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INFANT MORTALITY.

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THE large preventable wastage which occurs during the first year of human life, not only in this realm but in many other countries, is perhaps the most important medical and social problem of the age, and is, at present, engrossing much of the attention not merely of medical officers of health and of physicians, but of statesmen and sociologists in nearly every quarter of the globe; and it may be interesting to show that the important division of State Medicine, known as Infant Hygiene, which claims so much of your attention as civilian sanitary experts, has, in view of the large number of women and children borne "on the strength" of the army, a world-wide importance for officers of the Royal Army Medical Corps, and, in consequence, much interest for military sanitarians. You are all perfectly familiar with the agencies at work in producing what Mr. Punch has styled "the modern slaughter of the innocents," so what I would ask you to do to-night is to discuss the preventive measures best calculated to remove, or at least to mitigate, this great national calamity.

"Infant mortality in the early weeks of life," says Dr. Newman, Medical Officer of Health for Finsbury, "is evidently due in a large measure to the physical conditions of the mother leading to prematurity and debility of the infant; and in the latter months of the first year infant mortality appears to be due to unsatisfactory feeding of the infant.

"From either point of view it becomes clear that the problem of infant mortality is not one of sanitation alone, or housing, or indeed of poverty, as such, but is *mainly a question of motherhood.*"

Improved sanitation, better housing, and more plentiful food should all, theoretically, have had good effects on this condition, but they have not; for, although there has been a marked fall in the death-rate for this country generally, and in some cities (Glasgow, for example) the death-rate has fallen one half during the past thirty to thirty-five years, the rate of infant mortality for the United Kingdom remains practically stationary.

With a diminishing birth-rate and vast colonial territories clamouring for settlers, this continued waste of possible empire builders is no mere parochial or professional question, yet it is curious how sanitary authorities, who will light-heartedly take over sewage and water schemes involving the expenditure of millions, with a few enlightened exceptions, seem to persistently avoid all schemes for the protection of mere individual life as unworthy of their consideration. They do not appear to have realised that modern State Medicine has advanced beyond the hygiene of mere environment to the hygiene of the person, and concerns itself just as much with the preservation of the health of the individual as with the drainage of the cities.

Even an enlightened Cabinet Minister, who is an acknowledged authority on education, has failed to realise that some portion of preventive medicine should be studied by every citizen, and has refused to make hygiene a compulsory subject in elementary schools.

With these few preliminary remarks I propose to suggest the measures by which we may attain to a higher standard of physical motherhood, healthier babies, and, thereby, a diminution of infant mortality.

I think such measures fall under three divisions, viz. :—

1. Measures directed towards the mother.
2. Measures directed towards the child.
3. Measures requiring special statutory powers.

Let us consider these *seriatim*. Measures affecting the mother fall, I think, under three headings.

1. First and foremost of these I would place the education of elder girls in the care of infants and young children.

The Right Hon. John Burns, in his address to the National Conference on Infantile Mortality last June, said, "What the mother is the children are. The stream is no better than its source"; and therefore he urged "First concentrate on the mother."

Mr. Burns' opinion, as an able President of the Local Government Board, and *ipso facto* the Minister of Public Health for this realm, is

worthy of all respect, but I beg leave to say he is wrong in his advice to *first* concentrate on the mother.

By the time a girl has become a mother she has sometimes "ideas" (and, as we know only too well, often very wrong "ideas") on baby rearing, and it is frequently too late to inculcate sound notions on infant hygiene when the responsibilities of maternity have actually arrived.

I would therefore paraphrase Mr. Burns' words to "First concentrate on the elder girls if you would diminish infant mortality."

Herbert Spencer has written so appositely that he might have been addressing Mr. Burns' audience, and I venture to quote his remarks as peculiarly apropos.

"If," he says, "by some strange chance not a vestige of us descended to the remote future save a pile of school books or some college examination papers, we may imagine how puzzled an antiquary of the period would be on finding in them no sign that the learners were ever likely to become parents."

"This must have been the curriculum for the celibates," we may fancy him concluding. "I perceive here an elaborate preparation for many things, especially for reading the books of extinct nations and of co-existing nations (from which it seems clear that these people had very little worth reading in their own tongue), but I find no reference whatever to the bringing up of children."

"They could not have been so absurd as to omit all training in this gravest of responsibilities. Evidently then this was the school course of one of their monastic orders."

I am sure all will agree that it is indeed an astonishing fact that on the care and nutrition of those children whose whole future will depend on the ignorance or intelligence of their mothers, not one word of instruction is given to those who, by-and-by, will become parents.

Is it not monstrous that the fate of a new generation should be left to the chances of unreasoning custom or impulse, the advice of ignorant nurses, or the opinions of prejudiced counsellors, such as the mother of fourteen children who has lost most of them, and therefore "ought to know"?

Our first effort to obtain good motherhood is to secure that all elder girls should be taught the elements of infant hygiene as a separate portion of the school curriculum.

