by far the most satisfactory one in my opinion, and can be carried on with little inconvenience. Of course, it is better to have a nurse attending to the details, although a member of the family can be instructed and carry on the treatment very nicely. The only difficulty that I have ever experienced was in keeping the feeding solution at the proper temperature, and this can be overcome by surrounding the jar with hot water bags.

The technique of introducing the tube is very simple. The patient is in a sitting position and is told to take a swallow or two of warm water. The tip of the tube is then given with another large swallow of water and introduced very slowly, to prevent it from doubling upon itself. When the proper mark is reached on the tube we know that it is in its proper place, and it usually requires two or three hours to pass through the pylorus. Its presence in the duodenum is readily determined by aspirating and recovering a small amount of liquid, which, if from the stomach, is acid in reaction, and alkaline if in the duodenum. There are some cases, however, which have a marked pylorospasm, and there is a consequent delay in the passing of

the tube to the duodenum. The other points in recognizing the position of the tube are simply determined. Thus, a swallow or two of milk will promptly color the aspirated fluid if from the stomach, whereas the secretion which is recovered from the duodenum is, in the first place, difficult to obtain because it is usually empty, and when it does appear in small amount it gives the alkaline reaction. There are two other ways of determining the location of the tube: by introducing air it is felt in the stomach, whereas if it is in the duodenum it causes no discomfort. Of course, the most positive way of all is the X-ray, but entirely unnecessary as the simpler ways answer very well. In those cases where the tube is delayed in reaching the duodenum the patient can be given liquid food by mouth every two hours, and usually at the end of three hours duodenal contents can be aspirated.

The procedure after the tube is in place is not complicated, and the success of the treatment is now dependent upon careful attention to details, which may seem trivial, but in reality are of the utmost importance.

1. The nourishment must be maintained at body temperature.

2. The solution must be strained through muslin to avoid the stoppage of the tube at the bulb end. If this precaution is taken it may obviate the necessity of removing the tube, causing mental and physical discomfort to the patient. In only two of my cases has it been necessary to remove the tube, and when the tip was taken off of the button I found a small mass of threads, and under the microscope they proved to be cotton threads. I learned later that the nurse had used ordinary cut gauze to strain the solution.

3. The third point is extremely important. Clean the tube after each feeding by passing through it a small amount of warm water, followed by a syringe full of air, so that the tube may be kept empty. Attention must be paid to the patient's mouth and a good mouth wash used often.

The actual feeding is carried on as follows

on a basis of maintaining the body weight by giving the proper number of calories during the eight feedings in the twenty-four hours. As a fewer number of calories are required to maintain the nitrogen balance when the body is at complete rest, the estimated number of calories (2,900 or 3,000) is in excess of the required number, and is a substantial aid in the building up process. The patient is fed the first day every two hours, a mixture of milk, milk sugar and one raw egg, commencing with small quantities, three ounces, and gradually working up to seven or eight ounces, the feedings commencing at seven a.m. and the last one at eight p.m. Occasionally when the solution is given too rapidly the patients complain of flatulency and abdominal distress. This can be obviated by lengthening the feeding time. I wish to again emphasize the importance of turning off the tube stop cock as soon as the feeding is completed and before the tube is disconnected from the feeding jar, to prevent a regurgitation of trypsinized milk, which is apt to clog the tube; and also to emphasize the importance of passing an ounce of warm water through the tube after each feeding. The class of cases best suited for this method of feeding are those in which there is a marked excess of acid, which is the greatest single factor that prevents an ulcer from healing. The method is not always a success, but if it does not accomplish the desired results, it is beyond all doubt a true surgical case and as such it is a better surgical risk for having undergone this treatment. In those cases where the thread shows the ulcer to be at the pylorus or within six or eight centimeters of it, there may be a very obstinate pylorospasm which prevents the passage of the tube to the duodenum. If such is the case it is indeed a very difficult one to handle, and perhaps makes it necessary to have a gastro-enterostomy done. It is because of the great danger of a developing malignancy on an old ulcer site that makes this condition and its treatment one of the greatest import-

ance. This method of giving rest to the upper digestive tract is not limited to the treatment of gastric ulcer and duodenum, but is found extremely useful in many other conditions in cases of hyperacidity where the acid content remains high over an extended time. Also in chronic liver affections, where it is desirable to relieve the liver of additional work, in persistent vomiting conditions, and in giving medicines which are apt to disturb the stomach, such as thymol and male fern. That this method of treatment is always a success would be rather an extravagant statement, and is well exemplified in the following case, which at the outset gave hopes of excellent results:

