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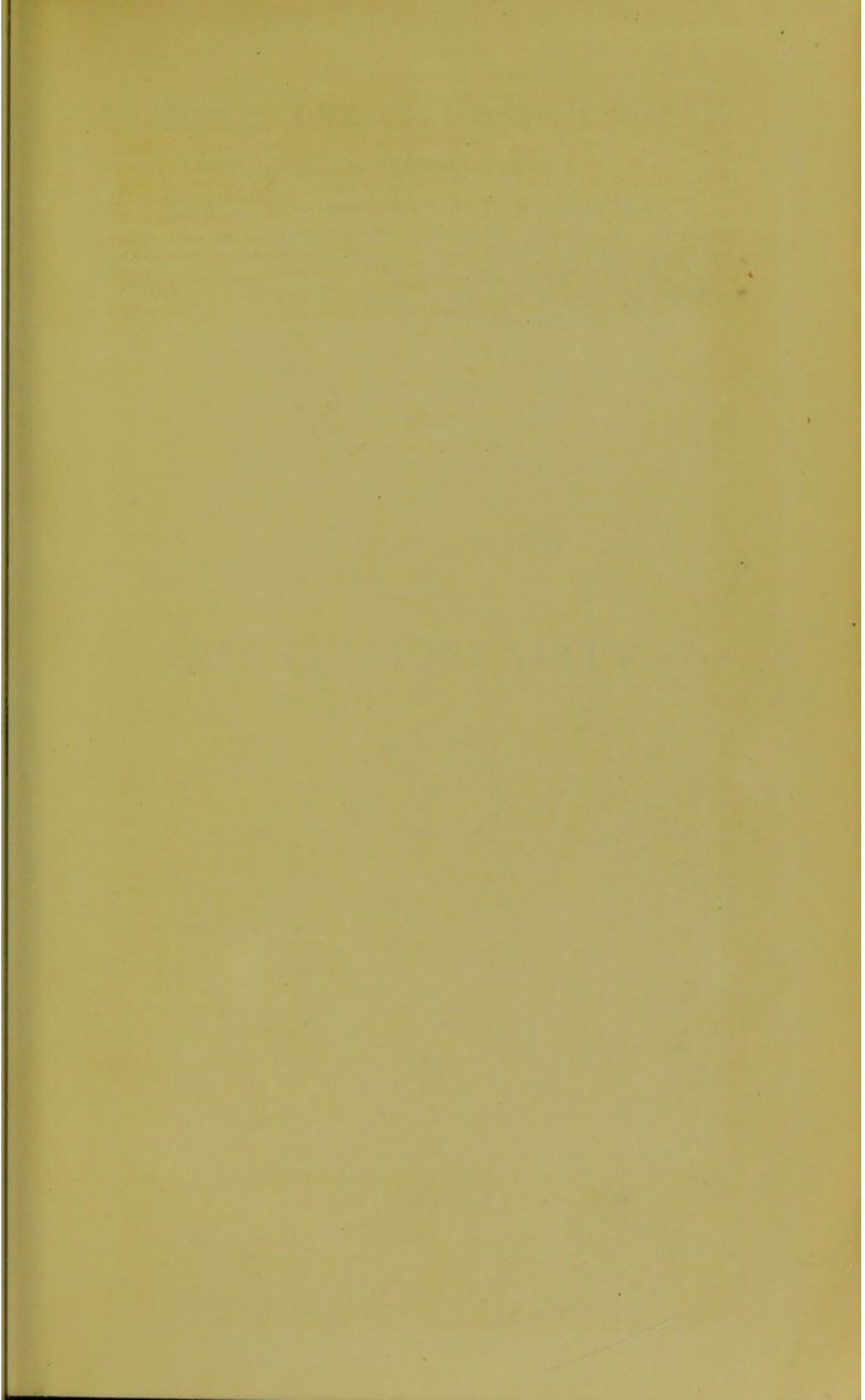
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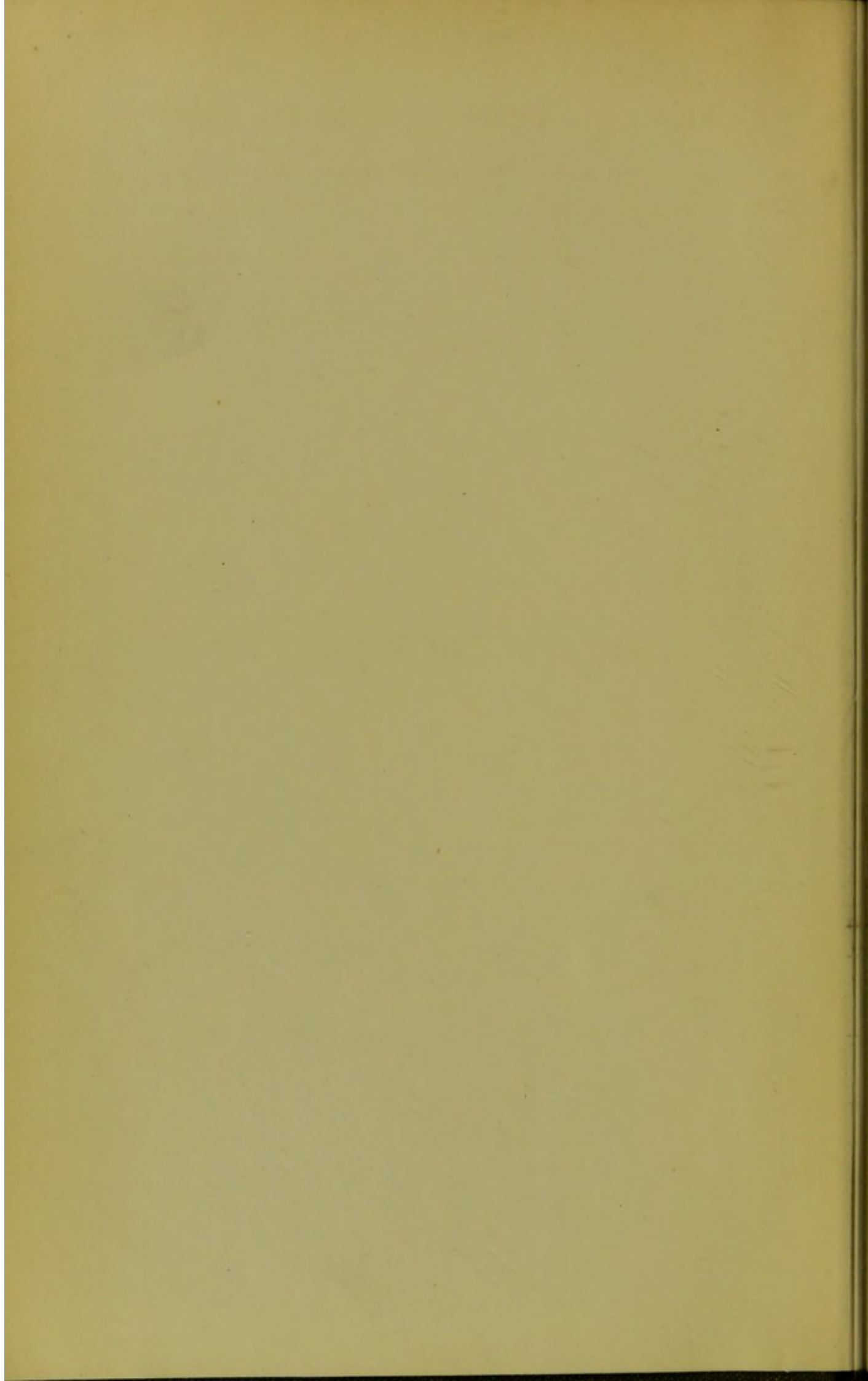
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INFANT MORTALITY

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INFANT MORTALITY

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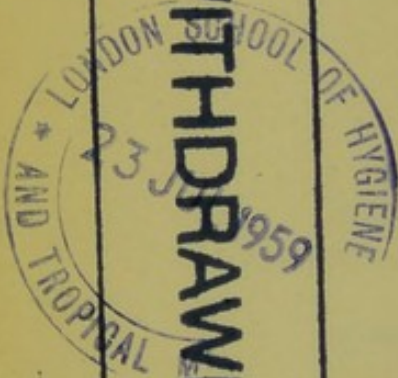
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EDITORS' PREFACE

IN view of the increasing importance of the study of public hygiene and the recognition by doctors, teachers, administrators and members of Public Health and Hygiene Committees alike that the *salus populi* must rest, in part at least, upon a scientific basis, the Syndics of the Cambridge University Press have decided to publish a series of volumes dealing with the various subjects connected with Public Health.

The books included in the Series present in a useful and handy form the knowledge now available in many branches of the subject. They are written by experts, and the authors are occupied, or have been occupied, either in investigations connected with the various themes or in their application and administration. They include the latest scientific and practical information offered in a manner which is not too technical. The bibliographies contain references to the literature of each subject which will ensure their utility to the specialist.

It has been the desire of the editors to arrange that the books should appeal to various classes of readers; and it is hoped that they will be useful to the medical profession at home and abroad, to bacteriologists and laboratory students, to municipal engineers and architects, to medical officers of health and sanitary inspectors and to teachers and administrators.

Many of the volumes will contain material which will be suggestive and instructive to members of Public Health and Hygiene Committees; and it is intended that they shall seek to influence the large body of educated and intelligent public opinion interested in the problems of public health.

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AUTHOR'S PREFACE

THE purpose of the present work is to try throughout the country to awaken more interest in the prevention of Infant Mortality, not only among the public, but also among those bodies entrusted with the safe upbringing of the future generation.

The great war of 1914-15 makes the subject of paramount importance at the present time; it is necessary for us as a nation to see that we have as many healthy children as possible.

The birth rate of this country, like that of others, has been steadily diminishing for many years, and it is therefore all the more desirable that we should give every infant as good a start in life as possible; it is on our children that the future of the nation depends in its competition with others, and for its own internal well-being and efficiency.

The basis of my experience has been mostly gained from contact with the poor in Manchester and Salford, where, as far as I can judge, the conditions of life among the poor are fairly typical of other large cities; but I have also studied the subject in some of the large towns in the United States of America. The practical side of the question has been kept in view throughout; all purely medical and technical details have been omitted. Infant Mortality is a most complex question, but at the same time it is a most fascinating one. An attempt has been made to ascertain its main causes and how the great waste and wreckage of infant life can be best avoided in the future, for it is quite plain that thousands of infants who die each year could be saved if only the subject were more fully understood and more thoroughly tackled. The difficulties with which the poor have to contend have been

described and the effects of poverty, ignorance, defective housing and the employment of married women, etc., have been discussed.

So much, however, is as yet hardly ripe for general recommendations, that it is impossible to say definitely how we can best set to work on this great subject. Many agencies such as Health Visitors and Schools for Mothers are doing most excellent work.

The duty of bringing up children belongs to the mothers, and whatever we do we must not be too ready to relieve them of their responsibility; we can, however, do much to see that the rights of the children are not ignored and that the mothers have the opportunity given them of learning how best to rear their children. I have tried so far as possible to avoid controversial matter or partisanship; on the other hand I have not hesitated to say which view I consider to be the correct one.

The object of this book will also not have been achieved if the picture of the condition of the poorer working classes is not brought home to many, who only need to know some of the difficulties of the poor to take more interest in them, and I am convinced that the benefit of a closer study and knowledge of "how the poor live" will not be all on the one side.

Much statistical information and many tables have been taken from the Annual Reports of the Medical Officer of the Local Government Board on Infant Mortality.

My best thanks are due to Miss A. E. Tuke, Mrs Grundy, and Mr Ed. H. Greg for very kindly reading through the proofs and for much help. Also to many others for very valuable advice.

H. T. A.

MANCHESTER,

February, 1915.

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CHAPTER I

INFANT MORTALITY: WHAT IT IS AND WHAT IT MEANS TO THE NATION

A healthy infancy is a natural prelude to a vigorous youth and manhood and a capacity for doing a full share of the world's work. In the natural order of events mortality is greatest at the two extremes of life. The annual rate of mortality of children under five years of age closely approximates to the mortality of individuals over sixty years of age, while the death rate of infants under one year is at least double that of any other period. We cannot expect it to be otherwise: the weakly infant and worn-out frame of the old—"weary with life's burden"—are less able to do battle with the adverse circumstances incident to life than the stronger constitution of the young and healthy adults.

We ought not to regard Infant Mortality as though it were simply a leakage in human life and thus proceed to suggest some specific remedy. Some of the very causes which are at work in producing an abnormal infant death rate are also giving rise to infantile and child diseases; a high rate of Infant Mortality implies not only a wastage of life, but also that a large number of our fellow citizens are living under wretched conditions, deprived of most of those advantages which alone can make life bright and happy. Moreover, a certain proportion of infants are prematurely born and are, in consequence, weakly and likely to succumb early in their career, thus materially adding to the already long rôle of infant deaths.

The word "infant" survives from the Latin word "infans," *i.e.* "unable to speak," and as its derivation implies, it was originally applied to those who could not speak, but the Romans used the word in a wider sense, and it ultimately came to be applied to children of much older years. In the present day, however, the term "infant" only includes that period of life which extends from birth to the end of the first year; and in this sense has come to be generally so used by sanitary authorities, when estimating the Infant Mortality for any given district. The high rate of mortality among children before they reach the age of one year is one of the most complex of our modern social problems, and the more deeply it is looked into the more difficult it becomes.

The expression "death rate" is generally understood as the proportion which all the deaths in a community bear to a thousand persons in such a community, and death rate, of course, includes the Infant Mortality. The latter, however, has come to have a special meaning of its own, and the term "Infant Mortality" is universally taken to mean the ratio which the number of infants who die in any one year bears to the number of births in that year; for instance, when we say that the Infant Mortality for England and Wales was 95 in the year 1912, we mean that out of every thousand infants born in England and Wales in that year, 95 died before they reached the age of twelve months.

Naturally Infant Mortality must vary considerably in different parts of the kingdom; some counties having a much lower rate than others, the towns in most cases having a higher rate than the country. Taking all the various circumstances into consideration, it may be generally stated that the places with low Infant Mortality are healthier than places with a high one.

The table opposite shows clearly how the Infant Mortality rate of the country remained more or less stationary till the year 1905. Since then, however, it has steadily decreased, owing to the organised efforts which have lately been exerted with a view to reducing it. With the exception of the year 1911, which was conspicuous for an exceptionally hot and dry

summer, producing conditions most inimical to infant health, when it rose to a higher level than any year prior to 1905. There is little doubt that no matter how much we may succeed in reducing Infant Mortality, the rate of the latter will always be largely influenced by the character of the summer in any given year.

Appended is a table showing the Infant Mortality in England and Wales for the last 34 years.

Year	Infant Mortality	Year	Infant Mortality
1879	135	1896	148
1880	153	1897	156
1881	130	1898	160
1882	141	1899	163
1883	137	1900	154
1884	147	1901	151
1885	138	1902	133
1886	149	1903	132
1887	145	1904	145
1888	136	1905	128
1889	144	1906	133
1890	151	1907	118
1891	149	1908	121
1892	148	1909	109
1893	159	1910	105
1894	137	1911	130
1895	161	1912	95

Birth not the Beginning of Life.

We must remember that a child's life does not start with its birth, for by this time it has been growing for nine months. Nature has cared for that life during a period of many months and then at the birth of the child entrusts it to the care of the mother. For this reason we should help the mother and see that the mother helps the child in every possible way.

Infant Mortality is at the highest during the first four weeks after birth, from which time it steadily decreases. These first four weeks, however, frequently play havoc with infants, and so great is this havoc, that were it to continue throughout the entire first year, there would be no infants left alive at the end of it.

Within the first week or so of life the infant has to contend with conditions which are peculiar to that period, inasmuch as in one way or another they are consequent upon the act of birth and its accompanying dangers. The infant, for example, may be born asphyxiated, and is liable to many injuries, especially if the mother has not at hand the necessary skilled or expert help. Again, the change from being entirely nourished by the mother to having to digest its own food and resist many adverse conditions all at the same time is a great one.

During infancy growth takes place at a very rapid rate, and this will be readily realised when we remember that a healthy infant doubles its weight by the time it is five months old and adds half as much again by the time it is a year old. It is not surprising, then, that the infant is extremely frail and liable to succumb to many ailments unless it is well and carefully tended. After the age of twelve months the infancy stage ceases and passes into childhood, during which time, although growth is still active, the child has gained in power of resistance and is not so easily upset by small changes in its food and environment.

*The Human Mother*¹.

A paradox of nature is that the mortality among the newly-born progeny is lowest in those animals whose young are born the most helpless. The human offspring is one of the most helpless of creatures and is quite incapable of living unless very carefully tended by the mother; yet the mortality among infants is one of the lowest among all living things, but even so, it is a great deal too high. The infant possesses very little natural instinct compared with other animals; and it cannot even find its way to the breast as can a kitten or puppy. The human offspring is thus helpless and has to rely for a longer period on the care and intelligence of the mother; the mother cat knows by instinct what is the best food for the kitten, and gives it. The human mother very often does not know what is best for the infant; the cat, again, keeps its kittens warm, washes them, and in its own way educates them

by playing or romping. We are wrong if we think that the human mother knows by instinct what is best for the child ; on the contrary, she has to be taught, and often her instructor, such as the next-door neighbour, or aunt or grandmother, is quite incapable of imparting the correct teaching.

The Mother a Heroine.

It is a somewhat popular fashion to say that a mother does not know her maternal business and duties, and should "*be ashamed to look a tabby cat in the face.*" Yet the average mother is a heroine ; she goes through a very great deal and often leads a life of great hardship. The soldier risks his life on the battle-field, but the mother hers many times in the home. For this reason she should have the very best help at child-birth, for hers it is "*to bear, to rear and then to lose.*" Again, the mother may suffer from bad health, and there is no handicap like this to a woman with young children to look after. Further, the unique helplessness of the human mother entails a correspondingly unique development of motherhood in the woman. Maternal affection is common to all animals, especially during that period when the young are quite helpless, and this is well marked in even the most timid, *e.g.* a plover will not uncommonly sham to be wounded to attract danger away from the nest. In the human race this affection for the offspring continues through life and is common to both parents. The cat or dog will drive their young away as soon as the suckling period is over, while very few male animals show any interest in, or even care at all, for their young at any time. It is the duty of the human father to look after the mother, while she is rearing the children ; amongst the lower forms of animals, however, with certain exceptions, the mother is not thus dependent on the father.

The Importance of Statistics.

In studying Infant Mortality, the first and foremost necessity is to have proper and reliable records of the registration of all births and deaths. By this means we can compare one district with another and find out why one county or one

special town has a greater mortality than another ; we cannot expect to understand the in-comings and out-goings of human life if we keep no exact records. Man is not less valuable than merchandise, nor births and deaths than receipts and expenditure.

Some countries keep better and more accurate statistics than others ; and there is published each year a very accurate annual report by the Registrar-General on Births, Deaths and Marriages in England and Wales. The advantages of keeping accurate birth certificates are to determine the child's exact age, and to know from this when it can legally leave school and begin work. For many like events, the register of births is not only very useful but indeed almost a necessity.

The Importance to the Nation.

As soon as we begin to realise the far-reaching extent of Infant Mortality we should be led on to consider its importance in relation to the State, which needs all the healthiest and strongest children it can obtain in order to keep abreast of the keen struggle for existence among the nations and races which is now going on and is likely to go on and even to become more strenuous in the future.

By seeing to it that our Infant Mortality falls below that of other nations, we shall not only tend to keep our numbers up, but increase more rapidly than other nations, and, by the care we shall then exercise, the number of damaged or unhealthy children will be less. Carelessness in connection with infant life is a sure sign of degeneracy in any country.

The population of a country depends very largely on two important factors, viz. the birth rate and the proportion of Infant Mortality to that birth rate ; and on this depends to some extent the health and strength of the nation as a whole. Physical vigour is required for health, happiness and efficiency, while mental vigour is needed no less than physical for the production of all the needs of a high civilisation. Putting it concisely, the population may thus be described as the birth rate minus Infant Mortality.

The Birth Rate.

The Birth Rate for any town or county, as previously stated, means the number of births in any one year per 1000 of the inhabitants. The declining birth rate, which during the last few years has aroused alarm in nearly every European country, has had one beneficial result, inasmuch as it has stimulated efforts to bring about a corresponding decrease in Infant Mortality. In the year 1876 the birth rate of this country reached its maximum, and it was then equal to 36·3 per 1000 living; since then it has gradually become less and less with a few small exceptions. In the year 1905 it was 27·3, and in 1910 it was 25·1. In the second quarter of 1913 (April, May, June) there was a small rise in the birth rate of ·8 per 1000 of the population as compared with the corresponding quarter of the previous year. This is the only rise in any second quarter, except in 1908, for the last ten years. As Dr Newsholme has pointed out, it will become increasingly difficult to materially reduce the *death* rate of the nation, and if the birth rate continues to fall at the same time the safety of the nation will be seriously endangered. Dr Hancock, the Medical Officer of Health for the town of Stalybridge, in his annual report for 1912, says that the birth rate in the town was only 21·25 per 1000 living; and this, together with the fact that the Infant Mortality in his town is very high, is a matter of serious concern for the borough, just as the low birth rate throughout the country is to the nation. Again, the falling off is too frequently noticeable in those grades of society where the infants might be well provided for, and in which not infrequently exist social and moral qualities, which the State can ill spare, and not in those where the struggle for existence is keen and constant.

When comparison is made between the birth rates of different parts of the country, Wales comes first, followed by the North, Midlands and South, in the order named. It is the high birth rate in the mining districts that makes it so high in Wales.

If the birth rate as a whole is going to diminish, the only

chance of keeping our numbers up is to reduce our Infant Mortality at a greater pace, and just as the births become fewer, it is the more incumbent upon us to give those that are born every chance of growing up strong and healthy. This is the problem with which they are specially faced in France, in which country the birth rate has diminished so very alarmingly. But it is not only in France, but in almost every civilised country, that the birth rate is declining.

In Australia a Royal Commission was appointed to enquire into the cause of the declining birth rate, and the conclusions to which that Commission came were, that the higher classes were unwilling to undertake the burden of producing and rearing children, whereas among the poor the unwillingness appeared to be absent and the birth rate was not diminishing. If this is so in Australia, then it is likely to be so in England, and the only remedy is that if the poor take the trouble to produce children, which the rich will not do, then the latter should help the poor to bear the burden of rearing them.

The following table, taken from the Local Government Board report on Infant Mortality for 1912-13, shows how both the actual birth rate and the natural rate of increase have diminished, while the Infant Mortality has shown no material decrease.

England and Wales	1876-80	1881-85	1886-90	1891-95	1896-1900	1901-05	1906-10
Birth rate	35.3	33.5	31.4	30.5	29.3	28.2	26.3
Infant Mortality rate per 1000 Births ..	145	139	145	151	156	138	117
Rate of Natural Increase	14.6	14.1	12.6	11.8	11.6	12.1	11.6

The Natural Increase of the Nation.

The natural increase of the population of a nation varies largely according to the birth rate in conjunction with the Infant Mortality. Now, as we have seen, the birth rate is diminishing, and thus if the natural rate of increase is to be maintained, there must be a corresponding decrease in the Infant Mortality, and the above table shows what has been the actual result in the 35-year period 1875-1910.

A remarkable feature is the evidence which we have during that period of the postponement of the marriage age on the part of women ; and it is well known that fertility diminishes with age ; this fact alone must have an appreciable effect in diminishing the birth rate.

Illiteracy among Women.

Another noticeable fact is that in those countries where the marriage document is signed with a X, instead of a signature, there is the highest Infant Mortality. In these countries there is a large proportion of women who have never been educated, and who are consequently ignorant not only about general matters but also about matters concerning the proper care of their infants.

Some years ago there were many more women unable to sign their names than there are now ; but compulsory education has effected a material improvement, and in consequence there is a higher standard of education all round. The following table gives the percentage in various countries of those signing the marriage document with a X :

Counties with Highest Infant Mortality			Counties with Lowest Infant Mortality		
Lancashire	..	2·5	Dorset	..	2
Glamorganshire	..	2·8	Wiltshire	..	2·1
Staffordshire	..	2·8	Berkshire	..	2·1
Nottinghamshire	..	2·3	Somerset	..	2·3
Durham	..	2·8	Westmorland	..	2·0

The proportion of both husbands and wives signing the register by mark in lieu of signature is becoming each year less. In the Home and agricultural counties the proportion of illiterate men is higher than that of the women ; but in the mining and industrial counties the reverse is the case.

The Extent of Infant Mortality.

If we take a series of years, such, *e.g.* as 1906-12, and calculate the Infant Mortality in England during that period, we shall perhaps better realise how serious it is. In these years the average Infant Mortality was 115, which means that out of every 1000 births in each of these years, only 885 babies

reached the age of one year. When we compare the ordinary death rate of all the people living with the death rate of infants, we find that there is a very marked difference, and that the Infant Mortality is seven to eight times as great as the mortality among living people of all ages. This is a very serious difference; but large as it is, we can never hope to reduce the Infant Mortality to the level of the mortality of all ages, because the infant is such a frail creature and has to pass through so many dangers, which it is unable to withstand in the same way as it can do as it grows older. To reduce this great Infant Mortality we should leave no stone unturned; but by saying this I do not mean to imply that nothing is being done at present; on the contrary, a great deal is being done, and people are now beginning to realise the value of babies and young children to the nation. An immense amount of voluntary and official effort, in our own and other English-speaking countries, has clearly effected an astonishing reduction of the rate of Infant Mortality. In this country alone the rate has been reduced in 15 years from 150 to 95, which means that every year 50,000 infants are saved who would have died 15 years ago.

Just as hot-house plants are exceedingly sensitive to their surroundings and only thrive when placed in the most favourable surroundings as regards light, warmth and soil, and quickly show by drooping the slightest departure from favourable conditions, so do infants respond favourably or unfavourably to feeding, housing and general environment, according as these are good or bad.

Signs are not wanting that down far below the surface of national life and thought, there is a rising conviction that all is not well with a nation, which can give no better account of its civilisation and stewardship than that furnished by our Infant Mortality returns in Great Britain. "We are all agreed," says Miss M. Loane², "as to the value of child life, from a natural as well as from a humanitarian point of view, and are determined to preserve it."

On whom does the responsibility of preserving the life and health of the child population rest?

Some would say that the State is wholly responsible ; this is surely wrong, as most of the things done by the State have to be done in a formal, methodical way, with no elasticity of any kind and little imagination or latitude. Babies and children cannot be efficiently brought up in the hide-bound, cast-iron way in which the State is accustomed to do things.

Others, on the contrary, would say that the parent is solely responsible ; but what if the mother is some half-witted woman and the father a loafer or a confirmed drunkard ? But it seems obvious that the problem must be solved by dividing the responsibility. Against this idea unfortunately experience shows that divided responsibility is generally a weakened one. The best way, then, would appear to be to place the responsibility primarily upon the parent and only when this fails to let the State step in.

Is it the Survival of the Fittest ?

It has been argued, and well argued, by many that it is altogether a mistake for us to try to preserve the lives of weakly infants, and that it is wrong to interfere with nature's own laws and methods in eliminating those infants who remain weakly and will never grow up like other children. This has been shown to be fallacious reasoning, and has received a severe check, if not been actually destroyed, by the painstaking and scientific investigation of Dr Newsholme and his department. He has shown that in fact it is not a weeding out of the unfit, and that it is by no means true that it is the weaklings who die off and that the strong survive. Elimination, even if selective, does not necessarily remove those calculated to prove inferior citizens. Many survive with enfeebled constitutions and weakly health, who in after-years help to swell the lists of pauperism and spend their lives in squalor and misery and become a charge upon the State. Every weakly infant should have the best chance of living which can be given it. During the course of a hot summer, when there has been, as so frequently happens, an epidemic of diarrhœa, many infants are left very weakly as the result of the disease ; but it is quite certain, that with care a large proportion of

these weakly infants will grow up to be as strong and healthy as those infants who were fortunate enough to escape the disease. In a great number, if not in the majority, of cases, the baby, who is born small and underweight, will with care eventually grow up to be as strong as any other baby. What would the mother of a small baby have to say if no efforts were made to help that baby to the very utmost of our ability? The Spartans in destroying weakly infants considered that they were serving the causes of eugenics and contributing to the vigour of manhood; no doubt they saved themselves a great deal of trouble in avoiding the necessity of rearing their weakly infants; but even the most ardent of race-improvers would scarcely think of advising such a procedure now-a-days! It has already been shown that every small, weakly baby, even if not cared for properly, does not die; and by helping the weakly infants we tend to prevent their gradually incurring some chronic crippling disease, such as rickets, and thus becoming a drag upon their parents and the nation.

We must not forget also, when speaking of Infant Mortality, that a high infant death rate represents a vast amount of sickness and suffering apart from the fatal cases.

There are many cases in those towns where the Infant Mortality is high, of infants who having survived some serious illness are nevertheless affected by it in after-life. In places where the Infant Mortality is low, there has been less sickness and in consequence fewer damaged infants. These damaged or weakly infants are liable to succumb to other ailments in childhood or later life.

Infant sickness, then, it is important to bear in mind, not only leads to a deplorable waste of human life, but sows the seeds of weakness, deformity and impaired vitality in those who survive to take their share in the duties of citizenship, and it contributes in no small degree to the physical degeneracy of the race, which we can see only too plainly taking place around us in the large cities.

Thus we see that these damaged and weakly infants, if not cared for, are liable to grow up into men and women

crippled in body and deficient in mind, who fill the hospitals, prisons and workhouses. By getting these infants well, does it not seem clear that we shall save ourselves much expense later in life; and is it not surely cheaper and preferable to pay for them at the start of their lives than to pay for them later on and in many cases for many years or for the natural term of their lives? A suckling baby extracts a great amount of energy from the mother, and this is even more the case when the baby is ill and weakly. The sickly and weakly baby further needs more attention and caring for, and indeed this may become so great as to necessitate the mother's attention being taken up all day and often all night with the baby, and this together with her manifold duties tends to soon wear her out and impair her health. The consequence is, that her milk soon leaves her, and the baby has consequently to be artificially fed with the bottle; and as has been well said by an authority on this subject: "If it is at all possible, a mother should not sublet her duty to a cow³."

The very difficulty and magnitude of the problem is overpowering, and we might be tempted to adopt the cynic's view, that it is better to let the weakly members of society die, than that they should live to struggle against odds, a burden to their parents, society and themselves! But surely no one can thus thrust aside his responsibilities and look complacently on this waste of human material. No one class of society can dissociate itself from another class, however low in the scale, and say that it has no duties and no responsibilities regarding it. "Man cannot live isolated," says Carlyle; "we are all bound together for mutual good or mutual misery, as living nerves in the same body. No highest man can disunite himself from the lowest."

There is, however, it is gratifying to know, a widespread awakening to the national importance of Child Mortality and a concentration of effort to diminish it, such as has never occurred before. During the year 1913 there was a great conference in London on Infant Mortality with Mr John Burns as the president. People came from all countries to take part in it, and much was done to stimulate the

interest of the general public. Not only this, but sanitary authorities and their officers now devote a large proportion of their time and energy to this supremely important matter. Medical Officers of Health pay considerable attention to this subject in their annual reports, and pass comments in their reports as to how their special town or district compares with other towns and districts and how best they can diminish the Infant Mortality in their own districts. The public conscience, largely due to their efforts, has been awakened, and it is significant that with their efforts, there has been a decline, and an increasing decline, of Infant Mortality which is unexampled. But though this is so, we must not relax our efforts, as there is still much to be done and many more infants to be saved in the future than we have yet been able to save in the past.

The Size of the Family in Relation to Infant Mortality.

One great trouble in dealing with the problem of Infant Mortality is that the most prolific are on the whole the least fitted for the important and responsible task of rearing the next generation. There is, in fact, too much poor stock raised, and there is too little restraint upon idiots, feeble-minded and the physically diseased. The better-to-do and usually more thrifty bring fewer children up than the poor, and Dr Alice Hamilton, of Hale House, Chicago, U.S.A., shows that the Infant Mortality of the families having six children is two-and-a-half times greater than that of families having four or less children. Families of three persons are the most numerous in England as shown by the census of 1911, and 77 per cent. of the total families consist of from two to six persons. The different size of families with their percentage and proportion to the total number is shown in the following table :

	Per cent.					
Two persons	16
Three persons	19
Four persons	18
Five persons	14
Six persons	10
						<hr/> 77

Mr Jacques Bertillon⁴ gives a table showing the annual births per 1000 women aged from 15 to 30 in different quarters of Paris, Berlin, Vienna and London, the quarters selected being those representing six grades of social position from the very poor to the very rich. In all four cities fertility is greatest in the poorer classes and gradually diminishes as comfort increases. It would thus seem as if these four nations, France, Germany, Austria and England, are being raised from the poorer and often from the mentally deficient and degenerate classes.

Darwin wrote some time back: "Hardly anyone is so ignorant as to allow his worst animal to breed: the farmer, etc., breeds from the best cattle, horses, dogs, etc., and why should we shut our eyes against this fact in man?" We should be able to prohibit the unfit, feeble-minded and the idiots from breeding, for the reason that if they do bring children into the world, these children are in a great proportion of cases also feeble-minded and idiots. This is one of the great advantages which, it is to be devoutly hoped, we shall derive from the Mental Deficiency Act recently passed by Parliament, and which came into force on April 1, 1914. The Act primarily provides that the feeble-minded shall be segregated into colonies and no facilities given to perpetuate their race.

There is also the question whether the children from a large family are more likely to grow up useful members of the community than those of a small family. Taking the poor class first, it would seem probable, and it is likely that the small or moderate family has a better chance than a large one. The mother is able to look after a family of four or five properly, but if there are more than this, some of the children will receive insufficient attention and thus be more liable to fall a prey to some infectious or wasting disease. There is also the question of poverty; a small wage will more efficiently feed and keep in health a small family than a large one. If there is deficient nutrition on the part of the mother or child, then it must interfere with the latter's prospect of health and life. A large family also almost certainly implies maternal overwork, and insufficient attention to domestic cleanliness,

especially in regard to the infant's food, and this must also tend to lead to the same result.

In a city like Manchester it was worked out that the birth rate is highest among the artisan class and diminishes as we ascend in the social scale. Now the artisan class is for the most part in certain and regular employment, and is generally speaking thrifty; moreover, it is proud of its position and tries hard to raise itself.

The fact came to light from vital statistics in Ireland and in the different counties of England, that a high birth rate is generally associated with a high rate of Infant Mortality. This, however, is not improbably due to the fact that large families are most common among the very poor, who cannot adequately or properly look after them. During any morning at a large out-patient department of a hospital it is no uncommon thing to find a mother with a thin, wasted baby in her arms, and on enquiring how many children she has had, to be told nine or ten, but that five or six are dead. It is, of course, quite possible for a good, hard-working mother under favourable conditions to bring up a large family successfully, but this is not commonly the case among the poor.

Among the better-to-do people a large family usually has as good a chance as a small one, and the children themselves will usually be the better, in that they will each have to a larger extent to fight their own way, and are less liable to be spoiled by having every wish gratified. Again, among the children of a large family there is more healthy rivalry, physical, intellectual and moral, and each child has to bring out his or her latent talent to a greater extent than is the case in a small family.

