

below the funnel by the fingers of the hand holding it.\* If this apparatus be not at hand, a Higginson's syringe is the next best thing. I need hardly say that the rectum should be empty when a nutrient injection is to be given.

4. *In what cases should recourse be had to rectal feeding?* I would recommend it in all cases where obstinate and constant vomiting has existed for four days, or even before; of course, if the cause be a removable one this should be attended to at once. Then there are a large number of cases in which rectal alimentation might be used beneficially as a means of treatment or even cure; such as painful diseases of the stomach, including gastric ulcer, cancer, dilatation, or, again, in some affections of the bowels.

*Composition of Nutrient Enemata.* Hot water can scarcely be regarded as a food; yet in some cases of collapse, the injection of it, about the temperature of the blood, might very reasonably be given. In many conditions of partial stoppage of the circulation, an addition to the volume of the blood has been successful, at least temporarily, in re-establishing the action of the heart.

Nutrient enemata have been in the past, and are often now, made with beef tea, milk, the yoke of an egg and a little brandy, either separately or combined; in bulk not exceeding three ounces, and given every two, four, or six hours, according to the exigencies of the case. Although the above have done good, their value has been enhanced since the introduction of artificial digestives. Pepsin, in its various forms and hydrochloric acid were long used in stomach digestion, before their value was recognized in rectal alimentation. Pepsin is now very much replaced by the preparations of pancreatine, the latter possessing the double power of acting on proteids as well as on starch. The two ferments which have the property of changing the proteids into peptones, and the starch into sugar, are called respectively proteolytic and diastatic; and, on account of this double property of pancreas, the preparations of the latter have come very much into vogue.

Two preparations of pancreas for rectal use have been made—one by Dr. Leube, and the other by Dr. Horace Dobell. In the former one part of finely minced pancreas is mixed with three parts of scraped meat, adding warm water sufficient to make a small injection, and sometimes a slight proportion of fat. Dr. Leube found by experiments on dogs that a considerable amount of nitrogen was thus consumed by the body. In the second preparation, a fourth of a pound of cooked beef or mutton is finely grated, to which are added twenty grains of pancreatic powder, and twenty pepsin (pig's); the whole is mixed in a warm mortar quickly, and one tablespoonful of brandy,

and enough warm water to bring the mixture to the consistency of treacle, are added; this is injected as quickly as possible after the mixture has been made.

I think that the best pancreatic preparation, and certainly the one most easily tried, is that known as liquor pancreaticus (Benger), strongly recommended by Dr. W. Roberts, of Manchester, in his Lumlean Lectures of 1880, "On the Digestive Ferments and the Preparations and Use of Artificially Digested Food." Speaking of the giving of food by the rectum, Dr. Roberts says, "The enema may be prepared, in the usual way with milk gruel and beef tea, and a dessert spoonful of liquor pancreaticus should be added just before administration. In the warm temperature of the bowel, the ferments find a favorable medium for their action on the nutritive materials with which they are mixed, and there is no acid secretion to interfere with the completion of the digestive process." Thus, in one thing the rectum possesses an advantage in the use of this preparation over the stomach, in the absence of any acid to interfere with the full action of the pancreatic ferments. In giving these enemata they should be made of milk, or milk with beef tea or of milk gruel. To a half pint of the warm enema, a tablespoonful of liquor pancreaticus and half a teaspoonful of bicarbonate of soda should be added. About three ounces of this mixture should be injected every two, four or six hours, as the case requires.

Enemata of blood have been recommended, and in some cases successfully tried. They were first suggested by Dr. Andrew H. Smith, of New York; he found that, when blood was administered *per rectum*, both corpuscles and serum were absorbed. Three or four ounces of defibrinated blood having been injected into the rectum at night, no trace was found in the evacuations the next morning. Ox's blood has generally been employed. It must be fresh and defibrinated before use, and two or three ounces may be injected every two or three hours; but if there be any stomach-digestion going on, it may less frequently used. In order that there may be no delay in its use, it can be obtained already prepared, concentrated and preserved in tins. To prepare the injection the concentrated blood is dropped into the warm fluid to make the enema, a fluid dram representing the fluid ounce of ordinary blood. The cases treated have been recorded by Dr. Smith, Dr. Hanks, and Dr. F. W. Brown in America, and Dr. A. Ernest Sansom in this country; they have been those of gastric ulcer, severe uterine hemorrhage, diphtheritic paralysis in a child, pulmonary phthisis, anemia, and a few others. The success so far attending this novel mode of treatment is certainly sufficient to encourage an extended trial.

\*To prevent air from entering the rectum, the tubing can be "clipped," either by a spring of the fingers, close to the bone extremity, while the food is being poured into the funnel.