I propose that this instruction should be given in a regular systematic way under the supervision of medical men appointed by some central and unbiassed authority, not on account of their political views and party

influence, but on account of their special knowledge of this new and important branch of State Medicine.

Failing this, there is no reason why courses of instruction in feeding and tending of young children should not be given in all elementary schools by specially trained and certificated nurses. This has been done under the Manchester Education Authority for some years, and Dr. Niven, the Medical Officer of Health for the city, informs me that the courses have been productive of much good.

Nurses appointed to teach a subject of this nature should hold some special certificate, and it would be well if The Royal Sanitary Institute were to institute a certificate in infant hygiene as a qualification for appointments of this nature. In this matter we in the army might, I think, lead the way, and I have suggested elsewhere that all army schoolmistresses should undergo a practical, I had almost said a clinical, course of instruction in infant hygiene at one of our military families' hospitals, and that the hygiene of infant and school life should form an essential part of the entrance examination of army schoolmistresses, and a regular subject of instruction for elder girls in army schools.

2. The second measure affecting the mother is provision for the proper care of poor women during and immediately after the puerperium.

The Midwives Act of 1902 is an important measure in this relation, but we will not be able to realise its full benefit for some years, as many ignorant women have been registered under the Act, and until 1910 it merely protects the *title* of midwife, and does not protect from the "handy" but terrible septic, woman who does not *call* herself a midwife, but still practices midwifery for gain.

No organisation, charitable or otherwise, exists in the Three Towns for the purpose of caring for poor women during child-birth, and the result must be that very many valuable lives are lost for want of skilled advice during this critical period.

The military authorities are ahead of even the wealthy and ancient Borough of Plymouth in this particular, as they have established as far back as 1865 the only maternity institution in the West of England with the exception of the hospitals at Bristol. The benefit derived from this military maternity may be gathered from the attached Table No. 1, in which I have attempted to contrast the military infant mortality of Devonport with that of the civil population.

My table is, of course, only approximately correct, but I think it is sufficiently so to show that the prospects of passing through the perils of the first year of life is at least twice as good in the case of the soldier's

infant as in that of the child of the civilian residing in the same neighbourhood.

This advantage is, however, not merely a local one, but exists for the whole Army, as in all important stations similar provision for soldiers' wives exists, and everywhere the soldier's family is not merely well housed, clothed, and fed, but has prompt medical attendance provided almost at its doors. In further proof of the claim that the soldier is better off than the civilian in this respect I submit the attached Table No. 2 for the decennium, 1896-1905, showing the mortality rate for the children of soldiers in the United Kingdom and India as rendered in the Army Medical Department Reports. As Colonel Caldwell says in his work on "Military Hygiene," an objection "may be raised to the figures (in Table No. 2) on the ground that they include children at ages which are not to be comprised in the term infancy. This is no doubt in a measure perfectly true, but it must not be forgotten that men cannot marry 'on the strength' during the early part of their service; that practically all the children included in the table were born in the Army of parents shown on the 'married strength,' and that transfer to the reserve takes place early in life. If these facts are borne in mind it is plain that the number of infants in soldiers' families must be relatively high" (*Military Hygiene*, page 394).

I think you will agree that it is a matter of which the Army may well be proud that the death-rate of its children, even in India, where the climatic conditions are so inimical to the earlier years of life, is only about one-third of that of this ancient Borough.

In the attached chart I have tried to show by a graphic method the relative infant mortality-rate in London, Glasgow, Devonport, and the married families of His Majesty's army in this Garrison.

Granting, therefore, the advantages which the Army confers by skilled medical advice and attention during, and after, pregnancy, I commend to the consideration of the wealthy and charitable in the West Country the Society for Nursing Mothers, which was established by private enterprise in France in 1876, and has now the support of the French Government.

The Society is divided into two branches. One branch consists of homes where destitute mothers are received during the last month of pregnancy. They are fed and cared for until the time comes for them to be passed on to the maternity branch and then out into the world again.

The result of this beneficent institution has been that no woman from the homes has so far died in child-birth.

Such an organisation might, however, stagger West Country enterprise

by its extent and the large initial outlay involved ; but our French neighbours have yet another preventive measure, which is quite within the reach of any body of private philanthropists.

The French have realised that a suckling mother requires abundant nourishment, and that it is often the lack of sufficient food which drives the poor mother to artificial feeding of her offspring in lieu of the nourishment which her own blood would supply were she in turn sufficiently nourished.

Once Nature's channels run dry, a suitably modified milk is unquestionably the greatest desideratum ; but, prior to this, the feeding of the nursing mother should be the primary aim in preventing infant mortality.

Restaurants have been established in Paris where women nursing at the breast are fed gratis twice daily. There is no question asked as to birth, religion, or legitimacy. The woman is hungry and has an infant to feed. That is sufficient for the French philanthropist.

Surely this is an example which might be followed in our charitable England.

3. The third and last measure directed towards the mother is provision for the further supervision of female labour in factories, and the prevention of women from engaging in arduous labour during the three months immediately preceding and following parturition.

