The prognosis in this case is very unfavorable. Although we know that in children dilatation of the heart may be entirely recovered from, yet as long as this condition exists there is danger of sudden death from cardiac failure. Where the cardiac dilatation results from extensive disease of the kidney, especially in the form which we most commonly meet with in scarlet fever, capsular glomerulo-nephritis, the chances are that this failure will take place before the nephritis has been recovered from, when a patient has been reduced to such a degree as is the case with this boy.

The treatment should be absolute rest so as not to tax the muscles of the heart more than can possibly be avoided. To relieve the intra-abdominal pressure, which augments the edema of the lungs and interferes with the action of the heart, paracentesis of the abdomen should be performed, as I have just told you. Hot baths should be given to increase the action of the skin, laxatives to relieve the congested condition of the kidneys, and non-irritating diuretics, such as acetate of potash and digitalis, are indicated. Nitroglycerine is valuable where the action of the heart at any time becomes suddenly feeble and irregular.

Original Article.

GAVAGE IN INFANTS.

BY JOHN W. BARTOL, M.D., BOSTON,
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THE attention of the profession was called long since to the value of tube feeding in patients (infant or adult) suffering with forms of disease attended by obstruction to the passage of food into the stomach; but it is perhaps not so generally recognized that there are frequently, among infant patients, cases free from such obstruction in which resort to this procedure will be followed by gratifying results.

When a child *can* but will not swallow its food, we are apt to accept the condition as a decree of nature and console ourselves with the belief that the patient is better after all without the food. That such refusal is, however, not rarely the result of some slight discomfort attending the taking of food, or of a whim caused by the disordered *morale* of the child, and not dependent on a seriously disabled condition of the digestive organs, is certainly indicated by the few cases here reported in support of such assertion.

In other words, the infant, like the adult, often has in its morbid conditions of body or mind a positive distaste for nourishment of any kind; but, unlike the adult, is not able to call to its aid the power of will so often essential for the obedient execution of the physician's mandates. It is obviously our duty, then, in appropriate cases, to feed him if need be directly against his will.

Let no one imagine that I am thus advocating wholesale and indiscriminate "forced-feeding" of sick children, or asking anybody to disregard the evident indications of a given case: the point simply being, not to disregard the possibility of satisfactory assimilation of much-needed nourishment in spite of obstinate refusal to receive such nourishment in the ordinary manner.

Furthermore, the method not only offers the advantage of administering food of fixed amount and definite

proportions at appropriately regulated intervals, but also furnishes a ready means of exhibiting, at the same time, such medicine as may be desirable.

The indications for instituting this method of feeding need no extensive mention, but the following three selected cases from the wards of the Summer Hospital at Rainsford Island, certainly show that it has a varied application.

CASE I was a male infant, eleven months old, who had previously been under treatment for congenital syphilis in the wards and out-patient department of the Infants' Hospital. He had been lost sight of for some months, but in the latter part of July was sent to Rainsford with the history of ten to twelve dejections daily, and of taking his food badly. It was further elicited that the inunction cure had been persisted in without medical supervision for four months.

The physical examination showed nothing of material interest except general delayed development. He was fairly well nourished. After admission to the wards and cessation of the inunctions there was no diarrhea; but he persistently refused to take a satisfactory quantity of food, and consequently as persistently lost weight (seven ounces in five days). He was accordingly discharged with the idea that he would probably take his food better in the home surroundings.

To quiet a possible suggestion that it may have been the taste of the food that caused him to rebel, it should be noted that, although at first he was given a Pasteurized modification, this was later changed to non-Pasteurized whole milk, without effect.

Ten days after discharge he re-appeared, and according to accounts had been vomiting and defecating almost constantly since going home. It was found that he had continued to lose weight at the rate of nine ounces in ten days, and now, at the age of eleven and a half months weighed 12 pounds 11 ounces.

The diarrhea proved not to be an important factor in his condition, but he at once resumed his old tactics of refusing food, and on the fourth day had dropped to a total food consumption of 20 ounces daily (the normal average being about 40 ounces), with a loss in weight of six ounces. During all this time he seemed perfectly well and happy but simply would not take his food.

He was then put on alternate feedings by tube, with the immediate effect of raising his total for the following twenty-four hours to 32 ounces. For the next month, by aid of the supplementary feedings, he maintained a daily average of 34 ounces; and in this time, his weight, which had steadily fallen for at least three weeks previous to beginning the treatment, increased one pound.

The day before his discharge tube feedings were entirely omitted, and the total amount of food taken fell from 32½ ounces to 21½ ounces, and his weight dropped 1½ ounces. But as cool weather came on, he began to take his food better; and I have lately learned that he is now thriving.

CASE II was a male infant, four months old, who entered the hospital with fermental diarrhea complicated by a moderate degree of colitis. The treatment of the latter condition proved somewhat prolonged and does not concern us now. The important consideration was to get him to take nourishment enough to keep from falling seriously behind in vitality; for in the first 17 days he averaged only 14 ounces daily, when he should have taken about 30 ounces, and his weight dropped from 10 pounds 1½ ounces to 8 pounds 9½ ounces, a loss of 1½ pounds.

He was accordingly put on alternate feedings by tube, which brought his total for the next twenty-four hours to 20½ ounces (from 14 ounces), with an immediate gain in weight of 2½ ounces.

