iodide, and ammonia, to be continued, and a pill containing equal parts of aloes, valerianate of zinc, and extract of conium, given every night.

The result of this treatment was, that we had no recurrence of fits of any kind for more than five weeks. Then we had one fit each night for three nights, and I confess that I was glad to see them return. Vanderkolk quotes some cases showing the danger to life which may arise from the prolonged freedom from fits. And, as a general rule, it may be said that in chronic epilepsy the longer you manage by treatment to prolong the interval between the attacks the more severe the following fit will be. Death occurs from asphyxia or from congestion of lungs and coma. It is astonishing that apoplexy is not frequent, but to me it is simply unknown as a result of the most violent and prolonged attacks.

I have had experience only of three fatal results; all occurred after a so-called cure had been made; all in the night, and the patients were found dead in the morning. What I wish you to remember is that after a prolonged interval of freedom you must apply some counter-irritant, such as a seton, issue, or leeches, to prevent or to break a too violent explosion.

To return to our case, To what is the improvement due? What is the rationale of the action of the means employed? Perhaps we should do best to see these points illustrated in another case.

ON A NEW METHOD OF SUPPLEMENTARY ALIMENTATION.

BY A. ERNEST SANSOM, M.D. LOND., F.R.C.P.

(Concluded from p. 289.)

THERE can, I think, be no doubt that the administration of artificially digested food per rectum in the manner previously described is a distinct therapeutic gain, and that when we advise nutritive enemata of the kind that we have hitherto employed, we ought to direct that the pancreatic ferment should be added thereto. But I have now to draw attention to a still more recent method of fulfilling the object which we have in view.

It occurred to my old and valued friend, Dr. Andrew H. Smith of New York, that the artificially dissolved juices of flesh which we have hitherto employed might very probably be inferior to the perfectly fluid and wholly absorbable flesh which nature has prepared for us. In what other substance could we be so certain of finding all the elements of the blood as in the blood itself? Dr. Smith pursued his inquiries, and 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 of the following morning. An interesting observation was made showing how absorption can take place from a surface much greater than that of the limited portion of the rectum in which the injection is first retained. A man under Dr. Smith's care in the St. Luke's Hospital of New York received every evening an injection of 120 grammes of blood. He was in the last stage of pulmonary phthisis, and died suddenly eight or nine hours after the last enema had been given. At the autopsy it was found that the large intestine was very evenly lined with a coating of thickened blood for a distance of nearly three feet. It would seem, therefore, that in the case of nutritive solutions administered by the rectum there is a retrograde peristalsis, whereby the material is spread over a considerable extent of the absorbing surface of the bowel.

Now, as to the *mode of employment of blood enemata*. Ox blood is usually employed, but sheep's blood may be used. It is necessary that it be defibrinated the moment it is drawn. Butchers understand this process, and will supply what is called "whipped" or "stirred" blood. It is, of course, requisite that the blood be fresh—that it be not kept more than a single day.[1] In urgent cases, where there is no stomach digestion, two or three ounces of blood may be injected into the rectum every two or three hours; the fluid may be warmed by placing the containing vessel in hot water, but it is often borne equally well when cold. For chronic cases, in which it supplements stomach alimentation, it is administered in quantities of from two to six ounces once or twice a day. In some cases its use tends to promote constipation; in a very small percentage the opposite condition of irritability.

Blood enemata thus administered present many practical advantages. The supply is easily obtained; the cost is very small—a really important point amongst the poor when a long-continued course of nutrition per rectum is ordered, one which hitherto has entailed a large outlay for the juice of meat and adjuncts—and the evidence of success is, as I shall presently show, considerable. On the other hand, in procuring the supply of fresh blood there may be some difficulties; especially is this the case when it is wanted in a great hurry, when, for example, the administration of blood per rectum is suggested in a case where direct transfusion might heretofore have been adopted. This difficulty is now overcome because the blood is prepared, concentrated, and preserved in tins, and thus is ready for immediate use. The preparation of this sanguis bovinus exsiccatus is conducted under the direct supervision of Dr. J. J. Craven, inventor of the great ship refrigerators for preserving meat during ocean voyages. The blood is taken from selected animals, and these are bled to death; this, it is said, being the only method of obtaining the blood duly arterialised. The blood is carefully dried at a temperature which never exceeds 110° F. Thus prepared desiccated blood is soluble in water at temperatures below 160° F., and contains all the elements of healthy blood, save water and fibrin. To prepare the injection the concentrated blood is dropped into the warm fluid which is to constitute the injection—a fluid drachm of the concentrated representing a fluid ounce of the ordinary blood.

Now, lastly, I have to consider the evidence of the success of this plan of treatment, and this will involve some indications as to the cases in which it may be employed.