At the present time we are paying a good deal of attention to and spending very large sums of money in the treatment and care of Tuberculosis. The Insurance Act necessitates our building many new tuberculosis dispensaries and sanatoria, so that we can treat this disease in its various forms. Now Tuberculosis, which includes Pulmonary Consumption, accounts for about ten per cent. of all the deaths in the United Kingdom, but the mortality among infants amounts to more than

double this percentage. Yet while the former is so much talked about and so many complaints made that not nearly enough is done, we worry little about Infant Mortality, which accounts for double the number of deaths.

Both Infant Mortality and Tuberculosis come under the field of modern medical research, and also under that of Preventive Medicine, and it is Preventive Medicine which will do so much for Infant Mortality in the future. By teaching the mothers and by looking after the infants, we shall prevent much illness later in life. "The saving of babies—the preservation of infant health, can be accomplished in only one way, and that is to awaken the active interest of everybody in the problem on behalf of the little ones and then join the hands of the mother, the family physician, the infant specialist and the trained nurse in one grand effort to reduce Infant Mortality. The purpose is so high, so imperative, so humane, that it appeals to the common sense of everyone⁵."

The Proportion of Male to Female Mortality.

Possibly due to the fact of the preponderance of female over male persons, it is not generally realised that there are more male children born each year than female, and in 1911 the proportion was 1039 male to 1000 female.

From the evidence of vital statistics it is known that the males suffer more and succumb more than the females during infant life, and this excess of deaths among male infants over female persists nearly all through life except between the ages 5-15 years. This remarkable fact is clearly seen when we examine the Registrar-General's reports for different years; these show in some cases that the male Infant Mortality is over 20 per cent. greater than the female. It is, however, during the first two months of life that the males die so often, and probably one of the main causes of this is that parturition is more difficult and dangerous to the infant if it is a male, on account of its larger size. Not only this, but the males seem to succumb more to convulsions, bronchitis and congenital defects. As the Registrar-General says, it cannot be that the boys are more liable at this early age to get into

mischievous than the girls; and so there must be other causes accounting for the fact which we have not yet discovered.

The preventive aspect of infant hygiene is as yet inadequately appreciated by those responsible for the medical curriculum, and it is only in a few medical schools where a systematic and compulsory course on the subject is demanded. A little organisation with a few modifications would easily afford instruction on the subject.

BIBLIOGRAPHY.

1. See also C. W. Saleeby, M.D., Proceedings of the National Conference on Infant Mortality, 1908; National Association for the Prevention of Infant Mortality and for the Welfare of Infancy. 4 Tavistock Sq., London, W.C.
2. Miss M. Loane, *Spectator*, Nov. 11, 1911.
3. "Infant Mortality," Helen MacMurchy, M.D. Special Report for the Province of Ontario, Canada, 1911.
4. *Journal of the Royal Statistical Society*, LXIX., Part 1.
5. Mrs Arnoldi, quoted by the American Committee of one hundred on National Health. 1910.

CHAPTER II

THE DISTRIBUTION OF INFANT MORTALITY

Speaking generally it may be said that if the infant's lot is cast among a rural population, or among the well-to-do dwellers of suburban districts, the chances of its surviving till the end of the first year will be considerable; approximately the chances in such cases are that out of 1000 infants born 900, or even more, will survive the first year. On the other hand, if the infant is born and brought up in some of our more crowded districts and towns, the chances of its living are much reduced, to such an extent in fact that out of 1000 infants born only 700 to 800 will survive the first year.

Sixty years ago about 75 per cent. of the people lived in the country and only 25 per cent. in the towns; now, however, the position is reversed, and only 25 per cent. live in the country

and 75 per cent. in the towns. There has thus been a remarkable influx to the towns from the country, and this makes it all the more difficult to reduce the Infant Mortality from year to year. This is an important point and one to be borne in mind when we reflect that the total Infant Mortality rate of the country has not been reduced to any appreciable extent.

The fact that we have succeeded in lowering it even to a small extent in face of these changes is all the more satisfactory and creditable, but there is nevertheless room for considerable improvement, and we must not be satisfied with what has been accomplished up to the present or relax our efforts.

It is seen, therefore, that those districts which contain a large population relative to their area, *i.e.* the urban districts, have nearly always a higher Infant Mortality than those which, like the rural districts, have a more scattered population. Towns are becoming cleaner and healthier as sanitation progresses, and as Mr John Burns has himself said: "I do not think town life is necessarily bad for children, given good mothering, good food and plenty of it."

In fact some towns and a few cities have as small an Infant Mortality, and in some cases less than some rural areas. This is due to the fact that wider knowledge about infants and how best to feed and look after them is being spread to great advantage, while the rural areas, being more isolated, have less done for them and there is in consequence more ignorance with regard to babies. With more work among the poor in the country districts, Infant Mortality in those districts should be very shortly reduced, more especially if there is an energetic and efficient Public Health Officer to supervise them.

It happens more often than not, that Infant Mortality during the first few weeks of infant life is actually less in the towns than in the country, just because the infants in the former can obtain more prompt and better attention from doctors and midwives at the time of birth. Distances are often great, and means of communication is difficult in the country. There is also delay and the exercise of less care at this important time. Doctors do a great deal of work in the poor quarters unpaid, and it is largely due to them that

Infant Mortality during the first few weeks following birth is being reduced.

There is one exception to the general fact that Infant Mortality is greater in urban than in rural districts, and this is in the county of Durham. In this county there are many large compact mining villages, which through having the general characteristics of the country such as fresh air, are nevertheless responsible for this county having one of the highest Infant Mortality rates in the country. Infant Mortality is thus seen to vary in different parts of the country. The counties, however, where the population is densest have, as a rule, a much larger Infant Mortality than counties with a more agricultural, sparser and more evenly distributed population. It may further be noted that difference in geographical position and climate do not in themselves account for this disparity among counties. Thus, for example, Orkney and Shetland, at the very north of the United Kingdom, have a very low rate, just as a county like Dorset, in the very south, has a low Infant Mortality.

The Counties.

It will be seen that the counties which have the highest Infant Mortality are Lancashire, Durham, Glamorganshire, Nottinghamshire, Staffordshire, the West Riding of Yorkshire, Northumberland and Warwickshire, and in all these counties there are large industrial centres situated within them.

Counties such as Hertfordshire, Somerset, Wiltshire and Dorset, which are almost entirely agricultural, have a very low Infant Mortality. The map from the Local Government Board Report shows how Infant Mortality is distributed throughout the country, and it will be at once noticed that towns with a high Infant Mortality are situated in the densely populated areas, while towns with a low Infant Mortality are placed in the less crowded areas. Here again, however, there are exceptions, as adjacent towns in a thickly populated district often have an Infant Mortality rate quite different from each other. For instance, if we take the county of Lancashire, we find that in the adjacent towns of Burnley and Nelson

there is a variation of as much as 60 per cent. in the Infant Mortality rate. These two towns closely resemble each other in most respects ; they are both cotton-weaving towns situated within a few miles of each other, yet in 1911 the Infant Mortality of the former was 210 per 1000, and in the latter only 77 per 1000. It would appear, therefore, that neither occupational differences, the employment of the mothers, the degree of poverty, nor the sanitary arrangements are enough to explain the wide differences. Married women work in the mills in both alike, and the conditions of life are similar. Burnley is, however, an old town and Nelson a modern one, which may in part account for it.

In Yorkshire there is a difference of 56 per cent. between such neighbouring towns as Halifax and Dewsbury ; and in Glamorganshire a difference of 39 per cent. between Cardiff and Aberdare. Counties which as a whole have a low Infant Mortality also contain neighbouring towns which vary very much in the degree of Infant Mortality. For instance, in Kent we find that there is a difference of 65 per cent. between Bromley and Chatham. These differences in the Infant Mortality rate among towns so similar and in such close proximity to each other must make us very careful in assigning the cause of Infant Mortality to any one factor, such as the industrial employment of married women or to a dense population, etc.

On studying the map (Fig. 1) it is seen at once how Lancashire stands out as being the worst county as regards Infant Mortality, for of the 25 towns with the highest Infant Mortality the first five are in the industrial areas of Lancashire, and out of the worst 50 towns no less than 21 are in Lancashire. This is hardly to be wondered at when we realise the vast population of the county, and how in certain parts one town practically adjoins or merges into the next. On the north side of Manchester one may actually travel from town to town by tram-car, for the whole southern part of the county is a veritable mass of towns linked up by tramway systems. The reason for all these towns being situated so close to one another is to take advantage of the great South Lancashire coalfield,

and also that the climate is specially suitable by reason of its dampness for the cotton industries. These two industries alone—coal-mining and cotton spinning and weaving—afford employment for a very large population. Lancashire is commercially very prosperous; trade has been decidedly good in recent years and the people have been regularly employed, but yet the Infant Mortality keeps high. No doubt in time, when some of the problems regarding Infant Mortality have been solved, it will be reduced, but it is too much to hope that it will reach the lower level obtaining in the more favoured counties. A high Infant Mortality is one of the penalties people have to pay for their prosperity.

It is frequently asked why the Infant Mortality of Lancashire should remain higher than that of London, but conditions differ so materially as regards work and trades and climate as to make one doubt if Lancashire can ever rival London in this respect, although Lancashire should and will doubtless in the future approximate much more closely to it than it does at present. Precautions taken against Infant Mortality in different counties and towns vary greatly, and this fact no doubt helps to keep up the differences in various localities.

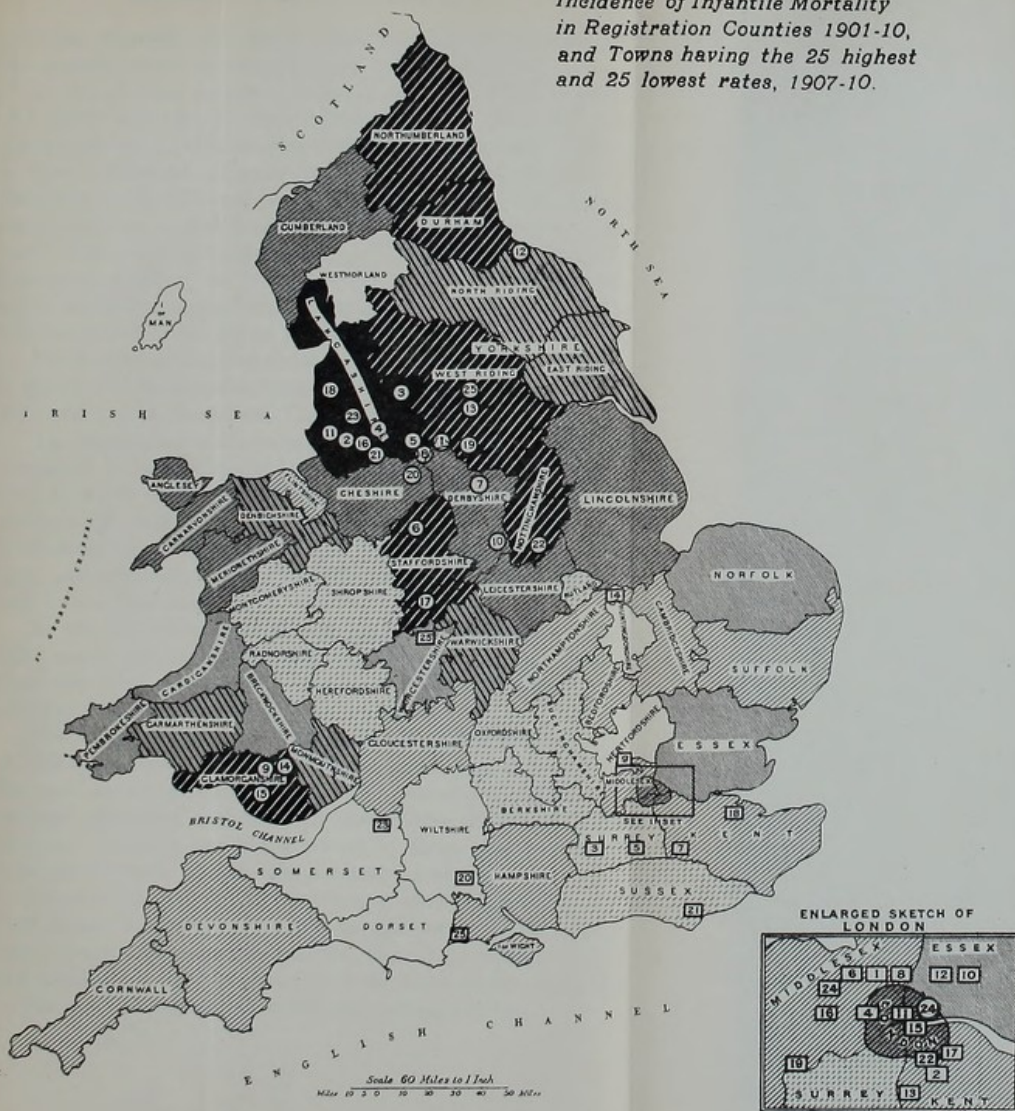
The harmful effect of town life is well marked in regard to the mortality among infants due to respiratory diseases and diarrhœa. It is in towns that infants are specially exposed to these two dangers.

Lancashire also has a very large number of miners, and the mortality among miners' infants is generally disproportionately high, especially when account is taken of the fact that miners earn good wages and are therefore in a financial position to enable them to provide for the welfare of their infants, and in addition to good wages their wives do not go out to work, as is so largely the case in the manufacturing districts.

All infants do not have an equally good chance at birth, and it is pretty certainly the case that a very large number of those born in Lancashire do not have the same chance as those born in counties such as Dorset or Buckinghamshire. In Lancashire the occupation of males and females of all ages in

ENGLAND AND WALES.

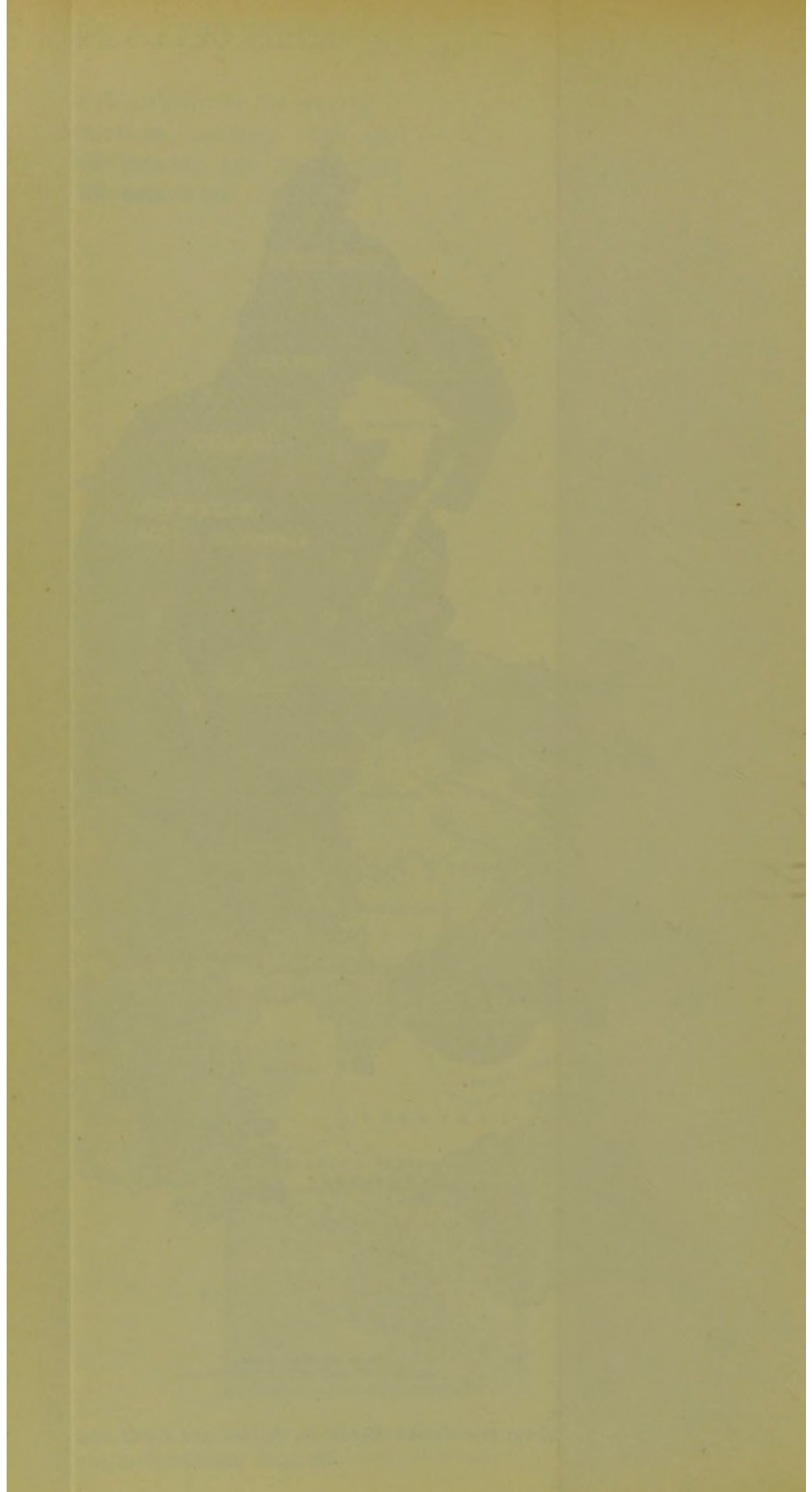
Incidence of Infantile Mortality in Registration Counties 1901-10, and Towns having the 25 highest and 25 lowest rates, 1907-10.



INFANT MORTALITY, 1907-10.

25 HIGHEST TOWNS.		25 LOWEST TOWNS.	
<i>Indicated on Map by circles.</i>		<i>Indicated on Map by squares.</i>	
① Stalybridge	189.0	① Hornsey	66.8
② Ince in Makerfield	185.4	② Bromley	68.1
③ Burnley	171.4	③ Guildford	69.6
④ Farnworth	164.0	④ Hampstead	71.4
⑤ Ashton under Lyne	163.7	⑤ Reigate	71.9
⑥ Stoke on Trent	161.9	⑥ Finchley	72.3
⑦ Chesterfield	158.5	⑦ Tunbridge Wells	72.7
⑧ Hyde	157.3	⑧ Wood Green	73.0
⑨ Aberdare	156.9	⑨ Watford	73.8
⑩ Ilkeston	166.6	⑩ Ilford	75.0
⑪ Wigan	156.3	⑪ Holborn	76.6
⑫ Middlesbrough	154.6	⑫ Leyton	77.8
⑬ Dewsbury	153.7	⑬ Beckenham	77.8
⑭ Merthyr Tydfil	162.7	⑭ Peterborough	78.0
⑮ Rhondda	162.5	⑮ London City	78.0
⑯ Hindley	162.4	⑯ Ealing	78.2
⑰ Bilston	162.3	⑰ Erith	78.7
⑱ Preston	162.0	⑱ Gillingham	80.8
⑳ Barnsley	161.6	⑳ Richmond	80.4
㉑ Stockport	150.0	㉑ Salisbury	80.5
㉒ Leigh	149.5	㉒ Hastings	81.3
㉓ Nottingham	147.4	㉓ Lewisham	82.8
㉔ Chorley	146.8	㉔ Bath	83.0
㉕ Shoreditch	145.1	㉕ Hendon	88.2
㉖ Batley	143.5	㉖ Kings Norton & Northfield	83.9
		㉗ Bournemouth	83.9

Fig. 1. From the *Second Report on Infant and Child Mortality, 1912-13*, by the Medical Officer of the Board (Dr Arthur Newsholme).
By kind permission of the Controller of His Majesty's Stationery Office.



factories, together with the frequent poverty and ill-health of the parents, must all influence the infants adversely.

As we proceed further it is found that the different parts of a town also vary in their Infant Mortality rate, one part being quite good, while another is correspondingly bad. There is often a difference of 50 or even 100 per cent. in the Infant Mortality in the different parts of the same town. In London the wards vary a good deal, but they vary even more when we come to the large industrial towns, such as Manchester, Salford, Liverpool, Halifax, etc. Taking the town of Burnley once more, we find that the Infant Mortality in 1911 varied in the different wards from 289 to 158 per 1000.

The following diagram shows how Infant Mortality varies in the City of Manchester, from 242 in Crumpsall to 84 in Moss Side and 110 in Rusholme, Cheetham and Moston.

The importance of knowing just where the Infant Mortality is highest is to enable the Medical Officer of Health for the city to set to work to ameliorate the conditions and causes producing it, and one of the best works we are accomplishing is the lowering of the high peaks of Infant Mortality in certain areas and gradually making the difference between the highest and lowest less marked.

In the industrial and densely populated districts there exist more dirt, crowding together, more women workers, more infectious diseases, and in the summer more diarrhoea ; all these conditions are inimical to the infant.

Every county that has a high Infant Mortality has a record of which it cannot and should not be proud, and it points to the need for an educational campaign, which the public, the medical profession and the city authorities should all take part in. There is something wrong in these places, and we must set to work to find this out and correct it.

To sum up, it is found that places most favourable to a high Infant Mortality are towns, though not necessarily large ones, situated in industrial centres, like those of Lancashire, and generally it may be stated that the more people there are to the acre the higher the death rate among infants.

MANCHESTER

THE VARIATIONS OF INFANT MORTALITY IN DIFFERENT
WARDS OR OTHER DIVISIONS OF THE SAME TOWN.

*Incidence of Infant Mortality, 1911, in different
areas in Manchester.*

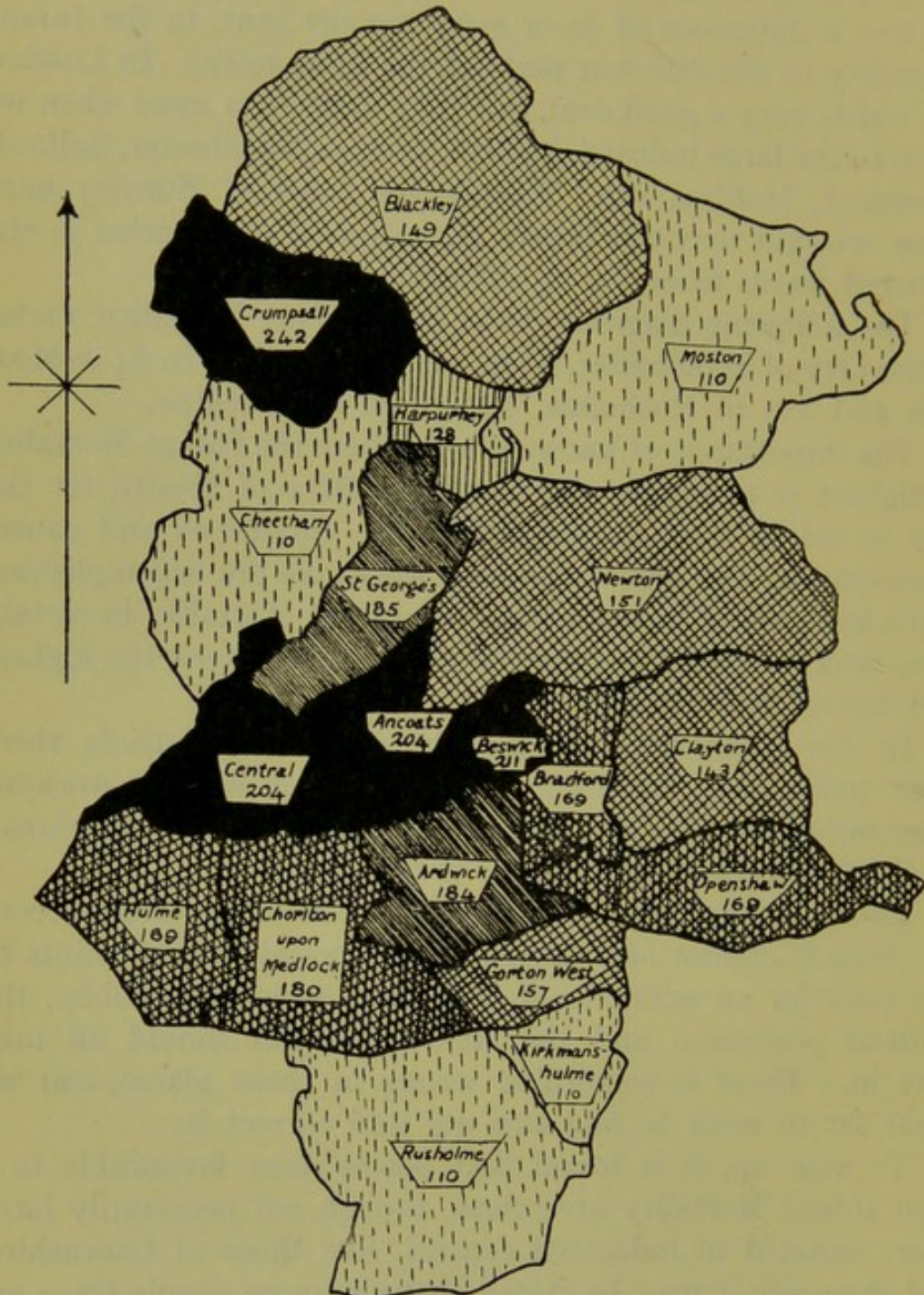


Fig. 2.

From the *Second Report on Infant and Child Mortality*, by the Medical Officer of the Board (Dr Arthur Newsholme), 1912-13. By kind permission of the Controller of His Majesty's Stationery Office.

The Jewish Population and Infant Mortality.

The Jews and their families have a very important bearing on Infant Mortality, especially in towns where they for the most part congregate. In nearly all large towns it is found that the Jews live together in a special quarter of the city, and this is apparent if we consult the map of Manchester (p. 24). The part of this city known as Cheetham is almost entirely inhabited by Jews; in the other poorer quarters there are not nearly so many. Now it is a notorious fact that in the districts inhabited by the Jews the Infant Mortality is low, and indeed much lower than in the other parts of the city. In 1911 the district of Cheetham in Manchester had an Infant Mortality rate of 110 compared with 154 for the whole of Manchester. When it is remembered that the Jews live in the poorer parts of towns, where there is often overcrowding, defective housing and a good deal of poverty, it is the more remarkable that they are able to rear and bring up their children better than non-Jewish people in more favourable circumstances. The same feature is also apparent abroad. In the City of New York, the Infant Mortality of the whole town decreased during the ten years 1896 to 1905 almost 45 per cent., and during these years the Jewish population increased enormously, partly due to their steady natural increase and partly due to immigration. This shows that the increase in the Jews probably helped to decrease the Infant Mortality rate of the whole city. The reason for this is that the Jewish parents look after their children extremely well: the mothers stay at home and breast-feed their babies almost without exception and tend the other children in a most careful way. The breast-feeding is probably above all the reason why so few of the Jewish babies die in infancy. The Jewish mother's love for her children is very strong, and she will make almost any sacrifice for their welfare. She gives them regular meals and wholesome food cooked in a proper way. The Jew is very scrupulous about what he puts into his own mouth and the mouths of his children, and he smokes as little as he drinks.

The Jews will not eat any tinned meats, as this meat has not been killed, from their point of view, in the proper way ; on the other hand, among the non-Jewish poor tinned foods are extensively used, for they save a good deal of trouble and there is little cooking to be done, but they are not nearly so economical or so wholesome as fresh food and are liable to produce ptomaine poisoning. The Jews are not especially clean in themselves, but they insist on having clean food, and they clothe their children well. It is rare to see a ragged or a bare-footed Jewish child in the streets. Another important point in their favour is that they are also very temperate, and so are able to spend money on food and clothes, which in the case of many others is spent in the public-house.

The miraculous survival of the Hebrew race, centuries after the names of their oppressors have passed away, is no doubt very largely due to the great attention to and success with the rearing of their children. They have set an example which they are proud of, and which other races might emulate and copy with advantage. Their patient, cheerful and persistent industry has also served them in good stead.

CHAPTER III

SOME FACTS ABOUT INFANT MORTALITY

How Infant Mortality is related to the Mortality at Higher Ages.

It was pointed out in Chapter I (p. 11) that when the Infant Mortality rate was highest there was the greatest proportion of damage done to those who survive. In every district, town or country, where a high death rate has obtained among infants, there has been often present a large amount of disease. In other words, a large number of infants survive despite their having had some illness, but of these survivors a certain number are left in a weakened or a crippled state, rendering them specially liable during the next few years to succumb if attacked by any serious disease.

For example, if a certain town or district has suffered from a serious epidemic of summer diarrhoea, although a large number of infants may survive, even if attacked, nevertheless many of these will survive only in a weakly state. The following figures clearly show how those places which have a high Infant Mortality rate also have a high death rate in the next few years of life. The converse is also true, and in those localities where the Infant Mortality is low fewer children are left crippled, and in consequence fewer die later.

The following table gives the comparative mortality figures between the ages 0-1 and 1-5 years. The towns with a high Infant Mortality are in the upper half and those with a low Infant Mortality in the lower half :

Town	Age 0-1 years	Age 1-5 years
Stalybridge	157	166
Burnley	142	132
Ashton-under-Lyne	136	135
Stoke-on-Trent	134	132
Wigan	128	143
Preston	126	116
Stockport	124	121
<hr/>		
Hornsey	55	50
Guildford	58	35
Reigate	59	45
Hastings	67	64
Bournemouth	70	55

From this table it will be seen that with the exception of Wigan and Stalybridge, the mortality among children between one and five years is on the whole less than the mortality during the first year. This is to be explained by the fact that infants are more susceptible to disease than they are after infancy is past. As they get older they are better able to withstand disease, and this is still more evident in youth and adult age. Then again, as old age comes on the resisting power of the body becomes weaker and the death rate increases again. Infants succumb in large numbers to alimentary diseases, due to errors in diet, and this is not to be wondered at when we realise how great are the chances infants have of contracting these diseases. Later in life the human being is far less easily

upset, and the alimentary canal becomes more able to adapt itself to irregularities in the matter of diet.

A point to be borne in mind is that in those places where the Infant Mortality is high and the conditions in regard to infant life bad the same conditions persist in later life, *i.e.* children born in a district where the conditions are inimical to life have to combat these same conditions not only during infancy but also later on in life.

Infant Mortality and Natural Selection.

It might be urged that the high rate of Infant Mortality in counties like Lancashire and Durham would have tended to bring about a sort of natural selection, and that the weakly infants would have been carried off, with the consequence that a healthier race would survive. This is a point almost impossible to definitely decide, and it would be necessary, in order to establish any basis for evidence, to transfer some of the infant population from a county like Lancashire, where there is a high Infant Mortality, to a county like Somerset with a low Infant Mortality, and conversely to take infants from Somerset and put them in Lancashire for a time and watch the result. Such an experiment is quite outside the range of possibility, but it may be generally stated that each selective process is largely negated by the conditions of life which persist in their later years, after the infant stage is passed.

Mortality of Infants influenced by the Father's Occupation.

If we compare the Infant Mortality in its relationship to the father's occupation, we get some very interesting facts.

Father's Occupation		Infant Mortality ¹				
		Months				
Group A	No. of Births	Total	0-1	1-3	3-6	6-12
Artists, Merchants, Med. Practitioners, Solicitors, Clergy- men, Army and Navy Officers, etc.	5,658	42	21.0	6.2	6.2	8.1
Group B						
Foundry, Dock, Fac- tory Labourers, Iron- workers, Navvies, Hawkers, Flax and Hemp Workers, etc.	80,949	171	46.3	31.7	36.4	56.8

The first group, consisting as it does of the commercial and professional class, comprises the occupations of fathers who, if not actually well-to-do, are to a large extent educated and have sufficient means and knowledge to lead a rational and hygienic existence; while those comprised in the latter are usually deficient in those advantages, in addition to which, at least at times, there will be a good deal of poverty.

The difference in the extent of Infant Mortality between the Groups A and B is at once seen to be colossal, and goes to show the great advantage which the former class has; for such adverse influences as poverty, ignorance, bad housing, etc., are all likely to be more prevalent among the classes forming Group B.

In Group A the Infant Mortality in the first month is equal to the whole of the rest of the first year. Group B, however, shows a steady Infant Mortality throughout the whole of the first year, with its highest rate during the second six months. This phenomenon in itself, as revealed in these tables, tends to show how Infant Mortality is more preventable in the later months than in the earlier, given the proper and favourable conditions.

Infant Mortality in Relation to the Ages of the Parent.

The age of the mother at the time her infant is born has a great deal to do with the chance the baby has of living. A high Infant Mortality rate is often ascribable in part to a too early motherhood and its consequent inexperience and carelessness. The ages of both parents influence the infant's chance, in so far as very young parents are unable often to provide a suitable home. Early marriages are more common in the industrial than in the rural districts, probably due, at any rate partially, to the parents in the former beginning to earn fair wages at an earlier age than in the latter.

The best age for the mother to be at the time the baby is born is between 25 and 30 years: if she is under 25 years old the baby has rather less chance, and this chance gradually diminishes as the age of the mother is less. Again, a young mother is in many cases less capable of giving birth to a healthy

baby. It is a fact the larger and stronger infants are generally born to mothers of a more mature age.

On the other hand, if the mother is over about 35 years of age the baby's chance again tends to diminish. The young mother is also more likely to rely on the advice of her neighbours and grandmothers instead of on those more able to give better advice.

The case is quite different among the better classes, where a competent nurse can be obtained to look after the baby, and the mother is likely to be better instructed in household affairs. Our aim at the present is to get hold of all the young mothers and educate and help them in every way; for experience has shown that these are much more easily influenced for good than the older ones who have already absorbed bad and erroneous ideas on baby management.

Dr Jessie C. Duncan made out some tables for the City of Birmingham², which showed that the younger mothers went out to work more often than the older ones. The reason for this is partly no doubt due to the fact that the young mother, with perhaps one child, can leave it in the care of some neighbour or relative, but directly the family increases she is unable to do this.

According to the Annual Report of the Registrar-General, the average age at which men and women marry is each year becoming greater. During the last 15 years the average age at which bachelors marry spinsters has risen from 26·30 to 27·19 years. In the same way the average age of spinsters who marry bachelors has increased from 24·54 to 25·32 years.

*How the Ante-natal Nurture and Physique of the
Mother influences the Child.*

There can be no doubt but that the ante-natal condition of the mother has a great effect on the infant before and after it is born. Mothers who have lived in poverty with an insufficient amount of food prior to the birth of the infant can only give birth to infants which are less healthy and smaller than if the mothers had been in good physical health. Not only this, but where there is poverty the mother has to work almost

up to the day of her confinement. Also when she has to do manual work the baby is often born before its full time (premature), and this again means usually a small, unhealthy child.

On the other hand, it is only fair to say that some well-known authorities hold the opposite view, and this is that no matter what condition the mother is in before the birth of the baby, the baby will be born healthy and in good condition. In the Report of the Privy Council upon physical deterioration Dr Eichholz "recalled a medical factor of great importance—viz. the small percentage of unhealthy births among the poor, even down to the poorest; the poorest and most ill-nurtured women bring forth as hale and strong-looking babies as those in better conditions. It almost appears as though the unborn child fights strenuously for its own health at the expense of the mother and arrives in the world with a full chance of living a normal physical existence."

