PART III.

MEDICAL MISCELLANY.

Reports, Transactions, and Scientific Intelligence.

Transmission of the Agglutinative Substance of the Bacillus of Eberth by the Mother's Milk. A Translation by GEORGE FOY, M.D., F.R.C.S.I.

A PAPER under the above title, by MM. Paul Commont and Coll, appears in the *Lyon Médical*, No. 92, 1899.

After the researches of d'Archard and Bensaude, confirmed by the work of a large number of experimenters, it is admitted that the milk of a woman suffering from typhoid fever acquires the property of agglutinating the bacilli of Eberth. The same property is possessed by cholestrum, as shown by Mr. Mosse (*Société Médicale des Hôpitaux*, 1896). This property of agglutination by the secretion of the mammary gland is constant, though always inferior to that of the blood serum. It is variable in amount, being sometimes very active and at other times very weak.

MM. Mosse and Fränkel reported a short time ago to the *Société Médicale des Hôpitaux* (1899) a case in which the agglutinative power of the milk of a typhoid patient was one in five hundred. A question here occurs. Does the serum of a baby breast-fed by a typhoid patient acquire the property of agglutinating the bacilli of Eberth? This is one of the sides of the question so important in considering the effect of the milk on the tissues of the child, and the part it may play in immunising or predisposing to maladies.

Bensaude, in his thesis (Paris, 1897), expresses the general opinion of his day in the conclusion that the property exists in the milk of the typhoid patient, but not in the blood serum of the suckling baby. This theory he supports by experiments giving negative results with the blood serum.

In 1896, d'Archard and Bensaude reported to the *Société Médicale des Hôpitaux* their observations on a case of a patient who continued to nurse her baby notwithstanding the development of typhoid fever, and, during the first ten or fifteen days of the fever, the milk of this patient agglutinated feebly the bacilli of Eberth,

more feebly than others (in the proportion of one to ten); the serum reaction sought for in the child's blood was not obtainable.

Hiercelin and Lenoble (*Presse Médicale*, 1896), arrived at a similar conclusion. A patient continued to nurse her baby to the twelfth day of her sickness (typhoid fever). The milk of the woman gave a positive agglutinative reaction, though of feeble action (one in six only). As for the serum of the infant's blood, it was not negative in reaction, but four drops of it were required for twelve of the culture.

Widal and Sicard (*Société de Biologie*, 1897), pointed out that in the mouse the property of agglutination is transmitted by suckling. This transmission, on the contrary, does not occur in the guinea-pig or the cat. They were also disappointed in their search for it in the human being.

On these facts being published, Landouzy and Griffon brought before the *Société de Biologie* (November 6th, 1897), the following positive observation:—A suckling child, in perfect health, three months old, breast-fed by the mother, who was suffering from typhoid fever of moderate intensity, to the end of the second week of her sickness, gave agglutinative serum, and the serum of the mother's milk gave a similar reaction.

Castaigne (*Médecine moderne*, November, 1897), publishes two cases—one negative and one positive. In the first the blood serum of the child gave no reaction; it is true that the milk of the mother gave a very feeble reaction in that case, not more than one in twenty. The positive observation of Castaigne is very interesting. The mother had reached the end of the second week of a severe attack of typhoid fever; the baby, who was suckled on this date, agglutinated to one to forty on the same day that it was taken from the breast. The following day the agglutinative power was only one in twenty, and the day following one in ten; on the fourth day the reaction could not be obtained. The infant was now put back to the breast, and the reaction reappeared but feebly, being only one in ten; but the day following it rose to one in fifty.

These observations, all sources of error being eliminated, show the possible transmission of the power of agglutination by feeding, and their variations and the rapidity of their attainment in babes.

Lastly, we have been able to study an analogous case, which we believe to be sufficiently interesting to report. A woman, aged twenty-six years, was admitted to the *Hôtel Dieu*, on the 7th day of July, by M. Bard. This patient had been nursing a baby for two months when she was seized with a feeling of prostration, headache, pain in the small of the back, and shivering. These were followed

by profuse diarrhoea without colic or tenesmus; there was a complete loss of appetite. On examination on admission to hospital there were found tympany, gurgling in the right iliac fossa, well-marked splenic enlargement, the typical rose rash, and some bronchial rales. The temperature ranged from 102° F. to 104° F. It was diagnosticated as a case of typhoid fever of ordinary severity. Well, this patient continued to suckle her baby for the two first weeks of her sickness. We examined the blood serum of the baby for serum reaction. On the 10th of July, three days after the babe was taken from the breast, we obtained the following result:—The blood serum of the mother agglutinated the bacilli of Eberth one in two hundred; the milk of the mother produced the reaction by one in thirty. The blood serum of the baby agglutinated in the proportion of one in ten only. On the 15th of July, that is eight days after the child was taken from the breast, its blood serum had lost all power of agglutination.

In conclusion, positive serum reaction in the suckling child of a typhoid patient is but temporary. This serum reaction bears testimony to the transmission by the milk of a power of agglutination.

