ON INFANTILE MORTALITY.*

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IN 1898 the number of deaths of infants in Limehouse under one year of age was 388, corresponding to 208 deaths for every 1,000 births. This means that for every 10 children born during the year only 8 lived twelve months. There were only two districts in London which had higher rates of infantile mortality, viz., Holborn (221) and St. Saviour's, Southwark (211). Three of the Eastern Districts had rates almost as high as that of Limehouse, viz., Shoreditch, 196 per 1,000 births, St. George's-in-the-East 195, and Poplar 191. The infantile mortality for the whole of London was last year 166 per 1,000 births.

I have made inquiries into the causes of death, not only of infants under a year old, but also of those dying under the age of eighteen months, excluding, however, those dying from notifiable infectious diseases, or within a few hours of birth from prematurity or congenital defects.

Of the 266 cases actually investigated, in 35 the deceased was the first and only child; of families having other children alive, in 68 the child in question was the only one that had died; in 119 other children had previously died under the age of one year; in 23 other children had died between one and two years of age; and in 8 other children had died between two and five years of age.

Of families with no surviving children, in 17 other children had died under one year of age; and in 3 other children had died between one and two years of age.

The frequency of infantile deaths in various families is given here :

No. of families that had children living and none dead previously	...	66
" " " 1 child dead "	...	62
" " " 2 children " "	...	48
" " " 3 " " "	...	31
" " " 4 " " "	...	21
" " " 5 " " "	...	8
" " " 6 " " "	...	3
" " " 8 " " "	...	1
" " " 14 " " "	...	1

Inquiries as to *manner of feeding* were made in 355 cases. In 85 instances the people were not known at the address given, or had gone away, their present address being unknown; and in four instances information was refused.

Of the remaining 266, 234 were under one year of age, and 32 were between twelve and eighteen months old.

Of those under one year of age, 104 were breast fed, and 130 were reared on artificial food, the various foods used being as follows :

Nestle's Milk	...	...	...	...	...	45
Cow's Milk	...	...	...	...	...	38
Mellin's Food	...	...	...	...	...	10
Ridge's Food	...	...	...	...	...	7
Hatfield's Food	...	...	...	...	...	3
Allen and Hanbury's Food	...	...	...	...	...	5

* From Annual Report for 1898.

Condensed Milk	3
Humanized Milk	2
Corn Flour	1
Benger's Food	1
Nursery Biscuits	4
Mellin's Food and Hatfield's Food	2
„ Nestle's Milk	3
„ Cow's Milk	1
Allen and Hanbury and Cow's Milk... ..	1
Nestle's Milk and Ridge's Food	3
„ Allen and Hanbury's Food	1

130

In the following table are set out the diseases from which the infants died, and the relative percentage of breast-fed infants and of those brought up on artificial foods :

Diseases.	Total.	UNDER ONE YEAR. ABOVE ONE YEAR.				Family gone away.
		Breast.	Artificial.	Breast.	Artificial.	
Bronchitis, Broncho - Pneumonia and Pneumonia	65	17	27	5	—	16
Cardiac failure	1	1	—	—	—	—
Convulsions	22	6	5	—	2	9
Debility	2	2	—	—	—	—
Inanition and debility from birth	14	6	4	—	—	4
Dentition	17	7	5	2	1	2
Dyspepsia	2	—	2	—	—	—
Diarrhœa	73	12	38	5	3	15
Gastritis, Enteritis, and Gastro-Enteritis	38	7	16	3	—	—
Marasmus	35	9	13	1	1	11
Meningitis	11	6	3	1	—	1
Prematurity	6	5	1	—	—	—
Tuberculosis	15	5	5	3	—	2
Tabes Mesenterica	6	4	1	—	—	1
Rickets	2	—	2	—	—	—
Hydrocephalus	3	1	—	—	—	2
Whooping-Cough	18	9	4	1	1	3
Skin Disease	1	1	—	—	—	—
Thrush	4	2	1	1	—	—
Abscess of Thigh	1	1	—	—	—	—
Suffocation in bed with the parents	7	3	1	—	—	3
Acute inflammation of the stomach due to improper feeding	2	2	—	—	—	—
Convulsions due to improper feeding	1	—	—	—	—	1
Cirrhosis of Liver	1	—	—	—	—	1
Malnutrition	1	—	—	—	—	1
Measles	1	—	—	—	—	1
Cellulitis of Scalp	1	—	—	—	—	1
Collapse of Lung	1	—	—	—	—	1
	351	104	130	22	10	85

Refused to supply information, 4.