The present Factories Act, as you are aware, prohibits the employment of women for one month after their confinements, but this is not enough ; and pending further legislation, employers of labour might be persuaded on humanitarian grounds to avoid the employment of mothers for the period suggested, and some might even be induced to establish crèches in connection with their factories as is done in France.

The factory crèche is, of course, an essentially different thing from an ordinary crèche. It is merely a nursery where children are cared for while their mothers attend to the loom or machine. When possible the infants are suckled by their parents, and artificial feeding is the exception rather than the rule.

The utility or otherwise of crèches generally is too big a question to undertake in the time at our disposal, but they are a measure in the prevention of infant mortality, which I consider of much importance. No institution of the kind exists in the Three Towns because, according to Dr. Williams, the able medical officer of health of Plymouth, we have no manufactories in which women are employed in any number.

I think that notwithstanding the absence of factories there is ample work for a crèche in Devonport and Stonehouse, as I know from my work

among the married families "off the strength" that there is a large number of women who go out to work as needlewomen and charwomen daily, leaving their children to the care of ignorant and dirty landladies who look after the unfortunate baby for a small fraction of its mother's earnings.

I sometimes see these daily nurslings at the Military Families' Out-patient Department, and their condition is too frequently truly pitiful.

The Alexandra nurses have represented to the Soldiers and Sailors Families' Association the desirability of establishing a crèche for the children of sailors and soldiers married without leave.

Personally I strongly advocate crèches for three reasons, viz. :—

1. Because the child has to be brought to the crèche clean, and therefore the mother is taught the necessity for cleanliness. Moreover, advice from the matron with regard to the use of "dummies" and bottles with tubes stands a fair chance of being regarded.

2. Because the child is properly fed and cared for during at least a portion of the day, and taught good habits.

3. Because the crèche being of necessity under medical supervision, illness is likely to be detected earlier, and "running ears" and like conditions, which are so frequently ignored by ignorant mothers, are treated and cured before they have time to work serious mischief.

These reasons are, I think, sufficient to justify the existence of such institutions, but if another were needed I would suggest their being used as schools for demonstrating to elder girls the principles of Infant Hygiene, which they have been taught in school, *in actual practice with real babies*.

We now proceed to consider those means of prevention specially directed towards the child, and we find that these again may be grouped under three heads, viz. :—

1. The provision of a pure milk for artificial feeding.
2. The appointment of lady health visitors.
3. Provision for the earlier registration of births.

1. The provision of a pure milk supply must take a very important place in all schemes for the prevention of infant mortality, as even deducting those unnatural parents who refuse to suckle their offspring, and those unable to do so as they have to earn their living, there are in all large communities a considerable number of women who are incapable of doing so.

Indeed, Dr. Holt writes : " Among the well-to-do classes in New York and its suburbs, of those who have earnestly and intelligently attempted to

nurse not more than 25 per cent., in my experience, have been able to continue satisfactorily for as long as three months. An intellectual city mother who is able to nurse her child successfully for the entire first year is almost a phenomenon. Among the poorer classes in our cities a marked decline in nursing abilities is also seen, although not yet to the same degree as in the higher social scale." (*"Diseases of Infancy and Childhood,"* 3rd edition, p. 167.)

It would be interesting to know if your experience in the West Country is similar to this American experience.

Nothing, of course, is equal to *good* maternal nursing, but no method of feeding gives much worse results than *poor* maternal feeding.

Personally I think that among the higher classes artificial feeding, though an undoubted evil, is not a very serious one; but among the poor, or so-called working classes, where so many sanitary sins are committed in the name of bottle feeding, maternal nursing should be persisted in as long as there is any chance of success.

As, therefore, many mothers are unable to suckle their children, it is obviously necessary to secure pure cow's milk to supply the defaults of *maternity*, and to meet this desideratum every sanitary authority seriously interested in the question of infant mortality should establish a municipal milk depot. These depots, like most schemes for preventing waste of infant life, come from France, where they were started in 1892.

The French institutions encourage breast feeding, but where this is impracticable provide sterilized milk in a number of bottles containing the necessary meals for one day. The infants are weighed and examined periodically by a physician, and both mother and child receive any medical treatment required.

The first depot in this country was opened at St. Helens in 1899, and has been followed by several others in various parts of the country.

The only depot of which I have any personal knowledge is that at Finsbury, which may be taken as a type of what such depots should be.

The principles on which it is worked are: (*a*) absolute control of the milk from its source, and avoidance of the fallacy of sterilizing unclean milk; (*b*) medical supervision of every detail of the depot work, and of the infants using the milk; and (*c*) a discriminating distribution of the milk to those only which cannot be breast fed.

To meet the first principle the sanitary authority at Finsbury has arranged for a supply of milk from a farm in Essex, where all details of refrigeration, sterilization, and modification are carried out on the spot.

This appears to be the first essential in infants' milk depots, as it is

obviously important not to work on the lines of obtaining ordinary unclean milk and trusting to sterilization for removal of unsatisfactory properties.

"It cannot be too clearly understood," says Dr. Newman, "that sterilization does not make bad milk good, or dirty milk clean; nor is it sufficient to merely contract for a supply to the depot from some dairyman of good standing."