We find (1) that the serum of the healthy suckling is deviated only slightly from its normal condition, and to a feeble degree to produce a positive reaction face to face with the bacilli of Eberth. On the other hand we have been unable to detect here any intra-uterine transmission, because of the many difficulties attending the research, the period of intra-uterine life, and the absence of evidence at birth of the mother having had the disease.

Lastly, as to the rapid disappearance of the agglutinative property of the serum of the child—we teach that this itself may be acquired as a temporary property of the serum. We do not think that a typhoid-nursed child will, after it has been weaned and separated from its mother, show evidence of the disease. Its temperature remains normal, there is no diarrhoea, and the illness which sometimes results may be ascribed to change of food.

The case we have reported is a good instance of the transmission from mother to child of the property of agglutination by suckling, and it is a contribution to the cases already given by Landouzy, Griffon, and Castaigne.

In considering the different results obtained by other investigators we must ask ourselves are the conditions the same?

Remarkable, also, is the rapid disappearance of the agglutinative property from the serum of the breast-fed. In Castaigne's positive case the rate of diminution of the property was so great that on the fourth day after weaning the serum gave no reaction. In one

case the serum, three days after weaning the baby, did not give more than a feeble reaction, and in five days the property was wholly gone. It is, however, possible that sometimes the substance which is agglutinative passed by the milk may have a negative reaction, and thus not respond to the test. But leaving out this source of error, it is very certain that the transference is not constant. We intend, therefore, to account for the reasons for believing that the effects are not constant.

We attribute no importance whatever to the chemical condition of the gastric secretion, although Vidal and Sicard attach so much importance to its difference in animals.

We admit the existence of gastro-intestinal lesions common to breast-fed children—necessary, according to the experience of d'Archard and Bensaude (*Société Médicale des Hôpitaux*, 1896) to explain the absorption of the agglutinative substance of the milk! We do not think the explanation a good one, for in one case such lesions were not present.

It appears essential to provoke an intensity more or less great (of the fever) to give the agglutinative property to the serum and milk of the mother. Though in our case the milk attained a rate of one in thirty, in the case of Castaigne it reached one in six hundred. On the other hand, in the negative case of d'Archard and Bensaude, it realised no more than one in ten, and even less (one in six) in those of Thiercelin and Lenoble.

Vidal and Sicard (*Société de Biologie*, 1897) say, in detailing their negative cases of cats and guinea pigs, that they succeeded by injecting a liquid of high agglutinative power in producing the peculiar property in the serum of those who previously gave no serum reaction. The variability of the strength of the milk in agglutinative power, therefore, may explain the inconstancy of the transmission of this property of the mother or foetus.

According to d'Archard and Bensaude the inconstancy in the transmission of the agglutinative property from the foetus to the mother by the placental circulation is due to the greater intensity of agglutinative conditions required. Mosse and Fränkel, in a recent communication to the *Société Médicale des Hôpitaux de Paris* (1899) concludes, also, that the strength of the property in the mother's serum is one of the conditions for the serum reaction in the foetus; but they consider another condition necessary—that those agglutinative bodies or agglutinogenetic bodies should be carried by the mother's blood freely to the placenta during a sufficient time.

For the transmission to the babe of the agglutinative property

the blood of the mother has to pass two barriers. There is, first, the filter of the mammary gland, which explains that the milk of the mother has not always the same proportional amount of agglutinative power as her blood. Then follows the epithelium of the digestive tract of the child, the second barrier which the substance has to pass; in some cases it has here been destroyed—not transmitted. Then there are so many other substances, probably of the same order (divers toxins and antitoxins), which are arrested at this point. At each barrier some portion of the agglutinative substance appears to be arrested; this may explain why each of the three fluids under consideration—the blood of the mother, the mother's milk, and the blood of the suckling—possess an agglutinative power of relatively less proportionate activity, which in our case was as follows:—

Serum of the mother's blood	...	1	in	200
Serum of the mother's milk	...	1	„	30
Serum of the child's blood	...	1	„	10

These facts make it clear that it is possible to transmit to the blood of the child certain of the properties of the blood of the nurse, and that they pass the barrier of the digestive epithelium. To effect this, two factors are requisite—The necessary strength of the property to be transmitted, and a sufficient duration of the period of transmission. This acquired property is always a temporary one, and disappears a few days after the cessation of the supply.

FATAL OBSTRUCTION FROM THE MURPHY BUTTON.

TIEBER (*Wien. klin. Woch.*, Oct. 6) reports a fatal case of obstruction of the lumen of the Murphy button by a plum stone, and comments on several other cases in which the button became blocked with hard faecal lumps. He concludes that the use of the button should always be preceded by washing out the stomach and evacuating the intestines to remove foreign bodies, and that liquid food should afterwards be given for some considerable time.

POISONING FROM A CARBOLIC DRESSING OF THE UMBILICAL CORD.

M. COSTÉ (*Gazette des Hôpitaux*, Nov. 5, p. 1167).—A dressing of glycerine and carbolic acid applied to the umbilical cord of a newborn child soon provoked symptoms of poisoning, to which it succumbed. A dressing of glycerine strongly coloured with methylene blue applied to the umbilical cords of lambs produced greenish discoloration of the urine.