REFERENCES.

- ¹ Wasserman, Neisser and Bruck: Deut. Med. Wochenschr., xxii, 1906, 745.
- ² Bordet and Gengou: Ann. de l'Inst. Pasteur, xv, 1901, 289.
- ³ Gengou: *Ibid.*, xvii, 1902, 1.
- ⁴ Gay: Centralbl. für Bakteriologie, Orig., xxix, 1905, 603.
- ⁵ Much and Eichelberg: Med. Klin., 1908, 671.
- ⁶ Jochmann and Töpfer: Münch. Med. Wochenschr., 1908, no. 32.
- ⁷ Meier: Med. Klin., 1908, no. 36.
- ⁸ Hoehne: Berl. Klin. Wochenschr., xxxviii, 1908, 1717.
- ⁹ Michaelis: *Ibid.*, xlvii, 1907, 1103.
- ¹⁰ Marie and Levaditi: Ann. de l'Inst. Pasteur, 1907, xxi, 138.
- ¹¹ Landsteiner, Muller and Plözl: Wien. klin. Wochenschr., xxi, 1908, 206.
- ¹² Levaditi and Yamanouchi: Compt. Rend. Soc. de Biol., 1907, 741.
- ¹³ Fleischmann: Berl. klin. Wochenschr., 1908, 491.
- ¹⁴ Porges and Meier: *Ibid.*, xlviii, 1908, 731.
- ¹⁵ Klausner: Wien. klin. Wochenschr., 1908, xxi, 214, 363.
- ¹⁶ Noguchi: Jour. Exp. Med., xi, 1909, 84.
- ¹⁷ Lesser: Discussion of paper by Citron, Berl. klin. Wochenschr., xlviii, 1908, 518.
- ¹⁸ Citron: *Ibid.*, xlvii, 1907, 1371.

HUMAN MILK IN THE TREATMENT OF VARIOUS INFECTIONS.*

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HUMAN milk is used by physicians chiefly for the treatment of two classes of cases:

1. For infants with disturbances of digestion which do not improve on properly modified cow's milk.
2. For infants suffering from disturbances of assimilation; that is, for the treatment of infantile atrophy.

There is a third use of human milk which is not sufficiently recognized by the profession, and that is its use to increase the resistance of the infant to infections. Human milk can be employed for that purpose just as we use antitoxins or bacterial vaccines.

Moro¹ has shown that the bactericidal power of the blood of nursing infants is greater than that of healthy adults. The most perfect demonstration of the increased resistance to infections which human milk gives the infant is seen in infant institutions. Artificially fed infants living in hospitals or asylums have a very high mortality, due, as Heubner² has shown, to the great exposure of these infants to infections. If some of these institution babies are partially fed on human milk they can live side by side with the artificially fed infants under exactly similar conditions except for the food and thrive as well as in a good private home. No more perfect demonstration could be asked for.

There are three classes of infections where human milk is of value:

- I. Infections of the gastro-intestinal tract.
- II. Infections of the respiratory tract.
- III. Septic infections.

INFECTIONS OF THE GASTRO-INTESTINAL TRACT.

About three years ago I reported the favorable results of the treatment of gastro-intestinal infections with small amounts of human milk³ and there are other similar reports in the literature. I shall, therefore, not consider this class here except to again emphasize the value of this treatment.

* Read at the meeting of the New England Pediatric Society, Nov. 28, 1908.

In many cases where human milk is given to infants because they are thought not to be able to digest cow's milk, the real cause of the trouble is a gastro-intestinal infection. The presence of undigested food in the bowels does not necessarily cause symptoms. Many of the symptoms which follow the giving of an indigestible food are the effects of bacterial growth in the intestinal contents. The toxins act on the digestive glands and impair their function. There is, therefore, a vicious circle produced and it is often difficult to tell which is primary, the digestive disturbance or the bacterial infection. In institutions, as Heubner² has shown, artificially fed infants more frequently suffer from attacks of "indigestion" than infants in their own homes, even when the hygienic conditions and the care in the preparation of the food are better in the institution. Although the symptoms of these attacks are indistinguishable from those usually classed as "indigestion," still from the conditions under which they occur many of them are certainly infections. In the test-tube there is little difference between the digestibility of human milk and modified cow's milk. I believe that when an infant suffering from "indigestion" will not improve after repeated trials of modified cow's milk, but does improve promptly when given the human milk, the improvement is often brought about by the increased resistance to infections which the human milk has given the infant.

INFECTIONS OF THE RESPIRATORY TRACT.

Bronchopneumonia is the most important of the infections of the respiratory tract in infants; it is much more frequent in those artificially fed than in infants on the breast and is a common terminal infection in infantile atrophy.

From a rather limited experience in the use of human milk in the treatment of pneumonias it has seemed to me that the results are nearly as good as in the infections of the gastro-intestinal tract. The following case is a good example of the benefit of human milk in the treatment of pneumonia.

