mechanical vibrator, will do all that "metallo-therapy" has achieved in the same class of cases. We do not sufficiently appreciate the effect of subtle or subtly-applied forces acting on the organism. When the so-called mesmerist induces a state of hypnotism in his patient by simply blowing on the face, or when by "passes" he impresses the retina, he acts *physically* on the terminal twigs of highly sensitive—and generally educated—nerves, and induces a set of actions which, though notable in themselves, are no more mysterious in the manner of their production than the involuntary strong muscular action excited by the "tickling" of a hair or a feather, or the crawling of an insect. As a matter of fact, the surface is generally more *powerfully* impressed by these minor applications of mechanical force than by the greater. If you touch an exposed sub-cuticular surface lightly you give extreme pain; if you grasp it somewhat firmly you cause less suffering. This is quite as likely to be because, in the first case, the terminal twigs of the sensitive nerves are set vibrating, whereas in the latter vibration is prevented, as due to the local blood-change to which these results are commonly attributed. While a poultice is moist, and clings to the surface of a sore, it soothes by holding the nerve-fibres still; when it begins to dry, and they are liberated, the poultice becomes an irritant. The physical basis of the so-called hysterical state, or the peculiarity of nervous organisation which predisposes to hysteria, is, I think, simply a class or type of structure which renders the nervous elements especially liable to vibrate in their sheaths, and thus exposes them to the risk of falling readily into any rhythm which the will, the physico-mental environment, or perhaps even the proximity of similar structures vibrating in other bodies characterised by the same physical organisation, may suggest. If musical burners supplied from different reservoirs of gas will presently vibrate in concord; if strings or reeds vibrating at the same time, though a short distance apart, will fall into harmony, why is it unlikely that nervous organisms possessing the same qualities of physical structure should exhibit a corresponding affinity? Science points clearly to physical states as the basis of nervous and mental phenomena. The female organism is characterised not inaccurately, though popularly, by the phrase "finely strung nerves." It is literally *mobile*, and it is chiefly among females the phenomena of hysteria, and the allied states, are observed. When the symptoms and conditions so designated do occur in the male, the individual organism is generally of a feminine character.

In conclusion, I would venture to predict that it will be found that nerve action, both normal and abnormal, consists of vibrations, and that *other* mechanical vibrations set up and propagated by any mechanical apparatus or appliance, acting from without and propagated through the tissues, may be made to modify the internal movements; that normal vibrations consist of movements of the constituent parts of a nerve within its sheath, and that when these become inordinate or disorderly they are propagated to the sheath itself, and then become painful; that under this last-mentioned condition the wave of vibration is likely to be propagated along the sheath of the nerve, and through it to the sheaths of other nerves with which the first in order of disturbance may be mechanically related, either by direct contact or through intervening tissues; that the action of irritants applied to the skin is mechanical, producing contraction of the tissues, and either first tripping and then relaxing the terminal twigs of the nerves, thus throwing them into mechanical vibration, or so changing the constitution of the bed in which these terminal twigs lie as to oppose a mechanical obstruction to their natural vibration, and thereby convert it into a morbid rhythm. This, indeed, has been demonstrated by Dr. Ringer, in his classic treatise on Therapeutics, in connexion with the *modus operandi* of blisters. These may be set down as crude speculations, but they are the results to which experiment and common-place reasoning point, and they are in harmony with a view of the phenomena of nerve-action and pain which the inquiry I am pursuing forces upon me, and by which nearly all the wonders of the hysterical school of medical philosophy may be explained. I cannot claim to have discovered a "cure" for neuralgia, or even a *certain* method of treatment for its relief. The time has not arrived when it may be possible to commend this *new method* to the notice of the medical profession as a known agency for the alleviation of suffering; but as the facts have been prematurely published I think the method should be tried.

Welbeck-street.

ON A NEW METHOD OF SUPPLEMENTARY ALIMENTATION.¹

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

I WISH to bring under notice a plan of treatment which, I think, is scarcely known in this country, but which shows promise of much practical usefulness. Every practitioner will, I am sure, acknowledge to an aching of heart over cases in which he feels that a little addition to the powers of nutrition, a little supply to the tissues of the materials necessary to their well-being, may turn the scale from death to life, and yet that little "aliquid" is not to be found. The difficulty presents itself in acute as well as in chronic cases, in conditions of immediate as well as prolonged emergency. Take the case of fevers in which a number of factors co-operate to induce a condition of danger—nutrition is not only in abeyance, but there is rapid waste. It is unnecessary to say that an increase in nutrition or a lessening of waste may make all the difference between death and life. Then, in chronic affections such as pulmonary phthisis, the experience of late years tells to the effect that if by means of a healthier general nutrition the pernicious metamorphosis of tissue which results in caseations or tubercles can be modified, we may turn the scale towards recovery. In sudden emergencies, as from alarming hæmorrhages, the craving for a rapid supply to the exhausted organism prompts us to adopt transfusion of blood, and in a like condition brought about by chronic maladies such as prolonged anæmia, we are sometimes called upon to consider the question of this most perilous method of treatment. We have presented to our view every day of our lives the probability of a case coming before us in which, if we could only suggest a method of conveying to the tissues the pabulum which they need, we might have the satisfaction of seeing our patient recover.

