

Conclusions drawn from the author's personal researches.

(1) Traumatic tetanus of the horse and mule is, at least sometimes, if not always, an infectious disease, transmissible to other animals, and therefore possibly also to man; and during the progress of this disease a virus is elaborated and multiplied which is capable of producing the same infectious disease in some other animals when placed beneath the dura mater of the cerebrum.

(2) This virus is contained in the medulla and spinal marrow of the animal suffering the disease. It is, like the virus of hydrophobia, capable of being strengthened in virulency by inoculation sub-dura cerebri from rabbit to rabbit, and, like the virus of hydrophobia is capable of attenuation by exposure for a sufficient time to the action of dry air at a temperature of summer heat, and still again like the rabic virus, its effects are far more intense when the virus is inserted beneath the dura-mater cerebri than when injected beneath the skin or between the muscles of the back.

The author reserves his conclusions concerning a prophylactic effect of inoculations of the attenuated virus, until the completion of experiments which are at present in progress.

Conclusions drawn from the author's experiments when correlated with those of Nicolayer, Carle and Ratone, Rosenbach, Ferrari, Flügge, *et al.*

Traumatic tetanus of the lower animals and of man, at least sometimes, possibly always, is a specific infectious disease due to the action of a specific infectious virus which exists in the tissues at the seat of infection, in the blood and in the central cerebro-spinal nervous system.

In view of the experimental evidence which we possess at present and of many unassailable observations of many surgeons and veterinarians, there seems to be ample warrant for the admission that not infrequently tetanus in man is acquired directly and indirectly from some of the domestic animals, notably the horse, which surround him.

THREE CASES OF DYSPEPSIA.¹

BY ELBRIDGE G. CUTLER, M.D.

Of the cases I am about to report, two illustrate the favorable result sometimes obtained by attending carefully to the diet. The other shows the advantage which may be gained at times by simply washing out the stomach.

CASE I. Miss P., aged twenty-two, had suffered from dyspepsia somewhat for five years, or ever since she had been a school-girl, and of late it had gradually become much worse. Her menstruation had been regular up to the previous spring, (she was first seen Dec. 23, 1882). It then became irregular, and since August of that year she had not menstruated at all. For several years her bowels had been constipated. All kinds of food after a time hurt her. She had got to taking less and less and changing from one thing to another, till she hardly knew what she could do in the way of digestion. She had been under treatment most of this time. She suffered from curious sensa-

tions in the head, due, I thought, to anæmia, and complained of having a veil over her eyes. She was pale, anæmic, emaciated, her sleep was disturbed by restlessness and dreams, the bowels were constipated. She had to keep her bed most of the time. The pulse was 80, small, soft, and regular. The cardiac area of flatness was normal, physical signs in the chest negative, except there was a venous hum in the neck. The epigastrium was not sensitive to the touch. The stomach as determined by percussion was rather small. The weight was about ninety pounds. The amount of urine in twenty-four hours was about one and a half pints. It contained much mucous and flat epithelium and a trace of albumen.

I began the treatment with raw oysters, milk, and milk and raw eggs, and a little Carlsbad salts in hot water in the morning; gradually increasing the quantities of food for four days, when she began to sleep better and I added dialysed iron. Two days later, I gave in addition malt and buttermilk. Two days later, half a pint of water was added. A few days later I gave the *syrupus hypophosphitum compositus*. On January 4th, the bowels had been doing very nicely and I added rock-salt to her morning bath. She was then passing one quart of urine in twenty-four hours. On the 17th the pulse was stronger, there was more color in the face, she was getting fatter. She was taking food and drink in sufficient quantity at regular intervals which was fairly well digested. The bowels were attended to daily. I then added passive movements to the treatment. The 25th she was sleeping well all night, and had had no trouble with food for several days. The dialysed iron was changed to *ferrum reductum*, and emulsionized cod liver oil was added to the treatment once a day. February 17th, had done splendidly in every way. Menstruation had come on since the last visit, and food had disagreed a little during that time. On March 28th, I made out a regular diet list and left her in the hands of her nurse, a most faithful, conscientious person. On July 26th, I saw her and found that she weighed one hundred and forty pounds, (she was five feet seven inches tall), she was looking remarkably well, and said she never felt better in her life. Since then, with the exception of occasional slight temporary fits of dyspepsia, she has remained perfectly well.