Female infant, eleven months. Never nursed. Fed on modified cow's milk, unpasteurized. When ten months old she developed symptoms of scurvy, which promptly disappeared when orange juice was added to the diet. She was taken sick with pneumonia on March 4, 1908. There was severe constitutional disturbance. During the first week the temperature was 104-105°; pulse 140-160; respiration 40-80. The physical signs were never marked. There appeared to be small areas of consolidation in the middle lobe on the right and in the left lower lobe. The course of the disease was a very prolonged one. On the seventeenth day there had been no crisis; the temperature was about 102°, but the pulse had not fallen and was of very poor quality. There was increasing abdominal distention and the child was sicker than at any time during its illness.

With the approval of Dr. J. L. Morse, who saw the child several times in consultation, I gave

the baby breast milk, beginning with 4 oz. on the evening of the seventeenth day. On the eighteenth day, 12 oz., on the nineteenth day, 16 oz., were given. On these days there was marked improvement in the child's general condition. She was brighter and stronger, as was evident to the two nurses and to the parents. The human milk was continued for two weeks, 104 oz. in all being given. Although the child subsequently had several setbacks, the improvement continued to complete recovery.

The best results from the use of human milk are obtained in a case of this type, where the course is a prolonged one and the child cannot seem to overcome the infection.

SEPTIC INFECTIONS.

Striking results are seen in the treatment of subacute skin infections like furunculosis. At the Massachusetts Infant Asylum I have repeatedly seen severe cases of furunculosis clear up rapidly after the infants were given breast milk at alternate feedings. Ordinarily these cases would have been very prolonged and some would have been fatal. In some cases that are thoroughly septic no improvement is seen, but in other milder cases the human milk seems to act like a specific.

HUMAN MILK FOR PROPHYLAXIS.

There is a class of cases where human milk should be used for prophylactic purposes and that is for the prevention of infections in infants in the early stages of infantile atrophy. Moro found the complement diminished almost without exception in the blood of atrophic infants, and they have a very low power of resistance.

Infants born prematurely and those who are below normal size, as is often the case with twins, are most likely to suffer from atrophy. When one of these small babies does not begin promptly to gain in weight human milk should be given at once. While there is no immediate danger of the infant's dying of atrophy, and while after a time *some* of these cases will begin to gain in weight on an exclusive artificial diet, still such a child is living on the edge of a precipice and may at any time develop a diarrhea or a bronchopneumonia which will sweep it off.

I have known a good many cases, some in well-to-do families, where these small babies have appeared to be just holding their own on an artificial diet and have then rather suddenly succumbed. The doctor, the family and friends all shake their heads and say it was too bad that the baby was too small and weak to live. It is true that these babies are not sufficiently developed to lead a complete independent existence, but most of them will survive if they can live according to nature's plan and receive human milk, through which they get ferments and other substances of the maternal blood similar to what they received through the placental circulation during fetal life.

THE USE OF HUMAN MILK AFTER THE FIRST YEAR.

If we grant that human milk, apart from its value as a food, increases the resistance of infants to infections, the question at once arises: at what age does human milk cease to aid the individual in resisting infections? If human milk will help an infant with pneumonia at the end of its first year (as in the case just reported), why should it not help a two-year-old child with the same disease? This is a question which I believe well merits further investigation.

I have had at the Massachusetts Infant Asylum three cases of very severe gastro-intestinal infections in infants during their second year who were treated with human milk; two of them were almost moribund. The beneficial effects were as prompt and decided as in any cases under a year that I have ever seen. Personally, I believe that human milk would be of value to many older children in infectious diseases running a prolonged course. I believe that in many such doubtful cases the child's resistance could be increased sufficiently by human milk to turn the scale to the side of recovery.

About a year ago I tried the experiment of giving human milk to typhoid-fever patients in the hope of raising the bacteriolytic power of their blood by increasing the complement.⁴ The results were not conclusive. Typhoid fever is in some respects an unfavorable disease in which to test the value of human milk to those who have passed the age of infancy, for the reason that typhoid fever attacks chiefly persons at an age when their powers of resistance to infections are naturally strong. We should expect human milk to be of more value in those diseases which attack persons having a diminished resistance to infections.

SUGGESTIONS FOR OBTAINING HUMAN MILK.

In this community it is often very difficult to secure a wet nurse. It is especially difficult for physicians who seldom have occasion to employ one. The difficulties of securing breast milk for babies seriously ill are especially great because these babies are usually too weak to nurse or have so little appetite that they cannot be taught to take the nurse's nipple; therefore, for most of the sick babies the milk has to be drawn. Wet nurses vary very much in their ability to draw their milk; some that are perfectly satisfactory when the baby can nurse, can furnish very little milk if it has to be drawn. I am more and more impressed with the importance of getting human milk from the mothers living in their own homes, especially if the milk has to be drawn. For the typhoid experiments already referred to over eighty quarts of human milk were collected without any difficulty at all from women living in their own homes. A large number of nursing mothers were visited, among whom a few were found who had a superabundance of milk. One mother who had only one breast that functioned was able to give us a whole quart a day besides wholly nourish-

ing her own vigorous child. There are a number of such women to be found if search is made for them.

