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"But a Thousand a Year"

The Cost and the Results in Rochester of Feeding Clean Milk as Food for the Hand-Fed Baby

GEORGE W. GOLER, M. D.
Health Officer, Rochester, N. Y.

THE CHARITY ORGANIZATION SOCIETY
105 East Twenty-second Street
NEW YORK

" . . . the ill-kempt city, and the undisguised insolence of the municipality that babbled away the lives of men. Life was cheap, however. The soil spawned humanity as it bred frogs in the rains, and the gap of the sickness of one season was filled to overflowing by the fecundity of the next."

RUDYARD KIPLING, IN *Otis Yeere.*

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THE COST AND THE RESULTS IN ROCHESTER OF FEEDING CLEAN MILK AS FOOD FOR THE HAND-FED BABY

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ALL OF THE DEATHS UNDER FIVE YEARS FROM ALL CAUSES IN THE CITY OF ROCHESTER, N. Y.

	JULY DEATHS.			AUGUST DEATHS.			
	Under 1 Year.	1 to 5 Years.		Under 1 Year.	1 to 5 Years.		
1889	133	18		83	24		
1890	88	18		94	18		
1891	81	15		93	17		No
1892	101	26		104	34		Municipal
1893	99	16		85	19		Milk
1894	82	18		72	29		Stations.
1895	92	16		56	11		
1896	108	18		59	17		
	784	145	929	646	169	815	1.744
1897	43	7		44	13		
1898	47	11		47	10		
1899	51	33		44	18		Municipal
1900	50	16		54	14		Milk
1901	37	12		38	8		Stations.
1902	26	5		43	20		
1903	32	16		34	16		
1904	15	11		43	6		
	301	111	412	347	105	452	864

Look over the figures on the lines above and you will see recorded all of the deaths from all causes that occurred under five years of age for the months of July and August for sixteen years, from 1889 to 1904, in the city of Rochester, New York. The figures are divided into two periods of eight years each; in the first period there were no municipal milk stations; in the second, municipal milk stations were established during July and August.

According to the United States Census, and to the state enumeration, Rochester had in 1890, 133,896; in 1892, 144,834; and in 1900, 162,608 people. The figures given in the table, however, have no relation to population. They represent the actual number of deaths that took place from all causes, under five years of age for the period considered. The deaths from all causes are included in this table because it is assumed that milk as food affects the health of all young children.

When prior to 1896 an examination of the mortality tables was undertaken, we were appalled at what appeared to be the unnecessarily large number of deaths in children under five years of age. It also seemed remarkable to find that the larger number of these deaths occurred in the months of July and August. Looking about for a cause, our attention was drawn, as in may other cities, to the condition of the milk supply, and, after excluding other related factors, it appeared that the milk supply was the really great cause for this awful mortality. Accordingly a systematic examination of cows,

THE "CLEAN" MILK FARM.

At the left is the portable room in which the milk is bottled and packed in ice. To the right, in order, are the bottle-washing tent, a tent where bottles and utensils are sterilized, and the tent of the nurse.

INFANTS' MILK DEPOT, ROCHESTER.

Distributing Center at a Police Station.

stables and dairies was undertaken, and therein we found ample cause for the mortality which we believed could be traced directly to them and the product they put forth. We found in many of these establishments conditions which neither print nor pictures could adequately describe. The stables were dirty, festooned with cobwebs and badly drained; the surroundings, sinks of mud and cow manure; the utensils dirty, often containing layers of sour milk with admixture of countless millions of bacteria; and the milk itself so imperfectly cared for and badly cooled that it often soured before reaching the consumer. Up to this period, children were fed upon such milk with hardly a protest upon the part of those responsible for their food. Here, then, seemed to be the main cause of sickness and deaths in infants. What could we do about the matter? The milkmen contended that they were taking the same care of the cows and milk that they had always taken of them, and that they could not take any better care of the milk for the price current at that time—five cents per quart. In the commercial sense, and as they saw it, the milkmen were right. Work with the milkmen alone at that time seemed hopeless, so we determined, at least during the summer season, to go into the milk business ourselves, and, as at that time it was customary to Pasteurize the white mixture of bacteria, dirt, and other foreign substances, known as milk, we made the mistake in the beginning, of Pasteurizing our milk.

This is the way we began our work:

The Beginning.

A pamphlet of eight pages was published in English, German, Italian and Yiddish containing in the simplest form the chief points relating to the care and the feeding of infants. It was entitled: *How to Take Care of Babies During Hot Weather.* Across its face in large red

letters was printed: "GIVE THE BABY WATER." In type large and distinct were these two sentences:

"No other milk, no other food, not even a wet nurse can take the place of milk from the child's own mother."

"Don't feed bananas, candy, popcorn, sugar, or anything else but milk, unless told to do so by your physician."

The headings of the pamphlet were:

TO KEEP A BABY WELL.