CASE II. Miss H., aged eighteen, as a child was always well and strong. Menstruation began regularly at the age, I think, of fourteen, and continued till eighteen months or two years ago, when, having had dyspepsia for two years and being run down, the menses ceased. Her food had hurt her constantly all this time and one article after another was omitted from her dietary till at last it became very meagre. She was sent to the mountains and the seashore without avail. The drug treatment consisted of pepsin, soda mint, hydrochloric acid, and some other things, and finally peptonized milk was added. In spite of what was being done she steadily became worse during the twelve months before I saw her, which was in November, 1885, so that at that time though five feet and eight or ten inches tall, she was very much emaciated, and weighed but 86½ pounds, when in ordinary street costume. The extremities were cold the whole time, the face was pinched, the hands suggestive of bird's claws. She was very restless, wanting to be constantly on the move, she slept poorly, had bad dreams, suffered from

¹ Read at the annual meeting of the Suffolk District Medical Society, April 30, 1887.

headache, and on starting to do anything she would stand about in a hesitating, helpless way which was at times almost painful to witness. She was rather listless, and although answering questions about her health readily, she evidently regarded the inquiries as a bore. Little positive could be made out in reference to the digestion of different articles of food by questioning, except that it was generally bad. Physical examination of the chest revealed nothing abnormal.

Forty-four ounces of urine were passed in twenty-four hours, and except an increase in the amount of indican and mucus, and a diminution of about one-quarter from the average amount of urea passed in health, it was not remarkable. The abdomen on physical examination was not abnormal. The stomach was diminished in size. There was slight epigastric discomfort on pressure. The skin was rough and scaly, especially on the face and limbs.

I began by prescribing a fixed diet for the next three days and before each meal a dose of gentian, and every morning a dose of Carlsbad salts in hot water to push on the contents of the stomach and prepare the way for the food of the day. I gave the Rabuteau's dragees and a preparation of maltine as a drink with breakfast. I gradually added to the dietary, seeing her every three days for a time, and by degrees lengthened the interval of my visits. On January 4, 1886, the weight was 88 pounds. On January 7th, I changed to Sedleitz Chanteaud,² and soon after began Koumiss. On February 20th, she was taking Sedleitz Chanteaud in the early morning, quassia before meals, Koumiss with dinner and supper, emulsionized cod-liver oil after meals, one Rabuteau dragee in the morning, peptonized milk between breakfast and dinner and between dinner and supper, and malt with breakfast. She weighed that day 97 pounds. By March 20th, she had reached 100 pounds. By April 17th, 107 pounds.

May 1st, she weighed 106 pounds; May 15th, she weighed 108 pounds; June 12th, she weighed 112½ pounds.

July 26th, she took ordinary meals with Koumiss and peptonized milk added, other things being omitted. September 10th, she weighed 126½ pounds. The menstruation had returned. October 23d, she weighed 136 pounds, and as that was the limit I had set, I omitted all treatment except that I insisted on her maintaining a certain proportion of the different kinds of food. April 17, 1887, I saw her, and found that she had been well all winter, had gone out to balls, parties, theatres, etc., and then weighed, in her spring costume, 130 pounds, which was ten pounds more than she desired.

These two cases are good examples of a type we frequently see, occurring chiefly in young women of the better classes who have recently passed from the school-girl romping period of good health, to the young lady period of private lessons, insufficient exercise, improper diet, constipated bowels, painting and general culture, the pernicious club (sewing or social), and afternoon teas. They first get deranged by insufficient outdoor exercise, and by an improper proportion of albuminates, fats and sugar or starchy foods in their diet, and by their general unhygienic life. The next step, which is a short one, is to indiscriminate or illogical dosing, and from that time the mis-

² A quite pure French preparation in form conveniently handled.

chief is accomplished. The cases also show the absolute necessity of accurately knowing from personal observation the exact condition of the patient's digestion. By this means only, by patient and persistent observation, can one know whether the proper proportions of the different articles are consumed and be ready to supplement any deficiency. A drug treatment without such knowledge I should strongly oppose. A second very important point, it seems to me, is the giving of a certain amount of food, beginning with a little less than is the proper average, and gradually increasing the amount, and at the same time insisting on the patient's taking it in spite of pain or other discomfort at first. I attach considerable importance also to the daily giving of a proper dose of Carlsbad salts or Sedleitz in the early morning.

