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

mucous membrane was studded with small nodular elevations, many of which were of a yellowish-white colour, and on section showed central necrosis and caseation. In the immediate surrounding ulcers of varying size were scattered about the mucous membrane. These had infiltrated and somewhat irregular edges, and their bases were composed of minute yellow caseous nodules. Crops of minute tubercles were found beneath the serous peritoneum, each surrounded by a hyperaemic zone, and the lymphatic vessels showed evidences of blocking by tuberculous infiltration. The mesenteric glands were found tuberculous in 3 cases.

These results bear out the observations made by pathologists on the Continent, and in the presence of so great a number of necropsies are of great importance in regard to the frequency of primary intestinal tuberculosis. They bear out, further, the views now generally recognized in regard to the invasion of the intestine by micro-organisms. The invasion of the alimentary canal under natural conditions by micro-organisms is by no means an established fact. In fact, there appears to be reason to doubt such an occurrence. Although the intestinal canal is the seat of election of the causal agents of a large number of diseases, yet the general results of all observations and experiments seem to show that under ordinary conditions the intestinal tract resists to a great extent the invasion of micro-organisms. The danger of auto-infection through the normal intestine appears to have been exaggerated, particularly in regard to the production of general disease in children. The researches of Czerny and Moser¹ are confirmative of this, and, according to Fischl,² most generalized diseases in children do not take origin from the intestine but from the respiratory tract. That such a condition of affairs is met with in tuberculosis in children I have been able to convince myself. By far the majority of cases of tuberculous disease amongst children in Hong Kong arise in connexion with the lungs and mediastinum. The investigations of Nocard and Kaufmann³, Lewin⁴, Wassilieff Kliemann⁵, and others, endeavouring to demonstrate the sieve-like structure of the intestine and its invasion by micro-organisms, would appear to be considerably weakened by the careful experiments of M. Neisser⁶ showing the resistance of the alimentary canal to the invasion of micro-organisms during normal processes of digestion and even after severe mechanical and chemical injuries to the intestinal mucous membrane.

These results have been confirmed by Simoncini¹⁰ and Tschistovitsch¹¹. At the present time it would appear advisable to take up something of an intermediate position in regard to the invasion of the intestine by micro-organisms. At the same time, the conditions in the intestine are remarkable when one considers that there is no other part of the body which is so closely and permanently in contact with such a rich bacterial flora.

It is said that although primary intestinal tuberculosis is a rarity, primary tuberculous disease of the mesenteric glands is by no means uncommon. The results of investigations from English and German sources are forthcoming, showing that this condition is found in a small percentage of cases. Woodhead¹² found it in 14 per cent. of all cases of tuberculosis in children. Biedert¹³ found it 40 times in 1,346 necropsies of tuberculous children; Carr¹⁴ 5 times in 120; and Grawitz¹⁵ in Griefswald 4 times out of 1,104 necropsies. Schlossmann¹⁶ and some others, however, believe tuberculosis of the mesenteric glands to be quite as rare as primary intestinal tuberculosis. My own observations would seem to show that the mesenteric glands are more rarely the seat of tuberculous disease than is generally acknowledged. During the past two years, in the presence of an enormous amount of pathological material, the outcome of over 5,000 necropsies shows 5 cases only of this condition. In each case the naked-eye appearances were supplemented by histological examination. In all of the cases the presence of tuberculous disease was found elsewhere in the body, most frequently in the lungs or lymphatic glands in the mediastinum. In no case was there evidence of tuberculous infection through the intestinal mucous membrane. The intestines were normal to the naked eye in each case. In one case acute generalized miliary tuberculosis was present, and the peritoneum was found scattered over with small tubercles. In another case the peritoneum was also tuberculous, but here the process was accompanied by thickening of the membrane, and the viscera were covered with a pearly-coloured layer, in which were found caseous tuberculous nodules.

Again, on performing a large series of necropsies on children one frequently comes across enlargement of the

mesenteric glands. The appearances in some of the cases are on superficial examination suggestive of the condition known as "tabes mesenterica." I have often experienced difficulty in regard to these cases, and had to resort to careful microscopic examination before pronouncing them free from tuberculous disease.

From my own cases one is hardly justified in concluding that the infection took place by way of the intestine. As has already been mentioned, the normal intestinal mucous membrane offers no great opportunities for the penetration of micro-organisms. The presence of tuberculous disease in other organs—for example, the lungs—allows of the possibility of the transmission of the causal agent from the latter to the mesenteric glands.

CONCLUSIONS.

My results would appear to justify the following conclusions:

1. That primary tuberculosis of the intestine is rare in children under 5 years of age.
2. That tuberculosis of the mesenteric glands is also rare.
3. That the results obtained amongst a native population where tuberculosis in all its forms is rife, and the conditions of life extremely favourable for the dissemination of the disease, point to the alimentary canal as a rare avenue through which infection in tuberculosis is conveyed in childhood.

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INTUBATION IN LARYNGEAL DIPHTHERIA.

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I.

ALTHOUGH a number of informing articles have appeared in recent years, notably one of great practical value by Goodall,¹ intubation of the larynx in diphtheria does not seem, in this country, to have received that recognition which, with due regard to its limitations, it deserves. A consideration of a series of cases is therefore perhaps permissible.

During the period covered by this paper, every laryngeal case requiring operation was treated, in the first instance at least, by intubation, and this absence of selection will, we believe, be of value in discussing the differentiation of cases suitable respectively for intubation and tracheotomy. In this connexion it should be said that intubation was not lightly undertaken; in almost every instance the obstruction was such that immediate interference was necessary. A few cases of a toxic and therefore unfavourable type were, however, intubated because, with only moderate obstruction, there was general loss of ground (see Group E).

We have thought it advisable to outline every case briefly as the best method of giving point to the principles considered in the body of the paper.

O'Dwyer's tubes, either all metal or vulcanite-coated, were used.

Approaching the cases from the point of view of the clinician, who has to decide whether an operation is necessary and also to choose between intubation and tracheotomy, we have arranged them in five groups. They are 70 in number. In stating the time during which the tube was worn, in every case the first day is counted as one.

GROUP A.

Cases not Intubated on Admission, but after a Varying Time for Progressive Obstruction; Twenty-three Cases, with Six Deaths.

CASE I.—M. E. W., female, 17 months. Eighth day. Extensive membrane on tonsils, palate and uvula; profuse nasal discharge. Broncho-pneumonia (right). Antitoxin 12,000 units. Intubated twelve hours later; relief complete. Removed on fourth, fifth, and finally on sixth day. Death on same day from broncho-pneumonia and toxæmia.

CASE II.—M. G., female, 10 years. Second day. Membrane both tonsils. Antitoxin, total dose 26,000 units. Intubated sixteen hours later. Relief not complete. Tube twice removed and cleaned. Death from broncho pneumonia thirty-six hours later.