1. Give it pure air day and night.
2. Give it no food but mother's milk, milk from the bottle, or food directed by the physician.
3. Whenever it cries or is fretful, do not offer it food, GIVE IT WATER.
4. Be sure that it gets enough sleep, two naps during the day at least.
5. Do not put too much clothing on it.
6. Bathe it in a tub every day.
7. Don't handle it; let it alone.

These headings were briefly discussed in the body of the pamphlet.

Then we started a milk station in charge of a trained nurse, with a woman assistant. In one of the most densely populous portions of the city a vacant store was rented. Behind a rough counter, a large sink was installed and the necessary table, racks, etc., were erected. An oil stove furnished heat for the apparatus in use. Milk was procured from what the milk inspectors thought to be one of the best farms in the vicinity. At the store the milk was diluted, sweetened and put up in four different mixtures of four, five, seven and eight-ounce nursing bottles of the Siebert type; Pasteurized at 180 degrees Fahrenheit for twenty minutes, cooled and sold at cost, varying from two four-ounce bottles for one cent, to one cent each for eight-ounce bottles; A deposit of three cents was required on each bottle and rubber cork. In the first instance the mother or nurse was required

PACKING THE MILK BOTTLES IN ICE BEFORE SENDING THEM TO THE CITY.

to come to the milk station and bring the baby, where, in the absence of advice from the physician, the baby was weighed, and a milk mixture prescribed according to the weight of the child, and not according to its age. The nurse talked with the mother about the air, water, food, sleep, recreation and clothing of her child, using the little pamphlet as her guide, and then giving the mother one of the pamphlets, called attention to the care of the child as there directed.

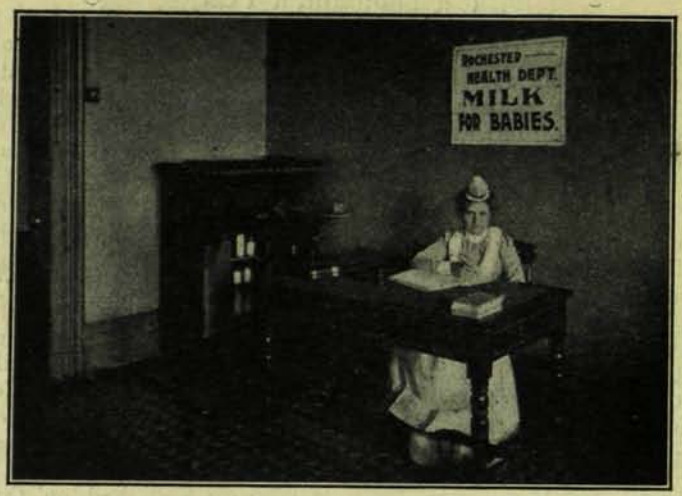
On August 1, a second station was opened, and both stations were run to their full capacity until September 1. The effect of these stations, aided by the general improvement in milk inspection and the helpful comments of the press, the advance in medical practice and the aid of the physicians, may be seen by the difference in mortality shown in the tables at the beginning of this article.

A Clean Milk Campaign.

For two more years the milk was Pasteurized, though considerable trouble was had with sour milk, and in finding a man to furnish reasonably clean milk. After the first year four stations in all were required for the needs of four quarters of the city. Then, in 1899, we established our central station on a farm, and instead of Pasteurizing milk, with all its contained filth and bacteria, we strove to keep dirt and germs out of the milk, and began to sterilize all of the utensils, bottles, etc., and to put out milk that was clean. Clean milk, or milk approximately clean, having no more than 20,000 bacteria per c. c. needs no application of heat to render it fit food for babies. Heat applied to milk alters it, makes its curd tougher and more difficult to digest, often gives rise to indigestion, diarrhœa, of constipation in the infant, and, further, the application of heat to milk in the operation of Pasteurizing or sterilizing leads people to think they may cure a condition that is more easily prevented by care in the handling of milk used for food.

We conduct our milk station work from July 5 to September 1, that being the time of year when babies most require clean milk, and from these stations we put out about 40,000 bottles of milk each season. Beside the station on the farm, which, because of its situation, does not sell milk, there are four stations in the four quarters of the city which we believe most need clean milk. Each station is in charge of a trained nurse who is provided with a table, chairs, scales for weighing the baby, a supply of pamphlets, paper and twine for wrapping up milk bottles, and a large refrigerator kept well stocked with ice. These stations may be located in a small vacant store, in the window corner of a bakery, hardware store, etc., in one part of a school building, or in one corner of a police station. As the time approaches each year for doing the work, the stations are arranged for both on the farm and in the city. Our central station we have had on three different farms in six years. For the central station we select a farm where the cattle, barn and surroundings are in good condition, and where the farmer is willing to take more than usual care of his cows. We do not seek an extraordinary fine appearing farm, but a farm where the ordinary conditions existing may be improved upon so as to make them fit for our purpose. For several years the nurse boarded with the farmer, but for the past two years she has provided her own meals, cooked them and lived in a tent adjoining the central station.