CASE III. Dan. McNeil, aged thirty-five, married, a machinist by trade, born and living in Boston, came to the Massachusetts General Hospital, November 10, complaining of gastric trouble. There was constant pain in the epigastrium a short time after eating, eructations of gas, and often, at some time in the day, an attack of vomiting, most frequently occurring in the morning. These symptoms had existed for five months, but had gradually become worse, and were associated with constipation. He was frequently detained from work. A careful physical examination of the chest showed no abnormality. The vomitus was very frothy. The abdomen was fairly prominent; the stomach, on percussion, certainly was not enlarged. There was a little tenderness in the epigastrium, at the lower end of the xyphoid cartilage. As it was believed that fermentation was occurring in the stomach, he was advised to allow the organ to be washed out. On full explanation, he readily assented, and, accordingly, a tube, such as is shown, was passed in, and one quart of warm water was carefully poured in, to which a teaspoonful of boracic acid had been added: part of this fluid was withdrawn by syphonage once or twice, and then nearly one pint was left in the stomach, to act as an anti-ferment. One week later, the patient reported again as having been very much improved. The gas was no longer passed, pain was much less; there had been no vomiting. He had gone back to his work from the hospital that day, and had pursued it steadily since. So much pleased was he with the effects of the treatment, that he had brought back with him a friend similarly affected for like relief. The procedure was repeated, and the patient went to work. On the 24th, he reported as being practically well. The washing out was performed again, and he was discharged well.

The mechanical treatment of gastric disorders was made use of by the ancient Greeks. In the time of the Roman emperors, a number of instruments were in use to facilitate vomiting, used chiefly in cases of poisoning. They consisted essentially of a leather cap to go on the finger, or a feather with which to irritate the pharynx.³ At the end of the seventeenth century, the direct treatment of the gastric mucous membrane was in vogue in the use of the stomach-brush. The handle of the instrument, twenty-six inches long, consisted of a twisted brass wire, wound with silk thread. On the lower end of it was a small brush, three inches long, two inches broad, made of goat's beard or horse-hair.⁴ In the eighteenth century, the elastic catheter

³ Leube. *Magensonde*, Erlanger, 1879.

⁴ Leube. *Loc. cit.*

was recommended for the purpose of exhibiting food and drugs. Hunter used hollow bougies or flexible catheters for this purpose. Soon followed the first attempts at emptying the stomach of its contents by means of a pump. The English surgeon, Bush, was probably the first who pumped out a stomach. In cases of opium-poisoning, he fastened an elastic, hollow tube to an ordinary syringe, injected water, and then pumped out the diluted contents of the stomach.

In the second decade of the present century, different sorts of stomach-pumps were devised by several different persons, and, as sounds, either gum-tubes ending in a perforated ivory knob, or flexible elastic tubes with rounded ends and two openings at the sides, were used. These instruments and methods were never in general use, and soon were forgotten. Our own countryman, Dr. Sommerville, of Virginia, proposed, in 1823, to syphon out the stomach, and took a flexible tube, four feet long, to wash it out, one end being arranged to pass into the stomach, and the other end being armed with a funnel.⁵

To Kussmaul, the German, however, belongs the honor of first having called general attention to the benefits to be derived from the systematic use of the stomach-pump, in his work on the treatment of dilatation of the stomach, in 1867; and through him the mechanical method was introduced into general practice, and has become, since then, a more or less general procedure. Since Kussmaul's work, the progress has been made of using the syphon, instead of the pump, which must be regarded as a great advance, and due largely to Oser,⁶ of Vienna.

The mechanical treatment of the stomach may be divided into three procedures: the catheterization of the œsophagus, the emptying of the contents of the stomach, and the local treatment of the gastric mucous membrane.

I. Before proceeding to *catheterize* the œsophagus, a careful examination of the cavities of the mouth and throat are to be made, to see, first, if the instrument can be passed at all. An abnormally narrow throat, very prominent tonsils, cicatrices, tumors, adhesions, may present an absolute bar to the passage of any instrument.

Quite as important is an accurate examination of the circulatory and respiratory organs, because severe, non-compensated, cardiac lesions, aneurisms of the aorta, advanced phthisis, present contraindications to catheterization, or, at least, demand extreme care, on account of the liability to spasm. Acute and chronic laryngeal catarrhs also interfere, for, as soon as one gets near the larynx with the catheter, an attack of laryngeal spasm may occur, which makes the patient, as well as the physician, think he is going to suffocate. The instrument is either the one of soft rubber, which I pass round, or a stiffer one, with a bell-mouth. The length of the tube is about thirty inches.