Complete control of the milk from the cow to the consumer is essential for a successful and scientifically correct infants' milk depot.

At Finsbury, infants requiring milk are introduced by medical practitioners, hospital nurses, sanitary inspectors, birth registrars, etc.

It is obligatory that the child should be brought once a fortnight to be weighed and, if necessary, examined by a medical man. No medical treatment is given, and if any is required the mother is directed to consult her regular medical adviser.

This is a very desirable, if not ideal, state of things, but failing this there are many ways in which milk contamination might be avoided.

Local sanitary authorities could easily raise the standard of cleanliness for milkshops, and surely the Plymouth City Fathers might prevent the exposure of an excellent bacteriological medium in counter pans, where the constant dipping with not overclean hands, flies and dust from shop and street, produce the culture of millions of pathogenic organisms, which is sold under the courtesy West Country title of "pure raw milk"!

2. We now pass to the second heading of this division, viz., the appointment of lady health visitors.

Plymouth has realised the importance of these officials in raising the general health standard amongst mothers, but Devonport and Stonehouse have still to learn their usefulness.

Not the least important of the duties of lady health visitors is to teach mothers how to *store* milk for infants.

"The poor have no pantries," and their milk is often stored in filthy vessels exposed to the most gross contamination.

Indeed, in the house of the comparatively wealthy the pantry in which, *inter alia*, milk is carelessly stored in uncovered vessels, is often a most insanitary apartment adjoining the servant's w.c.

3. We now pass to the third heading of this division and realize how appropriately it may be considered at this point, as it is a matter which lies midway between the question of lady health visitors and the third division of our subject, special statutory powers.

As you are aware, the law now requires births to be registered within six weeks of their occurrence.

For statistical purposes this arrangement works well enough, but for preventive purposes it is useless, as parents take full advantage of the legal time limit, and by the time the registrar notifies the medical officer of health and he, in his turn, requests the lady health visitor to visit the parent, the child has passed through the most critical period of its existence and, only too frequently, it is dead.

The law, therefore, requires modification, and the National Conference passed resolutions that all births and still births should be notified within forty-eight hours to the medical officer of health of the district in which they occur.

Pending, however, such powers being obtained by the tedious process of passing a Bill through Parliament, Alderman Broadbent, when Mayor of Huddersfield, has shown what can be done by private philanthropy.

The establishment of a private fund to secure the payment of a small fee for the early notification of births is a measure worth remembering in the prevention of infant mortality.

Registrars might be provided with a card of simple instructions in infant hygiene, which should be given to each mother on the registration of a birth. A card or some form of advice is now issued to military parents at many stations, and the Indian Government has prepared and distributed a pamphlet on the subject.

The final division of the subject now comes under consideration, and again I think we might group the new legislation required from Parliament into three Bills:—

1. A short Act on the lines of the Roussel law of France, prohibiting:
 - (a) the use of undigested farinaceous foods for infants less than seven months old;
 - (b) the sale of infants' foods which do not bear an analysis on each packet and a certificate from a Government analyst that they are non-injurious.
 - (c) the use of feeding bottles with tubes and "dummies" or infant soothers.
2. An Act amending and consolidating the Infant Life Protection Act of 1897 and the Prevention of Cruelty to Children Act of 1904. This Act would:—
 - (a) provide for the further protection of children sent out to nurse; every child adopted for lump sum or received for reward, whether alone or with others, would be inspected by a Government inspector till it attained the age of seven years;

- (b) prohibit and penalize the leaving of young children alone in circumstances of danger;
- (c) authorize the distribution by registrars of circulars giving advice on the care of children;
- (d) control and vigorously restrict the life insurance of the infants.

3. An Act replacing the present Dairies, Cowsheds, and Milkshops Order of the Local Government Board. The National Conference considered that (a) the provision of regulations by the local sanitary authority should be compulsory, instead of optional, as at present, and that (b) the scope of such regulations should be extended to cover *dirty* milk, and should enable local authorities to prohibit the sale of any milk which fails to agree with the conditions of purity agreed upon.

This question of infant mortality seems to be one which draws the practitioners of Curative and Preventive Medicine closer together than any other subject with which I am acquainted.

The latter has become too much a matter of sewers and drains and costly (and perhaps useless) isolation hospitals, but in this matter of preventing the waste of infant life there is "marked recognition of the value of the special function of the physician, viz., the care of the individual unit." "The engineer and the architect work in communities, but upon the physician devolves the far harder task of working individuals" (McCreary). The engineer and architect have rendered yeoman service to the cause of sanitation, but they are our servants and not our masters, for the protection of the public health is pre-eminently the work of practitioners of medicine, and there is no more promising field in our art than the prevention of disease in childhood. "The majority of the ailments from which children die, it is in the power of man to prevent." (Holt's "Diseases of Infancy and Childhood," p. 46.)

