any influence of the outside air, will keep in its natural liquid state unchanged for months. During a year's time observations and examinations have been made by eminent chemists in this way. Of a certain number of bottles which were prepared at the same time, one was examined at once, while the others were kept without precaution under the influences of changes in temperature, and opened in monthly intervals. The examinations were made in regard to the reaction, taste and flavor of the milk, and also in regard to the determination of the solid bodies and sugar of milk, The results have been that, after months, no change had taken place. The preserved milk tastes perfectly sweet,

As is known, cows' milk and human milk act differently after entering the stomach; while the cows' milk coagulates to a more or less solid lump, the casein of human milk separates in small flakes. This is, without doubt, the reason that human milk is more digestible than cow's milk, and that it is not the difference of the composition in regard to the quantities which causes this result.

The preserved milk after entering the stomach acts perfectly uniform with human milk in regard to the separation of the casein. No solid lumps are formed, but the casein of it separates in small flakes. This quality brings the preserved milk nearer to human milk than anything known, and it is, therefore, superior, as infants' food, to fresh cows' milk, condensed milk, or any other substitute.

Referring to what has been said above, milk preserved by Mr. Otto von Roden's process has in a sanitary direction the following advantages, viz.:

1. All germs which may cause a decomposition are perfectly killed, and as, by the hermetically sealing, the admittance of fresh air is prevented, the milk possesses a nearly unlimited keeping quality.

2. The casein, which forms an essential part of milk, is changed in a way that, by the influence of the stomach, it does not form solid lumps, but coagulates in small flakes (like human milk), which increases in consequence its digestibility.

3. By this process not only those sub (1) mentioned germs are killed, but also all germs of disease which may have been transmitted to the milk by diseased cows are destroyed, and it is impossible that the preserved milk can become the communicator of diseases by receiving germs of diseases during its transport, which is very often the case with milk transported in open vessels. Experiments made by Schwann, Lancaster, Cohn, and others, in regard to the influence of high temperature upon germs, and the experiments made by P. Bert in regard to the influence of compressed air, and, finally, the experiment made by Profs. Fleischmann and Munk in regard to the mentioned changes of the casein, proved what has been stated above.

A proof that milk preserved by Roden's method will withstand the effects of tropical climate is the award of a prize medal at the international exhibition at Porto, Alegra, Brazil, 1881.

The great value of pure milk in tropical climates cannot be over-estimated.

The award of the first prize to Mr. O. von Roden at the General Agricultural Exhibition at Hanover, Germany, 1881, for his prominent discovery to the benefit of agriculture in general shows that full credit was given to it by most prominent agricultural men of Germany.

The process has been thoroughly tried in Europe, and milk treated by von Roden's method has long been shipped from Hamburg to London. The product is endorsed by the highest authorities in Europe and America.

The great advantages of this system are that milk can be preserved in its natural condition any length of time, in any climate, and transported any distance without the addition of any foreign substance whatever. It will enable the cities of the South to get milk of the best quality from the East at reasonable prices, while for ocean travellers it will prove an inestimable boon, as every vessel can always have fresh milk in its stock. The American Milk Company, Jos. H. Reall, president, 32 Park Row, New York, has been formed to operate Mr. von Roden's invention in the United States, and will at once begin operations between the West and South.—*Thoroughbred Stock Journal.*

CONDENSED MILK.*

(BY THOS. MABEN.)

[*From the* PHARMACEUTICAL JOURNAL, *Dec.* 13, 1884.]

Condensed milk occupies an important position in the dietetics of the age, and though its introduction, at least in the forms in which we are now accustomed to, it is, comparatively speaking, somewhat recent, the industry has already assumed enormous proportions. The modern method of condensing milk was originated by an American about thirty-five years ago, though it was some ten years later before it came to be considered a practical success. But the idea of preserving milk by concentration was by no means new, as, according to Marco Polo, the Chinese Tartars were, so far back as the thirteenth century, in the habit of preparing a condensed milk, which differed from that now in use chiefly in this, that the fat was made use of for butter, while the preserved milk consisted chiefly of dried casein, milk, sugar and mineral matter.

The processes for preparing condensed milk have been greatly improved upon of late years and the methods given by some writers are probably now quite antiquated. The following epitome of the process as described in 1872, by Mr. Willard, of Cornell University, New York, may be of some interest:—"The milk when received at the factory is first passed through a strainer to the receiving vat; from this it is conducted off, going through another strainer into the heating cans, each holding about 20 gallons; these cans are set in hot water and the milk is set in them till it reaches a temperature of 150° to 175° F.; it then goes through another strainer into a large vat, at the bottom of which is a coil of copper pipe, through which steam is conducted, and here the milk is heated up to the boiling point. Then the best quality of white granulated sugar is added, in the proportion of 1¼ pounds of sugar to the gallon of milk, when it is drawn into the vacuum pan, having a capacity of condensing 3000 quarts or more at a time. The milk remains in the vacuum pan, subjected to steam, for about three hours, during which time about 75 per cent. of its bulk in water is removed, when it is drawn off into cans holding 40 quarts each. The cans are only partially filled and are then set in a large vat containing cold water, the water being of a height equal to that of the milk in the cans. Here it is stirred until the temperature of the condensed fluid is reduced to a little below 70°; it is then turned into large drawing cans with faucets, in order to facilitate the filling of the small cans, holding 1 pound each, which are then immediately soldered to exclude the air."

If this represents the actual process as now carried on, it effectually disposes of the allegation so frequently made, that a portion of the cream *is* taken from the milk before condensation. Of all the condensed milks I have examined there is only one in which there was the slightest ground for suspicion that a portion of the cream had been abstracted, and, generally speaking, I believe that condensed milks are perfectly reliable so far as the relative proportions of cream and casein are concerned.

Condensed milk is also sent into the market without added sugar. One practical difference between the sweetened and unsweetened milk is that the former keeps good almost indefinitely after the tin has been opened, whereas the latter must be used up immediately, otherwise it is certain to go bad.

Having during the past year had considerable experience with the use of con-

*Read at a meeting of the Hawick Pharmaceutical and Chemical Association, December 2nd.