the house from the cow. That is to say, there must be clean hands to milk the cows, whose teats, udders, and flanks must also be purified. In addition all milk after coming from the cow must be filtered and cooled, and if possible sold from sealed cans or bottles. That we admit to be the ideal which we must all seek to achieve in our respective districts. But by way of corollary to his able articles there appeared the replies received from many medical officers of health regarding the enforcing of regulations under the Dairies, Cowsheds, and Milkshops Orders. The sad tale need not be retold, but these replies showed that in many districts regulations were not even framed, and that where they were in existence they were frequently not enforced. It is a knowledge of these facts, unfortunate as they are, that has urged some medical officers of health to advise their local authorities to adopt the principle of supplying milk in such a way that it will be safer to drink than most of the filthy stuff coming in from badly kept cowsheds and dirty cows.

Two years ago we instituted a crusade against these cow-feeders who did not keep their premises in conformity with the existing regulations. The cow-feeders in the district promptly formed themselves into an association, engaged a solicitor, and held an indignation meeting at which we were denounced as "hounds of officials" who were seeking to ruin an arduous and honest calling. Much was achieved despite the meeting and the declamations, but it had to be done at the point of the bayonet.

In some districts the cow-feeders are alive to the necessity for keeping everything clean, but that appears to be the exception to the rule. The cow is a machine which is depleted three times daily, and fed to give plenty of milk. There is no time to waste over the cleansing of hands or anything else. Moreover, the general public looks upon cold milk with suspicion. It requires much education on this point, for if milk be warm, though it be heated with the addition of hot water or skimmed milk, the consumer believes it must be fresh from the cow. Filters and milk coolers are slow in action, and the cow-feeder starting operations at 4 or 5 every morning, declares that he has no time to waste over details which he is pleased to call the "fads of health officials." The average cow-feeder refuses to be taught. He will not leave the path trodden by his predecessors. Force alone will compel him to adopt more modern and cleaner methods. That force must be applied from two directions. First, the general practitioner must take a keener and more active interest in the subject of pure milk supplies. If the family physician only knew it, many a patient of his drinks milk which in the language of the Public Health Acts is "unfit for human food." Were the doctor to teach his patients why milk, artificially cooled, is safer to use by reason of its better keeping qualities, the urgent demands from consumers would soon goad the milk seller to supply the want. Secondly, the power must be placed in the hands of the medical officer of health to say to a cow-feeder when his traffic is not being conducted on satisfactory lines. Analogous power is granted under the Factory and Workshop Act when dealing with bakehouses. The fact that the local authority comes in as a buffer between the health official and the cow-feeder makes the supervision of the milk traffic often extremely difficult, and in some places well-nigh impossible. That this anomaly should be remedied appears to us to be absolutely necessary.

While the foregoing remarks have taken us beyond the province of our paper, they go to prove that the medical officer of health is perfectly justified in advocating the establishment of infant milk dépôts, and we speak from experience. It has been our constant aim to persuade and teach cow-feeders in our district the value and importance of cleanliness. We have made some progress, and have earned for ourselves a notoriety for hard heartedness and severity which few men possess, and all because we have tried to rouse the Rip Van Winkle cow-feeder out of his sleep. With that experience to guide us we had no hesitation in recommending the adoption of the principle of supplying infants with milk which had been filtered, mixed with cream, sugar, and water in definite proportions, put up in bottles which had been scrupulously washed, and finally subjected to a temperature sufficient to kill most of the micro-organisms present. We have been gratified beyond measure to see the good results, not the least valuable of which has been the education of the people. Many, indeed most, of those who come to our dépôt are drawn from that class which has been in the habit of feeding infants upon the rule of thumb principle. Dirty bottles, rancid teats and tubes, and extraordinary varieties

of food have been supplanted by consistently good and wholesome nourishment at a very low cost. Already many mothers have come to appreciate the difference between the old and new method, and when we can say we have educated them to value the importance of sound infant feeding we have achieved much.

When the ideal milk supply of our large towns is universal the people may have no need of corporations to assist in the mixing up of food for the young. We cannot, however, wait for the mountain to come to us, so we must go to it by taking an immediate step in the direction of preparing milk for infants, thousands of whom, despite the purest milk supply in the world, would be fed upon mixtures of wonderful concoction.

[NOTE.—Since the above was written it has been decided to pasteurize the milk by subjecting it to steam at 170° F. for twenty minutes, and subsequently cooling the bottles.]

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"GOUTTES DE LAIT ET CONSULTATIONS DE NOURRISSONS."