The supervision of child rearing by skilled physicians, not for the purpose of curing but of preventing disease, is the latest development of State Medicine, and in this work, I think, will be found plenty of scope for the devoted labour which is now largely wasted on the removal of pathological conditions, which, under a more advanced and enlightened system of Preventive Medicine, would never have come into existence.

[For Tables see over.

Infant Mortality.

TABLE I.

Showing Approximate Infantile Mortality amongst Married Families of His Majesty's Troops at Devonport during the Decennium 1897—1906, and the Civil Infant Mortality during the same period.

Year.	Births recorded at Military Families' Hospital.	Deaths under One Year recorded at Military Families' Hospital. In & Out Patients.	Approximate Military Infant Mortality rate per 1,000 Births.	Recorded Infantile Mortality per 1,000 Births, Civil Population of Devonport.
1897	45	1	22.2	149.2
1898	34	0	Nil	140.7
1899	52	6	118.03	163.2
1900	38	6	157.9	165.6
1901	44	0	Nil	146.2
1902	41	0	Nil	122.4
1903	70	2	28.5	73.0
1904	80	3	37.5	115.2
1905	90	2	22.2	135.9
1906	112	5	44.6	111.4
			Average for decennium = 43.09	Average for 10 yrs. = 134.6

TABLE II.

Showing the Mortality per Thousand of Children at all ages in the Army, at Home and in India, for the Decennium 1896—1905.
(Statistics for 1906 are not yet available.)

Year.	Great Britain and Ireland.	India.
1896	16.57	45.60
1897	20.36	50.49
1898	18.25	41.13
1899	18.31	41.03
1900	20.82	46.88
1901	16.62	32.95
1902	14.39	45.23
1903	12.97	36.99
1904	15.58	38.80
1905	12.04	36.87

TABLE III.

Showing strength of Women and Children at Five of the principal Stations of the Army in 1905.

	United Kingdom.	India.	South Africa.	Malta.	Egypt.
Women	13,933	3,375	1,116	548	180
Children	25,612	5,154	1,923	860	285

From the Army Medical Department Reports.

Chart showing the Infant Mortality

in London Glasgow and Devonport

and the approximate Military Infant Mortality in Devonport for the decennium 1897-1906.

MR. PAUL SWAIN, F.R.C.S. (Chairman of Plymouth Sanitary Committee) said that he had always held that in dealing with the housing question, and especially with regard to this question of infant mortality, one of the very best things they could do was to appoint women inspectors. He was glad to see that the Plymouth Corporation had been in advance in this matter, and that Exeter had followed in Plymouth's wake. But, as the lecturer had told them, Devonport still lagged behind. He thought the whole matter was entirely an educational one, and the well-trained lady inspector was the best person to educate the mother as to the bringing up of the child, and also as to the best sanitary methods to adopt. It was an extraordinary fact that the clergy and ministers of all denominations utterly failed in their conception of their duties from a sanitary point of view in visiting the poor. He admitted their zeal, and also the zeal of the lady district visitors, but, at the same time, he also recognised their ignorance of the real work they had to do and the way in which they ought to do it. He suggested that the clergy and ministers of all denominations should link themselves up with the women inspectors, and so gain from them that knowledge which they were quite ready to give in sanitary affairs.

DR. S. NOX SCOTT (Plymstock) said he thought Major Blackham very properly laid great stress on the great fact that the chief cause of infant mortality is the neglect of breast feeding. He never lost an opportunity of impressing upon a mother the grave neglect of duty she was guilty of when she deliberately abandoned the means which nature had given her for providing her baby with food—not only was she guilty of a great wrong towards herself, but she was also doing irreparable mischief to her offspring. One reason why some women of the poorer classes were sometimes unable to efficiently nurse their babies was that their husbands do not provide them with sufficient food. It does not seem to be widely recognised that the nursing mother requires more, and more frequent, food than at other times. It is equally true that if we want to rear healthy strong babies we must do all we can to promote the health and strength of the parents—not only healthy mothers but healthy fathers. The part that the father ought to play in the rearing of healthy babies was too often lost sight of, and, personally, he thought much blame attached to the father in regard to infant mortality. In spite of all that had been done in the cause of temperance, many of the working men of England still spent an utterly unjustifiable amount of their earnings on alcoholic liquor, and whilst this was so it would be difficult for the wives of such men to obtain, during their periods of pregnancy and nursing, such extra food as they ought to have. The question of the falling birth-rate could only be referred to as indirectly bearing on infant mortality, for if such falling birth-rate had come to stay (and, unfortunately, all evidence pointed that way) it only increases the relative importance of lessening, by every means in our power, the rate of mortality amongst such babies as are allowed to be born, for (leaving for the moment all the higher ethical aspects of the case)