Prof. D. T. Cunningham³ also supports Dr Eichholz, and says that the results of poverty are not transmissible from parent to offspring.

These latter views are, however, quite opposed to experience and to the results obtained from experiments on animals. The fœtus is not the same as a tumour, which grows like a parasite on its host, but it is a physiological process coming in the life of married women. The one is an abnormal condition, while the other is a normal one. The experience gained in children's hospitals, where babies born in different conditions of life are seen daily, shows clearly that if the mother is thin and badly nourished, the new-born baby is also thin and below the average weight of a healthy one. As the late Dr Henry Ashby⁴ said at the same conference on physical degeneration: "We often see a fully developed infant a day or two old brought to the out-patient department by a midwife or neighbour very badly nourished, feeble and quite incapable of withstanding the conditions of external existence. There may be no evidence or question of syphilis, but simply the fact of coming from a poor, badly nourished mother. Moreover, the infants from poor, weakly mothers,

even though fairly well nourished, are difficult to rear and readily waste on the slightest hardship. These infants start life at a low level. All babies do not start fair in the same way as do coins from the mint. Many weakly infants are born in our large cities who have a desperate struggle for existence for a few weeks and finally succumb. They are largely the infants of weakly mothers, who have been at work during pregnancy and who have been badly fed."

Then again there is the interesting fact that idiot children known as Mongolian idiots, from their resemblance to the Mongols, nearly always come at the end of a large family of children. The mother is getting worn out from continual child-bearing and hard work, and is not able to beget a normal baby. Dr Noel Paton⁵ made some interesting experiments on guinea-pigs, and found that the mother who had been well fed during pregnancy gave birth to much finer and healthier young guinea-pigs than one who had been kept on a low diet during her pregnancy. There is also the experience gained by altering the diet during pregnancy so as to make the infant smaller, so that it can be born the more easily. Prochownick⁶ showed by a series of cases that by dieting a number of women, who previously had had great difficulty at child-birth, the infants were born quite normally, and that the infants were smaller than those the women had had previously. Any breeder of animals will tell you that if you want good strong young, you must feed the mothers well and give them every attention. What is true of animals is also true of human beings. It is thus essential that not only must the mother be well nourished, but also that she must not perform work of a too laborious kind before the birth of the child.

It is because of this overwork and under-feeding that so many of the children of the poor die soon after birth and swell the Infant Mortality rate. Reckless parentage, early and imprudent marriages, especially when this means that the wife must go to work in a factory, are responsible for many weakly infants.

Whichever side we take, the mother should have the benefit of the doubt, and we should see that she is well fed and able

to rest for some weeks before confinement. The mother is doing a great duty to the nation, and we should do our duty towards her and see that she does not want at this critical period.

Dr A. E. Harris⁷, in his Report on the Prevention of Infant Mortality for Islington, 1907, says that he was discussing this question with a working man, and that this man knew of cases where the children were born strong and healthy when the father was in work, and weak and puny when he had no work to do. Later on, when work came again, the children were once more born healthy.

BIBLIOGRAPHY.

1. Annual Report of the Registrar-General, 1912. Table modified from.
2. Report on Infant Mortality of the City of Birmingham, 1911, p. 11.
3. Report of the Privy Council upon Physical Deterioration, 1904.
4. *Lancet*, Oct. 1, 1904, p. 477.
5. *Ante-natal Pathology and Hygiene*. "The Foetus." Ballantyne, p. 473. Wm. Green and Sons, 1904.
6. *Lancet*, July 4, 1903, p. 21. "The Influence of Diet in Pregnancy on the Weight of the Offspring."
7. A. E. Harris, M.D. Report on the Prevention of Infantile Mortality for the Metropolitan Borough of Islington, 1907.

CHAPTER IV

THE GENERAL CAUSES OF INFANT MORTALITY

The causes of Infant Mortality are numerous and they act in several different ways. In considering them, it is perhaps best to set down some general considerations first and then to take each special cause by itself in greater detail. Infant Mortality can be assigned to no one particular cause, but in the great majority of cases several causes are at work, all of which combine together to bring about the high death rate among infants. Again, it is most difficult to assess to each cause the precise effect it has upon Infant Mortality. There is also the question of the particular district and the nature and extent of overcrowding in that district, and what

may be a cause in one locality may have no influence upon Infant Mortality in another. This latter is a very important point, and has always to be considered carefully. Moreover, there are often harmful agencies and conditions influencing Infant Mortality in many ways.

Very often it happens that the same bad results come from different causes, and for this reason we are liable to attribute a given result to a wrong cause; for example, while great poverty no doubt leads to a high Infant Mortality, so also does the employment of the mother even in cases where great poverty exists only in a minor degree. Infant Mortality reflects the general social condition of the people, and, as already shown, is highest among the poorer districts. This being so, we must take into account very largely the poor and less well-to-do, and this leads us at once to the great question—to what extent does poverty *per se* affect Infant Mortality?

*Poverty*¹.

It is only to be expected that Infant Mortality should be comparatively low among the educated middle and upper classes, and highest among the poorer and more ignorant, who are for various reasons near to the poverty line.

Poverty is perhaps the first and greatest predisposing factor in Infant Mortality, and it is the one which practically dominates all the others. Moreover, it leads to many of the other causes of Infant Mortality, including the employment of married women during or too near to the period of pregnancy and child-birth. As we look closer into the subject, we come to the conclusion that as in most other similar social problems, there is a root cause, and in the case of Infant Mortality the root cause certainly appears to be poverty. The poor are always trying to overcome it and rise above it.

The life of a non-skilled labourer can be divided into almost alternating periods of want and of comparative plenty. During his early childhood he is often in poverty unless his father is a skilled workman. This lasts till the boy or some of the children begin to work and increase the family income, during which time he is often fairly well off. He then perhaps

marries and he is in a fairly good position till the family gets beyond more than one or two children. Directly this happens he is again in poverty till the children are old enough to go to work and bring in some money. He is then in good circumstances again till his children grow up, marry and leave the home. By this time he himself is also perhaps not in as good condition because of his age, and he falls into poverty again.

Apart from other advantages the infants of the well-to-do can usually secure good nursing and medical attention directly anything goes wrong. It is true the poor can always go to a hospital, but this is nothing like so advantageous as having medical care in the home itself. Again, domestic cleanliness is harder to obtain in small houses and tenements, where the infant has often to live in the same room in which the food is stored and the house refuse accumulates.

Poverty again is often responsible for a deficient supply of cow's milk, or milk of an inferior quality, or both.

In his annual report for 1911, Dr A. Evans, then Medical Officer of Health for Bradford, gives a table showing the relationship between the rateable value of dwelling houses and Infant Mortality.

Rateable Value	£6 and under	£6-8	£8-12	Over £12
Infant Mortality rates per 1000 births	163	128	123	88

The table clearly shows that the higher the rateable value the less the Infant Mortality, and *vice versa*, but, of course, how far the very high rate in the first group is due to poverty and how far it is due to the vicious habits of the parents it is hard to say, and it would be unsafe to admit it as a general fact or argument. Poverty, without any doubt, however, must have a great deal to do with it, and it is an almost established fact that the poor man's baby has a much smaller chance of surviving the first year than that of the middle or rich man's baby.

Wolf worked out statistics for the town of Erfurt in Germany and found that

505 babies out of 1000 died under one year old among the working class.				
173	"	"	"	middle "
89	"	"	"	rich "

This is an enormous difference, but it is practically borne out by the state of things existing in England. Dr Robertson, the Medical Officer of Health for Birmingham, in 1910 found that

The Infant Mortality among the poor in the city was 200 per 1000.

The Infant Mortality among the middle and rich was 50 per 1000.

There are in every town and community, but especially in large towns, a number of women who cannot buy, for lack of means, food necessary to keep themselves and their families in good health. These people also generally inhabit houses of bad quality in unhealthy surroundings.

Poverty is not a simple but a complex problem, and it probably leads to poor health, inefficiency or lack of energy, less than average intelligence, the result being that those who are afflicted with great poverty have difficulty in competing with others, and they consequently tend to remain on or rise little above the poverty line. Again, those with less than average intelligence more easily contract alcoholic habits, which in turn makes them more careless about their home and children; and thus they tend to continue in the vicious circle. On the other hand, it does not necessarily follow that poverty is always the main cause or that it invariably is connected with Infant Mortality.

One often hears it said, "After all, twenty-six shillings a week is pretty good pay for an unskilled man." But let those who say and think so pay six to seven shillings a week in rent, and in many towns there are few houses fit to live in under this, and then try to keep a wife and four or five children on the twenty shillings left over. The twenty shillings has to provide for fuel, light, insurance, clothes and many little items besides the food for the week. A little "housekeeping" soon makes one realise that even the wage of twenty-six shillings a week is all too little for any family to live on, and when we realise that there are many living on a good deal less than this, we shall understand that the poor have a very great deal to contend with.

Some of the principal causes of the earnings becoming inadequate are well shown in the following diagram.

Immediate Causes of Poverty

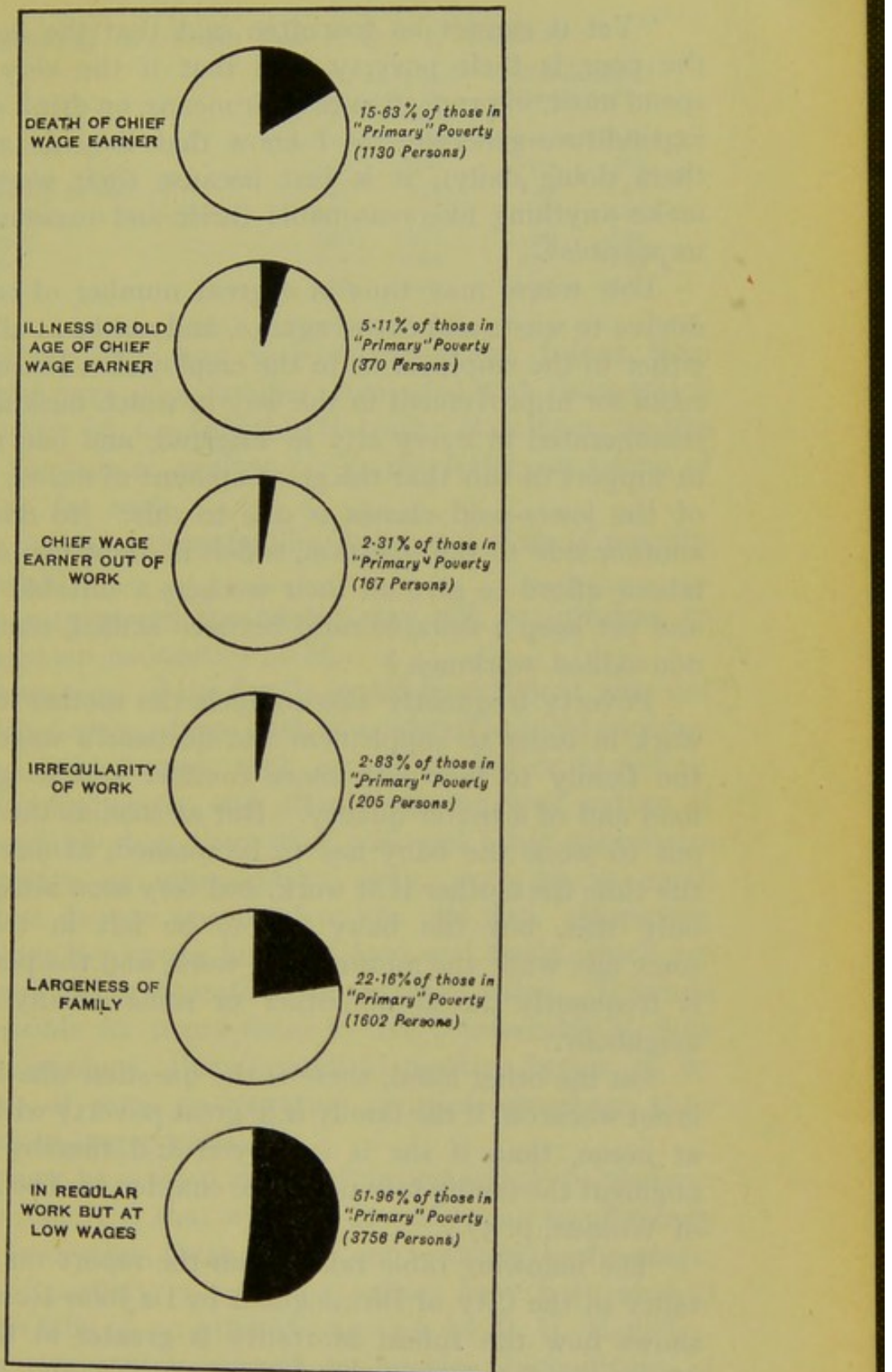


Fig. 3.

From Mr B. S. Rowntree's book *Poverty, a Study of Town Life*.

“Yet it cannot be too often said that the destruction of the poor is their poverty, and that if the very poor often spend most, in proportion to their means, on drink and wasteful expenditure generally (as I know that they do and as I see them doing daily), it is just because their wretched wages make anything like reasonable thrift and reasonable comfort impossible².”

Low wages may thus in a great number of cases be conducive to waste and extravagance, and not be at all economical either to the employer or to the employed. There is still vast room for improvement in the way in which unskilled labour is remunerated in every city in England, and one may assume in support of this that the great amount of unrest in the ranks of the lower-paid classes is due to this. No doubt there is another side to the question, which is—how can employers of labour afford to give all their workers a suitable living wage and yet keep a suitable ratio between skilled, semi-skilled and non-skilled workmen?

Poverty frequently also compels the mother to go out to work in order to supplement the husband's wage and enable the family to live with more comfort and to get sufficient food and of a better quality. But as soon as the mother goes out to work the baby has to be weaned, at any rate during the time the mother is at work, and very soon altogether. Not only this, but the baby has to be left in the charge of some one while the mother is at work, and the person selected is frequently the grandmother or some usually incompetent neighbour.

On the other hand, there is the question whether the baby is not worse off, if the family is in great poverty with the mother at home, than if she is employed and thereby assisting to augment the family income. (See chapter on The Employment of Women, p. 57.)

The following table taken from the report on Infant Mortality in the City of Birmingham by Dr John Robertson, 1912, shows how the Infant Mortality is greater in those families where the father earns under £1 a week, and less when he earns more than £1 a week:

Infantile Mortality and Wages of Father.

	Father out of work or earning less than £1 per week.		Father earning £1 per week or over.	
	Infantile Mortality.		Infantile Mortality.	
	1910	1909	1910	1909
Mother employed in factory	203	235	123	146
Employed at home or elsewhere	187	176	53	120
Total employed	198	217	99	137
Not employed	191	199	150	154
Total	196	211	127	146

These figures show how very excessive the Infant Mortality is in the very poor families, compared with those which are a little better off, the Infantile Mortality Rate being no less than 196 in the former, against 127 in the latter, an excess of more than 50 per cent.

Now the causes of these families being in a state of poverty may be twofold :

(a) The earnings of the family may not be sufficient to buy the minimum necessities of life.

(b) The earnings of the family would be sufficient were not a part, and frequently a large part, squandered in some unnecessary and wasteful luxury, such *e.g.* as alcohol or gambling. The poor also frequently, and often from the very nature of things unavoidably, buy their food, coal and other necessaries in an expensive or uneconomical way, such as in small quantities just for the one meal or the one day. Moreover, they often buy the wrong kinds of food and foods which are not only wasteful but contain little nutritive value. It would be quite possible for many more to live comfortably if they could only "manage" their household matters better, or by the adoption of some co-operative principle purchase their requirements in larger units.

Poverty may be divided into (a) Primary and (b) Secondary.

Primary poverty is that which is caused by an insufficiency of earnings, even when these are laid out to the best advantage. The causes of poverty in a country village have been worked out most carefully in an interesting paper by P. H. Mann³.

Secondary poverty is caused by unwise expenditure of the earnings or insufficient exertion to find work when it is

available, and one of the most frequent causes of secondary poverty is the waste of money on intoxicating liquors. If we examine the state of things existing in the country districts we find that the standard of life is usually lower than in the cities, the chance of success less and life generally less interesting. The cry "Back to the land" probably exists to a greater degree in the minds of idealists than is accounted for by actual facts, and if we want to get people back to the country we must make the lives of agricultural labourers more attractive and the wages more remunerative.

An interesting fact, and one to be borne in mind, is that when the family begins to increase in numbers, the same income has still to do duty, although there is more food and clothing to be bought. It means in most cases that the same amount of food has to go further and each member gets less in consequence. Mr B. S. Rowntree has very carefully worked this out, and makes it very plain when he says "that whenever a worker, having three children dependent on him and receiving not more than 21s. 8d. a week, indulges in any expenditure beyond that required for the best physical needs, he can only do so at the cost of his own physical efficiency, or of that of a member of his family." If the family is at all hard pinched for food, it is most often the mother who suffers: she will give all the food to the husband and children and keep far too little for herself.

Lack of Proper Knowledge on the part of the Mother in the Management of the Infant.

The mother is the natural guardian of the infant, and the infant's chance of living largely depends upon whether the mother looks after it well or badly. This being so, the mother who looks after and feeds her baby carefully and properly will give it a much better chance of living than the mother who is ignorant and careless in these things.

Mothers with few exceptions are, however, anxious to do all they can for their babies, and it is generally due to ignorance and carelessness rather than wilful neglect, when they do not do all that is right.

It is the fashion at times to attribute the high rate of Infant Mortality to maternal ignorance and apathy. Work among the poor, however, does not bear this out, and I have the greatest sympathy for parents who lose their children, especially when I see them working hard for those children in squalid surroundings, or in a tenement consisting of one room only. One of the reasons why Infant Mortality is so much higher in the crowded industrial districts is that the people are all of one class, and that often the most ignorant.

But few babies have been reared in the past, so that there does not appear to be ground for reproach that few should be reared in the present. There are few to raise them to a higher state. In the country conditions are different, for here there is often the local grocer's wife, or the chemist's wife, who possibly have reared large families with success, and who come into contact with the poorest and set them a good example in the management of babies. In the towns there is not enough mixing of the classes for the very poorest to derive the benefit of contact with richer neighbours. The "West End" keeps too aloof from the "East End," to quote the analogy of the Metropolis.

Competent and good mothers are to be found living side by side in the same street with ignorant and careless ones. The husbands of each are earning very likely the same wages, yet the home of the one will be probably always clean, the children will also be clean and attend school regularly, while next door everything is dirt and squalor, and only two or three out of probably a large family have been successfully reared. The essential difference will be the amount of intelligence and care bestowed upon infant life, and the wise or unwise spending of the wages for the comfort of the family in the two cases. If the parents keep steady, are intelligent and do not waste their income, they can do a great deal.

Hospital experience also bears out the fact that it is ignorance in baby management which in so many cases causes the baby not to thrive. Thus we often have mothers bringing their babies to the out-patient department week after week, and yet the baby will not gain weight, although

each time she comes the mother has it explained to her how to feed her baby. In desperation we take the baby into the hospital, where it is fed exactly as the mother had been told to feed it, and from the outset the majority begin to gain weight and thrive. It simply means that the mother lacks the intelligence or the care to feed and manage the baby properly. Of course, it is not all who thrive at once even in hospital; some have had their digestive systems so upset by continuous mismanagement that it takes time for them to get right. There are very few, however, who are not able in a very short time to leave the hospital in a satisfactory condition. Some of the babies are then lost sight of for a few weeks, but only to be brought back again mere shadows of their former selves, and dirty and unkempt. The care and the benefit received in hospital have all been thrown away by careless, reckless and ignorant mothers.

These facts show us that to combat this ignorance is one of our problems, and this can be done best by providing good Health Visitors to go and visit the poor *in their own homes*. The mothers are taught and their ignorance dispelled more effectually in this way than in any other. The mothers get confidence in the Health Visitors, and soon seek their help and advice in a way they will not do when they are gathered together at a "school for mothers" or at a class. Education is, however, a poor substitute for intelligence, and therefore we should strive to make the mother more intelligent by widening her view of the world, and by doing this we shall have accomplished a good deal.

It is often thought that every mother has within her the natural instinct to do what is best for her baby. This is surely an illusion. She will no doubt do her best, but this is not necessarily or most frequently the best for the baby.

A young mother has to learn all about the infant and how to attend to all its wants, and she should learn to do this before the first baby is born, and not have to learn how to do it by experimenting on her first baby. Knowledge comes to us by our quick aptitude and intelligence in picking up small facts and by the diffusion of information. The young

mother too frequently seeks advice from ignorant neighbours, and so the old ignorance gets handed down from generation to generation. It is true that the instinctive affection of motherhood goes a long way and acts as a driving force, but there must be knowledge for that driving force to be turned to the best advantage. It stands to reason that the factory girl who has worked in the mill since the age of 14 or 15 years, and worked there till her marriage, can have but little knowledge of housekeeping and looking after the baby. She is much more interested in her work, companions and places of amusement than in her home.

The most careful investigations have been made in New York as to the effects of the various agencies at work to reduce Infant Mortality. The unanimous opinion of the doctors, who made the observations, was that neither the surroundings of the infant, nor the exact character of the milk obtained, were as important factors in the health of the infant as the intelligent care of the mother. And this intelligent care includes many things, such, for example, as cleanliness as regards the feeding-bottles, the milk, the quantity of food given, suitable clothes, fresh air, etc.

Ignorance and lack of intelligence are thus two of the great evils which we have to contend against, and the mothers do not generally appreciate the extent upon which infant life depends in the adoption of simple hygienic precautions. The mothers are, however, gradually becoming more willing to change from their old ways of feeding and managing their infants than they used to be. This is evident at the Mothers' Guilds, the mothers who come with their second babies are much more alive as to how to look after them than they were when they came with their first baby.

Improper Feeding.

There is no fact more clearly established than the great importance to the health and life of infants among the poor than that they should be entirely breast-fed for at least six or seven months. If the baby is breast-fed for this length of time, even in the poorest surroundings and poverty, it will stand a very good chance of living. The baby will escape the many

pitfalls and dangers which lurk behind food out of a bottle. This fact is so plain that it is almost always possible to be able to say from the look of a baby whether it has been breast-fed or not. Artificially-fed babies are often fat like the others, but they are as a rule less healthy and have less power of resistance to disease. For this reason we must aim at persuading all mothers, rich and poor alike, to regard the breast-feeding as almost vital to the well-being of the child. It is a common failing among the upper classes to wean their babies early, often because breast-feeding is a trouble and a tie, but on the other hand the upper classes are often physically unable to suckle their babies for any lengthy period.

Directly the mother in the poorer districts has to wean her baby the trouble is likely to begin. She has not the knowledge and she is unable to take the care needed to bottle-feed her baby. The food needs very careful preparation and storing, the bottle has to be kept scrupulously clean and the milk itself must be fresh each day. Milk becomes dirty and contaminated with great ease in a small house, where the food and milk have to be kept in the only living room. The poor have few facilities for keeping their food, and this is partially why they are so fond of buying all their food in small quantities, sufficient often for only one meal.

During a hot, dry summer such as that of 1911, the artificially-fed babies got epidemic diarrhœa by the hundreds, while the breast-fed ones remained almost immune. The reason for this was that the food of the artificially-fed babies became contaminated and infected, in most cases by flies.

The artificially-fed baby is also often fed on foods quite unsuited to its requirements, and to add to the trouble its digestion gets easily deranged.

The mortality is indeed twice as high and often even more, among the hand-fed than among the breast-fed. The following statistics collected in Salford in 1909 show this fact clearly :

	Number of Births	Number of Deaths	Infant Mortality per 1000 births
Babies fed on breast alone	2880	328	113.9
Babies fed on other foods	235	74	314.9

Not only this, but the breast-fed babies come on better and remain healthier than the hand-fed. Experience gained at the Manchester Children's Hospital and at the Mothers' Guilds amply bears this out. There are far more babies brought to these institutions because of sickness and wasting among the hand-fed than among the breast-fed: the breast-fed babies more frequently remain healthy, and therefore do not need such frequent medical advice. Further, the baby remains well and relieves the mother of a great deal of worry and extra work. A good, contented baby is a boon in a small house, while the cross baby, who keeps all the household awake at night, is a nuisance, besides needing much attention. If the mother has to be looking after her baby all day and all night, she herself becomes worn out and less able to properly manage and do for the other children and her husband. It is difficult for a mother in the better classes to realise what a tie it is never to be without the baby day or night.

It would be an interesting experiment, were it possible, to obtain some twins and feed one entirely on the breast and the other artificially, both of them being cared for by the same mother and both living under the same social conditions. We could then see how the breast-fed baby outstrips the artificially-fed one. This is a difficult experiment to carry out, as if the mother has any breast milk the twins should share it alike and extra food be supplied to each. It would not be quite fair to give the one twin its natural food and not the other.

This experiment has been watched by Dr Vivian Poore⁴ in the case of triplets, one of whom was fed on the breast entirely, while the other two were artificially fed. All three were exactly the same weight at birth, but by the time they had reached the age of three months, the breast-fed one had far outstripped the other two.

During the cotton famine in Lancashire, 1861-5, caused by the American Civil War, when little cotton came to Lancashire, the Infant Mortality actually decreased. The mills were shut down and there was much unemployment, the consequence being that the mother had no option but to stay at home

and nurse her baby. The men did all the work there was, and the women were therefore not employed to the same extent as in normal times. Even despite the increased poverty, fewer babies died, simply owing to the fact that the babies were being breast-fed. The mothers at this time were no doubt themselves fed as the result of money collected for their benefit. In the same way, during the siege of Paris, 1870-1, the Infant Mortality also decreased, although the general mortality increased. Another important question is the effect which great poverty has upon the ability of the mother to feed her baby. If the mother is in a state in which she does not obtain enough food, then it becomes impossible for her to breast-feed her baby. She cannot secrete a supply of milk when she is getting an inadequate amount of food, or food containing little milk-forming ingredients. This is a great handicap upon the poor nursing mother, for even if her milk does not leave her altogether, it quickly becomes small in amount and poor in quality. It is a great strain at any time on a woman to produce milk regularly, and to do so she must maintain herself in good health and be supplied with good and sufficient food.

To overcome this difficulty, I think these nursing mothers should be supplied each day with one good meal at a cheap rate (*1d.* or *2d.*), or if necessary she should be able to get this meal free. Several of the Mothers' Guilds supply these meals and get the mothers to come regularly both before and after the baby is born, and it is astonishing what a difference this one meal makes to the baby and to the length of time it can be breast-fed.

Extreme poverty has thus a close connection with breast-feeding and consequently in its turn with the welfare of the baby. Poverty, it has been shown, has a connection with the employment of women, which in its turn affects the time at which the baby has to be weaned. This will be enlarged upon in a later chapter (The Employment of Married Women).

The essentials of breast-feeding can be summed up as follows :

- (a) The mother must have a reasonable amount of nourishment.
- (b) She must not be excessively overworked.
- (c) She must pay attention to her health, avoid constipation, refrain from too much excitement.
- (d) Pay attention to the condition of the nipples.

BIBLIOGRAPHY.

1. *Poverty, a study of town life.* B. S. Rowntree. Macmillan and Co., 1902.
2. "Artifex," *Manchester Guardian*, Jan. 1, 1914.
3. *Life in an English Village.* Sociological Papers, 1904. Macmillan and Co.
4. *Clinical Journal*, Jan. 9, 1901.

CHAPTER V

BAD HOUSING AND DEFECTIVE SANITATION IN RELATION TO INFANT MORTALITY

The housing of the poor has a very direct bearing not only on Infant Mortality but also on the whole death rate, and therefore is deserving of very careful consideration. The people have lately begun more and more to migrate and collect in the towns, and life in towns means for the working classes limited accommodation, more strain in battling with the small worries of life, and what is more important a weakening of family and home life.

The rearing of children under these conditions is difficult, although improved sanitation has done much to protect individuals from the evils of environment. Sir George Newman¹ well sums up life in a large city, when he says the homelessness, the habits and customs of town life operate most injuriously on infancy. It may not be possible to put our finger on any one item affecting the mother and killing the infant, but it is the general condition of domestic life in a city tenement which makes the rearing of infants a difficult and doubtful undertaking.

There are far too many wretched dwellings and tenements, and these all tend to foster degradation and crime. Slums have a tendency to breed slums, for the advent of an undesirable family into a street drives away the decent, respectable people. Sickness, unemployment and drink again largely contribute to force families into the worst dwellings through lack of means caused thereby.

There are no statistics to show how many people are living in slum conditions, but according to Mr Seebohm Rowntree they number about two millions. In the next grade of homes, having a living room, scullery and generally two bedrooms but sometimes three, there live between 65 and 80 per cent. of the working people. A quarter of the total dwellings of the country have only two bedrooms, and it is next to impossible for a growing-up family to live decently under such circumstances. Despite this, however, the working classes pay an appallingly large proportion of their total income in rent. It is more common than not for the labourer with a wage of 20s. to 25s. a week to pay 5s. a week as rent for his house, and this is not all, but even at this rate there is a shortage of such houses in most of the towns in England. This is not improbably due to the temporary check upon building enterprise caused by the scare of the Budget 1909, the condition of the money market and the large number of dwellings closed under the Housing and Town Planning Act of 1909. Houses are wanted badly, but they must be at a rent which the wage-earner can pay without crippling himself. If new houses are going to be built in a city a town plan would be beneficial, but at present Birmingham is almost the only city which has passed a town plan scheme. The usual method of erecting houses in a casual way, generally in rows, is not what is wanted, and it would be much better if they were erected in an orderly but not too stiff and formal way. The houses must not be crowded and each must have a chance of obtaining fresh air and sunlight. All this is difficult and costly to obtain because of the reluctance of landowners to part with land near towns at reasonable rates. It is admitted on all sides that the death rate from phthisis and infectious diseases is highest in those

places where there exists the greatest proportion of overcrowding, but it does not appear to be quite so readily realised how much Infant Mortality is adversely affected by the same overcrowding. The homes of the poor play a very great part in their lives, for it is here the mother and the younger members of the family spend their time day in and day out. The street and the backyard are the playgrounds for the children as soon as they can walk, and the surroundings of the home must affect favourably or adversely their lives and well-being to a large extent. Bad as the conditions of rural housing frequently are, those of the poorest parts of our large towns are generally worse. Our future as a nation depends upon the health, intelligence and skill of the workers, and good health cannot be enjoyed in full measure where housing accommodation is limited or defective. Overcrowding, besides its usual concomitant, lack of cleanliness, also frequently carries with it the further disadvantage of a deficiency in many cases of light and fresh air owing to the proximity of other houses or of factories and warehouses.

There is generally a fair amount of ventilation in the dwelling rooms, for the front and back doors, which lead straight into these rooms, have to be so often opened, that a current of air can pass through. On the other hand, the ventilation in the bedrooms is often atrocious, for the windows are in many cases never opened. This fact can be easily seen by walking down the slum streets on a fine summer day, for an open upstairs window is hardly to be seen. It is common, owing to the shortage of suitable houses, for a house to be sublet to several families, each of whom has perhaps only one or two rooms, and it is here that the family is born and reared. These houses, which in former years used to accommodate one family only, now accommodate three or four families. The common staircase is used by all, and the sanitary convenience and the water supply become quite inadequate to the new demands. When the surroundings of the home are dirty the continual passing in and out from the streets and yard conveys a lot of dirt indoors; the dust also blows in and it becomes well-nigh impossible for the mother to keep the house clean.

She gets disheartened at her task and gives it up. Sanitary authorities are now doing their best to keep the streets clean, and they remove all refuse at frequent intervals, with the result that conditions are improving. Public opinion appears also to be awakening to the urgent necessity of abating the smoke nuisance and purifying the air. The City of Dublin is a notorious example of excessive overcrowding, for nearly one-fourth of the total population is living in tenements of a single room. In this town there are 6000 living seven in a room, and 9000 living six in a room. The average death rate for the city during the last few years has been 24·8 per 1000, as compared with 13·6 per 1000 in London. A good deal of public attention has been attracted to the condition of Dublin, which is now slowly improving and the death rate is diminishing.

It would be advantageous if we could have a national survey of all the bad dwellings throughout England, so that we could see exactly where they are. This might perhaps stimulate some municipal authorities to cope with the evil.

The landlord often lives at some distance from his slum property and an agent looks after it, the result being that little is done to keep the houses in repair, and little decorating in the way of colour-washing is ever thought of. The landlord does not care as long as the rent is paid, and generally does not know how his property fares. If the landlord does try to keep his property in good order it is often almost impossible for him to do so, for the people are so careless and keep the rooms in such a dirty state that it is waste of money to try to help them. Some of these landlords are bad, but many are poor people who have to meet heavy ground rents and other charges, and cannot afford to be always patching up the property. These one-roomed tenements are to be found in the most fashionable parts of cities, even at the back of high-priced houses and behind the squares.

The poor have generally very inadequate arrangements in the way of cupboards for storing their food, which often lies on the table from meal to meal. They also quickly get into the habit of buying it in small quantities at a time, which leads to much extra expense. There is also the absence of a coal-

hole, and they have to buy coal by the hundredweight, which, like the food, is thus made dearer. These small houses and tenements easily become stuffy, and the windows, even if meant to do so, are seldom opened, and the room or rooms are dirty from refuse lying about. It is here that the milk for the bottle-fed baby gets contaminated by flies and dirt, with the consequence that diarrhoea and other diseases are set up. Wherever there is dirt and refuse, together with the necessary warmth, flies breed with all their accompanying evils.

The following diagram shows clearly how people who live in overcrowded surroundings have the highest Infant Mortality, and how this decreases with the number of rooms occupied. If the family lives in one room it is very fatal to the baby.

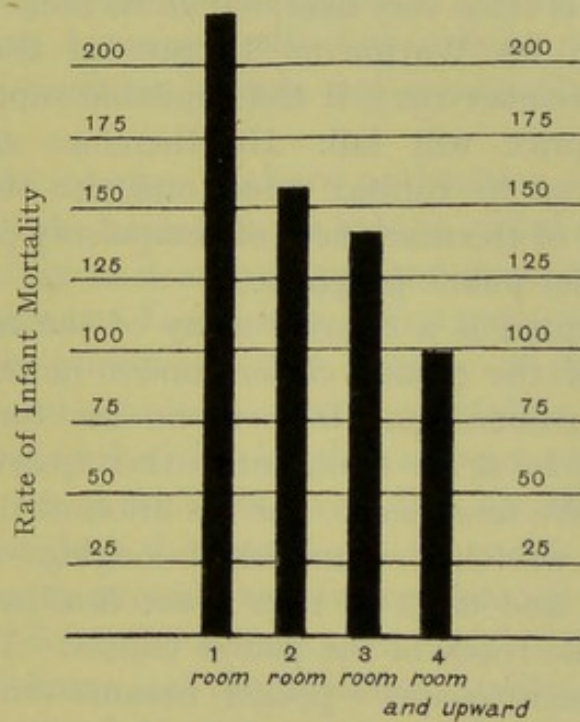


Fig. 4. Infant Mortality per 1000 births in the Metropolitan Borough of Finsbury, 1905, classified according to the number of rooms occupied by the family.