Twice during the past year I have had urgent need of drawn breast milk (one was the pneumonia case which I have just reported) and knowing of these women I was able to send a trained nurse and immediately get all the breast milk I needed. It was the greatest help. At the present time it would be very difficult for me to obtain any drawn breast milk. Now there is no reason why we should not all be able to get breast milk whenever we require it.

We need some organization, some society in this community, who would register wet nurses and keep a list of women who could furnish breast milk when called upon. There are many infant deaths that could be prevented by the use of human milk. There is plenty of human milk to be had. Is it not the duty of a society like this to teach the need of using human milk and to facilitate its being obtained?

REFERENCES.

- ¹ Moro: Wien. klin. Wochenschr., vol. xiv, p. 1073.
- ² Säuglingsernährung und Säuglingsspitäler. Verlag von Aug. Hirschwald. 1897.
- ³ Jour. Am. Med. Assn., Dec. 8, 1906, vol. xlvii, pp. 1904-1909.
- ⁴ BOSTON MED. AND SURG. JOUR., vol. clviii, no. 19, pp. 625-630, May 7, 1908.

DISCUSSION.

DR. J. L. MORSE: Just a word as to the difficulty in obtaining wet nurses. I never have any trouble in securing them. I have at present the names and addresses of four in my pocket who are anxious for places. Whether you can find a wet nurse depends upon how much you want one and how much you are willing to try. It is almost always possible to get breast milk at the Talitha Cumi or Salvation Army Home here in Boston, in either small or large quantities temporarily, if for any reason it is inadvisable to have a wet nurse in the house.

DR. T. M. ROTCH: I hope at some future time that the society will take action on Dr. Denny's suggestion and have a central office established where information concerning wet nurses can be obtained.

PSYCHOTHERAPY AS APPLIED TO CHILDREN.*

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THE literature published during the last few years on psychotherapy has dwelt chiefly with adults. Except for references and hints to its application to a child I have found very little written concerning this developmental stage of a human being. For what assistance I could get I am indebted to "The Psychic Treatment of Nervous Disorders," by Dubois; "The Force of Mind," by Scofield; Hall's "Psychology of Adolescence"; "Religion and Medicine," by Drs. Worcester, McComb and Coriat, and an article in the March, 1908, *Good Housekeeping* by Dr. Coriat on "Suggestions in Training Children."

A few months ago Dr. McComb told me that rarely did he give a lecture on the subject but at the end several mothers asked him how this could

be applied to children. This was an unconscious recognition that this could be applied to children, and, moreover, we owe it to parents that they should know how to apply it.

Childhood is the most suggestive period of a human life. From early infancy, in fact, from birth, the child is influenced by suggestion. First come the suggestions of external stimuli through the senses, then the suggestion of obedience to certain routine, necessary functions imposed upon the infant for his physical development, and finally, as speech develops, come the innumerable suggestions picked up from the conversation of those near at hand. The child's mind grows very rapidly and is exceedingly plastic, so that constant repetition easily develops a line of habit in the brain, and the constant influx of new sounds and ideas causes a rapidly increasing development of the mind.

The older a child grows naturally the firmer fixed become the habits of both thought and action. Hence, if suggestion can change habits fully developed in an adult, how much easier to change and model the mind into correct thoughts and actions during this plastic stage of childhood.

To take up the various opportunities for the use of suggestion, I shall divide childhood into three periods, viz.: Infancy and early childhood, from birth until five years of age. Early school life, from five until ten years of age. Early adolescent life, from ten until fifteen years of age.

During the first period we have the most notable development as far as rapidity is concerned. At birth the child instinctively eats and sleeps, a little animal, oblivious to outside influences. At five years of age the child has become a human being, seeing, hearing, thinking and demanding. He has already formed both good and bad habits and has learned his first lessons in obedience. His mind is fully alive to his small world and he absorbs more knowledge in twenty-four hours than we can appreciate. Thanks to the influence of physicians trained to care for children, he has, if fortunate, formed good habits of sleeping and eating; but perhaps his parents are careless or neurotic, and hence their method of training has resulted in the formation of other habits not so good. He may be irritable, he may easily cry, he may wet the bed at night, he may be impudent to strangers as well as to his parents. In other words, there may be innumerable different characteristics, which crop out at unexpected moments and which the parents try to change.

As physicians, we, of course, cannot assume the responsibility belonging to these parents, but many and many a time we have the opportunity to advise parents and oftentimes, at their request, to assume the responsibility of the training of some one habit. In all of these cases, being assured that there is no physical cause for the habit, suggestion can be of tremendous help. Many of these habits have been acquired by passive suggestion and they can be corrected by active suggestion. Hypnosis is rarely necessary in the treatment of children.

In this first period the best time to use sug-

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