In the preceding tables I have only represented the mode of bringing up the infants, and the diseases to which they ultimately succumbed. Besides the mode of feeding the infants, other conditions exist, which perhaps influence and undoubtedly modify this factor in infant life.

During the last year I have made careful inquiries into other causes that may have operated in producing this high infantile mortality, and I have come to the conclusion that the factors which enter into its causation are numerous and complex. In many instances it is difficult and almost impossible to determine which factor predominated as the predisposing agent in the death of the child.

I have felt it would be of great value if we could decide to what extent these conditions could be improved by means of the powers at present vested in the Sanitary Authority, and in what direction that power is deficient, and could profitably be strengthened by further legislation.

A few of the causes of this high mortality are, I am afraid, irremediable, and hopelessly beyond the control of any Sanitary Authority. Though aware of these conditions being beyond our control, yet that their relative importance may be gauged, I have recorded some of these, and shall briefly discuss them first. They may be divided into six groups :

1. <i>Poverty.</i>	4. <i>Unhealthy surroundings.</i>
2. <i>Illegitimacy.</i>	5. <i>Hereditary Diseases.</i>
3. <i>Overlaying.</i>	6. <i>Insurance.</i>

1. *Poverty.*—On account of poverty and other causes, wives work in factories, etc., even when pregnant. They are known to work up to within a day or two of their confinement. These conditions expose the mother to all sorts of risks, and very often cause the child to be prematurely born. In 1898, 33 deaths were registered as being due to prematurity, the intervals of survival being as follows :

5	lived less than one hour.
6	„ from one hour to twenty-four hours.
9	„ „ one day to one week.
9	„ „ one week to one month.
4	„ „ one month to three months.

This list does not include still-born children. But even when the child is born at full term and healthy, it does not stand a normal chance of surviving. The mother has soon to return to work, and the child has of necessity to be brought up on artificial food. This is not all : the mother cannot afford to pay a proper person to look after the child, and very often it is placed in the care of another child, who is probably only a few years older. The risks to which a child thus placed is exposed are obvious.

2. *Illegitimacy.*—The mortality amongst illegitimate children is twice as high as that amongst legitimate children. The number of illegitimate children born in Limehouse is very low when compared with England and Wales. In 1897 only 12 illegitimate children were born in the District, equal to 1 in 166 births ; whereas in the rest of England and Wales the proportion was 1 for every 20 births.

3. *Overlaying, or Suffocation of the Child whilst in Bed with the Parents.*—Seventeen inquests were held during the year on infants dying in this manner. It may be interesting to notice that this accident occurs much oftener on some days than on others : 12 deaths having occurred on Friday, Saturday and Sunday, and only 5 on the remaining four days of the week.

4. *Unhealthy Surroundings, and a Want of Sufficient Fresh Air and Daylight.*—A great many children are brought up amidst unhealthy surroundings. In many homes work is carried on daily by the parents,

and the nuisance arising from fish-offal, skin-dressing, and other similar occupations, must be injurious to the health of the children.

A great many of the courts and alleys in the District contain houses from which daylight is almost totally excluded, and this means lowered vitality to the inmates. It is surprising how difficult it is to persuade people that fresh air will not injure children. They block up every aperture which might serve as an entry to fresh air and an exit to the foul air, and think that by so doing they serve the best interests of their children.

5. *Hereditary Diseases*.—Diseases in the parents are often accountable for weak children. In some instances these diseases cause the children to be prematurely born, in other instances the children are born at full term, but the iniquities of the parents are visited upon the children. Under this heading might be included alcoholism in the parents. The question of whether acquired characteristics can be transmitted need not trouble us; but it must be admitted that habitual drunkenness in the parents does tend to produce feeble children. Not only does drunkenness affect the children by causing the inherited capital with which the child starts life to be deficient, but it also acts indirectly on the infant in this way, that often their surroundings are unhealthy, and the mother neglects the child.

6. *Insurance*.—It is often stated that infants that are insured stand a far worse chance of living than children that are not insured. I have been told that some of these are insured before they are born. The fact of there being a slight monetary advantage derived from its death is asserted to render the mother more careless of its health, and less anxious to rear it. I am not in a position either to prove or to disprove the above statement, but I have made inquiries from some of the best authorities. Knowing that Mr. Wynne Baxter, the Coroner for East London, at every inquest he holds on children, particularly asks whether the child is insured or not, I made inquiries of him. He told me that 75 per cent. of the children that die, and are the subject of investigation by him, are insured; but at the same time he does not think that the fact that they are insured has any influence or bearing on the death. Mr. Baxter's experience shows how prevalent the practice is amongst the poor of East London, but his opinion as to its effect must also be held as the highest and best in London.

