

MILK.

By M.

That the milk supply in India is in a very deplorable condition is realised by most thinking people, and that they may have cause to consider the question further is the hope of the writer of this short article.

To begin with the climate is very much against the milk remaining fresh for long, in fact, it can only be kept for a few hours before it becomes sour and unfit for use. The cattle sheds where the animals are crowded together in the smallest possible space, and where the sheds themselves and their surroundings are filthy to a degree, present an aspect of danger to the public at large. The great ignorance of the *gowlees* or men who carry round the milk to its destination all help to make it an undesirable article for human consumption. There are about 1,548 of these persons in Bombay city alone. We are all familiar with the picturesque and dirty *gowlee*, his body is in a filthy condition and his clothes form a fitting accompaniment to it. He may carry the milk in a brass pot cleverly balanced on his head, or convey it in two brass pots slung into a rope arrangement attached at each end to a bamboo pole, which pole he slings across his shoulders. These brass pots are called *lotas* and are given a covering at their openings either of dirty rag or hay stalks plaited together to form a wreath. The hay is in all probability picked up from the stable floor where muck and filth abound, and forms a fine source of contamination for the milk. The *lotas* are cleaned with dirt from the ground and often washed in the same water in which the cattle is watered.

There are other sources whereby milk can be contaminated from the act of milking to the final distribution of the article. During the process of milking the animal may have dirty udders, or its body may not be clean. The milkman may have dirty hands and unclean habits, such as clearing his throat, chewing betel nut, coughing, sneezing, and blowing his nose with his fingers. He may be an unhealthy person with the germs of disease in him. The stable, without doubt, is in a filthy condition, its walls, floor and ceiling reek with dirt and the microbes flourish around needing only the whisk of the animal's tail, or the movement of its feet, or the slightest breath of air, to find a home in the milk. The water supply of the stable may be polluted, the same tank, well or tap being used for the washing of clothes or vessels and the rinsing of mouths, this water is very likely used for the adulteration of the milk and is a likely source of contamination. While the milk is being carried to its destination it may very well collect more germs, the dust and dirt from the street entering through the imperfect covering. It is quite possible for the *gowlee* to adulterate the milk at any wayside tap, well, tank or ditch without anyone being the wiser. The milk may be carelessly handled by the consumer, and that scourge of humanity, the house fly, may settle and deposit germs by the thousands in it.

Milk is supplied by means of milk shops. The figure given for the number of these shops in Bombay is 837. The shop consists of a dark, narrow, badly lighted, badly ventilated room. Within this apartment are several rows of wooden benches, on these stand rows of brass *lotas* holding the milk, which is uncovered. The seller squats on the floor of his shop, possibly smoking *beri* or chewing betel nut. A child may be wandering around putting its fingers into the milk, or quite unconcernedly relieving nature upon the floor. The milk when sold is handled by dirty hands and received often in unclean utensils. Milk is sent out too from dairies; there are 36 of these places in Bombay. The sellers in these dairies do not often own the cattle but buy the milk at a reduced rate from *gowlees* and sell it at a higher price to their customers. There are a few good dairies in Bombay, they are mostly owned by Europeans, they are genuine, quite modern in their equipment, employing sanitary methods for the production and distribution of milk.

The Government Military Dairy in Bombay gets its milk supply from Kirkee near Poona and from Ahmedabad. The milk is pasteurised at 170° F. for ten minutes, it is then rapidly cooled to nearly freezing point and kept at that temperature until it is taken to the train. Insulated cans are used with cold packing, and the ordinary railway waggons convey the milk to Bombay. The milk cans are not kept at a constant temperature, it rises to 10° F. 25° F. On arrival the milk is again pasteurised and cooled to a temperature of 40° and is issued to customers either in sealed bottles or cans. The milk supply from Ahmedabad and Poona amounts to 2,200 pounds a day.

Milk is conveyed from the suburbs to Bombay. The supply stations on the B. B. & C. I. Railway are Virar, Bassein, Nalla Sopar, Borivilli, Andheri and Bandra. Those on the G. I. P. Railway are Kalyan, Thana, Ghatkooper and Kurla. The amount brought thus averages 45,000 pounds daily. The milk is carried in the trains in a most objectionable way. The milkmen crowd into the ordinary third class carriages, with the other passengers, and place their open cans under the seats. The carriage is crowded with unwashed persons with obnoxious habits. The air is hot, and becomes hotter as the train glides on, and the milk arrives in Bombay for distribution full of germs. There are about 1,500 men employed in bringing the milk and 429 importers.

The milk supply of other large cities is similar to Bombay; there may be a few local differences which are of no importance.

The milking time is between 2 A. M. and 4 A. M. and 12 noon and 1 P. M. The animals are milked in the place to which they are tethered, feeding at the same time. Amongst the beliefs in this country among the *gowlees* is one that the milk must be boiled, another is that it is necessary to add water before heating the milk or the animal will fall sick.

One of the artificial methods for the preservation of milk is refrigeration. The milk is cooled as soon as it is taken from the animal and kept at a temperature of 35° F., the consumer keeping the temperature to this standard by the milk being placed in an ice box. This method will not kill the germs already in the milk but it will prevent their multiplication. Boiling destroys almost all microbes and can be recommended as the safest and

cheapest way for domestic use for the purification of milk. Pasteurisation can be employed and one of the best methods is to pasteurise in the milk bottles. The bottles are corked and sealed and immersed in a water bath; the water is heated until the temperature of the milk within the bottles is 148° F. This temperature is maintained for thirty minutes, the bottles are then cooled and placed on ice. Pasteurisation when efficiently carried out destroys most of the harmful germs and the milk is just as digestible and nutritious as raw milk. Milk can be sterilised by heating it to a very high temperature, 248° F., for fifteen or twenty minutes; this will destroy all micro-organisms.

There is great need for reform as far as milk is concerned all over India but it will doubtless take time and education to accomplish it. Time because the habits of years cannot be changed easily nor the reasons why they should be changed understood until education enlightens the mass of people. When a demand for the best is universal then the supply will meet the demand, but until then it will certainly not improve as the *gowlees* will not put themselves to the inconvenience of being clean, or of taking care, amongst a people who do not insist on these qualities.

POEM.

VOX CLAMANTIS.

Song of a Munition Worker.

BY JOHN OXENHAM.

"Rattle and clatter and clank and whirr,"

And it's long and long the day is.

From earliest morn to late at night,

And all night long, the self-same song—

"Rattle and clank and whirr."

Day in, day out, all day, all night—

"Rattle and clank and whirr."

With faces tight, with all our might—

"Rattle and clank and whirr."

We may not stop, and we dare not err;

Our men are risking their lives out there,

And we at home must do our share;—

But it's long and long the day is.

We'll break if we must, but we cannot spare

A thought for ourselves, or the kids, or care;

For it's "Rattle and clatter and clank and whirr."

Our men are giving their lives out there,

And we'll give ours, we will do our share—

"Rattle and clank and whirr,"