It must be recognised that the figures in the diagram are only relative: because the baby dies in the one-roomed tenement, it does not necessarily mean that it has lived there all its life. Poverty may have overtaken the family and caused them to live in smaller quarters. To a large extent then bad housing is a question of poverty. Unskilled labourers earning

20s. a week cannot afford to pay 5s. a week in rent, to say nothing of 6s. or 7s., the price in many towns of a decent house. It does not necessarily mean that the rent is high, as the land is often expensive just where the slums are situated and the landlord must get some return from his property.

A remedy may be found by erecting suitable houses away from the centre of the town where land is cheaper and where it would be healthier. The garden suburb is perhaps the ideal, and it is best situated at a distance from the town, provided there is some cheap means of transit for the workers to the city. Urban housing is something of a monopoly, and this is where the municipal authorities might perhaps step in and look ahead, by acquiring the space which its population will shortly require. Land is often very dear, but as Mr Seebohm Rowntree pointed out in his Warburton Lecture at the Manchester University, November 1913, if the available supply of land is increased its price will fall. He therefore advocates the rating of land on its capital value, and also the simplifying and cheapening of the machinery of compulsory purchase when land is needed for public purposes.

What is wanted is a clearing away of the foul areas and a re-housing of the poorer classes under more healthy and comfortable surroundings. It is of no use turning out the tenants merely to drive them into other quarters to create slums again. We must see to the abolition of the dilapidated dwellings, the wretched unfurnished lodgings and the subdivided rooms, and erect in their place healthy dwellings at prices within the reach of the poorer classes. This may need an appeal to the ratepayer's pocket, because rentals of 4s. 6d. to 5s. a week will not allow of much profit. One of the difficulties which the authorities have is that the land where so many slums are situated is extremely dear and often unpurchasable except at a very high price.

Commercial enterprise and the needs of private and public companies often assist in the abolition of insanitary property. As the business grows more room and warehousing are needed, with the result that bad property is often pulled down and good non-residential buildings put up instead.

With the coming of the motor the streets are more easily kept clean, and there are, and will in the future be, fewer mews, to the advantage of all living near them.

The Local Government Board held an enquiry into the housing conditions of Dublin, 1913, and Sir Charles Cameron, the Medical Officer of Health for the city, giving evidence as to how the conditions might be improved, said that he would first of all see that all those families who then lived in one-roomed tenements should be provided with two-roomed dwellings. Also that all new dwellings should be erected as far as possible on the outskirts of the city. He also pointed out that although there are so many families living in one-roomed dwellings, there is in many cases no overcrowding, as the family often consists of one or two individuals only. This is an important point, and just because a city has a large number of these one-roomed tenements it does not necessarily mean there is overcrowding.

All over the country sanitary authorities are now working hard to get all the back-to-back houses pulled down, and even in the large cities of densely populated counties, such as Durham, Glamorgan and Lancashire, a vast amount of bad housing is being slowly improved. The expense of pulling down old dirty houses and tenements and the building of new ones is great, and local authorities on this account can only proceed with caution, for as the rates go up they are often blamed and in consequence lose their seats at the next election. It is also expensive to provide satisfactory paving for the streets and yards, but doing this is more economical in the long run than to have the sickness and the impaired vitality of a population living in dirty and insanitary surroundings. The hospitals supply a great need to the poor when they become ill. Think, for instance, not only of the relief to the patients themselves, but of the easing of the burden borne by the whole family who have to nurse and feed the invalid as well as they can. One of our efforts in the future must be to educate the poor to like better houses and cleaner surroundings. Licensed premises are often situated in some of the areas which a city council intend to demolish, but the inclusion of these largely increases

the cost of the schemes. The advantages gained to the district by the reduction in the number of public-houses are, however, quite great enough to make it worth while to pay the price. The number of these is gradually being reduced by the licensing authorities, and with any new housing scheme they will do well to co-operate in this matter with the city councils in their efforts to improve the city.

Some very careful investigations have been made in Liverpool into the general mortality of the insanitary quarters of the city, and it has been found that the mortality here is nearly twice as great as in the rest of the city. In Liverpool, when new dwellings are erected to take the place of those demolished, careful enquiries are made before the new occupants take possession, and only those who have lived for some time in and have been turned out of their tenements and houses are allowed to occupy the new corporation dwellings. It is only right that these should have the prior right, and there are many applicants for them. If enquiries are not made, families will often purposely overcrowd the old premises for a few days before the new dwellings are opened, in the hope that it will give them a chance of getting into the latter. Also when the new dwellings are occupied, they must be supervised by a competent caretaker, for the people who have been accustomed all their lives to overcrowding and insanitary surroundings and habits will soon convert the new dwellings into a state similar to their former ones. The new lodgers carry all their old customs with them, and for this reason the caretaker must be good and influential, for he can have a very important bearing on the future of these lodgers. The new tenants must be taught and made to keep everything clean and well ventilated, and above all they must not be allowed to sublet the rooms. It takes a little time to break them in, and there are many grumbles at the start. The Medical Officer of Health for Liverpool, Dr E. W. Hope, in his annual report, 1912, brings up an important fact, and this is, directly a dwelling unfit for human habitation becomes unoccupied it should on no account be reoccupied by fresh tenants. The reoccupation of dwellings unfit for habitation and admittedly dangerous and

injurious to health should not be allowed. At present this goes on unrestricted in many places, but it is difficult to prevent, as it would appear that when a single house is dealt with the tenants of neighbouring houses cease to regularly pay their rent, and a still further deterioration results from the action of roughs in damaging the property. Also if we prohibit certain houses from being occupied, we must take care to provide new dwellings, or else the overcrowding becomes worse than ever.

To realise the effects of improved housing we must be conversant with the original conditions under which the inhabitants lived before. There is undoubtedly a very marked improvement in the habits and cleanliness of the occupiers of new dwellings. The homes are kept cleaner and the children are healthier ; the districts are quiet and orderly and need less police supervision, and fewer inspectors to pay visits about the removal of nuisances. The mothers have a better chance of keeping the children in health, the food is cleaner and less liable to become contaminated. They have room to store the food and other necessaries, and they can in consequence buy more in bulk and more cheaply. All these advantages must tell greatly in lessening Infant Mortality. The building of new houses is bound to cost a good deal, but there are many compensations, not only to the people themselves, but also to the pockets of the ratepayers. The cost of cleaning and scavenging is much diminished, and this alone in Liverpool amounts to £3000 per annum.

Housing in the Rural Districts.

In the report of the Land Enquiry Committee, Mr A. H. Dyke Acland expresses the opinion that owing to bad housing in rural districts thousands of children and adults are dying or being permanently injured in health every year. This is a reproach to England, and, moreover, the progress which is being made is slow and inadequate. Infant Mortality is lower in the rural districts than in the urban, but no doubt it can be brought still lower, and attention must be paid to the rural

as well as to the urban. Many vigorous men and women are leaving the country districts because there are no houses available for them. If there are no houses the people cannot get married, the consequence being that they go to a town or emigrate, and we cannot afford to lose men and women like this. Rural district councils are often blamed for not carrying out the powers they possess, but it must be remembered that many of these councils administer districts which have a small population and a small rateable value. They cannot afford to build houses and run the risk of their not paying. In large towns a penny rate yields often many thousands of pounds, and a small loss each year is not felt. Rural councils also have no staff, as has a town council, who can advise them on a building enterprise, unless one of the members of the council happens to have the knowledge. Again, in some parts of the country there are owners who have invested their savings in cottage property, some of which is in an unsatisfactory state and which should not be occupied unless repairs are carried out, but the owners are not in a position to carry out such repairs.

What is wanted is that there must be a prospect of cottages being erected in the rural districts and that those in an unhealthy condition should be put in order. How this is to be done is a difficult question, but the newly created Land Commission may be able to help in some way. Provision will have to be made whereby the present owners may not suffer unduly, while at the same time the occupiers must be considered. An insanitary dwelling is a most costly asset, not only to the family which lives there, but also to the community at large.

BIBLIOGRAPHY.

1. *Infant Mortality*. Newman, p. 180. Methuen, 1906.

CHAPTER VI

THE EMPLOYMENT OF MARRIED WOMEN

The Employment of Married Women and its Effect on Infant Mortality.

Married and widowed women are employed in labour of one kind or another in all districts, but especially so in towns and thickly populated areas. The question now comes, Does this employment affect their children, and if it does, to what extent? A married woman in a poor district may do one of two kinds of work. She may go out by the day doing washing, charring, etc., and probably only be employed for two or three days each week, the rest of her time being spent at home. On the other hand, the majority of married women who are employed go to work in the factories or mills. In the old days women used to do work of different kinds in their own homes and take the finished material to their employer, who paid them by the piece. At the present time, however, the extended use of steam, electricity and machinery make it undesirable for the homes to be turned into workshops, as the work can be more economically and better performed by the women working together in a factory. This is to the advantage of both employers and employed. The former get more work done and have it done regularly, while the latter gain even more, as instead of working all day in a badly-lit and ill-ventilated cottage, they work in roomy and well-lighted workshops and factories. Then again, it is much more sociable and interesting for them to work together.

It is easy to place the blame for Infant Mortality on the mothers, and one would imagine from what is said sometimes that the mothers all like going to work, and, in consequence, neglect their babies. The mother too often has only the choice of seeing her whole family live on totally inadequate food or of going to work to enable them to live more comfortably, but

at the risk of doing harm to the baby. The separation of the baby from the mother, without good and sufficient reason, is much too painful for the majority of women. The young mother has many to advise her as the time of her confinement approaches, but little is effected in making ready for it. In many cases the anxiety about her wages makes her work right up to the time of her confinement instead of staying quietly at home. The old women ply her with many specifics, and recommend stout or some such beverage, to keep up her strength and spirits. After the child is born, money again worries her, and she goes back to work as soon as possible.

Some of the employers of labour are extremely good to their workpeople and take a great interest in their welfare.

When we begin to estimate the results from the employment of married and widowed women, we must take many things into account, such as the character of the work done and the conditions under which it is done, as well as the relation of the work to the health of the infants. In the industrial centres of the North of England thousands of women are employed in factories and mills, and, on going over the factories, one is impressed fairly favourably with the physique and generally healthy appearance of these women. The work in a cotton mill, where practically two-thirds of the workers are women, is not specially hard and the wages are good. The girls begin work soon after they leave school at the age of 14 or 15 years, and are gradually promoted as they show their ability. All the work is done by machinery and they are paid for the work done. The beginner gets about 5s. a week and the majority of the women workers earn between 20s. and 30s. a week, even more in some cases. There is very little lifting as a rule, and, as stated before, the employers are very considerate to their workers. This kind of work is good, but on the other hand there are many other kinds which are hard and badly paid. Instances of the latter are to be found in the potteries, where there is often much lifting and the hours of employment are long. In some laundries also the work is hard and not fitted for women, especially mothers with children. Lately there has been some

dispute as to the work which the pit-brow women do, and on going to see this work, which consists of sorting the coal from a moving platform passing in front of them, I do not think it is suitable for women, and certainly not for married women.

But though much might be done in some places to improve the conditions of labour among women as to ventilation of the workshop, hours of work, etc., general knowledge and facts seem to show that it is not the actual work performed by the women which is so injurious, as the absence of the mother from her baby and her home. As Miss Helen Blagg¹ says: "Mother and home are the two things for which there are no substitutes."

One would imagine from what is said so often, that it is only in Lancashire and other parts of the country, where women go out to work, that we find a high Infant Mortality, and that in those places where the women stay at home and devote themselves to their children there is a low death rate. There are many places, however, where few women go out to work and where there is as high or even higher Infant Mortality than in Lancashire.

Why is it that Married Women go out to Work?

On going into the question carefully and by asking a large number of married workers, it is found that the majority of them do so in order to supplement the family income. The husband may be in irregular employment, or if in employment his wages are low and not sufficient to keep the family in food and clothes and to pay the rent.

When this is the case the mother goes to work as well as the husband, and by this means the family is enabled to live in more comfortable circumstances. As the children get more numerous it becomes increasingly difficult for the mother to leave the home; thus there are more women employed who have only one or two children than women with large families. These latter will, however, do odd days' work if they can get it, but they cannot leave the home for many hours at a time. The poor have great difficulty in leaving their children at home,

and the duty of caring for them in the mother's absence is generally relegated to some incompetent person.

Another reason why a married woman goes to work is that she has either lost her husband or is living apart from him. The mother is then the sole supporter, and in consequence she must go out to work in order to keep herself and her family. Such cases are often very hard: the mother has not only to do all her housework but must earn as well. Even then she has to keep a family on a very small income.

There is another class of women who goes to work, generally in the factory or mill, simply because industrial work is considered to be preferable to staying at home and managing the house. These women do not need to go to work for financial reasons, but they prefer to pay someone to mind their children and house rather than do it themselves. To overcome this we should give girls an education that will make home life more attractive and interesting to them.

The most desirable and permanent way of stopping women labour would be to give higher wages to the husband; then there would be no necessity or excuse for the mother to work. The difficulty about giving higher wages is that the men are often not worth it, and the problem then comes, how can we make the husbands worth higher wages?

An unfortunate accompaniment of good trade is that the number of mothers employed has increased owing to the demand for hands being greater, and this, it is easy to see, is not an unmixed blessing from the children's point of view. Such children are frequently recognisable by their somewhat uncared-for appearance, although the increased income must in most cases reflect on their general nutrition.

Having now seen why women go out to work, we must find out the results of their being employed.

(1) Does the employment of mothers affect their health in any way?

(2) Does the employment affect the health of infants born to working mothers?

It is very difficult to give statistics as to the effect of work on the health of the mothers. If the work is light and in good

surroundings, I do not think it is harmful to them, and most of the women working in the factories are healthy and strong. Indeed, the work done by these women is often less exacting and less arduous than the work done by the mothers in the home, where they are tied down so much by the children and their wants. Some very thrifty and energetic women, determined not to get below the poverty line, may be able to do outside work and their house duties as well, but this is a hard task.

Again, directly the mother has to do any lifting of weights or hard manual labour, such as is found in laundries, where long hours are worked, it is certain that her health will suffer. Overwork, especially if combined with insufficient food, must be harmful, and should not be allowed for married women bearing children.

Taken as a whole, though, I do not think that the employment of mothers has any very marked harmful effect on their health, except when they do hard manual labour as described. The mothers should, however, not do any work for a short time before confinement; unfortunately there is no law forbidding this, and they often struggle on almost up to the day of the confinement. If only thoughtful employers of labour, as Alex. Paterson² says, "Who still remember that they are *in loco parentis* to those that work for them, will have given orders to their managers and foremen that girls are to be released from work and paid their wages for a month before confinement." This would, however, be very difficult to carry out and would lead to much abuse.

Our hospitals, both for women and children, are filled by many cases of illness owing to the mothers having gone back to work too soon after the birth of the child. The treatment of these is costly, let alone the disablement which comes from the illness, and little care and attention at the vital time would prevent much subsequent suffering and expense.

Let us now take the question: Does the employment of the mother affect the infant?

The infant may be affected both before and after birth. It has been pointed out in a previous chapter that the state

of the mother before the birth of the child does affect its size and condition at birth. The fact that the mother works during pregnancy does not harm the infant, as long as she has not to do hard manual labour, and easy work is generally good, especially if she has been used to it. If the mother works hard up to the day of confinement and has only bare necessities in the way of food, the baby is liable to be born smaller than if she rested and had a good diet. The following diagram shows this well:

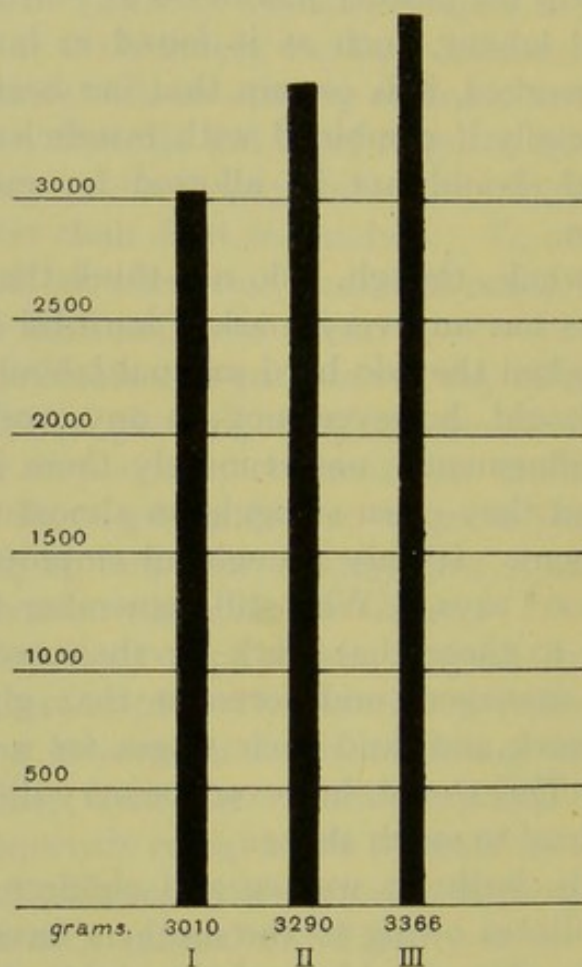


Fig. 5.

Average weight at birth:

- I of 500 children whose mothers work up to the day of confinement;
- II of 500 children whose mothers spent 10 days before confinement in a pre-maternity home;
- III of 500 children whose mothers spent more than 10 days in a pre-maternity home.

(From H. MacMurchy.)

In the annual report (1908) for Staffordshire, Dr Reid published a very interesting table showing how the Infant Mortality is higher in those parts of the county where many married and widowed women are employed than in those parts where few are working :

	Number employed, married and widowed	Number of towns	Deaths of infants under one year per 1000 registered births, 1901-1908
I.	12 per cent. or more	.. 5	187
II.	Under 12 per cent. and over 6 per cent.	.. 13	153
III.	Under 6 per cent.	.. 8	140

The infant may be affected after birth in two ways :

- (1) It may have to be weaned and artificially fed, and
- (2) it will miss the mother's care while she is at work.

(1) Girls and women who have been employed all their working lives in factories and mills are for the most part ignorant about household duties. They may have learnt a little at school and perhaps after leaving school in classes on cookery and household management, but by the time they are married most of this knowledge will have been forgotten.

The fact that the mother is employed after confinement obviously militates against her feeding the infant naturally, and, as we have seen, the absence of breast-feeding is a very serious disadvantage to the child. This absence of breast-feeding is perhaps the most serious argument against mothers working : directly the baby is artificially fed troubles are likely to begin, and for this reason employment of the mother in a factory is worse for the infant than if she be employed in casual labour at home. In cases where the mother does odd days' work the baby can still be breast-fed. What is wanted is that the mother should not go back to work after her confinement for at least some months, so that the baby may have a good start in life, after which it will take to and thrive better on artificial food. Many mothers cannot afford to do this, but must go back to work at the first opportunity. How to overcome this difficulty is a problem.

There is not very much to be hoped for from legislation affecting the employment of women. Prohibition is impossible

and would be a great hardship to the very poor and to those women who are widows, or those who for some reason, such as sickness of the husband, are the mainstay of the family. We should instead rather aim at improving the conditions of women's labour and make it manually as easy as possible. At present the law (Factory and Workshops Act, 1901) says that an occupier of a factory or workshop shall not knowingly allow a woman or girl to be employed therein within four weeks after she has given birth to a child. This is not long enough, and it is difficult to enforce the law, or for the employer to carry it out, as the women are frequently changing their situations. The maternity benefit of the Insurance Act is a start in the right direction, but the money obtained is not sufficient.

It would be well worth while for the State to make it possible for these mothers to stay away from work longer than they do at present. The Jewish community are able to maintain the principle of no married labour, and they are steadily increasing in proportion to the native population. What is possible for one race is surely possible for others. At the Conference on Infant Mortality in 1913, Mr John Burns advocated for the mother to stay away from work for four months before and after the baby is born. It is impossible for mothers working in factories and similar places to be continually out of employment for such long stretches at a time, and employers of labour could not keep their works open if this was enforced, for most, to keep going, want their hands back at work as soon as possible. The length of time women should be away from work also somewhat depends on the character of the work. Where the latter consists in lifting and carrying much weight, she should rest for a longer time than if it is of a sedentary nature. A longer abstinence from work should also be enforced before confinement in certain dangerous occupations, such as lead and other chemical works. Lead poisoning does not prevent pregnancy, but acts in a serious manner upon the infant. In a very large percentage of cases the infant is born prematurely, or else is stillborn. The lady inspectors of factories³ lay great emphasis on this fact, and all their evidence points most conclusively to it.

In Spain the employers are obliged to allow the mothers to nurse their children in the ordinary course of their employment, and the time so taken up does not entail any reduction in their wages⁴.

We must be careful about making laws prohibiting married women staying away from work too long, lest by doing so we may be penalising births. If this were to come about, we should be reducing the birth rate of the country and be promoting the very Infant Mortality which we are trying to reduce. Also, if we keep the mother from work too long the family in many instances falls into great poverty, and the mother, to be able to nurse her child, must have plenty of good food. In the majority of cases the mother's milk begins to get less in quantity and of poor quality just because she is not getting the food she should be having.

We are thus on the horns of a dilemma : if on the one hand we carry out the proposal to make the mother stay away from work for some time before and after her confinement, we are in many cases aggravating the poverty which is harmful to both mother and child, and by stopping married women from work for any length of time we are only penalising the reproduction of the race. The best solution of the difficulty is, perhaps, to help the mother so that by staying away from work she does not lose any wages. By this means the whole family stands to gain, and after all, the mothers are doing their duty to the nation, and the latter should respond by doing its duty towards them.

The Germans have tried to solve the question by compulsory assurance by which the working mother, who is prevented from working owing to child-birth, receives a sum equal to half the ordinary wages. There is also a law in Germany forbidding her employment for eight weeks before and after the confinement.

(2) The infant misses the mother's care whilst she is away at work.

When the mother goes out to work, it necessarily means that the home is left and the children do not get as much care as should be given to them. As Dr E. W. Hope⁵ says : "In

the poorer districts, it is plain to the most casual observer that necessary care and attention are not given to infants : nothing is more common than to see the infant handed over to the custody of children or irresponsible persons, while the responsible guardians are engaged in some other occupation. The children of the very poor are in this way exposed to neglect and inattention which, together with improper food and scanty clothing, are reflected in the sacrifice of life."

If we are to get successful homes we must have the women to take care of the house while the men furnish the means for carrying it on. This has been the order of things from time immemorial, and should be so now and in the future.

The general efficiency of the home is fundamental in importance, and children who are mothered well have a great gain. One of the disadvantages of the employment of women is that these have, at least in the factory districts, been employed since they left school, so that by the time they marry they have little knowledge of housekeeping and less of the feeding and management of children. These mothers have had no chance of learning their duties, and in consequence they have to gain their knowledge by mistakes made with the first baby.

During the mother's absence the baby is often fed irregularly, and on food made up anyhow. A strange fact, and one common among the poor, is that the mother trusts absolutely to the person in whose charge the baby is left, and often does not know what her baby is fed upon during her absence.

It is this personal factor which the baby misses so much when the mother is away from home ; for if the baby is to thrive it must be attended to in every detail. We have seen that the employment, and especially the industrial employment of married women, is inimical to the children, who are placed at a disadvantage in many ways. The matter does not, however, rest here ; there are other causes which have possibly even a greater influence on Infant Mortality than the going back to work of the mother.

Mr John Burns⁶ holds that the high rate of Infant Mortality

in the large industrial centres such as in Lancashire is due very largely to the employment of the women in factories and workshops. There is no doubt truth in this, and it would be folly to deny it, but there is a great deal to be said on the other side of the question. It has been explained (Chapter III) that the two great factors which keep up the Infant Mortality are poverty and ignorance among the poor. Poverty, as we have seen, has a very pernicious influence on the health of the mother and her offspring, and by reason of this the evil of the mother's going out to work is often marked. As previously stated, the mother goes to work in the majority of cases to supplement the family income and to enable herself and her family to live more comfortably. This being so, I think it is reasonable to suppose that the employment of the mother is of less importance than the severe poverty and poor food which she and her family would get if she did not help to raise the income.

Whether she is employed or not, provided the employment is not too arduous towards the end of pregnancy, the baby-to-come will be born stronger and heavier, if the mother has good food, and she will then be able to give her baby more and better milk. The mother's milk soon fails if she does not get enough suitable food. The life of a mother among the poorer classes is always a strenuous one, but when hunger is added, especially if she is expectant or nursing, the condition is particularly distressing.

There are, except in the better class houses, some mothers who stay at home, no matter what poverty the family is in. Such women are indolent and lazy and will neither look after the home nor go to work. They generally live in apartments and move from one house to another as soon as they are pressed for the rent. It would be much better if these mothers would go to work.

Dr Jessie Duncan⁷ has drawn up some very interesting tables for the city of Birmingham, showing the mortality among the infants of mothers who were employed and among those who were not. The infants were all closely kept in view from their birth till they reached the age of twelve months.

	Births	Deaths	Infant Mortality per 1000		
			1910	1909	1908
Mothers employed in factory.. ..	495	83	168	194	186
Employed at home or elsewhere ..	236	29	123	147	200
Total employed	731	112	153	179	190
Not employed	545	88	161	169	207
Total	1276	200	157	174	198

“Of the 1276 mothers, 731 were industrially employed before or after confinement, while 545 were not so employed.”

The table shows that the children born in 1910 of the mothers employed before or after confinement, was at the rate of 153 per 1000 births, while among those not employed the rate was higher, reaching 161 per 1000 births. The mortality was, therefore, less among the infants whose mothers worked than among those whose mothers did not do so, and these figures would make it look as if there is probably some other factor besides employment influencing the mortality. This factor is poverty which, together with ignorance perhaps, more than anything else dominates the situation.

It is found among the working classes that women who are not employed and those who are employed at home in irregular work have, as a rule, rather larger families than those who are industrially employed. The reason for this is that directly the family increases beyond one or two children, the mother must stay at home to look after them. It becomes too expensive and inconvenient to put many children out to nurse all day.

If we now collect the factors which influence women who are industrially employed and their children, we shall see :

Firstly. The families live in towns where the factories and mills are situated. This is a disadvantage in itself, especially to the children.

Secondly. The work is harmful to the mothers and to her children in varying degrees.

Thirdly. As well as the work in the factory, the mother has her work in the home. This must be very tiring after a long day's work in the mill.

Fourthly. And most important to the children is her absence during the day, which means there is little real home life for them.

It does not necessarily follow that the employment of married women causes a high Infant Mortality, and it is more likely that poverty and ignorance are most common in the large industrial centres, and that it is these which cause the high Infant Mortality. The evil effect of the industrial employment is thus often concealed by other preponderating evils.

Why the Demand for Women's Labour?

There can be no gainsaying the fact, that there is a large demand for women's labour, more especially in large towns and industrial centres. Nowadays competition is often so great and working expenses so high that employers of labour have to cut down working costs as much as possible. One of the ways to do this is to cheapen their labour, the consequence being that women are now employed in places where formerly men used to be. The advent of machinery, which works almost by itself and needs little attention, allows this unskilled and low paid labour of women to be employed. A great deal of the work done by women needs little apprenticeship, and a girl can start work soon after she leaves school. It happens at times that employers of labour are short of men in one of their departments, and to enable them to supply this shortage women labour is taken on. This happens in the collieries when the supply of miners is below the demand. Men and boys formerly used to sort the coal at the surface, but this work is now done by women (pit-brow workers), and in consequence the men who were formerly employed at this, now work in the coal mine itself. The demand for women's labour in the pits and mills also induces women to leave domestic service. While they are in domestic service, they have the opportunity of learning housework and how to look after children, which knowledge becomes very useful when they marry.

BIBLIOGRAPHY.

1. *Statistical Analysis of Infant Mortality and its Causes in the United Kingdom.* Helen M. Blagg. P. S. King and Son.
2. *Across the Bridges.* Alex. Paterson. Arnold and Son, 1913.
3. "Dangerous trades," and the Annual Reports of the Chief Inspector of Factories.
4. *Infant Mortality.* Geo. Newman, p. 71. Methuen, 1906.
5. Report of the Health of the City of Liverpool, 1912.
6. The Conference on Infant Mortality, 1913. National Association for the Prevention of Infant Mortality and for the Welfare of Infancy. 4 Tavistock Square, W.C.
7. Report on Infant Mortality. City of Birmingham, 1912.

CHAPTER VII

ALCOHOL AND ITS RELATION TO INFANT MORTALITY

There can be no doubt that there is a good deal of drinking among the inhabitants of the poorer parts of our large cities, and that it is worse in the slum quarters. Men and women drink in almost equal numbers, and though there may be comparatively little actual drunkenness, it is certain that much money is unnecessarily spent on alcohol, with the consequence that the family has all too little left for food and other necessaries. When part of the slender weekly income is absorbed by drink, it must lead to greater poverty. If the husband is earning £1 a week and spends 2s. or 3s. of it in beer, there is a large hole made in the family income. Mr Rowntree¹ and others have worked out the average weekly amount spent by the working-class families in the United Kingdom on drink, and they came to the conclusion that it was about six shillings. This sum, however, is at any rate too high an estimate, I am sure, for cities in the North of England.

We cannot be surprised that there is this drinking in the slums, for the public house is often a landmark among the

dirty streets and homes. As Mr Alex. Paterson² puts it: "In the evening the lights of the public houses are the brightest in the street, and even in the day there is no brass so polished and no windows so well rubbed as those of even the smallest beer-house. There are many of these bright oases, so few counter-suggestions, and in their idle moments men are very moth-like."

For the mothers in the slums, who can get away from their homes so little, the temptation must be great to go to the public house with a friend for a few minutes to relieve the monotony of the daily work in the house. The mother has all too few enjoyments, and thus her readiness to do anything that breaks the monotony of life. The public house is used for social purposes wherein to meet friends and spend the evenings. The danger is not so much that the mother gets intoxicated, but that she spends the household money, which can be ill-spared. The inhabitants of the slums are too much of one class, the less intelligent and the ignorant, and there is no one to set the example. There is too much of the East End and too little of the West End.

Intemperance is closely bound up with poverty and for this reason is one of the chief causes of Infant Mortality. Mr S. B. Wilson³ has shown that drunkenness is most common and prevalent in the mining and manufacturing counties, the very places where infant mortality is highest. There were the following convictions for drunkenness per 10,000 population in 1909:

County	Convictions per 10,000.	County	Convictions per 10,000.
Cambridgeshire ..	.. 10.5	Durham .. ..	.. 69.7
Oxfordshire ..	.. 11.4	Northumberland	.. 122.5
Wiltshire ..	.. 7.9	Glamorgan ..	.. 60.7
Average ..	.. 9.7	Average ..	.. 78.1

These figures show that the more crowded and industrial counties have a much higher percentage of convictions for drunkenness than the agricultural counties, where there is less poverty.

The amount of alcohol which is consumed in the country is gradually becoming less and less ; this is a good sign and it will help to lower the infant mortality rate. Also as the housing of the poor is gradually improved, there will not be the same temptation to leave the home and seek the comfort and the warmth of the public house.

Alcohol may affect the mother at two definite times ; firstly, before the child is born, and secondly, after the child is born.

The effect of alcohol on the mother before the child is born has been the subject of much controversy, well-known experts taking opposite views. The subject is very complex, and there are many sources of error. It is considered proved that alcohol does pass from the mother to the fœtus and may injure the tissues and retard the development of the cells. In his evidence before the inter-departmental committee on physical deterioration, 1904, Dr Wigglesworth⁴, the Medical Superintendent of the Rainhill County Asylum, said "that a habit of excessive drinking tends in some cases to a poisoning of the germ cells of the parent by means of the alcohol circulating in the blood, and a consequent tendency on the part of these germ cells to develop into an organism with an unstable and badly developed brain." On the other hand we know that perfectly healthy children are born of drunken parents, so that in many cases the poisoning does but little or no harm up to the birth of the child. Dr W. C. Sullivan⁵ has enquired carefully into the subject and gives figures which "illustrate very clearly the progressively augmenting character of the influence of the mother's alcoholism ; it is specially noteworthy that the rate of still births shows almost as marked a tendency to regular increase as does the death-rate among children born alive." Sullivan collected and followed up a number of mothers and their children with the following results :

	No. of mothers	No. of children	No. of children dead in two years	Percentage of dead children
Drunken mothers ..	21	125	69	55·2
Sober mothers ..	28	138	33	23·9

These figures show that the children from the drunken mothers succumb in greater numbers than the others, but how much this is due to ante-natal injury it is hard to say. There is also the question of environment and its effect on the child; the drunken mother is more likely to live in squalid surroundings and to look after her child less carefully than a sober mother.

If the use or abuse of alcohol is a cause of degeneration, we have a plain way of ascertaining the fact (Dr Archdall Reid⁶). We can compare races who have used and abused it with those who have not. When we do this we do not find that any race has undergone a change which can be attributed to alcohol. No one doubts that, given a proper education, South Europeans, Englishmen, French, Germans, Japanese, etc., are not inferior to the lowest New World savages. Other external influences, such as heat, cold, want and disease, many of them very powerful, do not influence the hereditary tendencies of the race, and it would be extraordinary if alcohol did so when these do not. As previously said, perfectly healthy children can be born to drunken parents, but on the other hand a large proportion of cases of insanity have had intemperate parents, and no doubt the two go together very largely, but whether it is that the insane and mentally unstable succumb more easily to alcoholism, or whether alcoholism tends to insanity, is a very debatable point.

Personally I should say that it is the mentally unstable people who fall into intemperate habits because they have little will power to keep steady, and not that alcoholic parents produce feeble-minded children.

Whichever side we take there can be no doubt that the taking of alcohol by a mother before the birth of her child has the effect of producing more poverty, which means a weakly and a less healthy baby.

Sir John E. Gorst⁷ puts the whole question in a nutshell when he says, "The effects of alcoholism of parents upon their offspring is not, as in syphilis, the production of any peculiar specific disease, but a general increasing tendency to idiocy, epilepsy, and other diseases." Dr J. W. Ballantyne⁸ also

supports the view, that rather than having a direct effect on the child the continual taking of alcohol leads to an unsteadiness of the higher centres and produces the feeble-minded idiots, etc.