Mr. D. W., age 50, referred by Dr. J., consulted me on April 26, 1914, complaining of the following symptoms: (a) Intense gnawing sensation in epigastrium, more pronounced two or three hours after meals, and relieved by eating. (b) Pyrosis. (c) Eructating gas. (d) Dull pain at times in epigastrium. This man was 50 years of age and had had digestive disturbances off and on for ten years. Gastric analysis showed free hcl. 20 and total acidity 36, with no occult blood. Three thread tests were negative. Feces showed poor fragmentation, undigested food and no occult blood. Examination of abdomen showed a palpable gall bladder and slight tenderness on deep pressure over pylorus. Splashing sound over upper two-thirds of epigastrium. No other points of tenderness in abdomen. X-ray examination confirmed the diagnosis of gastric ulcer, and on April 29 he was put on duodenal feeding and at the end of nineteen days the tube was removed and the patient put on a modified diet and minute instructions as to his daily regime. His reports, which were sent in from time to time, were favorable up to the 15th of August, when he complained of nausea and vomiting. On the second of September I saw him again at my office and gastric examination showed free HCl a faint trace, while the total acidity was 2, a reduction of 34 in the latter and 18 in the former; positive reaction for occult blood in ten seconds. Examination of abdomen showed a thickened infiltration of the stomach wall, absence of splashing sound; feces showed a faint reaction for occult blood.

Now this was a case in which the findings

at examination strongly supported the diagnosis of ulcer. There were, however, a few points that suggested malignancy but they were very vague; such as his age, history of digestive disturbances, and rather low acid content, all of which might appear in the symptom complex of sub-acid catarrh. For two months after the removal of the tube he gained in weight and the blood improved. At the present time his white count is 16,000 and the polymorphonuclears 82 per cent. His vocation is that of an electrician.

Case No. 2.—Mr. C., 52 years old, National bank examiner. Digestive disturbances for three years. (a) Cramp like pain in epigastrium, pyrosis, eructating gas, and at times regurgitation of acid contents. Gastric analysis showed free HCL 56. Total acidity 70, faint trace of occult blood. Thread test positive stain 4 cm. from pylorus. Considerable six-hour residue. Splashing sound over entire epigastrium to one finger's breadth below navel. At times his attacks of pain were so severe and sudden that he fainted. On examination of the abdomen a well-defined sensitive area was found in the region of the pylorus and considerable pain was elicited on deep pressure. This case was put on duodenal feeding and the tube remained in place twenty-two days. Since then he has been completely relieved of his old symptoms and a gastric analysis, made three months after this treatment, showed free HCL 42 and total acidity 60.

The next case is of interest because it demonstrates very well the futility of treating a well defined case of ulcer medicinally when we have this means at our command.

Mr. R. L. W., motorman, 25 years old, came under my observation November 20, 1913, with the following symptoms: (a) Pain in epigastrium between meals and relieved by eating. (b) Vomiting on an average of three times a week. (c) Eructation of gas. (d) Constant nausea. (e) Constipation. Gastric analysis showed free HCL 72 and total acidity 90. No occult blood in the stomach contents. Blood was found in the stool on a meat free diet in eight seconds. No six-hour residue. I put him on the medicinal and dietetic treatment for four months with some improvement, and at times his stools were free of blood and he gained six pounds, but he was never entirely free of all of his symptoms, so on

the 19th of March, 1914, he was put on duodenal feeding for eighteen days. There was a complete subsidence of all symptoms, and at the present time he is quite well.

On February 2, 1914, Mr. G. F. S. consulted me complaining of intense, burning, acid eructations, pyrosis, nausea and headaches. Gastric analysis showed free HCL 60 and total acidity 64; no occult blood. Examination of chest and abdomen negative, excepting the absence of splashing sound. Thread test at this time was negative. No occult blood in the feces. Blood examination normal. Urine normal excepting a large trace of indican. For three months he was on the medicinal and dietetic treatment. On April 11 the thread test showed a running stain near the pylorus, and on the 13th he was put on duodenal feeding. With the exception of a nervous chill he made an uneventful recovery, the tube being removed on the twentieth day. For some time after this he complained of a sensitive spot in the epigastrium. A second gastric analysis showed a return to normal of the total acidity and nearly normal percentage of free HCL. He has gained six pounds. In this case the nervous phenomenon were rather pronounced and made it a more difficult case to handle.