A suitable place selected, we agree with the farmer to take his milk at a fixed price, four and one-half to five cents a quart, and to get all the ice from him at market price. We then erect a milk laboratory or central station. It consists of a portable wooden house, built in sections, sixteen by twenty-two, containing shelving, tables, milk utensils, bottles, boxes for shipping milk and the necessary cleaning utensils. At the rear of this house, a long platform is built the width of the house and extending forty feet beyond it. Next to the house, and just outside of it, a sink is erected to which running water is piped from a large cistern. The drainage from the sink is piped away in an open drain. Both water pipe and drain pipe are laid temporarily on top of the ground. An awning, or tent fly, covers that part of the platform reserved for washing bottles so that a cool and sheltered place is provided for this purpose. Next beyond this



AT ONE OF THE MILK STATIONS.

is a tent twelve by fourteen where the sterilizers are mounted on oil stoves where the nurse gets her meals. The sterilizers are of the Arnold type, oblong in shape, fitted with large removable trays in which more than a gross of bottles may be sterilized at one time, and in which, when the trays are removed, the milk pails, cans, rubber corks, etc., may be sterilized. Beyond the sterilizing tent, separated by four feet of space, is the twelve by fourteen tent where the nurse lives, when not engaged in her work, and where she sleeps guarded by the farmer's dogs. From the rear of the portable house to the nurse's tent a series of long flies are stretched over the tent, so that in bad weather one may walk on the platform without getting wet.

How the Work Is Carried On.

Work in the portable laboratory is carried on as follows: In the late morning of the day before the milk is to be distributed to the city stations the cans and utensils are washed, sterilized and afterward enclosed in cheese cloth bags for use the next morning. The bottles are washed, rinsed, sterilized, placed in racks on the tables, their mouths being stopped with cotton batting to prevent dust from entering them; then the whole premises are thoroughly cleaned, and everything, so far as may be, put in readiness for use the next morning. Shortly after four A. M., the nurse and three assistants are ready for duty. Of the assistants, a woman to wash bottles receives $1.10 per day; a man to help and to deliver the milk, $9 per week, a girl to help fill bottles, $3.50 per week. The nurse receives $21 per week and an allowance of $3.50 per week for board. One assistant goes to the barn, observes the condition of the cows, and there the sterile milk pails are taken from the cheese cloth bags, the cows' udders wiped off with a clean, moist piece of cheese cloth, and the milking proceeds. The pails into which the cows are milked are not the usual milk pails. They are covered at the top, having but a four-inch opening from which a collar rises an inch in height. Over this collar and secured by a rim, a double thickness of cheese cloth is placed, and the cow is milked directly through this cheese cloth diaphragm into the pail. So soon as the pails are full they are taken to the laboratory, new diaphragms of cheese cloth are fitted, and the pails sent back for more milk. Now the various milk mixtures are made, four in number, sugar is added and the milk is racked off into the nursing bottles. These are then corked with rubber corks, placed in wooden shipping trays, holding four dozen each, covered with broken ice and shipped to the different city stations. Milk so prepared contained an average, as shown by successive daily counts, of less than 10,000 bacteria per c. c., while the ordinary milk sold contained more than

fifty times as many bacteria per c. c. Milk from the city milk stations will keep sweet for days at room temperature, and thus requires no ice in the house. Not having been subjected to heat, it is more easily digested by infants than Pasteurized or sterilized cows' milk. It does not poison the baby by adding a large number of bacteria to a child's digestive apparatus as does ordinary milk. As it is given to the mother properly diluted and sweetened it requires no addition of other substances. And as it is already in a sterile nursing bottle, it is not necessary to do anything to it other than to remove the rubber cork, fit a clean nipple onto the bottle, warm it, or for older children, pour it into a clean cup. For these reasons such a milk approximates the ideal milk for the hand-fed baby.

When the milk depots were organized an objection urged against them was that the milk would be used by a lot of children that would better die anyhow. This harsh criticism is unworthy of answer. If, however, it were true that the milk would be used solely by the poor and people in moderate circumstances, the answer is that the milk stations were really designed for such people. But it is a fact that all classes of people patronize the milk stations. To get milk from them, men ride miles on bicycles and people send in from neighboring lake resorts: all smilingly gratified for the milk they receive from the stations. Best of all, however, is the real gratitude expressed by the poorer people when they are shown by the nurses a few simple rules in the booklet, and are given the milk at a cost of a few cents a day. As one mother anxious for living children said: "May God bless you. I have lost three children with summer complaint, and I think the milk and the book kept my fourth baby."

So far as figures can, those at the beginning of this article show what Rochester has been able to accomplish in reducing its mortality among infants under five years of age, at an average expenditure of $1,000 a year for a season of two months.

Every season in the larger cities thousands of children die victims of poisoned milk. Here in Rochester we have demonstrated what may be done through eight years' work. What we have done, other and larger cities may do at an approximate cost of $1,000 per season for each 200,000 of population, and with quite as good results.