The above figures must of course be taken only as an approximate estimate, in the sense that they are the predisposing causes in the etiology of infantile mortality, as in many instances the causes are numerous and the conditions existing complex. But, on the whole, I think that in the Limehouse District the above figures are a fair index of their relative importance. The least important undoubtedly in this district are Illegitimacy and Insurance. This is fortunate for us, as they are also factors which could be least influenced by an efficient Sanitary Authority. Over-laying is more important and almost as difficult to suggest in what direction legislation is needed. I can only suggest that it be made compulsory that an infant of a certain age should not sleep with the parents, but have a separate cot by the side of the bed, even if it be only an old box, which can be made comfortable.

Poverty is an important question. If mothers must go out and work, some institutions, such as the crèche in Stepney Causeway, might be established, where the infants could be left and looked after during the day whilst the mother is at work. Such institutions would be of undoubted benefit for such mothers as are compelled to go out and work.

The question of unhealthy surroundings is to a great extent intimately bound up with the question of Poverty. Useful legislation has been enacted in respect to various trades in centres of population. To carry reforms in this direction very much further brings with it the risk of unnecessarily crippling useful and indispensable manufactures.

To what extent legislation ought to be undertaken in respect of Hereditary Diseases is a vexed and much-debated subject. It is beset with many difficulties, and the prospect of legislation is remote. For instance, from the standpoint of public health, a law to prevent consumptive patients from marrying would be an excellent step towards the eradication of tubercular disease; but any legislation that so interferes with the liberty of the subject would hardly be tolerated in England at present.

Insurance is, again, very closely connected with poverty, and assumes an importance only in poor districts. The expense of a funeral falls very heavily on a poor household, and were it not for the insurance money, it might involve the family in a debt that would take a considerable time to liquidate.

The other conditions that may possibly be improved I will first briefly enumerate, and then discuss more fully in giving the different diseases that they are responsible for.

1. *Insanitary Dwellings*.—By this term I do not mean that the conditions which exist are ordinary, and remediable in the usual way. Many houses are insanitary by reason of their position, and can never be rendered sanitary except by the clearance of adjoining sites or other structural alterations.

2. *Improper Feeding*.—During the siege of Paris the infant mortality was reduced to one-half of the average it had been for several years, though the ordinary death-rate had doubled. This was due to the mothers being obliged to suckle the babies, on account of the scarcity of milk and other food.

Improper feeding may be subdivided into :

- (a) Starchy food.
- (b) Sour milk, condensed and otherwise.
- (c) Unsuitable and dirty bottles.
- (d) Germs from diseased cows.

Bronchitis, Pneumonia, and Broncho-Pneumonia.—Of the 65 deaths that I inquired into, 16 of the families had moved, 32 of the children were brought up on the breast, and 17 artificially. These diseases in infants have several causes, but undue exposure, draughts and insufficient clothing are the chief. There is nothing worse than to take an infant of a few months old to a concert, theatre, or a music-hall, and then from that hot and crowded room to expose it to the cold night air. This happens oftener in the East End of London than in the better-class districts.

With regard to the clothing, I cannot understand why women dress their new-born infants in robes of such length and shape that the child is utterly incapable of using the muscles of its legs—an exercise that is of as much importance to it as it is to an adult. Then, when the baby is three or four months old, from being over-clothed it is suddenly put into short clothes, and becomes sadly underclothed. The neck and arms are bare as well as the legs. The thighs and hips are covered only by short skirts, which give very little protection to the child.

Summer Diarrhœa was very prevalent during July, August and September. It is due to a certain germ which migrates from the soil, and enters the milk and other food. The hotter the summer the more prevalent is the disease, and the higher is the mortality. I made inquiries into 73 deaths. Fifteen of the families had gone away. Eight of the deceased were children between twelve and eighteen months old. Of these, 3 were brought up artificially, and 5 on the breast. Of the remaining 50, which were under a twelvemonth old, 38 were brought up artificially, and 12 only on the breast. Of the 12 brought up on the breast, only 2 were under three months old.

Gastritis, Enteritis, and Gastro-Enteritis.—Of the 38 deaths from these diseases that I inquired into, 10 of the families had gone away. Of the 5 deaths of children that were over a year old, 2 were fed artificially, and 3 were brought up on the breast. One suckled till he was sixteen months old, a condition that was injurious to the mother as well as to the child. Of the 23 children under a twelvemonth old, 16 were brought up by artificial means, and 7 on the breast.