If alcohol can harm the unborn child, it can in a much greater degree harm the infant and continue to bear a harmful influence during the time the child is growing up. This can be disputed by no one. The National Society for the Prevention of Cruelty to Children does very good work in seeking out the victims of neglect due to drunkenness on the part of the parents, and almost 90 per cent. of the cases of neglect enquired into by the Society's officers, are said to be due to habits of excessive drinking on the part of one or both of the parents. In practical life the children belong to the mother, who arranges all, including the schooling, feeding, etc., so that if she is bad or if she drinks to excess the children suffer. Parents who are careless about themselves, are little likely to care for their children properly, and if the parents will not do this I think some other way should be found by which the children may be cared for. An infant or a child is a citizen and a subject of the King, and has a right to be looked after efficiently. As Mr Robert J. Parr⁹, a director of the National Society for the Prevention of Cruelty to Children says, "It is a significant and striking fact made evident by the careful enquiry of the Society's Inspectors, that the growth of the drink habit in a parent is marked by a corresponding decline of proper parental instinct; ordinarily kind-hearted people become callous; habits of decency are forgotten, and cruelty sits in the place of love on the domestic hearth." If the parent is a drunkard it is better for the children when it is the father than when it is the mother, for the latter can look after them, although of course at a great disadvantage. The worst cases are those where the father is steady, and the mother an habitual drunkard, who will pawn anything in the house to get drink directly the husband's back is turned. For these cases there is practically no other course than that of removing the children from her influence. These mothers lose all sense of parenthood; their

houses get indescribably filthy, the children are rarely washed and quickly go to swell the Infant Mortality rate. Indeed, it is almost a stroke of fortune for the infant if it does die, rather than grow up to swell the lists of the crippled, feeble-minded or diseased. One point about the drinking among women is that there are very few women who really prefer the drink to the children. Some of these women cannot go without alcohol, yet even some of the worst drunkards have a love for their children, but the latter suffer very much during a bout of drinking. This is disputed by some who say that a drunken woman has no affection for her children. This, I think, is not true. It is by this love for their children that we should be able to influence some of the mothers, by visiting them in their homes. The Infant Consultations and the Mothers' Guilds do not touch these women, for they never go to them, but by means of the Notification of Births Act, we are able to find where all the babies are, even those of the drunkards.

The Poor Law Act of 1899 allows the provisional adoption by Board of Guardians of neglected and deserted children, and the Certified Industrial School Act allows the children of the homeless and vagrants "not having proper guardianship—*e.g.*, owing to habitual drunkenness—to be cared for and received into a workhouse pending enquiries."

The saving of the infants of drunken parents is a very hard fight, as the parents are so difficult to impress and so soon go back to their old ways. We must not, however, put down too much to drunkenness in our zeal to stop it, and we must also not blame the poor too much in all cases, for they have many excuses. Gambling, like drink, leads to a waste in the family income, and also, like drink, grows on those who once start. The poor can ill afford to risk their money on the chance of making more, and again the odds of their making money is remote.

BIBLIOGRAPHY.

1. *Poverty, a Study of Town Life*. B. S. Rowntree. Macmillan and Co. See also *The Temperance Problem and Social Reform*, by Rowntree and Sherwell. Seventh and subsequent editions, p. 20.

2. *Across the Bridges*. Alex. Paterson. Arnold.
3. *Journal of the Royal Statistical Society*, January, 1912.
4. Report of Inter-departmental Committee on Physical Deterioration, 1904.
5. *Journal of Mental Science*, 1899, vol. III, and vol. XLV.
6. *Principles of Heredity*. Archdall Reid, p. 198. Chapman and Hall.
7. *The Children of the Nation*. Gorst, Sir J., p. 252. Methuen and Co.
8. *Manual of Ante-natal Pathology and Hygiene. The Fœtus*. Ballantyne, J. W. Green and Co.
9. The Cruelty of the Drunken and how Children suffer. R. J. Parr. N.S.P.C.C. Pamphlet.

CHAPTER VIII

THE SPECIAL CAUSES OF INFANT MORTALITY

Having now considered the more general causes of Infant Mortality, we will consider the special ones. The general causes, such as poverty, ignorance, bad housing, etc., affect the infant throughout its term of existence, no matter what other conditions may prevail; while on the other hand the special causes only come into play at certain times and under special circumstances.

The Special Causes.

These may be conveniently divided into three groups, which, however, in some cases merge into one another. These groups are:

- (1) The Preventable Causes;
- (2) The Partially Preventable Causes;
- (3) The Non-Preventable Causes.

If we take the first group, we find that there are several causes of Infant Mortality, which are wholly preventable, or as near to this as human nature can get, such as Diarrhœa in infants, accidents and negligence, and the infectious fevers, especially Measles and Whooping Cough.

Diarrhœa.

The chief among the preventable causes is diarrhœa, and it is the one which causes deaths among infants each summer and autumn in vast numbers. It is one of the commonest and most troublesome of the disorders of Infancy, for it is responsible for about one-fifth of the total mortality during the first year. Diarrhœa is always the name of a symptom of intestinal disturbance, and results from the continual administration of food unsuitable for the infant, and food which has been infected in some way. This giving of unsuitable food to the infant comes about largely from the ignorance of the mother, and from her negligence in not keeping the food clean and fresh. The mortality, which is almost confined to infants, is determined to a large extent by the previous ill health of the patient, and this is why diarrhœa is so fatal to children in their first year, and therefore concerns us very materially in looking for the cause and remedy of Infant Mortality.

At the Manchester Children's Hospital statistics show that of the infants up to the age of nine months who died from diarrhœa, over 95 per cent. had been fed on artificial food, and that less than 5 per cent. had been breast-fed entirely. This being so, we have the remedy at hand—the mothers should breast-feed their infants, but it is sad to believe that it is often a matter of convenience to wean the baby. Breast-fed infants seldom get diarrhœa, and, if they do get it, they quickly recover when treatment is begun. Diarrhœa is present in a varying degree all the year round, and there is never a week recorded by the Registrar-General when there is no death from it. Each year, however, the Infant Mortality from diarrhœa begins to rise about the middle of July, reaches its maximum at the end of August or in September, and then gradually falls to the normal rate by the end of October. The trouble begins after 2-3 weeks of warm weather, and the increase is more related to the higher temperature of the earth than to the temperature of the air.

It may be said with certainty that the hotter and drier the summer, the greater will be the Infant Mortality from diarrhœa.

In the hot dry summer of 1911 the death rate from diarrhœa rose to an alarming degree in some of the large towns, while in the cold wet summer of 1912 there was but little. This excessive diarrhœa in the late summer is called epidemic diarrhœa. As we have seen, the statistics relating to diarrhœa fluctuate widely, according to the nature of the summer, whereas those relating to other causes of mortality have shown a fairly steady decrease for some years. For this reason, as we are able to reduce the Infant Mortality rate year by year, the character of the summer will always influence it, and directly a hot dry one comes along, the Infant Mortality rate will rise again.

“The reality, therefore, of the fall in Infant Mortality during the present century can no longer be called in question; for if the low rates recorded for some years previous to 1911 had been merely cool summers, that of 1911 should have been conspicuously high. Instead of that it was well below the standard of the last century, when diarrhœa is included; and when diarrhœa is excluded it is lower than seemed in the 19th century any prospect of early attainment¹.”

The frequent falling of rain, even though little at a time, keeps the amount of epidemic diarrhœa low, as it washes the air and carries the dust to the ground. The rain also cools the earth, removes the surface pollution and with it the harmful micro-organisms. In the cool wet year of 1912 diarrhœa caused only 16.5 percentage of the deaths, while in 1911 diarrhœa caused 28 per cent. of the total Infant Mortality. For this reason alone the Infant Mortality for 1911 was high (130).

The high temperature favours the growth of bacteria, which infect the food, especially milk. Now milk is a good growing medium for bacteria, and when once it gets contaminated, it will infect the bottle-fed baby, with the result that diarrhœa is set up. The common house-fly is usually the means by which the infection is carried, for flies bring the bacteria from a refuse heap, diarrhœal stools, etc., and settle in the milk². Flies invade houses in large numbers in hot weather, and they may not only infect the food, but also, by settling on the baby's lips and face, infect the baby directly.

It has been suggested by some, notably by Peters³, that the diarrhoea infection is derived to a great extent from a human or personal source, for there is a common tendency for attacked houses to be situated in groups, and also there is a grouping in point of time. Infection of a house or group of houses has been traced to the introduction of the disease by a person who had contracted it in another part of the town.

While the majority of cases of diarrhoea are due to micro-organisms, they are sometimes due to indigestible food or to a chill, but the latter causes are rare compared with the former. Diarrhoea among infants is more common in the urban districts than in rural ones, and in our large towns during a hot dry summer it is very serious. It is in the towns that the food becomes so quickly contaminated, especially in the small cottages and tenements, where the food and the milk are often left standing uncovered in the living room. The flies quickly find their way to these, and the baby is at once infected. In the better class houses the milk is generally kept cleaner, is obtained fresh each day, and the baby is less liable to be attacked. Then again, the baby's bottle needs very carefully cleaning after each feed, and this is not often done in slum districts. The milk should always be kept in a covered vessel and should be sterilised or boiled before being given to the baby. Ignorance in these matters and carelessness in carrying them out are thus both general and special causes of Infant Mortality. An important point in infantile diarrhoea is that babies fed on condensed milk get the disease more quickly and more seriously than when they are fed on cow's milk. It is said that condensed milk is sterile, but experience does not bear this out, as the worst cases we see are generally those babies who have been fed on it. Flies are more attracted to condensed milk and patent foods than to cow's milk, because the former all contain a good deal of added sugar. This excess of sugar is a very real danger in the summer; for this reason alone and when the other factors against them are taken into consideration, the use of patent food as a routine becomes very bad.

The Local Government Board directed that an investigation be made on Condensed Milk as a food for infants, and this was carried out by Dr F. J. H. Coutts⁴ in 1911. It was stated in the summary of the report that there are numerous brands of condensed milk, for Dr Coutts was able to collect no less than 100 varieties of machine skimmed milk and 40 brands of full cream condensed milk. None of the condensed milk was free from germs. The merchant makes more profit on this machine skimmed condensed milk than on the full cream condensed milk. The lack of fat leads to much malnutrition and rickets. Those fed on it have a lowered vitality and are more liable to epidemic diarrhœa, bronchitis, etc.

Ignorance and poverty are the causes which lead to feeding babies on condensed milk, which is not cheap as an infant's food, although it is thought to be so by the poor. Infantile diarrhœa thus bears out in every detail the great maxim, that the mothers must breast-feed their babies if it is in any way possible. Breast-feeding is the greatest natural protection against disease that we have. It is not a complete protection, partly because breast-fed infants are often exposed to excessive changes of temperature in air polluted rooms, and partly because the mothers frequently give their breast-fed infants other food of an unsuitable kind. We must educate the mothers, who are often unaware of the dangers they are running, and the way to do this is through the health visitors. These visitors should give advice, if necessary, as to artificial feeding of the babies in their districts, and also teach the mothers to look after the babies' food carefully. The mothers are more likely to follow the instructions given during a period of danger, such as occurs when an epidemic of diarrhœa is raging, and it is at these times that we should be active. The sanitary authorities must also do their share and remove all refuse from the homes and streets at frequent intervals; in this way the number of flies will be diminished. The parents should have impressed upon them the importance of getting their infants treated as soon as the diarrhœa starts, for if treatment is started soon after the disease has begun, the infant will have a good chance of recovery. In the places where the Notification of

Births Act is adopted the authorities can have all the infants visited in times of danger and pay special attention to all the bottle-fed babies. Whatever we do, however, the climatic conditions will continue to influence the Infant Mortality, and directly a hot dry summer is experienced again, up will go the Infant Mortality rate. It has been advocated by some authorities that the disease should be made compulsorily notifiable in the same way as tuberculosis, scarlet fever, and some other infectious diseases are now. If this is to do any good, we must have the notifications in at once, so that the cases can be visited without delay. The Medical Officer of Health for Macclesfield, in his return to the Local Government Board, says: "Summer diarrhœa is compulsorily notifiable in children aged 0-5 years. Suitable cases are visited by the medical staff of the health department. Hospital treatment is occasionally given, and with respect to each notified case all the outbuildings, sanitary conveniences, ash-places, and so forth, are disinfected by flushing with abundance of water, and all accumulations of refuse in the vicinity are removed."

Diarrhœa is excessively prevalent in those areas where the conservancy method of disposal of excreta continues, and it is least in those places where each house has its own water-closet arrangement. The infant death rate in a hot summer is much higher in those towns where the sanitary conveniences are bad, and this is, partly at any rate, due to the excess of flies in these places.

A series of observations upon the Natural History of Epidemic Diarrhœa were made in Mansfield by Dr O. H. Peters⁵, and one of the most important conclusions he came to was, that it is the dirtiness of the household which increases the incidence of the disease at the time of year when the disease is prevalent. The dirtiness is probably due to carelessness in dealing with excreta, particularly of young children.

Some health authorities leave pamphlets at all houses where there is an infant, warning the parents how to take precautions against the disease. The following is one of the pamphlets distributed in the summer each year in the County Borough of Salford :

COUNTY BOROUGH OF SALFORD

PRECAUTIONS AGAINST SUMMER DIARRHŒA

1.—This disease is largely caused by the contamination of Food by Flies. Every care should be taken to prevent this by protecting food, destroying flies, and keeping the premises clear from any accumulation of filth.

2.—Children under 12 months of age, and especially those fed by hand, suffer most from this disease. If not breast-fed, children under this age should be fed on milk, and nothing else.

3.—All milk should be boiled before use, and then kept in a clean vessel covered over with a clean damp cloth.

4.—All tainted meat and fish, unripe and overripe fruit should be rejected, and all food should be kept in a clean well-aired place.

5.—Overcrowding is a cause of Diarrhœa. All bedroom windows and the fireplace should be left open day and night during warm weather. Closets, yards, and unpapered rooms should be limewashed.

6.—Dirt and filth are important causes of Diarrhœa. Floors should be frequently scrubbed, dust removed from rooms, and filth from back yards.

7.—All accumulations of filth, or offensive smells, should be at once reported to the Health Department, Town Hall, Salford.

C. H. TATTERSALL,
Medical Officer of Health.

July, 1913.

Rickets and Dyspepsia.

Among the causes of Infant Mortality which are certainly preventable, there are diseases such as rickets and dyspepsia. When the infants get their natural food, breast-milk for the full time, they are practically immune to these ailments. Rickets is a disease brought on by improper feeding, and affects the bones and nearly all the organs in the body. Children with severe rickets are crippled and grow up at a great disadvantage. We all know the deformities which it produces; the curved back, the bent legs, and the badly developed muscles. The disease does not start till the infant is six months old; it is not a fatal disease, but infants with rickets cannot withstand the ordinary diseases of infancy and childhood so well as the healthy ones.

Breast-feeding, then, is essential, and if this is impossible for some reason, we must see that the infant gets the best substitute for the breast. The best substitute for the breast-milk is cow's milk in suitable dilutions, so we must make certain that the infant gets this milk, and that the milk feeds for the baby are prepared in a proper manner.

Dyspepsia does occur in the breast-fed babies, but it is not nearly so common as in those artificially fed, and if it does occur in the former, it is easily cured. When it is found in the breast-fed baby there is generally some fairly obvious cause, such as the mother having partaken of some unwholesome food, which passes into her milk and upsets the baby. The artificially fed baby on the other hand needs careful watching to prevent dyspepsia. Now the baby with dyspepsia is a perfect nuisance in the home, for improper feeding results in a good deal of discomfort and pain, which cause it to be cross and fretful, the condition continuing often all day and all night.

Measles and Whooping Cough.

These are the two most common infectious fevers in infancy, and the two which bring about death in large numbers each year. Like rickets, they are not themselves very fatal, but it is the complications following after which are serious.

Measles is often looked upon as a mild ailment, which every child has to go through at one time of its life, so that the sooner it gets it the better. This is a great mistake, as the poor do not realise how essential the after-treatment is and how quickly the infant contracts bronchitis or pneumonia after this disease, or after an attack of whooping cough. In innumerable cases, these diseases are contracted through bringing infants into contact with infected children although the parents knew the infection was there. The only way to dispel this ignorance is to get into touch with the mothers and to teach them how to care for their infants, whilst suffering from these ailments.

**DEATHS UNDER
5 YEARS
OF AGE FROM INFECTIOUS DISEASE IN SALFORD,
FIVE YEARS—1908-12.**

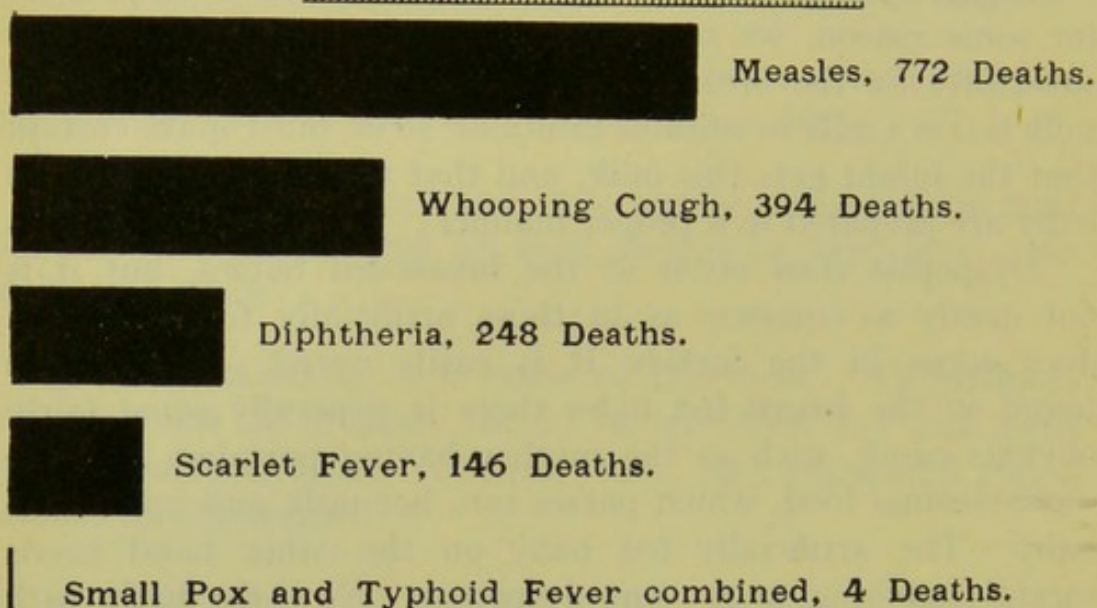


Fig. 6. Diagram to show how much more fatal to young children Measles and Whooping Cough are than the other infectious diseases.

The Infant Mortality from measles and whooping cough is much higher among the poorer classes than among the middle classes, partly because the seriousness of these diseases is not realised, and partly because the children do not receive the same care after they have had them. We should be able, in the future, to reduce to a large extent the Infant Mortality from these two diseases.

The following pamphlets are left by the health visitors in Salford at all houses where there are children, and by this means, together with the advice from the health visitors, some warning of the dangers is given.

HEALTH DEPARTMENT, TOWN HALL, SALFORD

PRECAUTIONS AGAINST MEASLES

Measles is a very fatal disease.

Children suffering from Measles should, where possible, be isolated upstairs, in a room ventilated by a partially opened window, and with a good fire in the room.

No children should be admitted into a house where measles is present, nor should a child suffering from this disease be allowed to sleep, play with, or in any way come in contact with other children.

Children suffering from Measles must not be allowed to attend school for a period of four weeks from the commencement of disease.

No child in a house where measles is present ought to attend the Infants' Department of any school.

It would be well that the clothes of the children should be disinfected before they return to school. This will, to some extent, be done by exposing them freely to the air outside for several days; but, on application at the Health Department, Town Hall, clothing will be removed and thoroughly disinfected.

*Disinfectants will be supplied upon application at the
Health Department, Town Hall.*

C. H. TATTERSALL,
Medical Officer of Health.

September, 1913.

HEALTH DEPARTMENT, TOWN HALL, SALFORD

PRECAUTIONS AGAINST WHOOPING COUGH

Whooping Cough is highly infectious, and in children a very fatal disease.

No children should be admitted into a house where Whooping Cough is present ; nor should a child suffering from this disease be allowed to sleep, play with, or in any way come in contact with other children until the whoops have entirely ceased.

A child suffering from Whooping Cough must not go to school until the whoops have ceased.

No young child in a house where Whooping Cough is present ought to attend the Infants' Department of any school.

It would be well that the clothes of the children should be disinfected before they return to school. This will to some extent be done by exposing them freely to the air outside for several days ; but on application at the Health Department, Town Hall, clothing will be removed and thoroughly disinfected.

*Disinfectants will be supplied upon application at the
Health Department, Town Hall.*

C. H. TATTERSALL,
Medical Officer of Health.

Accident or Negligence.

Almost every week we may see in the daily papers the report of an inquest on an infant which has died from being overlaid or suffocated in bed by one of the parents.

In the year 1910⁶ there were no less than 590 deaths from this carelessness, and all except three were under the age of one year. This is a cause of death which is absolutely preventable, and for which there is no excuse. These deplorable deaths of "Found dead in bed" are far too common. If the mothers cannot afford to buy a cradle, it is easy to obtain a large box which may be made into an admirable sleeping place for the baby. By demonstrating how easy it is to make one of these improvised cradles and how cheaply they can be fitted up, often at a cost of no more than one shilling, the Mothers' Guilds are doing good work. By the Act which came into force in 1909 the overlying of infants has been made a criminal offence when the death of the infant ensues. Of these deaths by suffocation by far the largest number occur at the week-ends, especially on Saturday nights. The reason for this, no doubt, is that the husband has received his weekly wage and he and the mother enjoy themselves with the money. The husband and wife go to bed after having drunk freely, and the baby is unnoticed during their heavy sleep.

From the Sunday, as the money gets scarcer, there is a gradual decline of these cases during the week, and the numbers rise again on the Friday night, on which day we find that some firms pay wages instead of on Saturday. If we can impress upon the parents the importance of putting the baby to sleep in a cot from its earliest days the habit will continue, even though the mother is the worse for drink.

These deaths are not cases of the fittest surviving, for the strong and the weak alike are unable to fight against overlying.

Partly Preventable Diseases.

The chief among the partly preventable diseases are malnutrition or wasting, bronchitis, pneumonia, and syphilis. These ailments cause a very considerable proportion of deaths,

but it is difficult to say exactly how great this is on account of the fallacy of the returns. Malnutrition is a term usually applied to those infants who do not thrive on account of some digestive trouble, but it is often made to cover other causes.

Malnutrition and wasting.

The history of these cases is usually that the infant was suckled for a time after birth, when either the milk failed or the mother had to go out to work. The infant was then probably looked after by a friend or by some one paid to do so, and from this time forward, it began to waste. It is then frequently found that it had been fed on sopped bread or biscuits, because the cow's milk did not agree and because the baby was not satisfied. Accordingly the baby at first gets some gastric trouble, and then progressive wasting becomes the prominent symptom. After this has gone on for some time it takes the very greatest care and nursing to bring the infant back to normal. If parents would only seek advice or be taught how properly to feed their babies artificially, this wasting would be at least partly preventable.

When the mother goes out to work it means in most cases that the baby must be weaned. This cannot always be helped, but it should be remembered that every baby, which is artificially fed, needs the greatest care to enable it to thrive.

The surroundings of the infant make a good deal of difference, and the town baby has much more to contend with than the country one. As long as the town baby is breast-fed it does well, no matter what the surroundings are, but directly it has to be artificially fed, the trouble is likely to begin. The infants of weakly parents, and also premature infants, are very difficult to rear, and this is to a large extent non-preventable. Weakly infants can, however, in many cases be reared with success to become healthy children, but they have, of course, less chance among the poor, because of the ignorance and poverty against which they have also to contend.

Prematurity and wasting cause about one-third of the total deaths of infants and are therefore very important considerations.

Bronchitis and Pneumonia.

Catarrh of the bronchial tubes and pneumonia are common affections of infancy in every social grade, but they are much more so among the poorer classes. As we have seen, unless children are looked after carefully when they have had measles or whooping cough, they are very liable to get bronchitis and broncho-pneumonia, both fatal diseases in early life. It is not very surprising that this should be so, seeing in urban districts how many infants insufficiently wrapped up are taken out of doors on cold damp days.

Infants who are put out to nurse during the time the mother is at work are often taken out by her in the early morning from a warm bed to the place where they are to spend the day. It is also common to see women standing in the streets or at the doors of their houses, with the baby in their arms, talking to the neighbours, and on Saturday nights especially the babies are often taken in trams to places of amusement, where they catch cold. Fluctuations in temperature are very fatal to infants, and there is much more bronchitis and pneumonia in the cold months than in the summer. We thus come back to the cause of many infant deaths, *e.g.*, ignorance among the mothers.

Congenital Syphilis.

It is in the form of syphilis, called congenital or hereditary, which chiefly concerns us in taking into account the results of this disease on Infant Mortality. In congenital syphilis the germ plasm may be infected or the foetus receive the poison at some time during intra-uterine life and be born with evidence of the disease upon it. Any infectious disease such as this, from which the mother is suffering, may affect the child, and quite a considerable number of children die each year from this cause. Syphilis is, however, declining as a cause of death, and should in the course of time be very largely diminished. But though it is declining there is a large amount of evidence to show that syphilis is one of the most active of all maternal infections in the production of congenital weakness in the

infant. It is impossible in England as yet to arrive at any definite conclusions as to its prevalence, but we know that the mother who has the disease, nearly always has a series of abortions and still-births before a living child is born. If there is at last a living infant born, it is in most cases diseased and liable to succumb.

Syphilis is even more dangerous to the state than to the individual⁷. The expectation of life is materially shortened for a person infected with the disease; the immediate danger extends, however, to the second generation and the vitality of the stock is diminished for several generations.

There is also considerable evidence to show, as pointed out by Dr F. W. Mott, that there is a large number of infants apparently healthy who are really infected with it, and the disease is only waiting, as it were, to appear in later life.

Death certificates do not give an accurate return of this subject, as the doctor is not bound to give an exact statement of the cause of death. The certificate is passed from the doctor to the registrar by the relatives, and the doctor often fills in his certificate in a way that does not give the true original cause of death. It would be better if the law with regard to certificates was amended, so that the doctor sent them in confidence by post to the registrar and then we should be able to get more reliable details as to the extent of the disease. There is at present a Royal Commission sitting to consider what improvement, if any, in this way can be effected.

It is now possible to tell by a test, called the Wassermann reaction, whether the syphilitic organism is active either in the child or in the mother. Infants suspected of having the disease may have this test made on them, and if it is found that they are infected, treatment can be begun at once to prevent trouble in later life. Syphilis is the essential cause of a very high percentage of all nervous diseases in adults, and a high percentage of the inmates of asylums have been born with the disease, or have acquired it at some time.

Mortality as a result of congenital syphilis occurs very largely in the first month of life, for a large percentage of those born with it die early, even if treated at once, and if they do

survive they are often weakly and unfit for the struggle of life. Those, who have worked at a maternity or at a children's hospital, come across long lists of records of women who have had numerous miscarriages before a living child is born, and one cannot help feeling that the disease is at least a great factor in producing this state of affairs.

Syphilis is the main cause of still-births, and also probably of a large proportion of early intra-uterine deaths, and for this it is not hard to realise what an important consideration it is when we are trying to diminish Infant Mortality. Each of these still-births or miscarriages represents a child which might have lived if all had been normal. Some means of finding out and treating all parents with the disease is needed, and, if this could be successfully done, the number of miscarriages and children born with the disease would be diminished enormously. Not only so, but the number of inmates in our asylums in future years would be much less than at present.

Non-Preventable Deaths.

Among these we may include some of the premature births and the congenital malformations in infants. Some can be, at any rate, partially prevented, thus making the number very limited. Many are due to lack of care and attention at the birth of the child, and the Registrar-General⁸ in his reports thinks that there is much loss of life from injury at birth among the middle and working classes. On the other hand, the figures appear to show that the greater skill and care bestowed upon the upper classes only just compensates for the greater difficulty they have at childbirth.

It is well known, as Sir Geo. Newman⁹ says, that in the animal and vegetable kingdom many separate organisms never arrive at an individual existence. Every spring time myriads of seeds fail to germinate, and in the human race the same waste occurs. Many of these so-called non-preventable deaths can really be prevented if the mother has instructions and is encouraged to look after herself more during the ante-natal period. By doing so many more infants would be carried to full time, and would grow up into healthy citizens. The

dangerous period for the infant is towards the end of pregnancy, and the questions arise as to whether the mother should not be compelled to take more care of herself and also whether she should not be made to discontinue all hard manual labour for a time.

Congenital malformations in the infant are absolutely non-preventable and we have no control over them. They are equally common in all classes, except that they are specially common among textile workers, and this may be related to the fact that these mothers frequently work in the mills throughout pregnancy.

The following table shows how the Infant Mortality rate of 130 per 1000 births was made up in the year 1911 :

1.	Diarrhœa and enteritis	..	..	..	..	..	36
2.	Tubercular diseases	..	..	..	..	..	3·8
3.	Convulsions	..	..	..	..	..	9
4.	Developmental and wasting diseases (atrophy, malnutrition, etc.)	..	..	..	..	..	41
5.	Bronchitis and pneumonia	..	..	..	..	..	18
6.	Common infectious diseases (mostly measles and whooping cough)	..	..	..	..	..	7·7
7.	Other causes (rickets, congenital syphilis, suffocation, etc.)	..	..	..	..	..	14·5
						Total	130

BIBLIOGRAPHY.

1. The seventy-fourth Annual Report of the Registrar-General. See also Local Government Board Reports (Food Report, No. 15), 1911, Dr Coutts' Report on an enquiry as to condensed milks with special reference to their use as Infants' foods; (Food Report No. 18), 1913, Dr W. C. Savage's report on Bacterial Food poisoning and Food infections; (Food Report No. 20), 1914, Report by Dr Coutts and Mr L. L. Baker on the use of proprietary foods for infant feeding and the analysis and composition of some proprietary foods for infants.
2. See also *Flies in relation to Disease (non-bloodsucking flies)*, 2nd Edition (1914), by Dr G. S. Graham-Smith (Cambridge Public Health Series).
3. *Observations upon the Natural History of Epidemic Diarrhœa*. O. H. Peters, M.D., D.P.H. Camb. Univ. Press, 1911.
4. Reports of the Local Government Board. See also New Series 16 *Further Preliminary Reports on Flies as carriers of Infection* G. F. H. Nuttall, M.D., F.R.S. and F. P. Jepson, B.A., 1909.
5. *Ibid.* 3.

6. Annual Reports of the Registrar-General, 1910, p. 451.
7. Mr D'Arcy Power, in his evidence given before the Royal Commission on Venereal Diseases. *British Medical Journal*, March 28, 1914, p. 720.
8. Annual Reports of the Registrar-General, 1910-1911.
9. *Infant Mortality*. G. Newman, p. 78. Methuen.

CHAPTER IX

THE WAYS BY WHICH INFANT MORTALITY CAN BE LOWERED

The part of the problem which we need specially to set to work on, is the one likely to give the most chance of success. Careful enquiries have been made in many towns and districts by keen and careful men and women, and definite conclusions have been arrived at. As we enquire into the question, we shall see that the one aim of all our educational efforts must be to secure the physical efficiency of the rising generation. Let us not expect too much from any single remedy, for just as the causes are many, so must the remedies be many. We have got to awaken the intelligence of the mother and husband, demand greater cleanliness, and see that the child is better looked after and fed. We shall be gratified later by the result of any service we have rendered in making happier homes and more vigorous children.

The physiological development of the infant depends mainly on (1) inheritance, (2) environment, and (3) food.

We can do little with inheritance, except by trying to prevent those marrying who are likely to beget unhealthy or defective children. On the other hand we can do a great deal with environment, but it is the food with which we can do most. As long as a baby is fed well, no matter what else happens to it, bad environment or anything else, it will thrive and generally overcome all other disadvantages.

The surroundings, the overcrowding of buildings, and consequent bad ventilation have been found to be a most

important problem. During the last five years great improvements have been effected with regard to tenement houses, and in the future still more will be done. Small parks have been made in many towns by the destruction of property, and other spaces have been opened out. Much good has been done in improving the quality of the milk by inspecting the farms and dairies. The storing of milk, the detection of dirty milk, and the use of preservatives have had attention given to them. Most unsatisfactory results come from feeding infants on condensed milk and patent foods in the summer months, if the heat becomes at all excessive. Better results would be obtained if some form of fresh milk were to be substituted for these foods, which have so much addition of malt and starch.

Most important work is being done by various agencies such as the Health Visitors, Infant Consultations, etc., for improving the condition of the poor and by instructing them in the best way of feeding and caring for infants. Then again the intelligent care of the mother for her child is most important, and she must be educated from girlhood to be most careful about her own tidiness and health. By receiving early instruction she is likely to continue to be careful when she has a home of her own.

A point to be borne in mind by all social workers is that the lower middle classes are often not touched at all. At present the efforts seem to be concentrated on the very poor, while the class above them is often in quite as much need of help and teaching. And, moreover, any help given to the latter stands more chance of bearing good results. The importance of a baby as a potential citizen and the responsibility of the community to the baby as a citizen of the future must be recognised.

It is now agreed that public money is needed for the work of reducing Infant Mortality, and the question comes forward who is to distribute the money. All such work should obviously centre around the home, and the visiting of the homes for all purposes connected with health and disease is at present carried out by the sanitary authorities. For this reason it will

most likely be found that the sanitary authorities should have the control of all money devoted to the alleviation of Infant Mortality, and act by means of the medical officers of health and the health visitors. The Midwives Act is at present mostly administered by the sanitary authorities and the Maternity Benefit will probably be similarly administered, so that all Infant Mortality work should naturally fall in as well.

The Education Authorities have charge of the children at school age, but there does not appear to be any good reasons why these authorities should start at an earlier age if the sanitary authorities can, as far as possible, see that the children reach school age in a good state of health. At present, however, many children reach school age in a bad state of health, but if more money could be obtained the sanitary authorities have the mechanism necessary for improving this.

There will also be more continuity and less overlapping if the sanitary authorities are able to combine ante-natal and post-natal work up to school age.

(a) *Health Visitors.*

It is now realised by all concerned in the subject, that Health Visitors can very materially help to reduce Infant Mortality, the chief factors of which are ignorance, carelessness, and neglect of the laws of hygiene. The visiting and instruction of the people in these matters is essentially women's work, and it opens up a wide field for their abilities. We must always remember that women in the poorer parts are not only mothers, but also housekeepers, cooks, charwomen, and nurses of the older children.

Infant Mortality can only be fought on preventive lines, for the baby is a very hard-worked little individual, and has not only to square his account, as it were, but has also to increase it all the time. A healthy baby is a marvel for resistance, considering what it has to go through. Most of the lower animals when they are born are more or less able to look after themselves, or if they do need looking after it is not for any length of time. The human baby, on the other hand, is absolutely dependent on its mother for food, warmth and clothing, for

many years after birth. The well-being of the mother is thus very necessary for that of the baby. Many infants are born before full-time, or are more feeble than usual, and by the careful attention of Health Visitors most of these can be saved to grow up and become healthy citizens.

The baby is not the only person the mother has to look to ; there is the husband and perhaps older children to cater for as well. "The ideal for the prevention of Infant Mortality has been and continues to be, to make the mother the central figure around whom we work both for the preservation of the health of the mother and the child¹."

Authorities, both in city and rural districts, who have adopted the plan of health visiting are, on the whole, very satisfied with their results, and I am sure this manner of reaching the poor is by far the most satisfactory single effort in reducing Infant Mortality. Moreover, it is a fairly cheap method, and one for which a comparatively small staff suffices, if the Health Visitors chosen are efficient and keen.

Most mothers are eager to learn and willing to try anything and everything for the baby, often to its disadvantage, and if we were able to gather together all those willing to learn, we should fill many halls for the lectures given. But lectures do not help much, for the mothers are not sufficiently educated to understand and remember what they hear. They cannot always spare the time to attend the lectures. The poor must, therefore, be visited in their homes, and have everything explained most carefully and simply, and they must be visited again and again in order to make sure that they are properly carrying out the instructions.