it should be preached continually that it pays much better to breed healthy children; and if a child, during its first and second years of life, be provided with proper food, proper clothing, and fresh air, and is kept clean and wholesome, such a child has an infinitely improved chance of reaching healthy adult life, and so of becoming an useful member of the State. It has been proved again and again, that in proportion as an infant is nourished on its natural food during the first nine months of its life, so is its chance of becoming a healthy child increased, chiefly because of its greater power of resistance to disease. His experience made him much more confident in the treatment of an infant who may be ill if he were informed that it was breast-fed. Again, that period of a child's life, known as the teething time, is passed much more comfortably, and is freer from gastric disturbance and convulsions if it be breast-fed. We therefore, on behalf of that most helpless, but none the less important, section of our community, the child population, insist on measures being taken for their protection. Such measures may roughly be divided into three classes: (1) that which the medical profession can do; (2) that which other individuals of the public can do; (3) that which the State can do. Up to the present doctors are agreed that the chief cause of infant mortality is "unnatural feeding." The first remedy they suggest is maternal nursing wherever possible. The next remedy is the use of good and pure cows' milk used in its proper way, and they teach constantly that when a mother cannot provide all the milk that her baby requires, it should be supplemented by good cows' milk. On the other hand, doctors find that a most unreasonable prejudice exists against cows' milk, more especially when it has to be used as an addition to breast feeding. As to what other individual members of the public could do, he agreed with Major Blackham that the educators of our girls could do much, for surely those who are to be the mothers of the future should know something of the rational methods of rearing and treating infants, and although it may be argued that it is hardly possible to teach girls at school the practical management of a baby, yet indirectly much might be done by teaching them the enormous importance of personal and domestic hygiene, the influence which general cleanliness, fresh air and sunlight have, and the equally valuable effects of good, simple, and nutritious foods, together with the economical preparation of useful dishes from inexpensive materials. As far as possible boys also should be included in this curriculum, and lessons on such subjects would prove much more valuable to all the children in our elementary schools than much of what is supposed to be taught there at present. He fully agreed with Major Blackham in the necessity of an authorised statement of the composition of all artificial foods being attached to each package. Then again, he was in accord with what Mr. Swain had said about the parsons, for he did not think our public teachers of morality would be using their pulpits for any less high purpose than they are intended to be if they would occasionally use them to insist more on the duties of parenthood, and, in fact, if they preached a little more about "one's duty towards one's

neighbour." He welcomed legislation which would increase our control over unhealthy dwellings; over milk supplies; over pregnant and nursing women (by preventing them engaging in unsuitable work); over unthrifty, careless, negligent, or drunken fathers (by enforced work, if necessary, in labour colonies); and over misleading and lying advertisements, especially those referring to abortifacients and improper infant foods. In a small pamphlet prepared by consent of the Rural District Council, he gave simple instructions for the management of infants, and each person registering the birth of a child is given a copy. It is a curious fact that coincidently with the distribution of these instructions and the introduction of stricter control over the local milk supply (by the enforcement of by-laws under the Dairies and Cowsheds Orders), there had been a remarkable fall in the amount of infant mortality. The average of the five years before the distribution (1896-1900) of the pamphlet was 134·6 per 1,000, whereas that for the five years since (1901-1905) was 98·01, and during last year, viz., 1906, it was only 78·88.

DR. C. A. HINGSTON (Plymouth) said that behind all the actual causes of infantile mortality lie two great factors, ignorance and prejudice, and our attention should be mainly directed to combat and overcome them. To accomplish this, some of the earliest lessons in all elementary schools should consist of the simplest sanitary instruction, and could be applied to home and nursery life in the classes of the elder girls. Such lessons would gradually and certainly undermine many of the most dangerous traditions which cause so much infantile deaths. The appointment of lady sanitary inspectors is of the first importance, and their duties in enforcing sanitary laws and regulations would be much lightened if the necessity for such laws had been learned by school instruction. In connection with these visits of the lady inspector, early notification of births would ensure her visit at a time when she is most needed, as the first week of infantile life frequently determines the question of life and death, and mistakes made then are frequently fatal in their results. Crèches in London and the large manufacturing centres are most useful and supply a marked need, but in this town and neighbourhood where comparatively few women are employed in manufactures, the need is not so great, and a crèche established here some years ago proved a failure from the limited number of mothers who sought their babies' admission.

LIEUT.-COL. R. CALDWELL (Plymouth) thought that Major Blackham had not insisted strongly enough on the influence of the dwelling in regard to infant mortality in the army as contrasted with infant mortality in civil life. If any unprejudiced person would compare the average quarter occupied by the private soldier's family with the average dwelling occupied by the corresponding class among civilians, he would see at once that the advantages were enormously in favour of the former. Man is the creature of circumstances, and of all the

circumstances acting on him the dwelling must certainly be one of the most important. Squalid and degrading surroundings produced squalid and degraded beings, and squalid and degraded beings naturally spent their time in the public-house and take no particular interest in their children, and still less in the exhortations of the health visitor; in short, a train was produced of those evils which the medical profession were endeavouring to combat in detail instead of collectively. The same principle applied here as elsewhere, viz., the necessity for seeking ultimate causes and dealing with them fearlessly, no matter what they may be: one of the ultimate causes in the present case is the dwelling. The speaker had personal experience of the dwellings of the working class in a large manufacturing town in the north, and the conditions of life were, owing to no fault of the people themselves, frightfully detrimental to the interests of the children. The only chance that many of these people had of learning anything of decency, or comfort, or cleanliness was when they were in jail. It was difficult to see how these dwellings could be improved owing to the enormous sums swallowed up by ground rents, conditions which the people had themselves created by their own industry; the ratepayer was sufficiently burdened, while the ground landlord fulfilled the pleasant functions of a recipient only. A sweeping measure of housing reform would not put an end to excessive infant mortality, but it would deal a direct blow at one of the principal roots of the evil.