Of course in all the cases now presented to us I assume that we have made up our minds that appeals to the stomach are unavailing. We have done, and still do, what we can to ensure to the full the absorption and assimilation of all that we can present to the alimentary tract through the mouth. Yet nutrition fails, and we have to think of plans of administering food by the rectum, by the skin, or by injection into the blood itself.

It is only *feeding by the rectum* that I shall now ask for consideration. The experience of every medical practitioner, I am sure, will tell of cases in which nutritive and stimulant enemata have been of essential service. We can point to cases kept alive—barely alive probably, but alive—by them. Of nutritive and stimulant enemata hitherto employed I may briefly refer to the following:—

1. *Hot Water*.—It has been recommended in certain conditions of collapse to administer, by the rectum, water at about the temperature of the blood. This would appear to repose on a reasonable basis. In many such conditions of halt on the part of the circulation a mere addition to the volume of the circulating blood has been successful in re-establishing, at least temporarily, the action of the heart. This is the rationale of action in the cases in which the injections of weak saline solutions into the veins in cholera collapse have been followed by improvement. There is no doubt that fluid is absorbed from the mucous surface of the large intestine, and so enters into the circulation. In sudden collapse, therefore, the practice of administering a warm fluid enema is decidedly to be recommended.

2. *Alcohol and Diffusible Stimulants*.—There is no doubt that the mucous surface of the lower bowel absorbs alcohol, ammonia, &c. The addition of these agents to a fluid enema may be considered as a matter of discretion. While reasonable and scientific additions to simple aqueous enemata, however, it is well to point out that alcoholic admixtures with nutritive enemata consisting of solutions of albumen are unscientific and unsound, the alcohol tending to coagulate the albumen.

3. *Medicinal Agents*.—It is well known that medicines may be absorbed from the mucous surface of the rectum.

¹ A paper read before the East London and South Essex District Branch of the British Medical Association.

This is proved to us by our frequent experience with regard to opiate enemata, as well as by the action of the hosts of medicated suppositories so commonly employed. We find that absorption of the medicine is not so complete as when it is presented to the stomach; so we are accustomed to administer larger doses per rectum. Moreover, we learn that rectal absorption is more tardy. Dr. A. H. Smith found that eight grains of fluid extract of rhubarb in twenty grains of water, at a temperature of 73° F., gave the characteristic red colour to the urine, on the addition of caustic potash, in sixteen minutes after injection into the stomach. In cases where the same quantity at the same temperature was injected into the rectum the period after which the reaction was evidenced was sixty-five and seventy minutes. But when the temperature of the enema was raised to 103° F. the reaction was obtained in forty minutes.

Whilst absorption, then, of medicines by the rectum is more tardy and less complete than absorption by the stomach, there is abundant evidence of administration by the bowel being a very important means whereby fluids, stimulants, and medicines enter the blood.

4. *Solutions of Albumen.*—Here also we have evidence of absorption, but under narrowly-defined limits. The rectum is but a passive pouch; it has no power of preparing albuminous bodies for absorption as the stomach has, and such absorption is only effected by dialysis into its venules. It follows, therefore, that albumen is only absorbed when it is in aqueous solution. We know how very limited is the absorbability of unmodified albumen. It is evident, therefore, that of the albuminous contents of nutritive enemata as commonly employed only a fractional proportion is taken up into the blood-current to subserve any useful purpose of nutrition.

5. Lastly, there is fair evidence to show that fatty matters, such as those pertaining to milk and cod-liver oil, are capable in some degree of absorption from the rectum. (For formulæ for enemata falling under the foregoing classification, see Tanner's "Practice of Medicine," vol. ii., p. 480.)

