of the Education Department for grants which enabled us to carry out this work.

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The Hitherto Unknown Effect of Thiamin to Regulate Human Milk Ingredients; Preliminary Report.¹⁾

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In the following diagrams (Figs. 1-4), let normal amounts of different ingredients of human milk be represented as having each equal space. Then normal milk will be like Fig. 1 (B_1 stands for thiamin and C for vitamin C).

Then thiamin-deficient milk may be like Fig. 2. But the fact is quite different. The real diagram for it will be like Fig. 3. So, some ingredients (e.g. $Cl^{2)}$ and $Na^{3)}$ have in general increased, some other ones (e.g. $Ca^{4)}$ and glyoxalase⁵⁾ decreased, and again some others (e.g. fat)⁶⁾ have either increased or decreased according to cases.

Not only that, but also a new substance⁷⁾ has arisen here (C' in Fig. 3), which will bear itself like vitamin C, reducing Tillmanns' reagent, so that even some biochemists believed it to be real vitamin C, going so far as

Fig. 1. Normal milk Fig. 2. B_1 -deficient milk

Fig. 3. B_1 -deficient milk

Fig. 4. No such milk

to take such human milk for a good milk.—To this substance A. Sato (one of us) has given the name “Pseudovitamin C.” This substance would, without simultaneous thiamin administration, cause heart enlargement and death of animals.

There is no such human milk as represented in Fig. 4. But if thiamin-deficient milk (Fig. 3) has been extracted with ether, then the rest will present such a milk. The only way to restore such a milk as given in Fig. 5 to normal milk (Fig. 1) is the administration of thiamin to the lactant.

So far there are a couple of milk ingredients for which thiamin is not in power to regulate : Urea⁸⁾ and vitamin C.⁹⁾—It was only after some 15 years' continued study of human milk that we had noticed the above described change of human milk in thiamin deficiency and the regulating effect of thiamin.

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