These diseases give rise to diarrhœa and vomiting, and are caused by some irritation, such as sour milk, starchy or other indigestible food. The saliva, or spittle, in infants is at first of very small amount, especially in the first two months. It becomes more abundant when teething begins. The chief function of the saliva in the adult is to help the digestion of starch by turning it into grape-sugar by means of an active principle or ferment, which is present in the saliva. Not only is the saliva scanty in the baby, but this active principle is almost entirely absent till the baby is six months old. Therefore, to give starch to a baby under six months old, in the form of nursery biscuits, bread, cornflour, or patent babies' foods, is to feed him on stuff that Nature has never intended him to be fed upon, and the digestion of which is practically impossible. These foods when so given will either cause the above diseases, or will pass through the infant without being assimilated, and will also cause the child great discomfort and pain.

Convulsions are more common in infancy than in adult age, and more especially towards the time of teething.

It is quite possible that there are several deaths registered as convulsions that are really due to overlaying. The appearances of the body after death are very much alike, and even if a *post-mortem* examination be made, it is very difficult to distinguish between the two.

Out of the 22 deaths that I inquired into, 9 of the families had moved, their present address being unknown. Seven were brought up artificially, and 6 on the breast.

Marasmus and Rickets are to a great extent food diseases. Out of 37 deaths that I inquired into, 11 of the families had gone away. Of the remaining 26, 10 were breast-fed, and 16 were brought up by artificial means.

Thrush is due to neglect of cleanliness in feeding, or using an imperfectly cleansed teat, or to the presence in the mouth of sour milk. Of the 4 deaths that I inquired into, only 1 was brought up artificially.

Four inquests were held where the jury brought in verdicts of acute inflammation of the stomach due to improper feeding, and 1 of convulsions due to improper feeding.

At the Congress of the Sanitary Institute held in Birmingham an account of the work done by the Infant Life Protection Society of Chesterfield was given. The practice of the lady appointed by that Society has been to pay a visit to each house where a birth has taken

place, and leave a leaflet on "Infant Management." Information is given on many points, and where necessary practical instruction in the care, feeding, and nurture of infants. Contrary to many predictions, a good reception, and in the majority of cases a hearty welcome, has been given to the visitor. Whenever second visits were paid, it was always found that some attempt had been made to carry out the teaching given.

Any person can secure the services of the officer by request at the Borough Health Department, and a practical demonstration of the success and value of the undertaking is shown by the large number of relatives, friends and neighbours who now report births and illnesses of babies, and make requests for visits. The Medical Officer of Health states that in August, 1897, the deaths from diarrhoea numbered 38, and in August, 1898, 17, a decrease of over 50 per cent., whereas in Limehouse there was an increase of nearly 25 per cent. This was undoubtedly due to the fact that the mean temperature in August, 1898, was very much higher than in August, 1897. The higher the temperature, the greater is the number of deaths from summer diarrhoea, and *vice versa*. Therefore a reduction of over 50 per cent. speaks volumes for the work that is done, and can be done in this direction, to lessen the large number of infants' lives that are sacrificed annually.

The only other practical suggestion that I can make is to have pamphlets printed, with instructions to mothers how to rear and bring up children, and that these pamphlets should be handed to the local Registrars, to be distributed by them whenever births are registered. This latter plan cannot, of course, compare with that adopted at Chesterfield. The only advantage it has, however, is that it is not so expensive.

LOCAL GOVERNMENT BOARD REPORTS.*

IN Ormskirk 1,298 of a population of 6,797 live in courts, abounding in many ramifications, relics of the time when the town was liable to be invaded. These courts exhibit insanitary conditions of the worst kind: back-to-back houses, enormous privies, middens, piggeries, overcrowding, water laid on to a stand-pipe for a whole court, cobble-stone paving, absence of eave-spouting, dampness of walls and foundations. It is little wonder that exceptional death-rates, especially from respiratory diseases, prevail, or that the justices should have called attention to the excessive number of convictions (most of them of dwellers in these courts) for crime and drunkenness.

Dr. Copeman thinks that nothing short of comprehensive schemes under the Housing of the Working Classes Acts can effectively deal with the evil, especially as in many instances the courts are split up into a plurality of holdings, the owners of which are unable to bear the expense of any extensive alterations.

At Gainsborough there are also many courts and alleys in the older part of the town, but houses more recently erected, though not arranged in "yards," are nevertheless much crowded together; even with new

* Report on the Sanitary Circumstances and Administration of the Urban District of Ormskirk, by Dr. S. Monekton Copeman, 1899. Report upon the Sanitary Circumstances and Administration of the Urban District of Gainsborough, with special reference to the Prevalence of Fever therein, by Dr. L. W. Darra Mair, 1899.