Such, then, were the enemata long in common employment, and such are those which now are very generally employed. A very great improvement was, however, effected when efforts were directed to render the albuminous constituents of a nutritive enema more capable of absorption. I have already said how very limited is the amount of albumen possible of absorption in an ordinary nutritive enema. The improvement consisted in administering the albuminous constituent of the enema in the form of *peptone*, such peptone being produced by the action of pepsine or pancreatine upon albuminous bodies. Pepsine used to be employed, but more recently preference has been given to pancreatine. Dr. Leube mixed one part of finely minced pancreas with three parts of scraped meat, adding warm water sufficient to make a small injection, and sometimes a slight proportion of fat. He found by experiments upon dogs that a considerable quantity of nitrogen was thus conveyed to the body. Dr. Horace Dobell has given the following formula:—Cooked beef or mutton, finely grated, $\frac{1}{2}$ lb.; pancreatic emulsion (Savory and Moore), 1 oz.; pancreatic powder, 20 grs.; pepsine (pig's), 20 grs. Mix the whole in a warm mortar quickly, and add one tablespoonful of brandy, and enough warm water to bring the mixture to the consistency of treacle. Inject from an elastic enema bottle as quickly after the mixture has been made as possible, and let it be retained. More recently pancreatic extracts have been employed as peptonising agents. The liquid extract or the saline extract of pancreas is added to milk, milk-gruel, or juice of meat, and kept for some time at a temperature of about 140° Fahr. The mode of preparing such peptones, whether for administration by stomach or by bowel, is fully described in Dr. W. Roberts's valuable Lumleian Lectures "On the Digestive Ferments, and the Preparation and Use of Artificially Digested Food." Speaking particularly of administration per 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. I have now had some experience in this method of alimentation, and have been satisfied with its success. In one case, a patient suffering

from post-pharyngeal abscess, which entirely occluded the cesophagus, was nourished exclusively for a period of three weeks (until the abscess broke) on enemata of milk-gruel mixed with pancreatic extract."

(To be concluded.)

ON THE ADVANTAGES OF CLOSING THE SAC BY CATGUT SUTURES IN HERNIOTOMY.

BY F. A. SOUTHAM, M.A. OXON., F.R.C.S.,
ASSISTANT-SURGEON TO THE MANCHESTER ROYAL INFIRMARY.

IN the operation of herniotomy, where the sac is opened, it is, I believe, the usual custom (excluding, of course, those cases where a radical cure is performed at the time of operation), after dividing the stricture and returning the bowel into the abdomen, simply to bring together the margins of the cutaneous wound with sutures of silk or silver wire. If, however, the cut edges of the opening in the peritoneal sac are in addition accurately brought into contact by means of catgut sutures, considerable benefit is derived, both as regards the more speedy healing of the wound and the prevention of extension of inflammatory action from the superficial structures to the interior of the sac.

The advantages of this simple proceeding are as follows. In the ordinary method of operation, when skin sutures are merely employed, and where, consequently, the edges of the wound in the sac are not brought into accurate contact and maintained in that position, but are left to adjust themselves as they best can, even though a drainage-tube be used, a ready way is left for the drainage backwards of inflammatory discharges into the sac through the opening that remains in its walls. If, however, the margins of the opening in the sac are brought into exact apposition by means of catgut sutures, this result will not occur, for as wounds in the peritoneum heal very rapidly, union of its cut surfaces will probably have taken place before any discharges have formed in the wound; consequently, instead of draining backwards into the sac, where they would tend to set up a local peritonitis which may afterwards spread, they will make their way downwards between the integuments and outer surface of the sac to the lower part of the skin-incision, where they will discharge themselves externally, if a drainage-tube has been inserted or an opening left for that purpose. For the same reason, if any recurrent hæmorrhage takes place after the conclusion of the operation, it will make its way externally, instead of gravitating backwards into the sac.

Though the operation of herniotomy may be performed antiseptically, yet from the situation of the wound and from the movements of the patient often tending to loosen the dressings and allowing the air to penetrate beneath their margins, difficulty is not unfrequently experienced in the after-treatment in keeping the wound perfectly aseptic. By the employment, however, of strict antiseptic precautions during the operation, and by the closure of the opening in the sac at its conclusion, the operation itself may in a sense be compared to one in which the sac has not been opened, and even if septic particles should subsequently, from some unpreventable cause, gain access to the wound, so that putrefactive changes are induced in its interior, the same condition may still be considered to exist; for under the most unfavourable circumstances it is not likely that this complication will occur within the first eighteen or twenty-four hours, by the end of which period considerably firm union will probably have taken place in the wound of the peritoneal sac, forming a barrier which will completely shut off its cavity and prevent the entrance into it of any septic matter.

I have recently availed myself of this modification of the method usually employed in closing the wound in six cases of herniotomy performed antiseptically in the Manchester Royal Infirmary, having, after reducing the bowel and clearing away all the blood clots and fluid from the interior of the sac, carefully adjusted the cut margins of its peritoneal walls, and brought them as nearly as possible into exact contact by catgut sutures introduced at a distance of about a third of an inch from each other and afterwards cut off short close to the wound. The margins of the skin-incision