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IN France rapid progress has been made in the scientific rearing of infants under a system of medical supervision. Midwifery doctors conceived the idea of having infants born in maternities brought back periodically to be weighed and inspected, and if need be that milk might be supplied for their nurture. Professor Hergott, of Nancy, founded in 1890 a charity in the maternity to encourage breast-feeding for infants. Mothers who suckled their children and who brought them back one month after birth in a satisfactory state received a monetary donation. Thus Dr. Hergott succeeded in materially stimulating the suckling of infants for the first few months of their lives, the most important period. In 1892 Professor Budin organized at La Charité in Paris a *consultation de nourrissons* for children born in his wards. He submitted the mothers to a weekly inspection during the whole period of nursing, and he also distributed sterilized milk to those who had an insufficient natural supply. Only 5 or 6 per cent. of the children were fed entirely from the bottle, 60 per cent. were breast-fed, and 35 per cent. received their nourishment partly from the breast and partly from the bottle. These are the most recent figures, and relate to cases which were attended to at the *consultation de nourrissons* at the Clinique Tarnier during 1903.

We physicians have adopted the method of watching our infants inaugurated by the accoucheurs, and have introduced it into a different sphere, into dispensaries for sick children situated in the poor quarters of Paris. In 1892 I established at the Dispensaire de Belleville, in one of the poorest districts of the French capital, a *goutte de lait*, and shall briefly describe the field in which it works and its methods. Children of the lowest and poorest classes are brought to us who are almost invariably fed artificially and rarely if ever breast-fed by their mothers, who are compelled to work hard to be able to rear their children. Most of the children are atrophic after illnesses such as gastro enteritis. They are not always brought by their mothers, but often by a grandmother, an elder sister, or an *éleveuse* (baby farmer). Bad rearing and the injudicious use of the feeding bottle are consequents of misery and pauperism. Such is the infant population of our *gouttes de lait* both in the poor quarters of Paris and in the manufacturing centres, where women are obliged to work in the manufactories or in the workshops. It is utterly impossible to resort to suckling to combat infantile mortality in such centres. The mothers have no longer any milk. We have therefore organized the scheme of distributing good sterilized milk, which we give gratuitously or at a reduced price according to the funds of the charity. This distribution of milk is of great value where the great majority of children have to be nursed artificially. For this reason we have adopted the apt title of *goutte de lait*, which was originated by Dr. Dufour in 1894 to designate the most interesting work he had organized at Fécamp.

It goes without saying that we watch these infants whom we are forced to nurse artificially, and of whom the overwhelming proportion are atrophic when they come into our hands. By distributing good milk, by graduating the feeding bottles, by weighing the children each week, by carefully watching the mothers, or *éleveuses*, and by distributing printed instructions for the nursing of children, we obtain most satisfactory results. We bring up artificially atrophic children who have been deficient in weight by one-third and sometimes by one-half of the normal. All these infants would have fallen into a marasmic state of atrophy and would have died if the neglect of hygienic requirements by the mothers and *éleveuses* had not been arrested. Our *gouttes de lait* thus become in the course of things schools for artificial nursing.

The comparison made by Dr. Peyroux between the mortality statistics of the *consultations de nourrissons* of the accoucheurs and the *gouttes de lait* of the physicians is manifestly unfair and calculated to raise false conclusions. The accoucheurs watch the rearing of children born in their wards mostly breast-fed; the *gouttes de lait* treat children of the poor and low classes, nursed artificially and usually brought in an atrophic state. The error into which Dr. Peyroux has fallen has come from lack of experience. He has neither founded nor directed any *consultation de nourrissons* or *goutte de lait*, and he simply works on statistics which are sometimes so deceptive. He has tackled a subject the complexity of which he has not appreciated.

Accoucheurs only lose 5 or 6 per cent. of the children who frequent their consultations, but this low figure is accounted for by the fact that they only accept a very small proportion of children artificially fed—5 or 6 per cent. Never can one hope to see a reduction to such a percentage of infantile mortality, taking all children in any country into the reckoning. The practice of accoucheurs in accepting only a very small percentage of artificially-fed children for treatment influences their statistics, and gives them an apparent favourable showing.

Of the children who are brought to us we lose in our *gouttes de lait*, from all causes, from 20 to 25 per cent., but the majority are atrophic when their treatment begins, and hereditary diseases account for a great number of deaths among the Parisian poor, where we work.

Those who wish to deprecate the *gouttes de lait*, and drag them into unfavourable comparison with the *consultations de nourrissons* of the accoucheurs completely ignore the fundamental principles of these two institutions, which, far from being antagonistic, are complementary one with the other.