The Personnel of the Visiting Staff.

On looking through the returns on health visiting from different districts, given to Dr Arthur Newsholme, the Medical Officer of the Local Government Board for England and Wales, it appears that the term "Health Visitor" includes persons, in some places at any rate, other than those working as Health Visitors direct. But it appears probable that a lady designated

under the term devotes the greater part of her time to visiting infants.

Visiting is carried out to a varying extent in nearly 100 large towns, in about 70 small towns, and in about 30 metropolitan areas. For the most part in the large towns the visiting is done by women specially appointed as Health Visitors, and in some of these towns there is a lady assistant medical officer of health, who devotes at least part of her time to supervising the Health Visitors and in visiting all cases needing her attention. In the smaller towns, the assistant medical officer of health, or the inspector of midwives, or the lady sanitary inspector often does the work alone, or with the assistance of Health Visitors. Voluntary workers do the work in one large town and in several other places; these assist the paid Health Visitors, but in Scotland it appears that the voluntary workers are the more numerous.

In some places the duties of school nurse are combined with those of a Health Visitor, and when this is so, besides her visiting, she has to be present at the medical inspection of school children and to visit the homes of any children found at the medical inspection to be in need of attention. In other places, as recently with the Manchester Ladies' Public Health Society, a voluntary society employs paid Health Visitors, with or without the supervision of the medical officer of health—good work is done, and, like the Health Visitors of the Ladies' Public Health Society, it may be eventually taken over by the local authority.

Qualities needed for Health Visitors.

Perhaps of the many qualities needed for a successful Health Visitor that of tact is uppermost. It is also a necessary part of their work that the visitor should try to make herself the real friend of the people whom she is employed to visit and help, for without this friendship the poor will pay no attention to the advice given. The teacher must be careful to speak as if convinced that the mother wishes to do her best for the child, and as if it were possible to be a respectable and intelligent woman, and at the same time to need a little

instruction as to the artificial feeding and general care of infants.

The doctor, midwife and sanitary inspector each gets a definite label, as it were, among the poor, but the Health Visitor has not this label, and the poor cannot at first make her out. At the beginning she is often regarded with suspicion, but when the mothers get to know and like her and when they see the value of her advice, she is welcomed joyfully. Workers among the poor soon get to know if they are welcome, and if they are making headway; if one mother is influenced more good is done than one can foresee. Such mothers lead very gregarious lives, and quickly pass on the good they have learnt to their neighbours.

Health visiting is often very trying and arduous, especially as so many women of different grades and characters have to be dealt with. It is often with the bad mothers, those who will not go to any Infant Consultation, nor seek advice about their babies, that most good can be done by Health Visitors, and to deal with these, the visitors must have an everlasting fund of good temper and patience. We find the desired qualities chiefly in well-educated and thoughtful women, who are really desirous of helping their fellow creatures, and the choice of such women needs the most careful judgment on the part of the inspector of Health Visitors.

The Health Visitors must not be too young, otherwise the women pay no attention to them, and they must be proficient in their work as any ignorance is quickly detected by the mothers. The work, however, is too physically arduous for elderly women—the best age is from 25 to 40 years as a rule. It is related that when a youngish Health Visitor went to see one of the older inhabitants of her district who had had a number of children, she was asked by the mother if she had had any children, and when the visitor replied “no” she was told to “come when thou hast.”

Many of the older women think they know all about babies, but to prove the contrary, it is only necessary to enquire into the number they have lost in infancy. The young mother, especially if she is visited when her first baby is born, is more

easy to influence than the older one, and she is generally only too glad to accept advice unless she is under the influence of some grandmother or neighbour !

Aim and Function.

We have seen in previous chapters that the causes of Infant Mortality are many and various, but that ignorance on the part of the mother in respect to her children, especially her babies, has much to do with this mortality. Recently Health Visitors have opened up a very bright prospect, and the result of their work has been to show that the mother's ignorance can be dispelled, and at the same time her interest in everything that concerns her child be largely increased.

The new mother requires teaching how to look after her baby, how to wash it, and how to attend to all its requirements. The mother can be greatly helped in all this by a few visits before the baby is born.

There is no close season for babies, and health visiting must go on all the year round, winter and summer. It is doubtful whether the work is harder during a spell of hot dry weather in the summer, when there is often a good deal of epidemic diarrhœa, or in the cold damp winter, when there is so much bronchitis and pneumonia amongst the babies to be fought.

Starting from the time of pregnancy, it is the duty of the Health Visitors to advise the expectant mother as to her health, and to get her to realise the importance of this to the baby-to-come. The mother at this time needs the best food that can be obtained. In some districts there are dinners given either free or at a very cheap rate, to which the mothers are invited, so that it is possible for them to get at least one good and comfortably served meal each day. Health Visitors can do a great deal towards inducing the mothers to take proper food, and also help by teaching them how to cook simple meals, instead of, as so often happens, eating tinned foods to save trouble. The mothers need showing how best to choose the most nourishing and economical kinds of foods, how to manage their household, and, above all, how to effect economy

both in time and money. The women will often do all these things if they are shown how and why, and when they realise the advantages they are gaining.

Help and advice on everything relating to the baby, including its clothes, cot, and cleanliness, must be given. Many are apt to pay little attention to this latter point, but if the baby is to thrive everything possible must be done for it, and the keeping of the baby clean is not the least important.

Perhaps the most important function the Health Visitor has, is to give advice on the proper feeding of infants and to do all in her power to see that the mother gives the baby the breast. Even if the mother at first appears to have little chance of breast-feeding her infant, a little patience and perseverance will often enable her to do so, and, moreover, the mother must be persuaded to go on feeding her baby till it is eight or nine months old. Health Visitors in doing this have many arguments with the mothers, who are tired of breast-feeding, or who, after the infant is a few months old, think it needs more food than the breast, although it may be coming on well. Even a mother who is able to nurse with one breast only, has often quite enough milk to satisfy the baby for a long time. If Health Visitors are able to increase the breast-feeding of infants, for this alone they will be well worth encouraging. In the cases where the baby has to be bottle-fed, either wholly or partly, the Health Visitors must see that it is fed on proper lines. They must note the conditions of the ignorantly fed babies, and counteract the evil by giving the mother proper advice as to how to prepare and use artificial food. In cases where the baby has to be bottle-fed, cow's milk should be advocated strongly; the visitors must see that the milk is kept properly, especially in hot weather, and the mother should be advised to boil or pasteurise all the milk used for the baby. There is much to contend with in bottle-feeding, for neighbours and friends are always advising the use of patent foods or condensed milk, which are widely advertised by pictures of fat babies reared on them. No long-tubed bottles must be allowed and all the babies' bottles must be kept scrupulously clean. The mothers receive

so much kindness and skill from the Health Visitors, that they are, in consequence, only too glad to follow their directions in full.

The question now comes—Should the Health Visitor have power to change the feeding of the baby? The answer to this is that it is better for the mother to take the baby to an Infant Consultation, if there is one at hand, and be guided by the doctor in attendance. On the other hand this is not always possible for there may be no such institution near. In a large town each of the 10 or 15 Health Visitors may have 100 or more infants in their district, and it is not practicable for the doctor to see each one, neither can he know the individual baby as well as the Health Visitor, who is in fairly constant touch with it. In the same way the superintendent of the Health Visitors or the medical officer of health or his assistant cannot do this. A trained and experienced Health Visitor should be capable of advising on ordinary changes of feeding except in cases of illness or extreme delicacy. She should also be capable of advising the use of simple remedies such as the giving of olive oil and cod liver oil emulsion. Health Visitors, however, should always have some skilled physician to whom they can refer all the difficult cases, for the artificial feeding of infants is in many instances no easy matter, and needs the experience of a doctor who has paid special attention to the subject. The Health Visitors can be of great value in seeing that the doctor's orders are carried out, and there is much to be gained from doctors, Infant Consultations and Health Visitors all working together in unison.

Printed Cards and Leaflets.

It is advantageous for Health Visitors to leave a printed card in each house at the first visit, in order to guide the mother with her baby. In Salford there are two kinds of cards used, one giving instructions for the management of breast-fed infants, and one for the bottle-fed. One or other of these, according to the need, is left in every house where there is a baby. These cards are such as can be hung up in a convenient place, and the instructions given on them are simple and explicit.

Where the child is a year old another card is left, giving directions for the management of young children. For copies of these cards see end of book.

The value of printed instructions is doubled when the instructions and advice are carefully explained in the house by the Health Visitors. The cards help to remind the mothers what has been advised by the Health Visitors.

Health Visitors must encourage vaccination of infants at the proper time, and do all in their power to overcome any little prejudice against it. The spread of infectious diseases, such as measles and whooping cough, can, at least, be guarded against, and the infection, if it has started, limited.

They should also keep a note of any insanitary or foul conditions in any of the homes visited and report them to the medical officer of health for the district, but it must be remembered they should only advise in matters coming under their notice, for they have no power to enforce the compliance of the laws relating to public health. It is the sanitary inspectors who are entrusted with the duty of seeing that certain Acts of Parliament are complied with and have the right of entry to premises where there is reason to suppose these acts are being contravened.

Infant Mortality is the most sensitive index we have of social welfare and proper sanitation, and it is here that Health Visitors can do so much to improve. It is very wearisome to do nothing but visit babies, and in Manchester and other places it has been found much better to vary the work by house-to-house unofficial sanitary inspection, etc., and in this way the Health Visitors meet with a lot of expectant mothers.

In some places the paid Health Visitor has to train and guide the voluntary Health Visitors, who are helping with or learning visiting.

Each week the Health Visitor receives information about the new births in her district from the Compulsory Notification of Births, or by other means in places where this is not in force. It is her duty to follow up these births, and to start visiting the homes directly the doctor or midwife has finished visiting, generally at about the tenth day. By this means she is in

touch with every new-born baby, and if her advice and help are accepted a great deal of good results. Most towns and areas, where health visiting is established, are divided up into districts, to each of which a Health Visitor is allotted. Each has thus her own district for which she is responsible, and it is her duty to keep herself acquainted with every home in her district where there is a baby under the age of one year. In most places she works in the district every day except Saturday, when she has to go to the town hall or some other central place to report on her cases to the authorities. A systematic record of all cases visited should be kept, so that results can be arrived at each year; then, as the years go on, we shall be able to judge of the value of health visiting.

If the baby's own mother is dead or incapable, an adopted one must be found for it, and it is the duty of Health Visitors to watch such cases carefully. Infants do much better and thrive more satisfactorily when treated on family lines than when put in institutions. Last, but not least, the Health Visitors must be careful not to paralyse the initiative of the mothers so that they lose all capacity for doing things for themselves. We can also never be too early in our efforts to save the baby. We are often too late to do anything. It is, in too many cases, the fact that no help or advice had been given to the mother, till she has perhaps two children in the grave, or at least one severely crippled with rickets.

The Qualifications needed.

We have now to consider what kind and what class of woman has the best qualities for the making of a good Health Visitor. There can be no doubt that the educated woman has the better qualities and probably is better able to adapt herself to the work in a more satisfactory manner than the uneducated. For our future Health Visitors, it is quite plain we must look to the better educated, and we must make it worth while financially for these to take up the work.

According to the regulations made by the Local Government Board under the London County Council (General Powers) Act, 1908, the following alternative qualifications are

required of Health Visitors appointed to London posts². These may serve as a guide for appointments made in other parts of the country.

The regulations state that a woman shall be qualified to be appointed a Health Visitor :

(a) If she is a duly qualified medical practitioner within the meaning of the Medical Acts ;

(b) Or if she is qualified for the appointment of nurse by having undergone, for three years at least, a course of instruction in the medical and surgical wards of any hospital or infirmary, being a training school for nurses, and having a resident physician or house surgeon ;

(c) Or if she is certified under the Midwives Act, 1902 ;

(d) Or if she has, for a period of not less than six months, undergone, in a hospital or infirmary receiving children as well as adults and having a resident physician or house surgeon, a course of instruction including subjects relating to personal hygiene, and holds the certificate of the Royal Sanitary Institute for Health Visitors and School Nurses, or the certificate or diploma of the National Health Society, or of any other body which may from time to time be approved by the Board ;

(e) Or if she has, in the service of a sanitary authority, or of the council of a borough or of another urban district or of any other public body or authority in England or Wales, discharged duties which are similar to those described in the Act or prescribed by these regulations in relation to the office of Health Visitor, and produces such evidence as, in the Board's opinion, suffices to prove her competency.

The National Health Society³ holds special courses of training lectures for ladies wishing to obtain their diploma, or the certificate of the Sanitary Inspectors' Examination Board. The course consists of lectures on Elementary Anatomy and Physiology, First Aid in accident and disease, Elementary Nursing, Domestic and Personal Hygiene, the care of infants and children, Tuberculosis and its prevention, in addition to Sanitation and Public Health. The training terminates with an examination, which is both theoretical and practical. Even when the intending Health Visitor has obtained her certificates

it must not be supposed that she is really competent, for the practical part of her work can only be learnt while actually working among the poor. The practical experience can best be obtained by accompanying one of the older Health Visitors on her rounds and by observing what she does.

It is true there is a certain class of women living in the poor parts of our cities who without much training can do very good work as Health Visitors. These women have risen above the general level of those around them, but they have had little education.

The training obtained as a nurse in a children's hospital is most helpful to a Health Visitor. In this training a girl or woman is taught how to feed and manage infants of all ages, and also to be exact and careful in everything concerning infants, which are two very important points. This adds much time to the other training necessary, but it is most helpful later on, not only when dealing with infants, but also in enabling them to realise the great difficulties with which the poor have to contend.

It is generally considered an advantage to have the Central Midwives Board certificate. The course for this certificate, a good training in cleanliness and accuracy, makes the student accustomed to handling small babies. The district work involved also shows the very poor homes and how the best must be made of very little.

It is often demanded of Health Visitors that they should have the certificate of the Royal Sanitary Institute, or the diploma of the National Health Society or some equivalent qualification. These courses take varying times to complete, and the prospective Health Visitors are taught and examined in various subjects likely to be of use to them in their future work. These degrees can be obtained in different parts of the country, mostly in large towns, and many technical schools give suitable classes to prepare students for the examinations.

The reason of their success is that they thoroughly understand and know how to manage and influence their fellow creatures.

The Remuneration and Cost of Health Visitors.

It cannot be too strongly emphasised that Health Visitors must be properly paid, for their employment, training, and the pressure of work devolving upon them warrant a suitable salary. The qualifications necessary for a competent Health Visitor entail a good deal of expense and time, and the remuneration should be such as to make it worth while for educated ladies to take up the work.

The desirability of Health Visitors wearing uniform raises a question on which there is much diversity of opinion. It is certain that there is more deference shown to a person in uniform than to one not so arrayed, and in this way certain advantages, which should not be ignored, are gained when working in the slums. The disadvantage of a uniform is that it adds a character of officialdom, which we need to avoid as much as possible in health-visiting work. On the whole I think it is best that the Health Visitor should wear a simple, non-conspicuous, official dress, without the effects of officialdom being too obvious. The present pay varies in different places, and it may be anything from about £40 to £120 a year. If the pay is under £100 a year, it is not enough to attract an educated woman, as it is insufficient to keep her in comfortable lodgings and food and to meet other incidental expenses. The Health Visitor has to work in all weathers in the dirtiest of streets, and often at a risk to her health from colds and infectious fevers.

The salaries paid to Health Visitors are generally provided out of the local rates, and the number of these visitors and the pay they receive vary according to the resources of local authorities.

The title did not receive recognition until the passing of the London County Council (General Powers) Act, 1908.

For Health Visitors appointed to London posts the approval of the L.G.B. is required as to the salary to be paid, and what allowance in respect of clothing, where uniform or other distinctive dress is considered necessary, may be made. The L.G.B. considers that having regard to the important duties

discharged by Health Visitors the salary should not be less than £100 per annum. It is often very difficult for local authorities to give even this salary, but if it could be realised what a real benefit to the people these Health Visitors are I am sure the money would be forthcoming.

The Government is now helping city authorities a great deal in regard to tuberculosis, medical inspection and treatment of school children, etc., and there should, in consequence, be more money available for use in other directions, such as preventing and lowering Infant Mortality. Part of this money should certainly go to provide satisfactory salaries for more Health Visitors.

Generally speaking the industrial districts, where the Infant Mortality is high, are those that are the most heavily burdened with rates, but it is just here where the great wealth of the country is produced, *e.g.* the densely populated part of Lancashire. If it were possible, some of the residential and health resorts, where the rates are often less, should come to the rescue of those which are badly off.

It is comparatively easy to get money for Cripples' Homes, Hospitals, etc., where the public can see definite results for their money expended, but it is exceedingly difficult to get it to prevent children becoming crippled or ill. As Miss Nightingale⁴ once said, "There are more people to pull us up when we fall, than to enable us to stand upon our feet." If the mothers of the country possessed more knowledge how to bring up their children in the best way and how to avoid disease, many children who are now cut off prematurely or who live a crippled existence might be saved.

Voluntary Health Visitors.

Health visiting is in some towns still carried out by voluntary Health Visitors, acting under a capable and trained superintendent, but their numbers are slowly decreasing, and the paid ones are taking their place. The purely pioneer work of voluntary Health Visitors is often of the greatest value when started in a town which refuses to pay anything towards the work. The visitors, however, generally end by being taken

over by the municipality, which will then gradually insist on a better training.

To get good work done by voluntary visitors there must be very careful supervision. Zeal and goodwill, without the necessary knowledge and training, are not of much value or help. The regular attendance of voluntary workers all the year round can never be relied upon, as the work is exacting and arduous; the Medical Officer of Health also has not the same control over these unpaid visitors as over the paid.

Voluntary workers, like the paid ones, must have a proper training, and the National Health Society has organised a course of lectures designed especially to give practical instruction to women voluntarily engaged in work among the poor, such as District Visitors, Health Visitors, and others. The course consists of 12 lectures with an examination at the end and certificates of competency for those who satisfy the examiners.

Edinburgh has no fewer than 170 such supervised workers, while there are also many in towns such as Birmingham, Halifax, Leicester, Huddersfield, etc., all working under a superintendent attached to the Health Department of the town. The work done by the voluntary visitors in Glasgow under the Cowscadden Infant Health Visitors Association is very good, and an account of the work is to be found in *National Health*, June, 1913. In Huddersfield also there are a large number of voluntary Health Visitors working under the supervision of the lady Assistant Medical Officer of Health. In case of need they send for her and she at once takes charge of all difficult cases. There is thus a voluntary effort in a setting of municipal activity. All these efforts are apt to prove a failure, however, if the work is not systematised in some way, or if the workers are untrained.

A few years ago Dr A. E. Harris, the Medical Officer of Health for Islington, addressed the following question to 70 great towns in England: "In your opinion, could unpaid voluntary Health Visitors satisfactorily discharge the duties performed by official and paid visitors?" The replies, with the exception of one, all came back "No." Some, however, modify their

answers and say that qualified and competent voluntary Health Visitors may help a good deal, if under supervision, but they all agree that voluntary Health Visitors cannot efficiently take the place of paid ones.

The Results of Health Visiting.

There cannot be the smallest doubt that the results of health visiting are magnificent; even if they do not bear fruit at the moment they will certainly do so in the next few years. As the mothers become better instructed, and as they leave some of their ignorance and antiquated ideas behind, so will there be a reduction in the Infant Mortality. The visitors succeed with the large majority of mothers and fail, as is inevitable, with a few, but in every case some good will have been done, though perhaps not as much as they expected or hoped for. At any rate instruction is brought within the reach of every mother, no matter how poor or ignorant she may be, and any mother who refuses this help and rejects the knowledge is herself to blame, and it is her further misfortune if she remains unimproved. All the same we must not place the whole blame on the mothers, who are often worn out by their other domestic work and who constantly not only get no sympathy or help from the fathers, but also have not enough money to keep the home properly together. The mental misery of running a house on insufficient means is usually underestimated, and the Health Visitors cannot do very much here.

It is very difficult to influence some of the mothers, and this is chiefly where there is intemperance, for in these cases they are quite indifferent to the condition of their home and children.

The statistics on Infant Mortality for some towns where health visiting has been working show very good results. Thus in Salford Health Visitors were started in 1899 and up to that year the Infant Mortality had remained stationary and uniformly high. Since the year 1899 the Infant Mortality in Salford has steadily dropped year by year, with the exception of some of the hot, dry years, when epidemic diarrhœa was so

(a 1) *The Work of Infant Consultations and Schools for Mothers.*

The institutions included under these heads are of different kinds, but they all have the same object. Firstly, to attempt to check the high rate of Infant Mortality by giving instruction in the care, management, and feeding of infants, of general hygiene, and by other means. Secondly, by providing meals at low charges to expectant and to nursing mothers.

The following are the principal kinds of institutions included:

(a) *Infant Consultations.*—These are centres to which infants are brought periodically to be weighed, so that their progress can be carefully watched week by week. There is a medical practitioner attached, who visits at stated intervals and who examines the infants and gives advice as to their feeding. The doctor does not give medical treatment, as this is no part or duty of the Infant Consultations.

(b) *Schools for Mothers.*—At these there are held classes for teaching the mothers infant care and hygiene, and also how to cook simple meals for the family and baby. Simple baby clothes, too, are made in some of the classes, and at some of these institutions dinners are provided for the mothers.

(c) *Infant Weighings.*—This term is applied to centres similar to Infant Consultations, but there is no medical practitioner attached.

Besides these three kinds there are several smaller ones, principally from which home visiting is done. It must be understood that infant milk depôts are not here included, as they have no part in infant welfare centres. Many institutions throughout the country appear under names such as Mothers' Guilds, Babies' Welcomes, Babies' Welfare Societies, Health Visiting Societies, etc., all of which are really Infant Consultations and Schools for Mothers.

An Infant Consultation, to be efficient, should include the giving of classes to the mothers together with dinners, as well as the periodic weighing, with advice from a medical practitioner. It is impossible to draw the line in many cases and to say whether a certain institution comes under this head or not,

as some of them make a special feature of one measure only, such as the dinners or the weighing, and rather leave the rest as subsidiary to the main feature. Every really efficient institution does work for the mother and infant as included in the two terms Infant Consultations and Schools for Mothers, and in this chapter these two terms are combined into the simpler and less confusing term Infant Consultation.

Many of these institutions have branches throughout the city; thus in Manchester there are at present six branches, with a likelihood of more being established in the near future, while in Salford there are two branches. As the work becomes more known and appreciated many ladies, willing to help, will enable these institutions to increase their scope and usefulness. There are at present in England over 200 such places, and an association has been formed under the title of The Association of Infant Consultations and School for Mothers. This is a new department of the National League for Physical Education and Improvement and has its headquarters at 4, Tavistock Square, London, W.C.⁵ All the Infant Consultations should join this Association, for by linking all together the work can be consolidated to the benefit of all. The journal *National Health*, which appears each month, price threepence, is the official organ of the Association, and through its pages views on everything concerning Infant Mortality are discussed, and there is a list of all Infant Welfare Centres printed in it each month.

The objects of the National League for Physical Education and Improvement are: (1) To link together already established health promoting agencies and to start others where none exist. (2) To promote fresh legislation when necessary. (3) To teach the nation how to save the babies' lives, how to secure clean milk supplies, how to prevent disease and suffering, how to have healthy homes, how to lead healthy happy lives, and how to build up steady, strong and strenuous citizens. The Central Association collects from home and abroad information likely to be useful, and passes it on. It promotes conferences in London and in the chief provincial centres, when papers are read by well-known authorities on Infant Mortality,

and by this means all the societies are benefiting by getting information or help from the work of others.

The Association should be able to stimulate all belonging to it, and see that more centres are established, not only in cities which have some already, but also in those where there are as yet no such institutions. Its bureau of information is always at the disposal of anyone applying. As the Central Association becomes more organised and better known, so its work will expand, not only in making more efficient the existing centres but in encouraging the establishment of new centres, especially in towns where none as yet exist. The Central Association is able to give much help and advice to those about to start new Infant Consultations and thus enable them to go about it from the beginning in the very best way.

Ladies and voluntary workers are often at a loss how to set about starting a new institution, and it is so often just the starting of a work of this kind which is difficult. People who can afford to give are asked for subscriptions by so many that any new charity is liable to be ignored until its work and usefulness are realised. The Central Association may, perhaps, later on be able to give financial support to new institutions, so that they can be started more easily and get people interested. As soon as this is done there can be no doubt the money will be forthcoming. The work is so interesting to ladies, and I am sure directly they see the difficulties the really poor and necessitous have with their babies their sympathy will be gained. The rich seldom begin to have an insight into the conditions existing in their own towns until they have worked in one of these institutions, and, moreover, the work is in no way in competition with the hospitals.

If only more knowledge could be spread regarding the feeding and management of infants, there would be less sickness and less need for hospitals. Infant Consultations are of recent development, and their object is to reduce Infant Mortality and to improve the health of the rising generation. They were originally started in France, where the Infant Mortality had of necessity to be reduced quickly, and to a

large extent in order to preserve the numbers of the nation. The birth rate has diminished in all the civilised countries of Europe, but nowhere to the large and alarming extent as it has done in France, and hence the efforts of the French to save themselves from a national calamity. The French found that it was the bottle-fed babies who died in such large numbers, and to prevent this most of their Infant Consultations have a milk depôt attached to them. This is not so common in England, and the Infant Consultations for the most part work without this help. A good deal of information in this book with regard to Infant Consultations has been obtained from Dr I. C. Gibbon⁶, who has issued a report on Infant Welfare Centres. This report is based on information received from a long list of questions sent to Infant Consultations throughout the country. The information obtained from this pamphlet is most instructive and interesting, and helps to throw light on many questions dealing with Infant Mortality.

Local Distribution.

Women work more in some cities than in others, and it is in those cities where there are a large number of women working that the schools should be specially well managed and efficient. In these large towns the Infant Mortality is greatest, as the babies are less well looked after. Nearly half of the infant deaths in towns occur in the first three months of life, and generally owing to some condition that can be remedied by improving the knowledge of the mothers. Small centres and many of them, are needed rather than a few large ones. The mothers cannot leave their homes for long, and they are unwilling to go long distances which entail a tram-fare, especially if they are going each day to the dinners. It is difficult for them to leave their homes, for these not only have to be locked up and the key taken, but someone has to be found to mind any other children there may be, or else the children have to go with the mother each time. The movement is only the growth of the last eight years, for the first school for mothers in this country was not started till 1907,

and nearly 50 of the 200 centres now in existence have come into being since 1911.

Broadly speaking Infant Consultations have been started in places where the leisured classes and the poor live together, but at discreet distances. This is naturally so, for it needs the rich to start the venture and the poor to receive the advantages. London has a good many centres, as also has Lancashire, but there are few in the Midlands (except in Birmingham and the pottery districts), the Eastern Counties and in the South-West of England, in comparison with the very large amount of poverty, ignorance, and high Infant Mortality found in these districts. Wales is also lacking in this respect, except that there are some centres in Cardiff (municipal), Swansea and Newport; the rest of the large colliery districts are almost without them, the reason being that in colliery and other densely populated districts there live few rich people able to start them. In Scotland the institutions are limited to the large towns, and in Ireland most are to be found in Dublin and Belfast. As yet there are few centres in rural districts, no doubt due to the more or less scanty population and the long distances which people would have to go to them. Owing to this Infant Consultations are found unsuitable for country districts, and the work must be done instead by district nurses, etc., and, indeed, the need for help and advice in the country is almost greater than in the towns. Country dwellers are far less able to get good advice than town dwellers and are more likely to continue on antiquated lines handed down from generation to generation.

The idea of starting these centres came originally from Belgium, and the St Pancras School⁷ in London was the first to be organised in England in 1907. Now, however, similar work is being carried out in most towns. Infant Consultations have arisen in various ways. About 40 per cent. have been started for their present purposes, and it is in this way that most of the future ones will be founded, either as branches of already existing Infant Consultations or as new ventures in towns where there is at present nothing of the kind. Some have started as Health Societies, like the Manchester

Ladies' Health Society, which was the originator of both the Manchester and Salford Schools for Mothers; of these there are now eight branches in all. There are several municipal centres throughout the country, which have been developed from organisations started to provide dinners for the mothers, and a few are connected with hospitals, dispensaries, churches, etc.

Large premises cannot be obtained in the small streets, nor are they necessary or essential. Where an established restaurant is not available, an ordinary six-roomed house is all that is needed. The three downstairs rooms are used, one for the kitchen and two for the dinners, which latter are also used for the weighing of the babies. The doctor has one of the rooms upstairs, where he sees the babies; another is used for the mothers with their babies after the latter have been weighed and before they go in to see the doctor, while the third is occupied by the housekeeper, who resides on the premises. Classes can be given in the rooms downstairs, as they will not be occupied at the time the dinners are being held. The house must be kept warm and in a spotless condition, so as to set a good example. The furniture must be simple but not ugly or depressing, and there should be a few nice photographs and pictures on the walls. There are many institutions which could start centres at little cost, but especially those which have already existing premises which could be used, and these will no doubt in the next few years be developing when the movement is thoroughly known and its worth appreciated. It is easier to start a new institution on an already existing organisation, for a more ready hold on the people is obtained, and the spirit of the old organisation gets into the new. It has only to be realised that a very large proportion of centres have only been working for a very few years to see that rapid progress is being made.

Municipal Institutions.

There has been of late, and no doubt there will be in future, greater activity in this line. The condition of the homes and the general spread of knowledge will allow the local authorities to devote more money to Health Visitors,

Infant Consultations, Milk Depôts and education of girls, etc. The Government is now giving more grants in many directions, with the consequence that local authorities have a good deal of money, as it were, set free, which they can devote to Infant Mortality work. Several towns already have municipal Infant Consultations, and among these are Birmingham, Bradford, Glasgow, Cardiff and Huddersfield. Care must be taken that in places where municipal and voluntary work are being carried on the two work harmoniously together and do not overlap. The Medical Officer of Health and his assistant are generally responsible for any municipal Infant Consultation in his town. Many local authorities give grants to Infant Consultations, and this is very welcome, as it gives the institution at least a start and is often sufficient to pay the salary of the superintendent. These grants vary from a few pounds up to £75 or £100. Some centres also receive an education grant in respect of the classes they may give, but if they do an inspector generally comes round to see that the classes are properly given: this, however, is not altogether a drawback.

Nearly all the Infant Consultations are managed by committees of ladies, and the doctor belonging to the institution is also on the committee. Ladies do by far the greater part of the work of organising and managing it, and this is as it should be, for the work and interest belong mainly to the sphere of womanhood. The work commends itself to lady doctors, and when these have time they can do much that is good and useful, both on the committee and as medical advisers attached to the institutions. Committees are made up of a Chairman, Vice-Chairman, Hon. Treasurer, Hon. Secretary, with others, including, as a rule, the Medical Officer of Health and the Superintendent of Health Visitors. Each branch, also, has its own special sub-committee to manage its own affairs, for by this means more and better work can be accomplished. In very few cases are the mothers represented, for the reason that the work is done in the very poor neighbourhoods where the inhabitants are not sufficiently educated to be of use.

No doubt committees should, to some extent at any rate,

take into consideration the views of the mothers attending, and these latter will appreciate it the more.

The work is carried on for the most part by an honorary medical officer, a superintendent, and voluntary workers. It is very desirable that each consultation should have a medical practitioner who can see the babies at intervals, and especially all babies who need careful watching or where there is difficulty with the feeding. The advice given by the doctor carries more weight than that given by anyone else, and both the superintendent and all the workers can pick up a good deal of knowledge concerning the babies from him. The doctor usually attends on a special day, once a week or fortnight, and all the babies are weighed just before he comes. In order to save time he generally sees only the new babies and all those who are not coming on. In a large Infant Consultation it is impossible for him to see every baby each weighing day. He is thus able to concentrate on the ones really needing supervision and help. By this means a good deal of disease is prevented and many mothers are started on the road to success, and without this timely advice many would have gone on feeding their babies in an improper manner till they had become too ill for much to be done for them.

The work of all Infant Consultations is preventive and to educate rather than to treat disease. All cases of illness other than that due to faulty feeding should be sent to their own doctor or to a hospital, preferably a children's hospital if there happens to be one in the town. The majority of cases will have to go to the hospital, for few parents are able to pay for the doctor. It is a great advantage if the doctor attached to the Infant Consultation is on the staff of a children's hospital in the town; he can arrange that all infants needing treatment at the centre can see him at the hospital. By this means he is able to follow all the cases right through, which is much more satisfactory for him and the infants. Also any case needing to be admitted to the hospital can be taken inside, and, in consequence, the doctor and the hospital staff take a special interest in it. The mothers too are better pleased if they are under the same doctor at the centre and at the hospital.

Directly two people have the treating of one case, independently of each other, things are apt to go wrong, just because each is unaware what the other is doing.

It must be quite clearly understood that it is never the part of the Infant Consultation to give medical treatment by advice or medicine to sickly babies except when they are ill through bad feeding. There is just one exception to this, and it is the question whether or not these centres should supply cod liver oil emulsion. If this is used as a food, generally as a substitute for cream and not as a drug, then I think it should be allowed. Cream is far too dear and of uncertain quality in the cities, and the emulsion takes its place exceedingly well.

The funds of an Infant Consultation seldom allow of the doctor being paid for the work, except it be under municipal control. All the funds are urgently needed to keep the institution going, and the doctor must be content to do this work voluntarily as he does for other charities. The work is, however, so interesting and instructive that few will grumble at the time given gratuitously, especially when the steady progress of the infant and the delight of the mother are realised. The medical part of the institution should be undertaken by a doctor who is more than interested in children, for the work is special. Infant feeding is a very limited branch of medicine and it is a very difficult subject, and for this reason it is best if a doctor who has had special experience in this line can be obtained. This is, of course, not always possible, especially in the smaller towns, and for the most part one of the local practitioners does the work.

At some places there is a rotation of local doctors, but the plan cannot be so advantageous as when it is under the control of one person who is responsible for all the babies attending. The work is specially adapted, as we have seen, to lady doctors, if they will make themselves thoroughly acquainted with infant feeding. The Infant Consultation in places where there is a medical school could make itself very useful in training students, and infant feeding is a subject about which so many students know little, but a good knowledge of it is of tremendous value in after-life when they

begin to practise for themselves. Some centres get extra help for the weighing day, and for this it is a good plan to get one of the district nurses to come in for a couple of hours, for besides assisting with the weighings she is often able to help the mothers and everyone connected with the guild.

The Lay-Workers.

A large number of centres rely entirely on voluntary workers, while others, usually the larger ones, have a paid superintendent, who is responsible for the satisfactory working of the institution. A superintendent can generally quite easily look after two centres, and this is probably the best way, as there is hardly enough to fill a woman's whole time at one, for the busy mothers who have other duties as well cannot always be attending the Infant Consultation nor be visited too often, because the baby is in most cases only a small part of her daily business.