1. Cases in which it has alone sufficed to support life. These, of course, afford the most crucial test of its value, but they are of necessity rare. Dr. Smith has narrated a case of gastric ulcer kept long upon milk diet; finally everything was rejected by the stomach, and for a fortnight the patient was nourished *entirely* by enemata of defibrinated blood. Yet she lapsed into a typhoid condition, and became almost moribund. It was then found that brandy was mixed with the blood at the time of injection; it was considered that the brandy coagulating the albumen militated against absorption. So the blood was administered alone, an occasional teaspoonful of brandy and milk being given by the mouth. Then ensued an astonishing improvement, and the patient made a perfect recovery. Another case is recorded by Dr. Hanks, in which after profuse uterine hæmorrhage all food was rejected by the stomach. Here four to six ounces of fluid blood were injected per rectum three times a day. The patient improved steadily during the use of the injection, till the stomach became tolerant. Dr. F. W. Brown[2] has recorded a case of diphtheritic paralysis in a child of two years in whom starvation was imminent. The desiccated ox blood administered per rectum appeared to cause immediate reaction, and its use was followed by complete recovery. These instances, I consider, are enough to establish a strong *primâ facie* case in regard to the nutritive value of blood enemata.

2. Cases in which it has supplemented nutrition through the stomach. The evidence by which this can be proved is—(*a*) amelioration of symptoms; (*b*) gain of weight.

Perhaps as the least complex condition in which these enemata have been adopted as a method of treatment we may consider dyspepsia. One of Dr. Smith's cases was that of a young man (aged twenty-two), with extreme irritability of stomach. Even the smallest quantity of solid food induced vomiting. "No medicine was ordered, but he was directed to take a teacupful of blood by the rectum twice a day, and to apply a belladonna plaster over the stomach. The epigastric pain and the vomiting ceased within two or three days, and solid food was taken without inconvenience. In seventeen days he gained in weight 11½ lb." In another case (reported by Dr. Geo. Bayles), a patient was nourished for nearly nine weeks with blood injections, only a little

[1] I have just learned by a letter from Dr. A. H. Smith that the addition of a grain or a grain and a half of chloral hydrate to each ounce of the blood serves to avert decomposition, and to prevent any offensive odour in the dejection.

[2] American Therapeutic Gazette, p. 271, Sept. 1880.

claret-and-water, toast-water, or tea with milk being taken by the mouth. Under this treatment there was gain in weight and the patient recovered. In the following case under my own care at the North-Eastern Hospital for Children, the evidence of the direct value of the blood enemata may appear more doubtful, but yet my own belief was that the method was one whereby a fatal result was averted, and difficulties tided over till stomach digestion was resumed. The case was one of peculiarly difficult diagnosis. A boy of eleven complained of excruciating pain after all food in so far that he voluntarily starved himself. Cerebral troubles and many forms of abdominal disease were simulated, but one could not arrive at a precise diagnosis. Under observation in the hospital, however, the following phenomena occurred:—Retention of urine, appearance of some blood in the urine, afterwards a little pus and crystals of oxalate of lime; with this tenderness and a little swelling doubtfully felt deep in the left iliac region. I think it most probable that the pain was produced by the irritation of the left ureter by oxalic calculi. However, the boy lapsed into a most critical state; he took no solid food and very little liquid; and then I ordered blood enemata (four ounces), at first once, afterwards twice a day. At this time he took a very little milk, and occasionally a dry biscuit, but nothing else. After continuing nearly four months in a critical state I got him to take, by the stomach, first milk, beef-tea, and cocoa, then cod-liver oil, then boluses made of bread and raw meat, and lastly boluses made of cooked meat (he could not touch meat in the usual way), and then, strange to say, he took a liking to uncooked Nestle's food. His weight during his illness fell from 3 st. 6 lb. to 2 st. 13 lb., but when he began to mend it gradually rose to 3 st. 12 lb., when he was discharged. During the period of blood enemata it was maintained for two months between 3 st. 3 lb. and 3 st. 4 lb., but the gain of weight was distinctly traceable to the recommencement of stomach digestion. In another case under my care at the London hospital, I consider that the evidence was less equivocal. This case was one of greatly dilated stomach, intense anæmia with purpura on the body, attended with severe pain and vomiting; there had been history of scorbutic affection. Half a pint of defibrinated ox blood was administered night and morning. After three days the patient felt much better, and made a very good recovery.

In anæmia the plan of treatment would seem to be especially indicated, and Dr. Smith has reported cases which seem to establish its value. Instances are also given in which it has greatly relieved inveterate neuralgia, one case gaining 5 lb., and another about 3 lb., in six weeks. In cases of pulmonary phthisis a decided improvement was recorded in one half the cases reported.