At the beginning of this month (April, 1904), at the Congrès d'Obstétrique et de Pédiatrie at Rouen, the subject of *gouttes de lait* was the occasion of numerous interesting communications on the part of Monsieur le Docteur Brunon, Director of the School of Medicine at Rouen; Mme. Marie Roussel, Dr. Lourier (Elboeuf), Dr. Ausset (Lille), Professor Pinard, and others; and there were rather heated discussions on this matter. In spite of the efforts of the accoucheurs, who desire to use specially the *consultations de nourrissons* for the supervision of breast-fed infants, the tendency of the *gouttes de lait* is to control the artificial feeding of infants. Doctors naturally think—and rightly so—that breast-fed children do not require such strict supervision as those fed artificially. This is how Dr. George Carpenter, in his editorial article in the *British Journal of Children's Diseases*, has understood the working of *gouttes de lait*, and he recommends that institutions such as these be founded in all the large cities of Britain. Dr. Carpenter rightly criticizes dépôts for merely selling milk organized both by the municipality and by private people without the strict supervision of a medical man. But these dépôts have absolutely nothing in common with the *gouttes de lait* organized in Paris, and in a certain number of towns in France which are all supervised by doctors who alone are qualified to direct such institutions.

THE OCCURRENCE OF PRIMARY TUBERCULOUS INFECTION OF THE INTESTINAL TRACT IN CHILDREN:

THE RESULTS OF 5,142 CONSECUTIVE NECROPSIES.

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THE statements made by Koch¹ in his address before the Congress on Tuberculosis in London in 1901, regarding the identity of human and bovine tuberculosis and the modes of

transmission of the infection have since been subjected to most careful and searching investigation without any definite solution of the problem being arrived at. In conjunction with Schütz, he carried out a number of experiments, the results of which led him to conclude that human tuberculosis is not identical with bovine tuberculosis, and that the former is not transmissible to the latter, and further that the dangers ascribed to the consumption of tuberculous infected food have been grossly exaggerated. As is well known, articles of diet frequently contain in a living and virulent condition bacilli of *Perlsucht* in considerable numbers, and the quantities of such consumed by man daily would afford excellent opportunities for these micro-organisms to infect man.

Such, however, is not the case. According to Koch, tuberculous infections through the agency of food can only be accepted when the intestine itself is found affected—that is, when a so-called primary intestinal tuberculosis is found. Koch found such a condition extremely rare; in fact, he only remembers having seen two cases during his many years' investigation into tuberculous pathology. He is supported in this conclusion by the results obtained by other Continental observers. In the Charité of Berlin, where an enormous number of necropsies are held, only 5 cases of primary intestinal tuberculosis were found in five years. Baginsky,² working in the Kaiser and Kaiserin Friedrich Hospital for Children, found in a total of 933 cases of tuberculosis in children no case of primary intestinal tuberculosis without accompanying tuberculous changes in the lungs and bronchial glands. And Biedert³ found only 16 cases of the condition out of 3,104 necropsies on tuberculous children.

These results appear to show the rarity of intestinal tuberculosis in children, and strongly support the dictum of Koch that the dangers of infection through tuberculous infected food are of no greater moment than that which obtains for hereditary transmission of the disease, and may be discarded from the point of view of prophylaxis.

At the same time the observations of others must not be discarded. Previous to the Congress on Tuberculosis in 1901, the opinion was widely diffused that the tubercle bacillus most frequently gained an entrance into the body through the tonsils and the lower part of the small intestine. Such were the conclusions arrived at by Professors Sidney Martin and Sims Woodhead, who conducted experiments on tuberculosis when engaged in the work of the Tuberculosis Commission in London. In their opinion invasion of the intestine by tubercle bacilli could take place without leaving any trace of a pathological condition.

OBSERVATIONS IN HONG KONG.

During the years 1902 and 1903, 5,142 necropsies were held at the public mortuary in Hong Kong. The number of those performed on children under 5 years of age comprises about 35 per cent. The bodies came from all parts of Hong Kong and the adjoining newly acquired territory. Special attention was directed to the presence or absence of abdominal tuberculosis in its various forms, and the results where necessary were amplified by microscopic and histological examination. Tuberculosis in all its varieties is widespread amongst the Chinese population in Hong Kong. All ages are affected, but children and young adults are responsible for the majority of the cases. The modes of life of the native population, coupled with the extraordinary overcrowding existent in the densest parts of the city, are distinctly favourable for the rapid dissemination of the disease. The frequency of the occurrence of the disease would not appear to depend on any climatic or racial peculiarity, nor would the course of the disease appear to be more rapid in Hong Kong than in Europe.

The results of my investigation into the frequency of intestinal tuberculosis show that out of 5,142 necropsies only 13 cases of the condition were found. In 8 of the cases the condition was regarded as secondary, the infection being derived from the presence of tuberculous foci in other parts of the body. Pulmonary tuberculosis was found in 5 and acute generalized tuberculosis with marked affection of both lungs in 3 cases. In these the infection of the intestinal tract was probably occasioned through the swallowing of infected sputum. In all of these cases the manifestations of intestinal tuberculosis were typical.

Only 5 of the cases could be regarded as instances of primary intestinal tuberculosis. They all occurred in children under 5 years of age. In these the tuberculous process had apparently commenced in the follicles of the small intestine. All stages of the disease were usually present in each case. The