DR. WEBBER (Plymouth) found that fifty per cent. of the mothers that came under his notice were physically incapable of nursing their children. He always urged a trial of maternal feeding, but found that in many cases six weeks was the limit to which the mother's strength would last, and nursing often had to be abandoned in less time than this.

DR. SOLTAU (Plymouth) said that the general trend of the discussion seemed to indicate that the root of the whole evil was ignorance, and that that must be combated first. He considered that it was the duty of all interested in the question to insist on the importance of education. He referred to the experience afforded in Plymouth, and considered that sanitation, model houses, and a pure milk supply, although in themselves excellent and important factors, were of no great value unless there was at the same time an educative process to teach people the utility and importance of these measures. He referred to what he considered the important point of the carrying of infection by flies, and the influence which this probably had on the spread of disease, especially by means of milk infection. He urged the importance of the Three Towns uniting to grapple with a great evil.

DR. ROSA BALE (Plymouth) agreed with Dr. Webber, but urged that the child would do very well on good cow's milk. Mothers were all too anxious to try patent foods, and she was afraid the medical profession was not entirely blameless in this matter. They often recommended patent foods. She believed

the intemperance of women to be one cause of infant mortality, and pointed out that the series of articles lately published in the *Tribune* by Mr. Sims had revealed a very serious aspect of this question, with which it was to be hoped that future legislation would deal.

DR. WM. HAMMOND (Liskeard) said that while squalid houses and insanitary surroundings were a large factor in the excessive infant mortality, yet he believed that ignorance and prejudice (as a former speaker had said) were at the bottom of most of the avoidable deaths. He welcomed more women inspectors for the purpose of teaching the mothers, and helping them to do what was right; and the press might do much if it would refuse to publish the advertisements, often grossly misleading, of various patent foods which could not take the place in health of breast feeding, or, failing that, of milk properly diluted. Such foods were largely the cause of a low vitality, and the result was many deaths. Some people might say: How could the papers be expected to discriminate when some medical men ordered these foods? Of course, they must know that the almost universal verdict of the medical profession is *against* these products of the chemist if the child is healthy, that in some illnesses they are and must be used, and that the only difficulty is the refusal of a paying advertisement.

DR. SYDNEY G. VINTER (Torpoint) said that from the remarks of previous speakers it was obvious that an unnecessarily high infant mortality had a double bearing. There was, first, the unnecessary pain caused to the individual infant; there was, secondly, the loss to the nation of the infant's life, with all its potentialities for usefulness. Under this second heading he should like to emphasise the remarks of Dr. Noy Scott on the influence of improper advertisements, where the advertisers seek to enable women to destroy possible infant life. In 1903 he pointed out to the National Vigilance Society the urgent need of obtaining an amendment of the Indecent Advertisements Act of 1889, which was promoted by them. The matter had now been taken in hand by the London Council for the Promotion of Public Morality, acting with the British Medical Association, and a private Bill was being promoted. The object of this Bill was to strengthen the law against the publication of improper advertisements. The London Council for the Promotion of Public Morality was anxious to receive all the moral support which it could obtain, and there was no society whose support they would more value than that of The Royal Sanitary Institute.

DR. HORE BRENTON (Plymouth) said he agreed with the previous speakers, who attributed the undue infantile mortality to ignorance and prejudice. He personally considered, from a long experience among the poor, that a very great portion of the infantile mortality was due to the prevailing practice of feeding young infants with food consisting more or less entirely of carbo-hydrates. He found it very difficult indeed to convince mothers of the danger of so doing,

but a great deal could be done by instructing prospective mothers, by lectures or other method of instruction, in the manner of feeding infants, and that infants were physiologically unable to digest starchy food. He approved of the appointment of a second lady sanitary inspector, who could visit the homes of children and improve the hygiene, as in many houses in poor-law practice it was not a wonder why infants died, but why they lived.

MISS M. MARK (Plymouth) said that in her opinion the chief factors in the production of the abnormal infantile mortality of this country were ignorance, carelessness, improper feeding, and the absence of any intelligent system of education of children in the elementary schools. She referred especially to the imparting instruction in domestic hygiene, elementary physiology, and the value of foods.

MR. J. J. JUDGE (*Western Evening Herald*) said it was hardly fair to expect the press to be able to discriminate between the various proprietary foods. From what one speaker had said, it seemed that doctors themselves were somewhat to blame in the matter of these foods. If they recommended them, they believed in them. Where doctors differed, then, how was the press to decide? Some time ago, if he recollected aright, a certain brand of condensed milk was condemned: a day or two after, a woman wrote to say that she had known children to be brought up healthily on that very milk.

