since the introduction of artificial digestives. Pepsine, in its various forms, and hydrochloric acid, were long used in stomach digestion, before their value was recognised in rectal alimentation. Pepsine 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 grains of pepsine (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 Lumenian 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 dessertspoonful of liquor pancreaticus should be added just before administration. In the warm temperature of the bowel, the ferments find a favourable 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 a 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.

In a communication to the BRITISH MEDICAL JOURNAL of February 19th, 1881, a nutrient suppository is recommended by Mr. Spencer of York in cases where the nutrient enema would otherwise be used. The suppository is about the size and shape of the old-fashion bullets; it is made of peptonised beef. Mr. Spencer speaks well of its use; but I think some more experience is necessary to test its comparative value. Its obvious gain is the ease with which it can be introduced into the bowel, causing no trouble to either patient or nurse; but a drawback is likely to arise from the solidity of the preparation, the rectum being supposed not to take up food readily in this way. I have used the suppository in one case, and recommended it in another; in the latter, I believe, with fair results. It would seem that the cacao-butter with which Mr. Slinger (the chemist who made them at the suggestion of Mr. Spencer) covered the suppositories, is rather detrimental than beneficial, as opposing somewhat the liquefaction of the meat. Mr. Martindale, of New Cavendish Street, London, made some for me, simply oiling the exterior, and adding to each suppository a fourth of a grain of acetate of morphia; in this form, I found them better retained, and apparently more quickly dissolved. Lastly, 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 be 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 drachm representing a fluid ounce of ordinary blood. The cases so 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 hæmorrhage, diphtherit paralysis in a child, pulmonary phthisis, anæmia, and a few others. The success so far attending this novel mode of treatment is certainly sufficient to encourage an extended trial.

In this paper, I have purposely avoided the subject of using the rectum medicinally; yet, surely, the bowel might be more profitably used in this way than at present. We know the great value of administering morphia by the bowel; and there is every reason to believe that other medicines, used in suitable cases, would have an equally good effect.

EBERTH'S TYPHOID BACILLUS.

By JOSEPH COATS, M.D.,
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In the number of this JOURNAL for November 26th, 1881, there appears a short notice of Eberth's discovery of bacilli in typhoid fever. I had recently brought to me a portion of the intestine and mesenteric gland from a case which died in the Belvidere Fever Hospital, Glasgow; and, as the results from this case definitely corroborate those of Eberth, it may be worth while to make a brief note of it.

The case was one of virulent typhoid fever in a young woman, fatal on the ninth day. The mesenteric gland, received from Dr. Prichard, one of the resident medical officers, was enlarged, and presented, on section, a deep reddish-brown colour. The cut surface was scraped with a clean knife, and the material spread on a thin cover-glass, so as to form a fine film. The cover-glass was then exposed for about ten minutes in an oven to a temperature of 120° C. (in order to fix the albumen, according to Koch's method). A large drop of methyl-violet solution was then placed on the film on the cover-glass, and allowed to lie for a few minutes. It was then washed off; the film was dried, and mounted in Canada balsam.

The accompanying woodcut shows the conditions presented under a magnifying power of 1,500 diameters. The drawing was made with the camera lucida with Zeiss's $\frac{1}{8}$ " oil immersion-lens and No. 4 eye-piece. The red corpuscles were abundant, and are represented as

Eberth's typhoid bacilli, drawn with the camera lucida, 1,500 diameters. The paler bodies are red corpuscles, the darker ones the nuclei of lymphatic cells. This does not represent a single field, but representatives from several.

pale flat bodies. The nuclei of the lymphatic cells were deeply stained, and are shown as rounded dark bodies in the figure. There were frequent bacilli of various lengths, and many of them obviously germinating. The identity of these with the organisms described and figured by Eberth is unmistakable. In Eberth's figure, the drawing was made with the same objective, but with No. 5 eye-piece, giving a magnifying power of about 2,000 diameters instead of 1,500 as in ours.

After the gland had been hardened, it was much more difficult to detect the bacilli, the same resistance to the staining with aniline dyes which Eberth notes being experienced. The difficulty was enhanced by the fact that the bacilli do not apparently form definite zoogloea, although they do occur in groups. By diligent search, however, they were found in considerable abundance when fine sections stained with Bismarck brown, and mounted in Canada balsam, were used. The bacilli were found in considerable numbers in some parts, while entirely absent in others. They seemed to have definite centres, in which they were closely set, becoming more sparse in passing outwards; so that, at the peripheral parts, there were isolated rods, extending a considerable distance from the centre, and insinuating themselves between the lymphatic cells. In a very few cases, isolated bacilli were found at a distance from such aggregates, and, where they were met with, they may have been outlying units of groups in a part not involved in the section.