In passing it in, the patient sits with the head thrown slightly back and the mouth wide open, the index finger of the left hand is placed on the tongue, and the right hand passes the tube, wet with water, or better, milk,⁷ to the back of the throat, and the patient being told to swallow, the point of the catheter is passed down, so that the constrictors of the pharynx grasp the end, and the instrument is then rapidly pushed down dur-

ing repeated acts of swallowing. Long breaths minimize the sense of choking often experienced. The tube must be passed, at least, twenty-eight inches, as eighteen inches represents the distance from the teeth to the cardiac end of the stomach (sixty or seventy centimeters is the rule). According to Penzold's investigations, a sound three-eighths of the length of the body suffices to reach the deepest part of the stomach.

The advantages of the soft tube are the almost impossibilities of causing injury to the œsophagus, as it bends and turns round or returns and does not perforate the tissues in case of meeting with an obstruction. It cannot injure the gastric mucous membrane when with ordinary care. It may be used to rouse the gastric muscular contractions without injury, which are of great assistance in syphonage.

The disadvantages are that it is sometimes grasped and compressed by the muscular tissue so that it cannot be passed, or its lumen becomes closed when it has reached the stomach, so that it is rendered useless for the purposes of syphonage. In this case the stiffer tube is to be used.

II. The emptying of the gastric contents.

(a) Solids and fluids. For this purpose the pump and the syphon are used. The pump is the ordinary one used for aspiration, and may be attached to the end of the flexible catheter. The chief disadvantage of its use is the danger of aspirating some of the gastric mucous membrane and tearing it off. It is, however, to be used when all the contents are to be removed unchanged for a chemical or microscopic examination, and in most cases of poisoning.

The simpler and easier method is the syphon, which must be at least two meters (six feet) long. The catheter is to be filled with water and passed in and then a tube of the same length and diameter may be attached to the outer end by means of a glass tube, and the lower end sunk below the epigastrium or to the ground, when the contents, such as will, may run out. Sometimes it will be necessary to let a little fluid run in, half a pint or less, in order to start the flow, or if a solid particle gets lodged, it must be dislodged by more fluid or the patient be made to cough, or the tube be removed, washed out and reinserted. A pint or a pint and a half may be needed, if much solid matter is present.

(b) If gas is present the tube must be passed in but 40 to 50 centimeters instead of 60 or 70, and the abdominal muscles brought into play either voluntarily or by kneading.

III. Irrigation of the stomach.

In most cases a simple washing out with fresh, cool water will suffice; in anæmic persons the water must be lukewarm.

The quantity is one pint to a quart, and it is to be allowed to run in and out until it returns clear. Or a solution of bicarbonate of soda, one drachm to the quart may be used if there be much mucus, or in cases of constipation sulphate of soda a drachm and a half to the quart of water. In some cases of chronic catarrh, alkaline waters, Carlsbad, Vichy, and so forth may be used with advantage, or the above mentioned solution of bicarbonate of soda, one to two per cent. or the same of sprudel salts. If the contents are very acid or fetid, salicylate of soda, thirty to forty grains to the quart may be used to be followed by pure water. Resorcin one-half to three per cent. is rec-

⁵ Leube. Loc. cit.

⁶ Wiener Klinik., 1875.

⁷ When vaseline or oil is used, an unpleasant taste is left in the mouth.

ommended (the latter per cent. seems to me to be too strong). Carbolic acid is dangerous. Permanganate of potash in weak, violet-colored solution and boracic acid one to two per cent. are also good in cases of fermentation. In cases of severe pain, suspensions of bismuth subnitrate, an ounce to the pint, and allowed to remain for a time in the stomach so as to deposit a layer of bismuth or chloroform water (aqua chloroformi of the "United States Pharmacopœa") diluted one-half may be used.⁸

The best time to wash out is before the chief meal in the day, or three or four hours after breakfast. Some persons whose sleep is apt to be disturbed by pain caused by food are better treated at night. The kind of disease and the result obtained determine the number of washings to be made. Sometimes severe inflammatory symptoms have appeared afterward, or great tenderness of the stomach or vomiting. These complications I have never seen. The treatment should end when the digestion is essentially benefited and the digestive power greater, and when no mucus or undigested food is brought out (naturally the washing must be four or five hours after taking food). Some cases require but a few washings, while others demand it daily the rest of their lives.