DR. F. M. WILLIAMS (Plymouth) said that, in his opinion, the two great factors tending to bring about the abnormal infant mortality of the country were (1) physical deterioration of the inhabitants of urban centres, so that from the stock breeder's view they were breeding from a stock which was physically and mentally unfit to produce offspring that were either physically or mentally fit; (2) there was an enormous number of children born of a parent or parents who passed on to them the effects of communicable preventable disease, which, at present, was in no way controlled by legislation. He referred, of course, to syphilis.

DR. H. B. PALMER (Plymouth) first wished to point out that if the reduction of infantile mortality was to be seriously undertaken, consideration would have to be given to parental conditions. He pointed out that in an average practice, he found from the counterfoils of the death certificate book that fully forty per cent. of the certificates given for children under two years of age were given for children under ten days; in other words, for children who had never practically commenced to live. Of these children a large percentage had syphilitic parents, and in this district it might be advisable to consider if the reintroduction of the Contagious Diseases Acts might not be beneficial. He objected to the deprecatory remarks that had been made about patent foods in general, and stated that he had seen thoroughly healthy children reared on the majority of them, and

stated that they had their uses. From his experience, he thought that poverty was the principal cause of the large infantile mortality. Poor people succeeded better in rearing their first child or children than the later ones, and from this he inferred that ignorance was not so important a factor as was maintained. The question of a municipal supply of sterilised milk was on the horizon, but he did not think much of the project; and that if this was to be used as an agent to check the infantile death-rate, it would be better to supply sterilised milk free of charge to parents with three or more children than supply the whole town with the milk under the cost of production, as it would be necessary to do if the object were to get the majority of mothers to use it. It was absurd to think that sterilised milk would act as a panacea against an infantile death-rate due to multiple causes.

COUNCILLOR S. J. PAGE (Plymouth) thought that the crux of the problem of infant mortality was in the homes of the poor, and the condition under which they lived. When four or more persons lived in one room in slums, where little or no sunlight penetrated, and in which all the domestic arrangements had to be carried on, it was impossible to rear healthy families. It was useless to talk of educating women and children compelled to live under conditions where it was impossible to apply any of the principles taught. Sterilised milk was of very little use in homes where the milk was contaminated again within half an hour after it had been brought into the home. He was convinced that until the slum dwellers lived in healthier houses, very little improvement would result. In Plymouth they were faced with the awful knowledge that about five hundred infants die every year before they reach the age of twelve months, and this alone should be sufficient to urge The Royal Sanitary Institute to use every means to arouse the public conscience, and compel local bodies to remedy such a state of things. When the homes were improved, education and sterilised milk would become powerful aids to perfect the cure.

COUNCILLOR A. E. WOOD (Plymouth), as a layman, felt some diffidence in entering the discussion after so much expert evidence had been given; but he dissented from the comparisons made by the lecturer, considering that they were not fair. It must be remembered that the Government provided for the soldiers and their families sufficient accommodation and air space, and even prisoners were ensured a sufficiency of air space; but not so the ordinary person. The Local Government Board had no fixed rule with regard to air space, but it was left to the caprice of medical officers of health to decide that point. While agreeing that the subject was of vast importance, and believing that everything possible should be done to diminish the great infant mortality, yet there were prominent townsmen present who, while regretting the facts as presented, did nothing to ensure the worker a wage which would enable him to live a better and healthier life, and probably there were others from other places who were equally neglectful. Dr. Bale had given the conference some harrowing

pictures of what occurred in London, where women with young children frequented public-houses; but he ventured to suggest that it was possible that these public-houses were more sanitary than the homes of these very people. Possibly some men spent in beverages money which would be of great service to the women, both before and after confinement; but could this be wondered at when many families lived in one-room tenements, and could surprise be felt if, when a man, after a day's hard work, arrived home to find that one room filled with clothes to dry after washing day, he went to seek some more wholesome atmosphere? If this regrettable waste of infant life was to be stayed, more attention would have to be given to a wholesome housing reform, and an increase of the income of the poorer of our town dwellers.

MAJOR BLACKHAM, in reply, said he believed that Col. Caldwell's opinion with reference to environment had much evidence in its favour, and instanced the improvement in physique and appearance which the healthy environment of a barrack so rapidly produced in the recruit. He could not agree with Dr. Hammond that the press was to blame for publishing advertisements for pernicious infants' foods, as the other speakers had shown that doctors were not guiltless of recommending some preparations of this nature. What was wanted was a modification of the Roussel law of France, and an earnest, intelligent appreciation of the importance of each infant to the State, which the great French republic had grasped, but we had not yet realised in this country. It was useless to deplore a falling birth-rate while the slaughter of the innocents went on. The nation could compensate for fewer births by fewer infant deaths, if it only seriously tried to prevent the waste of child life. This was, indeed, no professional or parochial question, for each male infant death was a loss to the Army of a potential recruit, and to civil life of a possible defender of the Empire.

DR. WARD also spoke in the discussion.