The Midwife.

The Physiological Ideal in the Artificial Feeding of Infants.

In an interesting article in the *Lancet*, Dr. J. Snowman, M.R.C.P., says in part:—Professor Budin of Paris claims success for feeding infants on undiluted cow's milk which has been fully sterilised. It is stated that the complete sterilisation alters the casein in such a way as to prevent the formation of tough curds. A new method of feeding in case of gastro-enteritis and toxæmia of infants by means of "casein" milk has lately secured extensive trial in Germany. This milk contains 3.5 per cent. of casein, and only 1-1.5 per cent. of sugar, but the casein is presented in such a way that the development of indigestible curds is prevented. It probably exists in this milk in the form of casein lactate.

From yet another source there comes corroborative evidence that casein has been unduly incriminated in the production of digestive disturbances in infants. From time immemorial we have been accustomed to scrutinise the stools of infants, and we have pointed to the white masses as testimony of casein indigestion. Some authorities have lately denied the truth of this inference, and maintain that these masses do not consist of casein but of fat. Some analyses are said to have shown that they contain fatty acids and soap only. Other analyses certainly do reveal the presence of proteid, but the suggestion is made that this probably comes from the intestinal secretion. Indeed, Ludwig Meyer states that these so-called casein curds are even found in the stools of infants fed on whey. A keen controversy is in progress in regard to this matter, but it is quite obvious that the truth lies midway between the extreme views of the opponents, for it is well known that casein entangles a large proportion of fat in its meshes as it clots. If the clot happens to be tough, it will resist the action of the digestive juices; the fat in its interior will not be acted on by the pancreatic secretion, and hence the appearance in the stools of more or less unaltered fat. There is no doubt that large curds owe their size to their association with fat. Simple casein curd without any fat is never bulky, neither is it leathery and tenacious.

These observations also direct our attention to the existence of fat indigestion. It would be rash to adopt the view of those who are beginning to ascribe to the fat of cow's milk the main responsibility for infantile indigestion, but we cannot disguise from ourselves the fact that there are important differences between the fat of human milk and of cow's milk. The fat of human milk is comparatively rich in olein, which is an easily digested substance, whereas stearin and palmitin predominate in cow's milk fat, and these require much more digestive effort. The fat of human milk has a higher iodine value than that of cow's milk; and it also possesses a lower melting point. When cream is used to supply deficiency in fat the infant is often provided with some preservative which may prove detrimental. So far we are unaware of any plan to eliminate fat indigestion as has been achieved in the case of casein indigestion. But the very fact that we can banish casein indigestion and permit an infant to feed with impunity on a somewhat larger proportion thereof than Nature dictates, intimates to us that our dilution of the cow's milk need not go so far as to make it unduly poor in fat, and thus there will be no need to add cream to the final mixture. There is reason to believe that an excess of really digestible casein will satisfactorily supplement the deficiency in fat as long as it does not fall below 2 per cent. If the fat is reduced to less than 1 per cent. the infant becomes hungry, notwithstanding an abundance of proteids. It is not possible to be dogmatic on this question of fat in infant feeding, because current scientific opinion thereon is in a state of fluctuation, but it is undoubtedly wrong to assume that the usual mixture containing equal parts of milk and water requires the addition of cream. Provided that the casein in such a mixture is really digestible the addition of cream is in ordinary circumstances quite unnecessary.

The practical outcome of the foregoing remarks resolves itself into a strong claim for a routine milk mixture which consists of equal parts of milk and water, with the addition of three grains of albulactin (lactalbumin) to each ounce of the mixture and of an appropriate quantity of sugar. Although this mixture contains more casein than human milk, this excess is justified by the presence of lactalbumin, which protects it from the formation of tough curds, and it likewise also compensates for the fact that the fat is not up to the human standard in quantity. This mixture of equal parts of milk and water should not be given

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