It will be easily understood that the head of the centre, whether she be paid or not, is the pivot on which the whole work moves. In about 25 per cent. of institutions there is no paid superintendent, while the majority of the rest have one or at most two. Unpaid workers are often a little unreliable at attending regularly, and a good many are needed to run the institution each day, as most, perhaps, only go to the centre one day a week; hence the need of a really good superintendent to supervise and keep everything going smoothly and well. If there is no paid superintendent the institution should have one or two very capable hard-working ladies who are willing to give up a good deal of time and devote much attention to the work. A small centre is obviously more suited for voluntary workers alone than a large one.

The paid superintendent must be the right kind of woman with good qualifications, but her personal qualities are even more important, for the work is at times most exacting and trying. She must have the power of managing and influencing women and be able to get on with all, whether they are those attending or those helping to carry out the work. Opinions

differ as to what training and certificates a superintendent should have. Her work is mostly preventive and not like that of a nurse who helps to cure, but all the same, if she has had some hospital training it will no doubt stand her in good stead. Experience in district nursing is also good, as it gives knowledge of the poor and enables a woman to realise the adversities these have to contend with, and teaches her how best the difficulties of a two or three roomed house are to be met. The training given to health visitors and midwives is also good, the former teaching the preventive work among the poor, and the latter showing the great difficulties of the smaller houses. Both the superintendents of the Manchester centres have the Central Midwives Board certificate, and both have found the training useful to them in their present work, but whatever training the superintendent has had she will fail to be good unless she possesses the requisite personal qualities.

Dr Gibbon lately obtained information of the qualifications of the superintendents of about 50 institutions and found that in 40 per cent. these were a nurse, in 30 per cent. a certified midwife and in 15 per cent. a Health Visitor, but in many cases a superintendent had more than one qualification. In a few places the consultations are attended by a Health Visitor of the local authority, who acts as a superintendent. The salary of the superintendents varies from £60 to £100 a year.

The duties of the superintendent depend on the size of the institution and on the amount of work done there. In the main, however, she is more or less responsible for the satisfactory working of the whole plan, and it is her duty to direct all the helpers under her care. She has to watch each infant and see that it is brought regularly if possible, and send up to the doctor on his weekly visit every case that needs his help. In the doctor's absence, and between the times he attends, she herself has to advise the mothers about their babies and the feeding of them. The superintendent should also do some home visiting, as she can then see that the advice given at the centre is carried out at the home. So many of the mothers do not quite take in all that is told them at the Infant Consultation, that it is extremely useful if the superintendent visits

the homes themselves, and if necessary goes over the ground a second time. She should also give sundry classes and supervise those given by other helpers.

Nearly every institution depends largely of necessity on voluntary workers whose chief duty is to do home visiting among those who attend with their babies. The superintendent or the hon. secretary or other responsible person in cases where there is no paid superintendent, has the task of looking after and directing the work of the voluntary helpers. It is often difficult to get just the right kind of voluntary helpers, as it is not everyone who is suitable, and all should have a certain amount of training, and this often falls on the superintendent.

Lectures by experts should be given to the voluntary helpers and all their visiting should be supervised and they should refer all cases of difficulty to the superintendent. Most of the voluntary helpers belong to the well-to-do classes, as these only are able to give the necessary time. On the other hand, some centres are able to get some of the better class working women to help. This type of woman, if she is intelligent, and if she has had some training, often does very good work, for she thoroughly understands the difficulties which beset her own class.

The post of hon. secretary is generally a most responsible one, especially when there is no paid superintendent. She has to help to raise the funds necessary for carrying on the work, to arrange for public meetings, in addition to getting the voluntary workers to come. She has moreover to smooth down all the little grievances, etc., which are sure to crop up in places where so many workers are concerned.

The Work done at the Infant Consultations.

Every School for Mothers should make the nourishment by the mother of her offspring the central aim of its work. This teaching can begin with the expectant mother, who is induced to come to the dinners and to the classes at which hints can be given. There is a too prominent tendency among women to think little of the importance of food for themselves, and many

often only get a good meal at the time when the husband comes home.

Having now seen what constitutes the Infant Consultations, we will consider the work done by them. In the first place all teaching must be practical. Many of the mothers before coming to the centre have lost interest in their babies on account of continual disappointment because the baby is not



Fig. 7. Weighing Day, Salford Schools for Mothers. *Daily Mail* photo.

gaining as it should, and to help and encourage these mothers should be the one aim of the schools. Each baby as it is brought week by week is weighed and a card indicating the weight is given to the mother, who can thus easily see what progress her baby is making. The mother takes the card home and it is shown to the father, who is generally quite as much interested in the baby's progress as the mother. The card is

a great help, as it keeps up the mother's interest and stimulates her to do her very best, and it is indeed a gratifying sight to see the mother's joy if the baby is successful in gaining each week.

No doubt there is some little disappointment when the baby does not gain, but a little encouragement by the doctor or one of the workers soon puts this right, and she is all the more pleased if the baby has gained the next time. "The mothers look forward to these weighing days, and there is often a little friendly rivalry which helps to keep them doing their best. The mothers in the poor districts have a great love of their children, and it is really nice to see the keenness on the part of the mother for the good of her baby⁸." If the weight is unsatisfactory the mothers are generally most ready to listen to advice and to carry it out.

There is at times, however, a good deal of superstition about or dislike to weighing of the babies, but this is quickly overcome, and nearly all, especially the young mothers, are eager for the weighing. After the baby is weighed all those who have not gained and all those who need careful watching go to see the doctor, who should if possible attend on that day. He is then able to give advice about the feeding, and perhaps change the diet or food of those who are not coming on as they should. The weighing brings home to the mother that the baby is doing well if it gains weight, although it may have minor ailments, such as slight vomiting, screaming or skin trouble, and she can be more easily persuaded to go on nursing her baby in spite of these small ailments.

Most institutions endeavour to get the mother to the weighing once a week, and this regular attendance is very important. Regularity is often difficult to obtain, sometimes because the mother is rather careless, at others because she is unable to come on account of some difficulty in leaving the home. It is thus important that the weekly weighing should be put at a time of day most convenient to the mothers, for at certain hours it is quite impossible for them to come.

Seeing that the baby is properly clothed is also an important part of the work. Mistakes in this respect are frequent

and often very bad for the baby. Some are very scantily clothed, while others are so muffled up with unnecessary and heavy garments, that they can hardly move. The mothers must be taught at the different classes how the baby can be simply but well dressed, and, moreover, dressed according to the season of the year. It is all too common for the babies to be brought dressed in garments with no sleeves and with nothing protecting the legs and feet. Babies often suffer from cold just because simple precautions like this are omitted. It is part of the work of the superintendent to show members the possibility of providing a cot even in the poorest household, and so avoiding the dangers of an infant sleeping with its mother. Cheap cots can be made from banana crates; the following is the cost of one of them:

Four yards of valencing @ 2½d.	..	..	11d.
Three yards of calico @ 2d.	..	..	6d.
Tape .. .. .	..	..	1d.
Banana crate and straw	..	..	1d.
One yard of ribbon	..	..	1d.
			<hr/>
Total	..		1s. 8d.

Simple cots such as these should be on view at the centres, so that they can be easily copied.

Domestic Economy in the Slums.

At the schools there are also talks to the mothers on how to make the money they have at their disposal spread out evenly through the week in buying good, cheap and wholesome food. It is often found that there is a store of comparatively costly food bought on the wage day, generally Saturday evening. This store only lasts till about the middle of the next week, after which the family has to go on short commons till the next wage day comes round. Other talks have to do with the ventilation of the homes, the dangers of soothing syrups, teething powders, etc.

Home Visiting. Practically all the Infant Consultations undertake home visiting, and this is an essential part of their work if it is to be effective. It has been pointed out in a

previous chapter (Health Visiting) what a great help the Health Visitors are to the poor, and in exactly the same way home visiting, as done from these centres, is useful. The home visiting in connection with an Infant Consultation has rather a different standing from that done by Health Visitors. The latter take in the whole city, while the Home Visitors are as yet few and scattered here and there, and can only visit those mothers in their immediate neighbourhoods.

The home visiting is only done in connection with cases attending the centre, and the object is to see that the advice given by the doctor and superintendent at the Infant Consultation is carried out properly. It is one thing to teach at the centre and another thing for the mother to carry them out at home, even if she remembers what is told her. For this reason I think it is good that all instructions given to the mother, especially about the baby's feeding, should be written down on a slip of paper for her, so that if she forgets or is uncertain what she was told she is able to refer to her instructions on the paper. These instructions must, of course, be put very simply and made as plain as possible. One of the slips of paper about the baby's feeding given to the mother at the Manchester Children's Hospital is as follows :

Please give your baby in a clean bottle

Cow's milk	}	parts every	hours.
Water			
Give		tablespoons at each feed.	

To each feed add of sugar.

The voluntary workers also benefit by doing some home visiting, as they then begin to realise the adverse circumstances against which the people have to contend. The area round the centre is generally marked out into divisions, and the workers are allocated to each of these divisions. If the voluntary workers attend regularly and are capable, then the superintendent is able to pay special attention to those cases which need it and to leave the others in the hands of the voluntary workers. All visiting must, however, be done in unison with the ordinary Health Visitors and with other institutions in the neighbourhood. Home visiting can be overdone if care is not taken, for

the people will begin to object. The Manchester Schools for Mothers are carrying out an interesting experiment in a special area, and all babies under twelve months of age in a definite district are visited and kept under observation by two special Health Visitors.

The mothers are encouraged to attend the school. This work will be continued for five years, and the results already obtained encourage the confident belief that at the end of these five years we shall be able to show that the work of the school for mothers has been effectual in lessening both Infant Mortality and infant sickness. The whole-time medical officer of the schools devotes special attention to this area, and there should be some very interesting results to be shown at the end of the time.

Classes.

Most centres are now having classes for the mothers, but these are necessarily subject to the rest of the work being efficiently done. All the teaching must be as simple as possible and adapted to the mother's capabilities. It is most difficult to give classes of a kind that the mothers can really benefit from, for they are quite unaccustomed to anything of the sort and they all too quickly forget. The subjects taught are Hygiene and the Care of Infants, the Making of Clothes, and Cookery, etc., and everything is concentrated on the welfare of the infant. The classes show a tremendous amount of ignorance, on the part of the mothers, even of the simplest things, such as bathing the baby.

Many centres are provided with teachers from the local education authorities, and this is an advantage, as not only is there a saving of money, but also of the time of the helpers. The teachers are used to their work and should in consequence be able to do it well if they understand the difficulties and ignorance of this class of mother. Instruction as to cooking cheap meals and information as to what is and what is not economical and suitable food for the baby are given.

One of the difficulties about the cookery classes is the absence of proper cooking conveniences in the homes of the

poor, and for this reason lessons must be given and all the cooking taught as if the mother were doing it in her own home. Every now and then it is good to have a lecture instead of a class, and this is very popular among the women. While the classes and lectures are being given the infants must be looked after in another room, for it is only when these are out of the way that the mothers can give any attention. It is also quite a treat for the mothers to be released from their offspring for an hour or so, and they enjoy the lessons all the more.

The preparation of a syllabus of lectures on infant care suitable for mothers attending Infant Consultations is not easy, but the one in use at the Wimbledon Mothers' and Babies' Welfare Society gives a very good idea of the subjects of the lectures to be given.

THE WIMBLEDON MOTHERS' AND BABIES'
WELFARE SOCIETY.

SYLLABUS OF A COURSE OF MOTHERCRAFT, 1913-1914.

- I. The mother's health during pregnancy and nursing.
 - Clothing. Exercise ; rest.
 - Feeding. Special warning against stout and gin.
 - Demonstration.* Lentil soup, or other cheap nourishing dish.
- II. Management of infants during (a) Breast-feeding ;
(b) Weaning.
 - Demonstration.* Oatmeal jelly or barley water.
- III. Artificial feeding (i).
 - Danger of starch foods.
 - Sweetened condensed milk.
 - Skimmed condensed milk.
 - Demonstration.* Sample tins of good and bad brands of milk. Suitable and unsuitable feeding-bottles.
- IV. Artificial feeding (ii).
 - Care of milk. Sterilisation.
 - Care and cleaning of bottle.
 - Demonstration.* Care and cleaning of bottle.
- V. Cleanliness.
 - Bath ; cold sponge.
 - Care of navel, feet, hair, skin, etc.
 - Demonstration.* Boiled starch for sore skin.
- VI. Clothing for infants and children.
 - "Warmth without weight." "Freedom for movement."
 - Danger of flannelette.
 - Demonstration.* Model garments. "Non-flam" flannelette.
- VII. Teething, and care of the teeth. Care of the eyes.
 - Demonstration.* Eye-bathing. Boracic lotion.

- VIII. Feeding of children from one to five years.
 Regular meals at the table.
 Mastication of food.
 Dangers of "drinking with the mouth full."
Demonstration. Baked flour. Porridge, or light pudding.
- IX. Ailments (i).
 Summer diarrhoea. Causes; description; prevention; cure;
 castor oil.
Demonstration. Albumen water. Arrowroot.
- X. Ailments (ii).
 Thrush. Colic; dill water.
 Constipation; olive oil and magnesia.
 Bronchitis and common cold; ipecacuanha and glycerine.
 Croup.
Demonstration. Poultices and fomentations. Improvised bronchitis
 kettle.
- XI. Infectious diseases: signs and symptoms.
 Measles; scarlet fever; diphtheria; whooping-cough.
Demonstration. Bed-making. Tent for steam-kettle.
- XII. Training of habits and character of children.
 Use of comforter. Separate cot. Regularity of feeding.
Demonstration. Banana crate, or other simple cot
- XIII. Care of the house.
 Cleanliness; danger of flies; care of dustbins, closets, sinks
 and cisterns; fire-guards.
Demonstration. Covers for milk-jugs. Home-made safe.
- XIV. Ventilation.
 Importance of sunshine, fresh air and exercise. Let the baby
 sleep outside.
Demonstration. Method of ventilation. Towel-horse screen against
 draughts.
- XV. The mother.
 Importance of a mother's health to a whole house. Clothing.
 Care of the teeth. Rest; get the children to bed early.
 Avoid stout and gin. The mother as cook and manager.
Demonstration. Simple recipes for cheap feeding.

The following also give very excellent plans for lectures:
*Schemes of Instruction in First Aid, Home Nursing, Health
 and Infant Care*⁹.

*Syllabus of Seven Simple Lectures on the Care of Infants
 and Mothers*¹⁰.

The French experience supports the contention that the
 sound lines of progress are those which recognise and utilise
 the mother. Health visiting and Infant Consultations do this
 entirely, and more good will result by this means than by using
 crèches, milk depôts, etc., which seek to supersede the mother.

The Dinners.

One of the best and most useful features of the work done at Infant Consultations is the provision of good cheap dinners for the expectant and nursing mothers. It is perhaps the most favoured part of all the work done by the centres, and it is work which appeals to the general public, the workers and the helpers. The provision of cheap dinners is the main object and was the origin of some centres, the rest of the work including the weighing and the visiting following. Nearly all Infant Consultations provide dinners and many of them give from five to ten thousand meals each year. The charge is usually from a penny to twopence a dinner, for which sum a good wholesome meal is obtained; in some really necessitous cases the dinners are given free. Even at the price of twopence there is a good deal of charity. The mothers as a rule are good with regard to paying, bringing the money regularly with them each day, and at times it is not uncommon for one or two to club together and pay the dinner money for a neighbour who for some reason cannot pay.

When the dinners were started it was thought by some that all the mothers would want them free, but this is not borne out by experience, and it is often difficult to get the deserving mothers to come at all when they cannot pay. The giving of free dinners, however, needs a good deal of care, and it is essential that they are only provided after the case has been carefully gone into and the home visited. The number of free dinners varies largely according to the state in which trade and employment for the husbands are at the moment, and in times of stress the number of free dinners has to be largely increased.

During the coal strike of 1912 the centres in Salford, where the work depends largely on the coal, the number of free dinners had to be increased very largely, but we were able to make a special collection for these dinners at the time, and overcame the difficulty. The giving of dinners is a very cheap way of giving charity, but an extremely good one. All mothers

who are given free dinners have the obligation put on them of attending the centre and the weighing regularly, and they must do so till the baby is a year old.

The object of providing the dinners is to enable the mothers to breast-feed their babies to greater advantage, not only by providing better milk but by being able to continue breast-feeding for as long a time as possible, even until the baby is nine months old. The cooking of a good wholesome meal at a small expense in the homes of the poor is a very difficult matter, and an almost impossible task, but by coming to the centre the mothers at least get one good, well-cooked meal, a meal in fact consisting of a cut off a joint and vegetables. The very poor seldom have a joint, so this is much appreciated. The meals supply this want for the nursing mothers when they most need it.

In hard times the mothers continue to suckle their babies longer than they can properly do so, simply because, if the baby is weaned, there is nothing to feed it on. It is a sad thing to see a mother gradually losing her milk for lack of food, owing to her husband being out of work; it is not medicine that she wants so much as nourishing food. The dinners, I am sure, do a great deal of good and, moreover, two persons are fed by this means. The mother is also saved the expense of feeding her baby artificially, either wholly or partly, and the money she pays for the dinners will cost her far less than food for her baby.

If she goes to the dinners regularly for five days the cost will be tenpence a week, plus the cost of her dinner at home on Saturdays and Sundays, when the husband is not generally at work. If the baby is fed artificially on cow's milk or by some other means the cost is quite three shillings or more a week at the lowest estimate, and a breast-fed baby is much healthier and better in every way, as has been pointed out in the previous chapters. During one's work among the mothers it is common to find a baby which is not coming on as it should. The baby is cross, needs much attention, and is keeping the household awake at night. On enquiries being made it is found that the reason for all this is that the mother

has not enough milk for her baby, and on being persuaded to go to the dinners regularly all is soon put right. The number of artificially-fed babies in a neighbourhood near a centre with dinners is generally less than in a neighbourhood not so advantageously placed. There is thus an economic side to breast-feeding, and the only way to humanise cow's milk is to pass it through the mother.

At many centres not only nursing but expectant mothers are invited to come to the dinners, and these also benefit a great deal, for they are able to keep in better health than they would otherwise have done. We have seen in ante-natal hygiene how the health of the mother before her child is born influences the latter, and the dinners can but influence the mothers for good. I have made several enquiries from the mothers themselves on this point, and I have been told many times that when they went to the dinners before confinement the baby has been larger and healthier than when they had not done so. This is particularly evident with some of the older mothers who come to the centre for the first time with perhaps their third or fourth baby.

The following abstract appears in the Medical Report, 1911, of one of the branches of the Salford Schools for Mothers: "The mothers and babies attending Haworth Hall are showing very markedly the benefit they are getting from the dinners each day, and although they are drawn from a very poor neighbourhood, they are quick to realise what a great amount of good they are obtaining for themselves and for their babies."

After a baby is born some centres send free dinners to the mothers in their homes for a week; this is much appreciated, and when done many will tell how much more easily they get through their confinements. If a mother has been coming regularly to the dinners before the baby is born it is rather hard that she should go without, just when she is laid up. Except at the time of lying-in the mother should always go to the institution for the dinners, for if this is not enforced the children get the dinner which is primarily and solely intended for the mother.

The following was the menu of two courses for a week at one of the branches of the Salford Schools for Mothers :

Monday	..	..	Beef and two vegetables.
Tuesday	..	..	Hot pot.
Wednesday	..	..	Potato pie.
Thursday	..	..	Stewed steak and potatoes.
Friday	..	..	Boiled fish and parsley sauce.

Every day milk puddings, rice and tapioca, and stewed fruit in season. The mothers enjoy the milk puddings very much and never seem to get tired of them, although the puddings are of the same kind each day. The price of the dinner to the mother is twopence and the actual cost threepence, so that the centre is out of pocket by one penny for every dinner provided. In cases where the dinners are free the expense goes up, but taken all the year round there is not a high percentage of free dinners; it is generally less than a third. The housekeeper goes out each morning and does the shopping for the day. The following is an account of a morning's shopping for one of the mid-day meals for the mothers :

					<i>s.</i>	<i>d.</i>
3½ lbs. of meat, bones	..	..	..	..	2	1½
2 lbs. of marrowfat peas	..	..	..	..		7
22½ lbs. of potatoes	..	..	..	..	1	1½
7 oz. flour	..	..	..	..		1
1 lb. 6 oz. rice	..	..	..	..		2¾
16 oz. sugar	..	..	..	..		2
3 oz. dripping	..	..	..	..		1¼
10 pints of milk	..	..	..	..	1	5½
						<hr/>
Total	..				5	10½

All the groceries are ordered monthly from the local tradespeople, who very kindly allow a liberal discount as a contribution to the institution.

This was enough to give a two-course dinner to 28 women, of whom 27 paid, making 4s. 6d. The centre was thus only 1s. 4½d. out of pocket on that day. The average cost of the dinners is from 5s. 6d. to 7s. a day, the higher price being paid on Fridays, when fish is provided.

The housekeeper lives in the house rented for the Infant Consultation, and is paid 10s. 6d. a week, with coal, gas, and

rent free. She does all the shopping, the cooking and serving the dinners, and generally looks after the house. There were nearly 6000 dinners served at this centre last year.

The other centre in Salford is even more advantageously placed, as the use of a very large room with a kitchen attached is provided rent free. This room is used as a dinner room and club for the mill-girls from a cotton mill close by and was built for the purpose by Mr A. Haworth, one of the owners of the mill. The mill-girls have their mid-day meal here every day from one to two p.m., and at two o'clock when they have gone back to work the mothers come in and have their dinner. There is everything on the spot ready for the mothers' dinner, so that there is practically no cost to the centre for rent, attendance or light, etc. At this centre the menu is practically the same as at the former, but this being a particularly poor neighbourhood the mothers only pay one penny a day for the dinners, to which the centre has to add twopence to defray the cost. This it is able to do as its other expenses are so low. About 60 to 100 women attend, so that the daily out-of-pocket expense is between 10s. and 15s. for five days a week. This with a few extra items, including £12 a year for an extra maid, is practically the only expense incurred. It is very probable that more places like this will be used in the future.

The Provision of Milk.

All Infant Consultations should strive to promote breast-feeding, and only when this is absolutely impossible, or when the breast milk is not enough to satisfy the baby, should the mother be allowed to give anything else. The great proportion of mothers who attend the Infant Consultations throughout the country do breast-feed their babies, and the reason for this is that breast-feeding is so instilled into them that they have no desire to do otherwise. Another reason for this fact is, no doubt, that it is only the better mothers who attend, and not so much the careless or ignorant ones. It is difficult to get these latter to go to an Infant Consultation, and this is why health visiting is so important, for Health Visitors become

intimate with and can influence the good and the bad alike. Sad to say a great many of the older mothers who think they know—"the last word"—about infant feeding will not go out of their way to attend an Infant Consultation, and will often do all they can to prevent others attending.

Many centres now provide dried milk and sell it to the mothers for their bottle-fed babies at cost price. This milk is clean, easily kept, and does not give rise to any waste. Moreover, it is specially good in hot weather, when it is difficult to keep fresh milk clean and sound. Other centres provide cow's milk or milk specially prepared for infants.

The Salford School for Mothers have an arrangement with a good local milk dealer to provide the milk. Orders are sent each week to the dealer by the superintendent on the doctor's authority, for so much milk to be delivered for the seven days free to a certain number of homes, and the order has to be renewed weekly. The dealer then sends in his bill to the centre. The visitors make certain that the baby gets the milk and that it is not used for any other purpose. This scheme works satisfactorily, and the babies benefit from it greatly.

Cow's milk is by far the best substitute for breast milk, and should be used whenever possible. The mothers must, however, have definite and strict instructions as to how to dilute it properly, and how often to give it to the baby. The bottle with which the baby is fed is a source of many mistakes. A good many babies brought for the first time are found not to have a feeding-bottle at all, but in its stead a beer bottle or the like with a teat fitted on to it. Then, again, there is the long tube bottle, the origin of so much diarrhoea, etc., and it would be good indeed if we were to copy France and make the use of this illegal in England. All centres should insist on the use of, and if necessary supply, proper feeding-bottles.

Baby Shows and Competitions.

Many centres hold annual baby shows, generally with the object of demonstrating to the neighbourhood what fine babies can be produced by going to the Infant Consultation, while many others have competitions for the babies. Any work done on these lines must be carried out with caution, and care must be taken that no jealousy or ill-feeling arises among the mothers. This frequently happens in those competitions where prizes are awarded, and the mothers are apt to get the idea that it is only the huge fat baby which is the healthy one, while the contrary is almost always the case. In every competition the regular attendance of the mother at the centre, the baby's clothes and general condition besides its actual weight should be taken into consideration.

Baby shows may do good by stimulating interest in some particular neighbourhood, but I cannot help thinking it can be better done by other methods.

The Oldham School for Mothers¹¹, of which there are now five branches, hold many baby shows in connection with which they make an interesting display on the platform of health posters, suitable clothing, non-flam flannelette, and babies' cradles, in which fly netting plays a prominent part, with suitable notices such as "Summer diarrhoea is carried by flies" and "Keep the flies from baby's face." They have also a very large model, seven feet high, of a long tube feeding-bottle labelled "The baby killer," and an equally imposing dummy with a suitable warning notice. These last two models can be hired if desired by other societies on payment of carriage and packing.

Miscellaneous.

Meetings for fathers are held at some Infant Consultations, with the object of getting them to realise the difficulties and the tremendous amount of work done by their wives. It is unlikely though that any great amount of good can come from these meetings, the indifferent fathers will not take the trouble, and the good ones already understand the wife's difficulties.

Most of the fathers simply say that the whole affair is the wife's business and nothing to do with them, and, again, it needs a good deal of persuasion to get the fathers to meetings after they have done their day's work.

Some centres sell fire-guards at a low price, and try to teach the mothers the necessity of having these when there are young children in the home. A mother cannot always be watching her children, and hence the necessity of fire-guards. In future years many good institutions will provide the means whereby women can obtain practical instruction in infant welfare work, and the centres have good opportunities in this branch of the work. The Leeds Babies' Welfare already provides a three months' course for a new diploma in Social Study at the University. The care of infants enters very largely into the work of all medical practitioners, and medical students would gain much knowledge which would be useful to them in their future work if they would attend the centres at the times when the doctor is there. The difficulties attendant on Infant Feeding could then be explained and all difficult cases watched from week to week.

The class of Mother which the Infant Consultation should aim at helping.

Mr Seebohm Rowntree¹² has divided the poor in the city of York into a number of classes.

(A) Area 1. The poorest working class, out of a thousand children born 247 die before they are twelve months old.

(B) Area 2. The middle working class, out of a thousand children born 184 die before they are twelve months old.

(C) Area 3. The highest working class, out of a thousand children born 174 die before they are twelve months old.

(D) Servant-keeping class, out of a thousand children born 94 die before they are twelve months old.

The table shows clearly that the Infant Mortality among the poorest class is far higher than among the middle or highest working class, and that in the latter it is in turn a good deal higher than among the servant-keeping class. The high Infant Mortality among Class A, the poorest, is probably due to

poverty, ignorance and carelessness in feeding. The general death rate for all ages is very high among this class, which consists chiefly of loafers, ne'er-do-wells, and persons defective mentally and physically. Infant Consultations can do little good with these, for the mothers are not amenable to discipline and will not listen to advice. In consequence it is much better to concentrate our efforts on the classes above, for the result of trying to deal with the lowest tends to the neglect of those better classes, which can and do benefit by advice and teaching.

Class *B*, which consists of the middle working class, but who is still poor owing to their husbands being at times out of employment. Life is a very hard struggle for these, but many can be helped. There are still, however, even in Class *B* many quite beyond help. Class *C*, the highest working class, gives the best result. The husbands are in regular employment and the mothers are anxious to do their best. It may be thought by some that these should be able to get along without help, but it has only to be realised what is demanded of the mother to see that they do need assistance, and it is this class which gives results far beyond any obtained from Class *A* or *B*.

The servant-keeping class are above any help from the Infant Consultations, but all the same they are often in need of advice. In conclusion, the real work of an Infant Consultation is best expended on the better half of the middle and on the highest working classes. We shall get better results for our energy and money by helping these rather than by doing very much for the poorest. This conclusion is borne out by the reports of many institutions. "We find that we have a much better result from this class of mother (the better working class), they are poor, but not of the poorest, they are more reliable and more willing to carry out instructions given to them." "The most successful (work) is among the better class women."

Dr Gibbon, in his pamphlet¹³, also makes this point very clear and says that though the high Infant Death-rate which is highest among the poorest was the dragon we set out to slay, it does not follow that the work should be concentrated on one class.

Income and Expenditure.

The voluntary institutions have, like hospitals, to depend on subscriptions and donations, and the raising of these entails a great deal of work on the part of the secretary and committee. Some are fortunate enough to have a wealthy subscriber, who comes forward and provides, most generously, the larger proportion of the necessary funds. But, on the whole, most are hampered from want of money. Very few have any endowed funds like hospitals, for these institutions have been started comparatively recently and their work is not yet fully appreciated. Many raise funds by concerts, sales of work, bazaars, entertainments, which bring in quite a nice sum of money. A continual begging for funds often brings home to people the need for the centres, and once the public become interested, subscribers are generally found to come forward. Many centres obtain their premises free, either from some philanthropic organisation or from the local authority, but rent and upkeep may at times swamp a good deal of the income. The medical practitioner in nearly every case gives his services free, as there are no means of providing payment for him. Taking it all round a centre need not cost very much if it is started on small lines; the salary of the superintendent will be the largest item of the expenditure if there is no voluntary worker capable of undertaking this post. Many small centres distributed all over the town are more needed than fewer large ones. The following is a list of expenditure for the Rosamond Street Branch of the Salford Schools for Mothers, 1912 :

	£	s.	d.
By dinners	43	10	0
Glaxo (dried milk).. .. .	12	12	0
Wages	26	0	0
Extra help for cleaning and washing ..	7	10	0
Coal	6	13	4
Gas for cooking	6	2	10
Rent	22	2	0
Fee for the nurse	6	0	0
Sundries	3	0	0
	133	10	2

from which we find that the mothers paid for Glaxo £8 13s. 8½d., and for the dinners £28 1s. 9d., making altogether £36 15s. 5½d. The total cost of this centre is thus about £100 per annum. All the work is done voluntarily, except that of the nurse, who attends on weighing days, and there is here no paid superintendent. Centres with paid superintendents, and also those with several branches, cost of course very much more, *e.g.*, the Manchester School for Mothers pays about £500 per annum in salaries, and the total cost is over £1500 per annum. This included four branches where some exceedingly good work is done.

The Results.

There can be no doubt of the benefit produced by the Infant Consultations and all workers are agreed on this point. It is, however, as yet very difficult actually to give definite statistical evidence, as there are so many other agencies working to reduce Infant Mortality, but this is, we think, second only to that accomplished by good Health Visitors. There are many whom the Infant Consultations do not reach, including the delicate babies of a few weeks old who, either because they are too weakly or because the mother is ill, are not brought. Sick babies also do not come, nor do the careless and bad mothers avail themselves of this help. Infant Consultations raise the standard of the health of the babies, and in this way must be preventive of illness later in life. The improvement in the babies, who have been brought for a time, is very noticeable, not only in health but in general cleanliness and clothes.

Most centres keep records, a difficult and tedious task, especially in the rush of work, and unless there is someone whose business it is to keep these carefully and accurately I am afraid they are not worth very much. If they do happen to be kept well, then in time to come they will help to solve some of the problems of Infant Mortality, including its relation to poverty.

The prospects of life are made or marred in the earliest years of the child, and the physical well-being may be fatally impaired by the ignorance of the mother ; and it is this ignorance on the part of the mother that the schools for mothers are trying to abolish.

(b) *Infant Milk Depôts.*

The decreasing and low birth rate in France compelled this nation to improve the artificial feeding of its infants, with the result that the *Consultations de nourrissons* and the *Goutte de Lait*¹⁴ were started long before anything of the kind was begun in England. The former was the earlier institution and the first of these was founded by Professor Hergott in 1890 at Nancy. From this was founded by Professor Budin the *Consultation de nourrisson* at the Charité Hôpital, Paris, in 1892, and soon afterwards many more were started throughout France. These institutions are generally attached to Maternity Hospitals, and are limited to the children born in them. The women are admitted for confinement free of charge and all children born in the hospital are kept under medical supervision for two years, and all infants who cannot be breast-fed by their mothers receive the sterilised milk daily from the hospital. The mothers are also required to bring their babies regularly to be weighed and examined.

The second type of milk depôts started in France was the *Goutte de Lait*, which is a centre from which sterilised milk suitable for infants is distributed. The object of the *Goutte de Lait* is to provide good and proper milk for all those infants who cannot be breast-fed. They have no connection with any hospital and many are managed by philanthropic societies, which are often assisted by the municipality. The *Gouttes de Lait* were the precursors of the milk depôts in England, and they are practically milk dispensaries, from which infants are fed under medical supervision.

In England 13 milk depôts have been started, but of these three have been closed. The first Infants' Milk Depôt in

England was opened in 1899 at St Helens, Lancashire, and the following are still working :

Town	Number of infants fed in 1911
St Helens	68
Liverpool	3036
Battersea	347
Ashton-under-Lyne ..	48 daily
Bradford	?
Lambeth	258
Leicester	Only dried milk now sold.
Cambridge	27 daily
West Ham	60 daily

Besides these milk depôts many Infant Consultations, etc., supply pure milk for the feeding of infants, and the organisers carefully watch to see if the infants thrive on it. The chief milk depôts in this country are carried on by municipal authorities and they are larger and more expensive than the French *Gouttes de Lait*; it is the expense which prevents more being opened and which necessitates the closing of some of those already in operation.

The largest milk depôt in this country is in Liverpool, where the cost to the rates for the year 1911 was nearly £3000. The milk is prepared at a central station and is distributed throughout the city from smaller centres placed in different parts of the city. Nearly 3000 infants were fed on the milk during 1911. A milk depôt was opened in Finsbury in 1904 by private enterprise, and was later taken over by the local authority, but had to be closed down on account of the high expense, and because comparatively few infants were benefited. Instead of the milk depôt two health visitors were appointed.

Directly a milk depôt is opened, the control of the milk supply has to be considered, and the supply of milk must be under very strict supervision. The farm has to be selected by the medical officer of health, the cows certified by a veterinary surgeon as being free from tuberculosis, and the milk, directly after milking, must be delivered at the depôt in sealed cans.

The milk is generally supplied to the mother in sealed bottles and all she has to do is to warm the bottle, open it and place a rubber teat on the end for the baby to have its feed.

The mother gets the requisite number of bottles each day, and each bottle contains the proper amount for each feed as a rule. A visitor also goes round to see that all goes right and that the milk is really taken by the baby. The usefulness of a depôt is much increased if an infant consultation forms part of the organisation.

The principles on which the Finsbury milk depôt was started was as follows :

- (a) The absolute control of the milk.
- (b) Medical supervision of the depôt and of the infants using the depôt.
- (c) That the milk be only supplied to infants who could not be breast-fed.
- (d) To watch the effect of the milk on the infant.

If all these principles could be carried out efficiently then milk depôts would be a source of great good ; unfortunately they are difficult to attain and the expense in many places is prohibitive.