Unpleasant symptoms seldom occur. At first the procedure may be difficult, later it is not so. Spasm of the larynx has not been very rare, or slight faintness perhaps in a few cases. The gastric mucous membrane has been torn off sometimes, usually not accompanied by much pain or hæmorrhage. Considerable hæmorrhage may occur in gastric ulcer or phthisis, or heart disease, and prove a bar to the use of the sound.

Indications. (a) For diagnostic purposes. To determine the size of the stomach, differentiate the transverse colon, to get the contents for chemical or microscopic examination. (b) For therapeutic purposes. To remove injurious substances, either those taken in, or those which have undergone changes, and to treat the diseased mucous membrane, and lastly to increase the diminished contractility of the stomach. It is, therefore, used in poisoning, especially by alkalis, in acute and chronic catarrh, dilatation, ulcer, cardialgia, cancer with consecutive dilatation, and catarrh.

Contraindications. The existence of those diseases in which vomiting, if it be caused by the procedure, may prove harmful, proves a bar; as in hæmoptysis, in persons with atheromatous arteries, in those having a tendency to apoplexy, in aneurisms of the aorta and large vessels, in non compensatory heart lesions, in cases of weak or fatty heart, in advancing gastric ulcer or recent hæmatemesis.

By means of this method of treatment we may do a vast amount of good at times. Fortunately, it is the very persons who need most to be well in the quickest possible time, namely hospital and dispensary cases, who make the least objections to its use. In my experience, at least, the better class of patients, to whom the element of time in recovery is no object, view the procedure with distrust, apprehension and disgust. They prefer the longer and ordinary methods of treatment, and are constantly making future appointments for the operation and not fulfilling their part of the agreement when the appointed time arrives.

⁸ Dujardin-Beaumetz.

Reports of Societies.

PROCEEDINGS OF THE SUFFOLK DISTRICT MEDICAL SOCIETY.

HERBERT L. BURRELL, M.D., SECRETARY.

APRIL 30, 1887, the President, DR. G. B. SHATTUCK, in the chair.

DR. E. G. CUTLER read a paper on

THREE CASES OF DYSPEPSIA.¹

DR. F. MINOT thought that dyspepsia was a less common disease now than formerly, owing to the improved hygienic condition of life, the better food and better cooking of the present time. The cases reported by Dr. Cutler might be divided into two kinds. The first two were examples of failure of nutrition consequent upon a chlorotic condition, as shown by the improvement following the administration of iron, and the careful regulation of the diet. The last case seemed to him to be one of chronic gastric catarrh, with abundant secretion of mucus, which by its alkaline reaction neutralizes the acidity of the gastric juice, besides enveloping the food and protecting it from the latter. It is this condition especially which leads to dilatation of the stomach, and fermentation of its contents. Dr. Minot had had no personal experience in irrigation of the stomach in these cases, but he believed it was by far the most effectual mode of treatment; the stomach is speedily relieved of the mass of fermenting material, together with the mucus, and the lining membrane can be subjected to appropriate local treatment.

DR. F. C. SHATTUCK expressed his interest in the two first cases of the reader, cases which show well what can be done by intelligent and painstaking treatment. Both patients had been long sufferers, had been under the care of physicians, but had not been placed upon, or else had not been willing to undergo, treatment suitable to them until they came under Dr. Cutler's care.

But the third case is one for the report of which the Society should feel especially grateful to Dr. Cutler. The simple operation of washing out the stomach is one which has not received the favor and attention here in Boston which is its due. As was remarked by the reader, the procedure is repugnant to many people, especially those in comfortable circumstances, and members of this class generally prefer some more tedious method of treatment which has less disagreeable associations. Those who consent to try the tube find it less unpleasant than they expect, especially after they have used it several times. Some patients of the speaker have very soon learnt how to swallow the tube themselves.

Some years ago, when making a visit to St. Luke's Hospital in New York, with Dr. Kinnicutt, the speaker saw there several patients whose stomachs were being washed out. One was asked whether the process gave her any relief, and replied: "Oh, doctor, my stomach wants it every morning just as a baby does his bath."

The reader seemed to imply that the use of the tube is contraindicated in cases of tuberculosis in the stage of cavity formation, a view from which the speaker dissented. We are all familiar with Debove's treatment of phthisis by hyperalimentation, large

¹ See page 252.