

In all these cases rectal feeding is useful when food is refused, or if swallowed tends to get into the bronchi; or when the passing of a tube brings on vomiting or suffocative spasm; or when the food regurgitates or is vomited with likelihood of getting into the air passages; or when the resistance made by the patient endangers life, owing to the effects of effort upon frail but vitally important organs.

If, then, one *has* decided to feed by the rectum, the next questions are: What are the best forms of nutriment to employ, and what are the best special modes of manipulation in introducing the food into the bowel?

As to the former, the question of the best form of nutriment for use for injection, the older plan, and the one still most in vogue, is merely to inject fluid food and stimulants, not specially prepared, but in the form in which they are taken by the mouth. Beef tea, milk and brandy have been largely used for this purpose, and I have heard of arrowroot being so used in considerable quantities.

Some amount of stimulation can be attained by the use of the substances just named, and from them can be absorbed constituents which enable the nutritive powers better to utilize the stores of nutriment already within the system. But for true food purposes their value is apparently slight. As Dr. Sansom stated (*Lancet*, February 19, 1881) only a fractional proportion of the albuminous contents of nutritive enemata, as commonly employed, is taken up into the blood current to subserve any useful purpose of nutrition. This fact has led to many attempts to improve upon the ordinary nutritive enemata.

The use of various digestive substances with the food injected has been tried, and many experiments, as well as observations which have practically the bearing of experiments, have been made.

Thus M. Catillon fed two dogs for two months by rectal injections of eggs only. One, which received eggs only, lived with difficulty and lost weight; the other, which had eggs, glycerine and pepsine, kept well and kept up weight, but when the pepsine was omitted, he too lost weight and his temperature fell.

In further observations, firstly, meat, bread and potatoes were taken, then no meat for three days, and the amount of urea excreted and the bodily weight both fell; then for one week peptones of meat were taken and the urea and weight went up again; next, for four days enemata of peptones only, and the weight was constant and the urea proportioned to it; next, low diet, no meat or peptones, and urea and weight fell. For a sustaining ration he suggests about five oz. of saturated solution of peptone, and for nutritive enemata, peptone of meat (saturated solution at 19° C.), 40 grammes; water, 125 grammes; laudanum drops iii.; sodii bicarb., 3 grammes (about 5 grains).

Czerney and Latschenberger, whose experiments were conducted on a man's colon, through fistulae following gangrene of an irreducible scrotal hernia,

found that while little benefit comes from raw material in the bowel, much improvement in health and strength results if substances are previously partly digested, as, for instance, if fat is emulsified, albumen reduced to a soluble state and starch converted into glucose.

Marchwald is rather a pessimist in this matter. From his observations on a case in which the anterior wall of a caecal hernia had sloughed, he concluded that the colon does not convert starch into sugar, nor digest fibrin or coagulated albumen, though putrefaction occurred and peptones formed; nor absorb ready-made peptones or fluid albumen; while it absorbs water slowly, and a little peptone, especially that formed in the bowel itself.

On the whole, I conclude that the rectum and colon digest but little, and that, even when inverse peristalsis is set up, the action of the bowel upon enenata is chiefly absorptive. If so the food should either be introduced mixed with digestive substances, or else, before administration, should, in some way or measure, be digested and ready for absorption into the venules and lymphatics of the intestinal walls. Several methods have been devised to attain these objects.

Thus Dr. Leube gives three parts of meat with one part of pancreas, both finely minced and mixed with a little water. An addition of fat does not harm the digestion of the meat and pancreas when injected, but more than one-sixth of fat is apt to cause stool. Brown Séquard's plan is first to clear out the bowel by an enema of luke-warm water, and then by a wooden syringe inject into the bowel two-thirds of a pound of raw beef and a quarter of a pound of hog's pancreas. Repeat twice a day. The pancreas must be fresh, the animal recently slaughtered, the fat and cellular tissue taken away. The meat and pancreas must be very finely divided, and thoroughly mixed. M. Catillon's formula I have already given above; when speaking of his experiments; it represents a peptone of meat. M. Henninger gives a complicated formula for a peptone of meat by digestion of meat under HCl and pepsine. Slinger has manufactured a nutrient suppository, consisting of nearly pure peptones, made by digesting lean meat with the mucous membrane of the pig's stomach. Numerous new preparations are brought before the profession each year.

Defibrinated blood and solutions of desiccated blood have been used for enemata, and especially in America. Three years ago, when I was on that side of the water, and met some medical men in consultation in reference to a certain case, in which the question of feeding by rectum arose, I found that the medical attendant at once suggested a solution of desiccated blood, which is usually employed there, I believe, in the proportion of one to eight of water for injection. Fresh defibrinated ox or sheep blood appears to be considerably used in America for nutritive enemata, as Dr. Sansom was one of the first to tell us.