On April 23, Miss M. S. consulted me. Her early history was negative with the exception of being a delicate child and from time to time having mild digestive disturbances. During the previous year and a half she complained of being nauseated immediately after each meal, and would occasionally vomit. She had frequent severe headaches, pyrosis and eructations. There was a well-defined stain on the thread a few cm. from the pylorus; gastric analysis showed free HCL 80 and total acidity 98. No occult blood. Feces negative. Heart and lungs normal. Examination of abdomen: Well formed, splashing sound over upper two-thirds of epigastrium and to the left mammary line; some tenderness over the region of the pylorus on deep pressure; abdominal walls very much relaxed; haemoglobin 75 per cent, leucocytes 6,800, while the polymorphonuclear count was normal. Urine normal with the exception of a heavy trace of indican. I explained to her the extreme importance of undergoing treatment at once, as I expected to leave for Europe on the 30th of May and did not believe that she ought to go through the summer without treatment. On my return in September I found her in an extremely poor condition. She had spent two out of every seven days in bed and was now complaining of a dull

pain in the epigastrium. I started her at once upon duodenal feeding every two hours and a large, hot flaxseed poultice every two hours, with a cold abdominal bandage at night. At the time of writing this she is free of her symptoms and the tube is still in place.

I have brought to your attention the above cases chiefly because they represent the very best results of duodenal alimentation and have purposely omitted the reporting of cases which were of no special interest and made an uneventful recovery. There is one more case of which I will speak, because it presents rather an unusual development. After the introduction of the tube his salivary glands became exceedingly active, and in twelve hours over 55 cc. were secreted. Much of the mucus was ropy and thick, and caused a great deal of discomfort. The following twelve hours 500 cc. were secreted. Much of the mucus secretion has gradually diminished, but even at the present time it is excessive and requires the use of belladonna in quarter grain doses, given by tube. Of the simpler cases many more could be cited to illustrate efficacy of this method in the treatment of gastric and duodenal ulcers. Of the other conditions in which duodenal feeding is applicable perhaps its use in gastroptosis comes first, as in this condition we have usually a dilated stomach in addition the mal-position, and the stomach is quite as incapable of emptying itself, due to its impaired muscular tone and the increased angulation at the pylorus, and not sufficient food is allowed to pass the pylorus to properly nourish the patient. Consequently by the duodenal method of feeding the patient is properly nourished and the stomach is given a complete rest.

In closing I desire to speak of the relation of the thread test to duodenal feeding. It has been my practice until recently to give the thread after completing this treatment, and while it is extremely interesting and gratifying to get a negative thread, I do not believe it to be the best thing to do in all cases, as in a small percentage of cases I

have discovered a faint stain, and in the eyes of the patient the treatment has been a failure, whereas in reality the treatment has been successful and their symptoms are entirely relieved. They commence at once to gain in weight. My disinclination to give the thread is because of the psychic effect on the patient, and the explanation for those cases in which a faint stain is found lies in the fact that there probably were multiple ulcers originally, of course confined to a very small area, while the ulcer that caused the symptoms is now healed; and that the second or late stain is probably due to some small, superficial ulcers, whose penetration has been slight and which is slowly healing and which later, as the patient's general condition improves, entirely heals. Otherwise we would have a recurrence of the old symptoms. Up to the present time I have not had a single case which has had a recurrence, consequently I am firm in my belief that this is the explanation. In January, 1911, it was my pleasure to take a duodenal feeding outfit to Prof. C. A. Ewald from Dr. Max Einhorn, the originator of this method, and to whom the greatest possible credit must be given. It is one of the great achievements in successfully treating gastric and duodenal ulcers, which heretofore have required many weeks in bed and with very little assurance of a successful outcome.

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DISCUSSION.

Dr. J. Clarence Johnson, Atlanta, Ga.: Dr. Stanley has presented to the Association the discussion of a method of feeding which I believe holds much promise for the profession in the future. The main objection to it is the absence of the spectacular, and because of this absence it is less appealing.

He has in a very practical way demonstrated the utility of the method; also, he has mentioned the simplicity of it. That is another objection to it, and yet, on the other hand, when we realize the truth of the fact that simplicity in our methods means more than anything else it gives us greater confidence in it.

His paper was so suggestive that it is hard to select the proper things to say, although so much can be said. An effort of any kind which will give us further knowledge of the duodenum ought to be attractive, ought to be of interest, not only

to the physiologist, the pathologist, the internist and the therapist, but should be of no mean account to the surgeon. The truth of the matter is that disorders of the appendix, the gall-bladder, the stomach and the rest of the tract have spoken with such loud voices and have manifested themselves with such evident objective symptoms, that this little quiet, unobtrusive organ has been neglected, and yet we only have to stop for a moment to consider that, when viewed in all its complications, it is really the melting pot of the alimentary canal. In no other part of the body is there such a complex action; in no other part of the body is the function so fundamental and so essential and so consistent and so dependable as in the duodenum, and in no other part of the body is there such a fine adjustment for chemical action as in the duodenum. There is no other organ in the body so tolerant as the duodenum. It has been less abused than the liver, it is true, in the minds of the profession.