For the ensuing 26 days, that is, the period of supplementary feedings, his daily average was 27 ounces as against 14 ounces, and his total gain in weight one pound one ounce.

The intestinal disorder having yielded to treatment, tube

feedings were omitted, and, although his average food-consumption and weight-gain showed an immediate drop, the advantage gained was permanent, and he was discharged in first-rate condition, weighing, in spite of his initial loss of $1\frac{1}{2}$ pounds, three-quarters of a pound more than at entrance.

CASE III is in some respects the most satisfactory of the three chosen for report, because, while in the others the procedure served to keep the system much nearer par, and thus established normal gain much earlier and on a more rapidly advancing basis than could otherwise have been done, in this case the prognosis *quoad vitam* was distinctly gloomy, and the necessity for quickly turning a corner very evident.

The patient was a female infant, one and a half years old. Her previous history was not obtained, but at entrance she had a temperature of 103° , with signs of well-developed broncho-pneumonia. There was evident delirium, and she seemed entirely unconscious of her surroundings, throwing herself about the crib regardless of consequences.

Without further reference to the course of the disease, it is sufficient to say that the problem which soon presented itself was how to get proper food and stimulation into her. From the first what milk she took voluntarily was evidently simply to satisfy her thirst; and at the end of the first week she was taking only twelve to fifteen ounces daily, and much of that under protest and at expense of provoking exhausting spasms of coughing. Put upon tube feedings, alternating with others from a cup, she rapidly increased her average; and when it was considered safe to begin regular weighing, which so far had been omitted on account of her serious condition, she was found to be steadily gaining.

To spare further details, I will simply add, that, partly on account of her disinclination to take food, partly because of the obstinacy of the spasm of coughing provoked by drinking, the tube feedings, which were attended by much less irritation, were continued to a greater or less extent for one month; and that in the 21 days after weighing was begun she gained one pound four ounces.

The progress thus so satisfactorily initiated continued until her discharge, one month later, during which period she made a further gain of two pounds five ounces.

Of the *modus operandi* I need hardly speak, except to remind those who happen never to have followed the procedure, of its great simplicity.

The entire apparatus consists of a soft-rubber catheter coupled to a small funnel by a combination of rubber and glass tubing. Of course, the largest catheter that can be comfortably passed gives quickest results. In most cases I found the nose by far the better route, but in at least one case the milkran much better when the catheter was passed through the mouth. For the nasal cases a No. 6 catheter was generally found best, and for the mouth Nos. 10 to 12.

Feedings were given with patient lying in the crib, firmly rolled up in a sheet to keep the arms and legs from interfering. The right and left nostrils were taken alternately, and in no instance was there notable irritation of the mucous membrane, although in one case four tube feedings daily were given for nearly a month. There is almost no danger of passing the tube into the larynx, but a sufficient check against this, is the sound of the voice in the short fit of crying that is sure to be excited by the procedure. The arrival of the end of the tube in the stomach is heralded by the escape of a small amount of gas. The food may then be poured in at once, disregarding the small column of air in the catheter.

The tube during withdrawal should be tightly pinched to prevent the milk from trickling over the pharyngeal wall and exciting the reflex. Coughing

and crying delay, but do not prevent, the passage of the food, which flows at least during the inspiratory interval. If there is any indication for it, the feeding should be preceded by washing out the stomach.

Catheters and tubing should be boiled daily and kept between feedings, after thorough washing, in boric-acid solution.

There is an important class of cases which is not illustrated here by any specific instance because there happened to be no striking example in the wards, but which deserves emphatic mention before closing this paper. I refer to a certain type of obstinate vomiting, where the child takes food readily enough, but is unable to retain it even in small amounts. It will often be found in these cases that the reflex vomiting is much less likely to be excited by the passage of the tube, than by the food itself taken in the natural way; and thus patients that give every promise of steadily advancing failure may be tided over until a slight gain in tone enables them to resume the normal habit.

Clinical Department.

A CASE OF CONGENITAL MALARIA.

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MALE child. Family history negative, except that mother had quotidian malaria of a severe type for two weeks preceding birth of patient. The malaria was untreated by her physicians who deemed such treatment unwise during pregnancy. The malaria continued until parturition, and then ceased. The child weighed seven pounds at birth, was well developed, and appeared sound, except for an umbilical hernia.

The writer saw the baby for the first time, December 3, 1896, when the child was ten weeks old, the case having been kindly referred to him by Dr. F. H. Davenport, of Boston.

The child did not flourish on his mother's milk; had colic and vomiting. Most of the artificial foods had been tried for a few days each in turn, and Meig's mixture had been in use for a short time previous to my visit. The baby appeared to improve with all the foods at first, and then began to vomit, had colic and refused the food altogether. Considerable mucus had been evacuated from the bowels (which were generally constipated) and vomited from the stomach. In addition to these symptoms the child slept little, cried a great deal, was continually moving, and had cold hands and feet.

Physical examination showed the patient to be much emaciated, pale and weak. Chest and abdomen negative, except hernia. Muscles of the limbs and neck rigid; head slightly retracted; and child cries out on handling.

This child was fed for a few days succeeding my visit on whey and beef-broth, when the patient had a severe convulsion in the writer's presence, characterized by muscular rigidity, unconsciousness, clonic spasms and strabismus, followed by a period of muscular relaxation and stupor. It then developed that these attacks had occurred daily since birth, and had been unrecognized as convulsions. They were always preceded by prolonged crying.