It will be understood that my object in bringing this subject forward is to establish a *primâ facie* case. Enough has, I think, been adduced to point the desirability of further observations. The opportunities of making such observations must occur in the course of the practice of us all.

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CASE OF STRANGULATED CONGENITAL UMBILICAL HERNIA.

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I VENTURE to draw attention to the following case of hernia, not only on account of the rareness of this form of rupture, but on account mainly of its important clinical bearings, the necessity for its early recognition, its remarkable tendency to cure even when seriously complicated by strangulation or rupture of its sac and coverings, and the success attending certain operative procedures for its relief.

An infant was brought to me at the London Hospital in August last with the statement that its bowels had never been opened, and that something was amiss with the umbilical cord. I saw the child on a certain Tuesday afternoon and it had been born in the early morning of the preceding day. The child, a male, was small and wizen, and the umbilical cord at its point of connexion with the abdomen presented an oval and uniform swelling about the size of a bantam's egg. This swelling was in the cord itself, and that structure at its union with the abdominal parietes was but little larger than normal. It appeared, indeed, as if the funis immediately beyond its attachment had undergone a sudden oval enlargement and was normal both on the distal and proximal side of that swelling. The coverings of this swelling and of the cord beyond appeared to be in every respect normal. Nothing had passed the child's bowels since its birth, and a little milk-and-water administered occasionally in a spoon had been in every instance rejected. The infant kept its legs drawn up, the belly was tense and a little distended, and the child appeared to have paroxysms of pain. The nurse, to meet these symptoms, had dosed the infant with castor oil and with honey and water, but the former remedy had not relieved the constipation, nor the latter the vomiting. Before the child came under my notice it had been seen by Mr. Appleford (acting for Mr. Gordon Brown, of Finsbury), who informed me that the tumour, when he first saw it, was slightly larger than at present, and that a small portion of its contents could be reduced into the abdomen, leaving the bulk of the tumour firm and solid, as it was when I saw it. The labour, moreover, had been normal. The swelling, when the case came under my notice, was everywhere uniformly firm, and had precisely the consistence and general characters, as regards both its coverings and its aspect, as the cord itself; it was dull on percussion; there was not the least impulse on crying, nor could the size of the mass be diminished by pressure. The anus was quite patent, and a No. 12 india-rubber catheter passed readily about four inches up the rectum. Nothing came away with the catheter, but its introduction produced much straining. I urged upon the friends the advisability of exploring the tumour; they, however, declined any operative interference at the time, but brought the child to me again on the afternoon of the following day, Wednesday. The infant was then much worse, the abdomen much distended, and evidently very tender; the legs were kept constantly drawn up; the tongue was dry and coated, the pulse extremely feeble, and the eyes and fontanelles sunken. Nothing had passed the anus, and the vomiting had been persistent. Acting upon the presumption that an operation could scarcely render the child's condition more serious, even if it effected no good, I proceeded to explore the tumour. The mass itself had altered but little in appearance since it was last examined, beyond the fact that its colour was somewhat changed, having become greenish in some places and more purplish in others. Its consistence, moreover, was less firm to the touch, and its outline a little less regular. The changes were evidently connected with the approaching disintegration of the cord, and were equally obvious in that part of the funis beyond the tumour. I made a vertical incision along the whole length of the tumour in the middle line, and almost immediately opened a distinct sac, from which escaped about a drachm of opaque blood-stained fluid. In this sac was found about two inches of the lower part of the ileum, the whole of the cæcum, and the vermiform appendix.

The herniated bowel was very firmly strangulated, the seat of constriction being at the neck of the sac, and formed obviously by the unyielding wall of the abdomen. The mouth of the sac was nearly circular, and was about the size of an adult's thumb. The protruded intestine was of a deep claret colour, still firm and resilient. The surface of the herniated portion of the ileum was dull and sticky, and the surface of the cæcum and appendix covered entirely with lymph, and from this surface, on being handled, blood oozed somewhat freely. The aperture into the abdomen was enlarged by an incision directly upwards in the middle line, the small gut was found to be somewhat adherent to the margin of the opening, and to a small portion of the sac wall behind the margin, but the cæcum was extensively adherent to the sac by the whole of that portion of its surface that looked towards the abdomen. In attempting, first of all, to reduce the ileum a large quantity of small intestine escaped from the distended abdomen through the wound. The reduction of this proved a matter of much difficulty—a difficulty evidently due, for the most part, to the great distension of the bowel by gas. I therefore thrust the point of a hypodermic syringe into the inflated gut, and, having removed the piston, allowed the flatus to escape. The reduction now became simple, and soon all the intestine had been replaced into the abdomen, the cæcum being reduced last, its ad-