I have great respect for the duodenum. I have more awe for it than I have respect, because I know less about it than any other part of the alimentary canal.

There is much to be considered in the use of duodenal feeding. I do not pretend to be fully familiar with all the work that has been done in the way of research or practical experimentation, but I have seen the method employed by others with excellent results. I have used it in my own work, and perhaps it is not irrelevant for me to say that I not only use it for feeding in the common acceptance of that term, but for systemic medication and for local application to the duodenum. The doctor evidently had that in mind when he read his paper, but did not have time to bring it up.

Dr. Philip S. Roy, Washington, D. C.: One of the most important things about duodenal feeding is its simplicity. Dr. Stanley is a skilled man in his line of work, but he tried to impress upon you that any physician in this room can use duodenal feeding. It is simplicity itself and the apparatus is not expensive, and therefore duodenal feeding can be used by every physician.

Dr. Stanley touched on diagnosis. In the last year or so there has been a great deal of discussion about finding occult blood in the feces. One speaker at the A. M. A. meeting at Atlantic City last June said he could find occult blood in the stools at all times. Another point in connection with diagnosis is the string test. Tie a shot to a string and let the patient swallow it. The next morning you pull it up and if you find the string blood-stained it is fair to assume you have an ulcer. Of course you may have cancer, or a juicy mucus membrane, but if you also have high acidity, which does not usually occur in malignant disease, you greatly strengthen your diagnosis of ulcer of the stomach or duodenum. I have on two occasions found, on feeding for duodenal (not gastric) ulcer, that the tube did not go down far enough to be below the ulcer, and therefore duodenal feeding was as painful as by the mouth.

Dr. Camp Stanley, Washington, D. C. (closing):

In answering the question referring to the thread test, I wish to say that instead of attaching a BB shot, which is enclosed in a three-grain capsule, to the end of the thread, I now give it in all cases without the shot, thus doing away with the possibility of irritating the gastric mucosa, at the pylorus, a point which is the site of 70 per cent of all gastric ulcers. Without the shot it also minimizes the possibility of pylorospasm. The thread usually passes into the duodenum without difficulty, whereas frequently when the shot-thread is given, the shot lies in the stomach all night.

With reference to the efficacy of the occult blood reaction as confirmatory evidence of gastric or duodenal ulcer, I can but repeat what all laboratory men claim is the greatest single factor in getting a positive or negative reaction, and this is—careful technique—and it is exceedingly important. Where the technique is faulty naturally the results are inaccurate, but men doing gastro-intestinal work attach the greatest importance to finding occult blood when a patient is on a meat free diet and presents symptoms referable to the gastro-intestinal tract.

Dr. Johnson spoke of other conditions of the duodenum in which the method is applicable. For instance, in catarrhal duodenitis it can be used with excellent results. It is strongly indicated in that condition. Dr. Roy spoke of cases of duodenal ulcer in which he had a little abdominal distress after feeding. In my experience I have had a few cases in which abdominal discomfort followed the feedings, but in every instance this discomfort disappeared when the feeding solution was given slowly, and at the proper temperature. The tube should also be introduced four inches more into the duodenum. I now use a specially designed metal hot water bottle, which carries the rubber feeding tube through its center, and in this way I have overcome one of the greatest difficulties of this method of feeding, as now the solution is always at the proper temperature and the patient is entirely comfortable.

AUTHORS' ABSTRACTS.

Medicine.

Pyorrhea Dentalis and Alveolaris: Specific Cause and Treatment. By C. C. Bass and F. M. Johns, New Orleans, La. *Journal of the American Medical Association*, February 13, 1915, pp. 553-558.

Bass and Johns think that the prompt improvement coincident with the disappearance of the endamebas as a result of specific treatment, prove that they are the specific cause of the disease.

SUMMARY.

1. Pyorrhea dentalis and alveolaris is practically a universal disease, which leads to the loss of the teeth by a long suppurating process. All people have it sooner or later. It begins in early adult life or earlier.

2. The specific cause of the disease is *Endameba buccalis* and possibly other species, which infect and destroy the periodontal membrane. The pyor-