All milk sent out is sterilised and it is modified and made up in different strengths, suitable for babies according to their age and digestive powers. The milk is put up in bottles at a central depôt, from which it is distributed through subsidiary depôts, so that the people do not have too great a distance to go for it.

Every milk depôt must be exceedingly careful in seeing that no baby is artificially fed on the milk if there is any possibility of the mother nursing it. Directly artificial feeding is made easier the greater will the temptation be for the mother to wean her baby. Ignorant mothers are only too ready to think that the milk from the depôt will take the place of her breast-milk and that breast-feeding need not be persevered with.

At the best, milk depôts can only be adjuncts to other schemes, and they should be looked upon merely as temporary expedients. Directly there is a good, reliable milk supply they will not be needed, not only because Infant Mortality can be lowered in many more economical ways, but because the health visitors and the infant consultations will be able to see that all bottle-fed babies are brought up on the ordinary milk supply of the town.

And again, by persuading the mothers to go on breast-feeding, and by enabling them to do so by providing the dinners, we shall attain our ends in better ways. Milk depôts can only reach a few, while our other methods reach the great majority. Milk depôts are thus good, but Infant Consultations are better, and their success is measured by the small quantity of milk they sell and by the large number of nursing mothers who come to them. A good account of infant milk depôts can be obtained from Dr G. F. McCleary's¹⁵ book on the subject.

The infant milk depôt in Dundee¹⁶ has, like others, been obliged to close because it was not taken advantage of to the extent it was anticipated, nor was it used by that class of people for whom it was mainly intended.

The Leicester municipal infants' milk depôt¹⁷ was started in 1906 as one of the usual type, and there was a cost to the rates of varying amounts each year. This depôt has lately given up supplying fresh milk, but instead gives out dried milk alone, with the result that there is now a small profit each year. The price of the dried milk depends on the percentage of fat, there being three grades; the price also varies a little according to the season of the year. A certain number of mothers are allowed to have the milk at a reduced price, and a few have it free. On two afternoons a week the medical officer of health or one of his colleagues, attends at the milk depôt, when all mothers whose infants are not thriving on the milk are brought to see him.

In 1913 there was a profit of £90 on the year's working, and this is about the only milk depôt in the country which is supporting itself by the sale of its milk.

There can be no doubt that most of the infants do exceedingly well on the milk, whether fresh or dried, supplied from a depôt. The mortality among infants thus fed is lower than among the ordinary bottle-fed babies, simply because the milk is so much superior to other artificial foods which find such a ready sale.

The milk problem has received much attention in New York¹⁸ of late years, and the method adopted there is to educate the mother to buy only the best milk procurable for her baby,

and to teach her how to modify it at her home instead of having the milk modified and given out at a milk depôt. This is a very much cheaper method, and in England it should be possible to dispense largely with the expensive milk depôts by means of infant consultations and health visitors, who teach the mothers to modify the milk in their own homes.

Hospitals for Infants and Children.

Children's hospitals need to be rather different from those where adults are taken. The feeding of babies at all times is difficult, especially so when they are ill and require much attention and specially trained nurses. It is in these institutions that observations and research in the treating of sick infants can take place. The best methods of feeding can be elaborated and the children of the poor obtain proper attention, which they cannot get at home when they are ill.

The visiting staff are afforded opportunities for learning more; the resident staff are taught and when these latter set up in practice they can impart much knowledge about infant feeding. It is a great help, as has been pointed out, when a school for mothers can be run side by side with a children's hospital, for in this way many of the very weakly infants can be saved. Nurses, who have had some training in a children's hospital, should make very efficient health visitors later on, and it would be advantageous if all health visitors had some such training in infant feeding in a hospital of this kind.

(c) Day Nurseries or Crèches.

Like health visitors and infant consultations, day nurseries or crèches aim at preventing disease and injury to the health of young children.

The National Society of Day Nurseries¹⁹ was started with the object of raising all day nurseries to a high standard of efficiency and cleanliness, and at the same time to utilise them as instruction centres where the mothers can be taught the elementary principles of sanitation and health. The parent

society unites the crèches throughout the country, and it endeavours to see that the simple rules laid down by the society are carried out. It would be advantageous if all crèches became affiliated to the parent society. There are now 63 crèches affiliated to the society, of which 33 are in London, 29 elsewhere in the British Isles, and 1 in Toronto, Canada. There are also several in the course of formation, but we are behindhand with the work in England. The French *Société des Crèches* was founded in 1846 and has 48 crèches in Paris alone.

At present there is no inspection of crèches, but they must conform to the general provisions of the Public Health Acts. For this reason alone it must be good if all crèches will carry out the rules of the parent society, so that all may be kept up to a high state of efficiency. All affiliated crèches are inspected at least twice a year by a lady inspector in the employ of the National Society, and she gives advice and any suggestions that may be necessary. The inspector can also be of much use when any new crèche is being started, and it is a great help if she visits the new crèche and set it going on proper lines.

Most crèches have been started by individual initiative and are supported by voluntary contributions, so that it is unfair to expect ideal conditions in all. If demands beyond the essential or investigations of a too strict kind are made we shall discourage private enterprise, which we believe to be very necessary, and if these demands be insisted on, institutions such as crèches, infant consultations, etc., will either be discontinued or become a burden on the rates; on the other hand, little good and even some harm may come from them.

Crèches abroad receive grants from the state and public bodies, and are thus much more advantageously placed than in this country, where it is always difficult to find enough money to run a crèche in a thoroughly up-to-date way owing to lack of funds.

Every institution that aims at improving the coming race must be efficient and set a good example to those attending; a well-managed crèche must make an impression on the mother for the good of her children. All crèches are usually managed

by an executive committee, consisting of a President, Hon. Treasurer, Hon. Secretary, Medical Adviser, and a number of other members. As a rule mixed committees are the most efficient, and on these ladies will necessarily form the majority.

The Objects of Crèches.

The two principal objects are :

Firstly, to make provision during the day for those children whose mothers go out to work.

Secondly, to advise the mothers as to the feeding and care of their children.

Both these objects have the same end in view, namely, to improve the race by seeing that the children are brought up in a more healthy manner, and when this can be accomplished there will be fewer cripples and paupers to keep later in life.

All crèches like infant consultations should, if possible, be in a central position, so that the mothers have not too far to go. The house should be of a convenient size, with as much space on the ground floor as possible, and it should have some open ground or a yard where the children can be put in fine weather. The Douglas Crèche at Hoxton has a flat-roof which takes the place of the ordinary garden.

The children taken at crèches vary from the age of one month up to ten years, but the majority do not admit them over five or six years of age, for these institutions are more useful for infants and young children. It is for infants who specially need care and attention generally not attainable elsewhere and when the mother has to leave the home that crèches are useful.

The crèches usually open at 5.30 to 6 a.m. and keep open till 6 p.m., or on Saturdays till 1 p.m. The children must be brought clean and tidy, and above all must not have been exposed to or be suffering from any infectious disease. Some crèches wash every child on its arrival, and this is generally necessary. All the children should be provided with an overall, which is slipped on the child as it is taken in.

Crèches are specially useful in those places where the

mothers go out to work and for this reason they are of the most benefit in the crowded industrial parts of our large cities. When the employment of married women outside their homes is unavoidable and when the mothers must be away, a well-conducted crèche to which they can take and leave their children, with the knowledge that they will be well cared for and fed is a great boon.

The ideal is that the man should keep the home and that the woman should stay in and make it. The husband, often from unemployment or ill-health, does not always earn enough to keep the family, and when this happens women are obliged to enter the field of labour in order to keep the home together. "So long as cheap labour is required women will be employed, and their work is necessary in many industries, especially in a town like Dundee²⁰."

There is also the widower, the ailing wife, and the unmarried woman to think of. In all these circumstances the children are left in the hands of some incompetent person, who generally takes little interest in them. There have been many serious cases brought to light by the National Society for the Prevention of Cruelty to Children, in which these caretakers of the children have been found neglecting them. Crèches will at any rate mitigate the evils to which these children are subjected.

But we must be very careful not to encourage the mothers to go out to work the more quickly because there is a day nursery at hand where they can place their children, for it is far better if they will stay at home, rather than go to work and take the children to a crèche. All the same the fact remains that babies thrive in the crèche, and that they gain weight there regularly proves that much good is done, and, moreover, the mothers get an education as to how best to look after their babies generally, as well as how to feed them, and by this means much illness in later life may be prevented.

In every crèche one may see children who have come there wasted and suffering from rickets or other disease, but who have improved enormously after some weeks. The children are also taught cleanliness and acquire good habits; the change in this respect is great and is very noticeable after they have

been in the crèche for a short time. From the way most crèches are patronised, especially those in industrial districts, it would appear that they fulfil a want, and it is beyond doubt that at least while the infants are at the crèche they are well fed and cared for.

Care must always be taken that the crèches are used by mothers only, who for some reason are obliged to go out to work and not by those who simply want to save themselves the trouble of looking after their children at home. Some crèches insist on the mother who wishes to leave a child, having a form signed by her employer saying that she is working for him and that she is a respectable woman and deserving help.

Children between the age of one month and six years are generally received at the crèches, but when a mother wishes to leave a baby under nine months old, strict enquiries should always be made why the baby is brought, for it necessarily implies that it is weaned before the proper time. If there is any possibility of the mother continuing to nurse her baby, she must be encouraged to do so and, if necessary, means should be found whereby she can stay from work and continue to do so. It is good if all crèches are run in connection with an Infant Consultation near at hand, so that the babies can be weighed and looked after carefully with the others.

All mothers who use the crèches must pay for their children, and this charge is usually 2*d.* to 4*d.* a day. For this sum the child is cared for and fed for the whole day. This fee does not cover the working expenses of the institution, and the rest has to be found by voluntary contribution. Children of widows and widowers are generally taken at a reduced rate. All money has to be paid daily at the time the child is taken in.

The Staff.

The staff must of course be regulated according to the size of the crèche, and also according to the financial conditions. For 25-30 children there should be a matron, a nurse, a servant, and some probationers. The post of matron is a responsible one, and a really good capable woman is required. She should

have had a suitable training, if possible in a children's hospital, or at any rate in a children's ward of a general hospital. She must thoroughly understand the feeding of infants and this must be her special care, for the doctor cannot always be calling to see to them. The crèche can provide a training for two or three probationers as nurses, but this training is necessarily inferior to that obtainable at a hospital. The matron usually has sole control of the crèche, subject to the ruling of the committee, and it is she who decides as to the fitness or otherwise of the children brought for admission. The National Society inspector is always willing to help in advising about the management of the crèche, and also to try and find matrons, nurses, etc., for those requiring them. A good account of crèches abroad is to be found in Dr G. C. Moore's book *Infantile Mortality*²¹. There are, however, many more crèches in France and Germany than in England. Wiesbaden possesses a building capable of holding 70 children, while at St Louis, in the United States, a new crèche has just been opened, at which 90 children are cared for daily at a cost of 5 cents each.

Schools for Mothers and the "Toddlers."

An experiment has lately been tried at the St Pancras School for Mothers, the rooms of the institution being used as a day nursery for the young children of parents attending the school²².

The objects of this are :

(1) To provide a place where mothers can leave their children at times when they cannot look after them for some temporary cause. This happens when the mother has to attend a hospital either for herself or for one of her children. Also during the time the mother is confined or ill.

(2) To give those children who come from very crowded districts the benefit of fresh air and sunlight for part of the day.

(3) To show the mothers the effect of healthy surroundings and good training on the children.

The idea underlying the scheme is to do something to lessen the strain imposed upon mothers at times when it is most felt, and also to educate them.

The premises consist of two nurseries and of a walled garden, in which the children are kept all day during the summer. The day nursery is open from 9.30 a.m. to 5 p.m., and the charge is a penny a day.

The experiment has only been working for a few months, and with a shifting population it is difficult to get definite results. The children who have been to the nursery regularly, even if only for a fortnight, have become more sociable, less irritable, and more capable of amusing themselves. The improvement is undoubtedly due to the fresh air, the greater space, regular habits, and more sleep.

The work is no doubt very useful, especially when for a temporary reason the mother cannot look after her children, who are more efficiently cared for in one of these than in the home of a neighbour. Great care should be exercised in seeing that the mothers have good reason for leaving their children and are not doing so because they wish for a holiday away from them.

Whatever we do we must be careful not to relieve the parents of the responsibility for their children, for directly we do this they will become careless and all home life will be lost. But at present there can be few institutions having the space or the helpers necessary to start this work.

The Excursionists' Day Nursery at Southport.

Nearly everybody nowadays tries to get a day's holiday at the seaside, and when the father and mother take their day's outing they must generally take the children and even the baby with them. The day is often a disappointment and weariness to the younger children, owing to its excessive length and the excitement of it all. The parents, too, get tired out dragging their children round all day, and little or no benefit is obtained by either. The Excursionists' Day Nursery provides a place for the children to rest and play, and be taken care of. The baby, like other children, may be left here and the parents enabled to enter into the life and enjoyment of a holiday. The nursery is under the management

of an excellent committee of ladies with the Mayoress of the town as president and Miss Willett as chairman. The work is carried on most systematically. As each child is received the name and address of the parents are entered in a book and a ticket is given the mother, while a similar ticket is fastened on to the child, with any needful instruction in regard to the feeding written on it.

The building consists of a wooden structure on the sand by the sea, and surrounded by palings which enclose quite a large piece of ground. Children who are old enough are placed in the playground, where there are toys of every description and where they can dig in the sand to their heart's desire. The babies are nursed and some go off to sleep in the cots provided. About 70 ladies give their help voluntarily and there are three paid nurses and a doorkeeper.

The charges are :

All day . . .	6d. per child
Half-day . . .	4d. „ „
Per hour . . .	1d. „ „

which must be paid on admission. The nursery is open from 9 a.m. to 6.30 p.m., and is of course open only in the summer months. During 1913 some 6173 children were received; the busiest days are, naturally, the Bank Holidays. On the August Bank Holiday no fewer than 482 were taken into the crèche. Other watering places such as Blackpool, Weymouth, Weston-super-Mare, Scarborough, etc., are now copying this one.

BIBLIOGRAPHY.

1. *The Preservation of Infant Life.* Emelia Kanthack. H. K. Lewis.
2. *The Health Visitor*, Pamphlet No. 2. The National League for Physical Education and Improvement, 4, Tavistock Square, London, W.C.
3. National Health Society, 53, Berners Street, Oxford Street, London, W. Miss Lankester, secretary.
4. *Letters from Miss Nightingale—Health Visiting in Rural Districts.* National League for Physical Education and Improvement. P. S. King and Co.
5. Secretary, Miss Halford, who will supply any information.

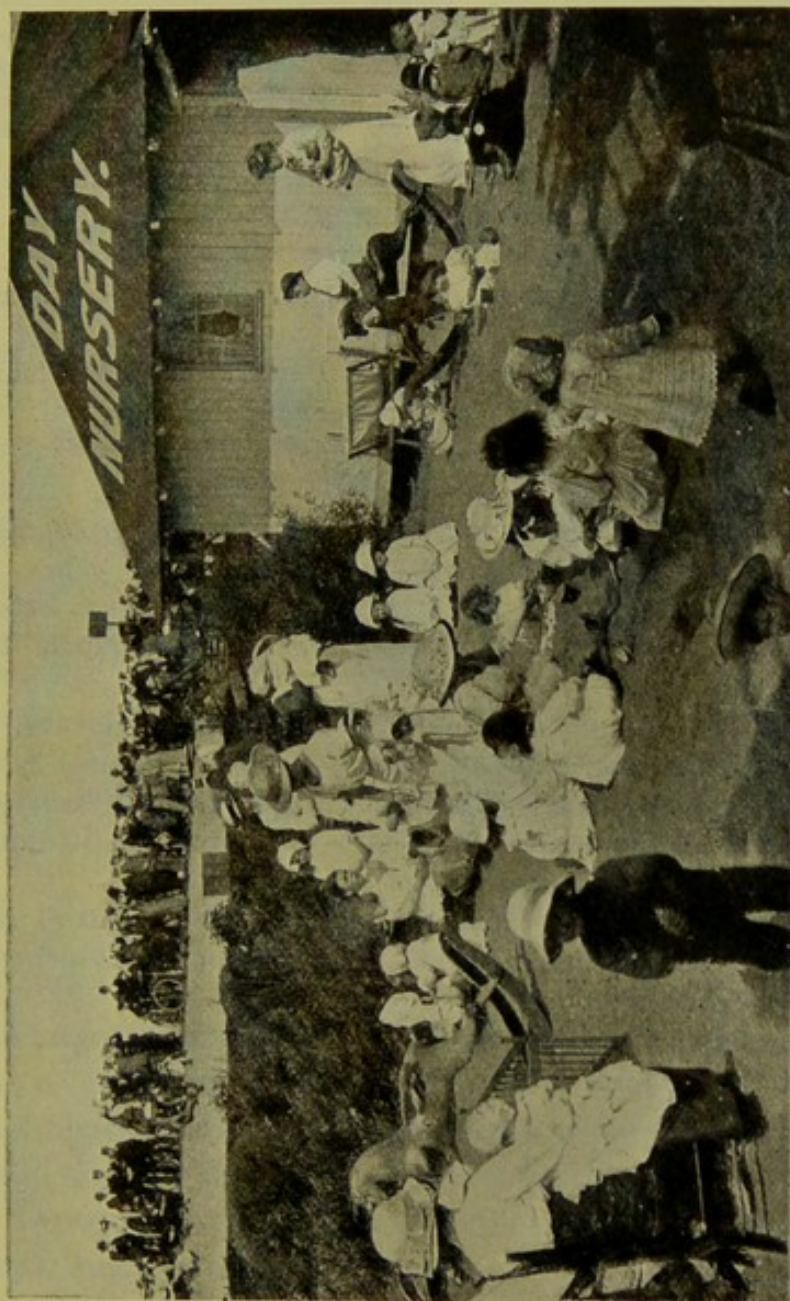


Fig. 8. Southport Excursionists' Day Nursery. [Photo by W. Rees

6. *Infant Welfare Centres*. I. C. Gibbon. The National League for Physical Education and Improvement. Pamphlet No. 7, 1913.
7. Bunting, Miss E., chapter on *Infancy*. Edited by T. N. Kelynack, M.D. C. H. Kelly, 1910. Price 1s.
8. *The Child. Critical Survey on Schools for Mothers*, 1910. H. T. Ashby.
9. Published by the London County Council for its evening schools. P. S. King and Son, 2, Great Smith Street, Westminster, S.W. Price 3d. post free.
10. C. M. Symonds, Scientific Press Ltd., 28, Southampton Street, Strand, W.C. Price 7½d. post free.
11. *National Health*, Aug., 1912, p. 52.
12. *Poverty, a Study of Town Life*. B. S. Rowntree. Macmillan.
13. See reference 6.
14. *Infantile Mortality and Infant Milk Depôts*. G. F. McCleary, M.B. P. S. King and Son; also *Journal of Hygiene*, vol. IV. 1904, pp. 329-368.
15. See former reference 14.
16. *Report of the Medical Officer of Health for the City of Dundee*, 1911.
17. *National Health*, Jan. 1914, p. 203.
18. *Milk in the poor home*. C. R. Pisek. Report of the Proceedings of the English speaking Conference on Infant Mortality, 1913, p. 338.
19. National Society of Day Nurseries, 4, Sydney Terrace, Fulham Road, London, S.W.
20. Muriel, Lady Helmsley, Chairman of the National Society of Day Nurseries Conference on Health-Promoting Institutions, 1910. *Report of the Proceedings*, p. 76.
21. *Infantile Mortality. Thesis for the Degree of Doctor of Medicine*, 1905. G. C. Moore, M.D. Daily Chronicle Printing Works, Huddersfield.
22. *National Health*, February, 1914, p. 229, Isabel Ainger, Assistant, St Pancras School for Mothers.

CHAPTER X

MILK

Milk is the most important link connecting the present with the past. It is with this vital fluid that the foundations of human life are laid, and upon the kind of milk employed will depend the physical character of the human unit.

All foods are more or less unsatisfactory substitutes for human milk, but the best is no doubt some modification of cow's milk. The term, modified milk, is applied to any food of which milk in any form is the basis, no matter whether it is a simple dilution of whole milk with water or a mixture with barley water, whey, sugar, etc.

Besides cow's milk, the milk from the goat and ass is used. The usefulness of the goat as an animal for supplying milk has of late years been brought under the notice of the public of this country. It has been called the "poor man's cow," as it costs less to keep and, if carefully fed, yields milk of good taste and quality. Ass's milk being very digestible is well adapted for delicate infants, but it is not readily obtainable.

There is, perhaps, no single factor in connection with Infant Mortality so important and so full of pitfalls as the supply of milk. The general public know little about milk, and are quite content as long as they have it delivered regularly at the door. The quality of the milk supplied both in towns and country is of vital importance to all children. We have seen that epidemic summer diarrhoea especially affects children who are fed on impure cow's milk and on condensed milk. Those who are breast-fed or brought up on good clean milk suffer the least. Coming now more closely to the point as to what can be done to reduce the excessive Infant Mortality from this cause, the experience gained in other countries, such as the United States of America, notably New York State, points to the fact that a better available milk supply must be obtained.

The infant does not know the possible results of the food it is getting—if it tastes well it takes it—it has no power to express disapprobation except by its cries, its vomiting, and its diarrhœa. By no other means can it impress upon its caretaker the results of improper food. As the food is the most frequent source of the ailments of infancy and as these ailments annoy and occupy much of the time of the caretaker, naturally the food question becomes prominent. It is common for one food after another to be introduced into the baby's stomach, which is small and sensitive, with the result that these tamperings lead to unfortunate results. It is only of late years that the idea has begun to occupy the minds of the thinking part of the medical profession that the feeding of infants in the past has been inexact. The human stomach is not a test-tube, into which all manner of food can be introduced with impunity. As Dr Hope¹ writes, "The breast-milk of the mother is beyond any doubt peculiarly adapted both chemically and physically to the special requirements of her special offspring. It is fresh-produced, in fact, as it is required; it is adequately mixed; the temperature is exactly what it ought to be; but above all it has not been exposed to the air; no atmospheric impurities have reached it as it passes direct from the gland to the stomach of the infant, and is consequently bacteriologically pure." Every artificially fed baby is thus at a great disadvantage compared with the breast-fed.

When good human milk is not to be obtained we must be able to prepare a food which will be likely to agree with the infant, and this can best be done by modifying cow's milk in one way or another. Cow's milk can be procured anywhere, and thus it is preferable to all others. The reason why we have to modify cow's milk is that it differs in the amount of its ingredients from human milk. The baby's stomach is meant to digest human milk, so that if a supply of the latter is impossible, we must make the cow's milk resemble it as closely as we can. The younger the baby, the greater the rôle which the milk question plays in its welfare, and we all know how the mortality of infants depends in a great measure either directly or indirectly on the food. Milk then is

a subject which should be studied from the point of view of public health, and we must acknowledge that it is a broad public question affecting, to its very centre, the whole race.

Milk, when pure, is an ideal food, but it is of all foodstuffs the most difficult to preserve pure and to handle successfully. How to get pure milk is a vital question, since it constitutes the food not only of the artificially fed infants, but also of the entire sick population. It is a delicate organic fluid, easily spoilt and needing great care. It may be the cause of disease, *e.g.*, epidemic diarrhoea in infants, typhoid fever, or it may be the carrier of contagion in many fatal epidemics. There are three stages at which milk may become contaminated, namely, in production, in distribution, and in the home.

The danger at the very beginning is most important—here at the farm the milker has little knowledge of the care required in handling the milk. As the milker goes from cow to cow particles of dust are caught from the cow herself, from the hands, and from the floor, unless scrupulous care is taken. The cowsheds are in many places dirty and unsanitary, and the milk is continually receiving sowings of micro-organisms; this happens in what we call in England good dairies. Directly milk is infected the population of micro-organisms in it grow and multiply with great speed. In the United States of America much more attention is paid to milk than in England, and the farms and cows are kept in very good condition. Local authorities in England have, it is true, under the "Dairies, Cowsheds and Milkshops Orders" powers to compel cleanliness in dairies, but these powers are largely in abeyance. Prof. Delépine has made a special study of the Manchester milk supply, and he states very definitely that milk is infected at the farm to a very large extent. This may occur at the milking or be caused by dirty milk cans.

Prof. Delépine says, "It will be noticed that a large proportion of the samples of milk obtained at railway stations or at the actual farms, is already infectious before it reaches the consumer."

Milk is also liable to become infected during its distribution, especially in large towns to which it is sent from long distances,

and is already many hours old before the consumer gets it. At present most of the milk comes into the towns by rail, but in future motor waggons may be more generally used for this purpose. Milk often receives bad and careless treatment in transit by rail, for the milk cans are often put out at a junction and left standing for hours on a platform amid the whirl of dust, or, it may be heated by the sun to quite a high temperature. The methods adopted by the railway companies for dealing with the transit of milk are often primitive. Some companies do provide a few ventilated cars for long distance milk, but the larger proportion simply put the churns into the ordinary luggage vans among the vegetables and other things which may infect it. Milk quickly gets contaminated, and should at least have a van to itself.

The supplying of a pure milk, however well done, cannot of itself effect much without careful handling in the household, and the intelligent care of the mother.

During the round of the milk-cart and during the house-to-house distribution it also stands every chance of becoming infected. The consumer also allows the milk to become infected in his home, where flies and dirt get into it and further contamination is only too likely to take place in dirty feeding-bottles. In the poorer parts the long-tubed baby's bottle is still to be found. The long tube cannot be properly cleaned, and is a regular breeding place for micro-organisms, which the baby swallows at each feed. Its use in France is illegal and should be so in England. The proper bottle is boat-shaped, has no corners, and can be cleaned with ease.

Cleanliness in the supply of milk can only be obtained by degrees. If we press too quickly for improvements we shall diminish the small margin of profit in the milk trade, and so diminish the supply of pure milk, causing thereby a preference for the use of cheap milk, such as condensed milk of the skimmed variety. Pure and fresh country milk can no doubt be obtained, but it necessarily commands a higher price. It is the low-priced variety which attracts the poor; this may be cheap at first, but as the baby's health suffers, it becomes expensive in the long run.

The interests of the farmers, of the milk dealers, and of our poorer citizens are practically the same with regard to the milk supply. Large quantities of condensed milk and various kinds of patent foods containing much starch and sugar are made and imported into this country and used in infant feeding. I have no hesitation in saying that in nearly every case in which such foods are used, better results would be obtained if some form of fresh cow's milk were substituted. The reason these foods are so largely used is partly, no doubt, that they are pushed by bold advertisement, and partly because so-called fresh milk has been tried and failed to nourish the infant. The milk in the vast majority of these cases has been of inferior quality, or else the mother has given it in a wrong manner or whenever the infant cries. The mother then complains that fresh milk does not agree with her infant. It behoves us all to support the town authorities in their endeavours to prevent the sale of impure and dirty milk, by the inspection of milk-shops and dairies, and by insisting on a high standard of cleanliness in the cows and in the handling of the milk. By way of showing how difficult it is to carry out proper inspection we have only to realise that milk comes into our towns, not from one district only, but in many cases from 100 to 300 different places, often a long distance away.

It is no wonder, what with the contamination of the cowshed and feeding-bottle, etc., that cow's milk does not agree with an infant of weak digestion. "It comes up curdled"; "It does not satisfy the child"; such expressions are common. Then it is that the wiseacres of the neighbourhood advise the mother to give the baby boiled bread or some starchy patent food, which fails to nourish and only upsets the baby's digestion, and the result is that the child wastes.

The digestive organs of the infant are worked hard enough in infancy to supply the material to make up for the rapid growth at this age, even when proper food is forthcoming. The feeding of babies is scientific, and cannot be done by rule of thumb. The great subject of improvement of milk for the people necessitates a combination of all who are connected with the production of milk, and the farmers, the salesmen, the

physicians, and the Public Health Department must all combine and work together for this object.

Another reason for bringing about reform of the milk supply is the desirability of increasing its consumption, especially among the poor. Even if the baby is breast-fed for the normal nine months, it must have cow's milk after this, and in a large percentage of cases long before it is nine months old. We must aim at getting the people to use cow's milk more, instead of the unsatisfactory condensed milk and patent foods. Milk is the ideal food for children after the suckling period is over, and an increase in its consumption would improve the physique of the coming generation.

The ordinary householder has a great deal to learn in the way of keeping the milk delivered at his door clean. It is too often taken from the milkman and placed in a dirty jug or kept uncovered during the day, so that dirt and flies get into it. All milk should be placed in clean, scalded vessels, and these most carefully covered up and kept surrounded with cold water. During hot weather the milk should, if possible, stand in running water, so that the temperature is kept continuously low.

Another danger is the adulteration of milk by adding water and removing some of the cream. Now the cream, which is fat, is the most important ingredient of milk as far as the young child is concerned, and it is when this is deficient that the child begins to waste. By the use of such milk infants are being improperly fed and starved, and the results are seen throughout the country in the large numbers of infants suffering from malnutrition. Later on the infant gets rickets, with all its deformities; for this disease is primarily caused by a deficiency of fat in the food. It is for this reason that so many of the infants fed on condensed milk become wasted and later on contract rickets, for this milk is very much lacking in fat or cream, especially the cheaper brands made of skimmed milk. "The constituent of human milk, like cow's milk, most important to the healthy growth of the child, is fat," as was proved by the work of Dr Olive M. Elgood². This fact is also borne out very clearly in clinical practice, for if the nursing mother gets

insufficient food, or if her milk begins to fail for any reason, it is the fat in her milk which first fails, and without a normal amount of this the infant at once ceases to gain as it should.

Lastly, preservatives, such as boracic acid, are at times illegally added to milk to make it keep longer. This is most injurious to infants and upsets their digestive faculties. We should always beware of milk which will not become sour after being kept long enough, for it may mean that some preservative has been added.

Milk is a very great factor in the health, growth, and physique of a child. It is easy to buy in the towns, it cooks well, it is fairly cheap, and it is a very good food for mother and child. We should thus make it accessible to all, and especially to those living in the poor districts.

Every baby born has at one time or another to consume a large quantity of cow's milk, and for this reason it is very desirable that pure clean milk should be obtainable everywhere throughout the country. The public health authorities will be well repaid by seeing to this point.

The Milk Act of 1909 was accepted by agriculturists at the time as being fair, but has now been withdrawn and a new Milk Act³ brought in (1914)*. The 1914 Act provides for the slaughtering of any cow which is suspected of being tuberculous or of giving milk that is dangerous to the public. Two valuations of the same animal are made, one to apply if after slaughter and examination it is found free from tuberculosis; and the other to apply when the carcase is found diseased. If a cow when slaughtered reveals the least trace of disease, compensation is paid only on the "diseased value," at the rate of three-fourths; if the animal is slightly affected and one-fourth of it is in a state of advanced tuberculosis, the minimum compensation in this case is 30s. If the cow is found not to be tuberculous then full value is paid with the addition of £1 for the disturbance of the owner's business. It is only fair that the people in the towns, who consume the milk, should pay a share in the cost of the destruction of the animals, for it is to their advantage the diseased animals are destroyed.

* This Act does not come into operation till 1st October 1915.

Milk and Tuberculosis.

There are few diseases so common and so disastrous in their results as tuberculosis in infancy and childhood. Tuberculosis, by which term we include consumption, is contracted by taking into the system the germs or microbes of the disease, either from the dust in the air as it is breathed, or in the food. In children a very common way of becoming infected is by drinking raw milk which contains these tubercle germs. The intestines of the child are very thin and allow these germs to pass through their walls into the body, with the greatest of ease. Now a very serious proportion of milk of the country contains tubercle germs, and this is partly why we have so many children suffering from tuberculosis. Cows are specially prone to the disease, and when they have tuberculosis of the udder the milk contains tuberculosis germs in large quantities. The report of the Public Health Committee shows that of 10,638 samples of milk examined since July, 1908, when the L.C.C. Powers Act came into force, over 10 per cent. proved to be tuberculous. Means are now provided by most towns for the bacteriological examination of milk for tuberculosis, and samples of milk are continually being taken by the town authorities. In cases of infringement of the Dairies, Cowsheds, and Milkshops Order, and of any adulteration of milk, the magistrates can and should inflict adequate and progressive fines.

To avoid this infection of tuberculosis through the milk it is advisable to look upon all milk as if it may possibly be contaminated, and to avoid all risk it is essential to sterilise the milk. Boiling or else heating the milk to 160° F. (pasteurising) is the most certain and the easiest way of destroying the germs. If the milk is boiled, it should only be heated until the bubbles just begin to rise and not to boiling-point proper. This is the simplest and perhaps the best way for the poor. If the milk is heated to a less extent, or as it is called pasteurised, some special apparatus is needed, such as a Hawksley's Steriliser or a double milk saucepan with water in the outer part. The

water is heated to boiling for four minutes, after which the inner saucepan with the milk is removed and cooled. This latter method does not alter the taste of the milk so much as the boiling, and for this reason is to be preferred.

The Sixth Annual Report of the Manchester Schools for Mothers contains the following: "More and more do we feel the need of a better milk supply. Under present conditions it is not wise to do other than recommend the heating of the milk supply to the mothers amongst whom we work. The chief reason for this is the danger of tuberculous infection—a danger that has been so amply demonstrated quite recently, that it must now be accepted as a scientific fact, that infection by the bovine type of bacillus and tuberculous disease occur from taking tuberculous milk."

English people are about the only civilised nation in the world who habitually consume uncooked milk; many countries make the heating of it before use compulsory. Tuberculosis is specially common in England, and partly for this reason. The other way by which children can become infected with tuberculosis is by contracting the disease from a parent who is tuberculous or from some other person who has the disease. It is important therefore to keep all infants and children away from any tuberculous person, and all kissing of infected persons should certainly be avoided. The Japanese do not use cow's milk, but yet they have tuberculosis, thus showing that there is this second method of infection. Some time ago Koch and his followers practically dismissed the idea that milk is a source of infection in children. This view is, however, quite untenable. It is now possible by examining the diseased structures to say whether the disease has been caused by the bovine (milk infection) or by the human tuberculosis germs. The result of a large number of such examinations in children shows that a very high percentage of the disease is due to the bovine (milk) bacilli.

Mr H. J. Stiles, of Edinburgh, has lately had all the tissues which were diseased by tuberculosis and removed by operation in children examined, and again the results show that the milk infection is the predominant one. Surgical tuberculosis,

by which we include the disease as it appears in bones, joints, glands of the neck, etc., is also more common in England than in other countries, because we have an inadequate control of the milk supply, and because so much raw milk is used. In America, where the milk supply is much more satisfactory, I was impressed by the small amount of tuberculosis in children compared with what one sees in England. As Mr Stiles⁴ says, it is satisfactory to know that the government of this country is at last becoming alive to the fact that bovine tuberculosis is a real source of danger.

Lately tuberculosis in every form has been made compulsorily notifiable, by which means all cases can be traced and further infection prevented to a certain extent. The tuberculosis order has also made provision for a uniform veterinary inspection of cattle throughout the country, and cattle infected with the disease can be eliminated from the herds. This in itself will in time help to diminish the amount of infectious milk. The maxim "prevention is better than cure" applies with great force to tuberculosis in infants.

It has been thought by some that infants do not thrive so well on boiled milk as they do on the raw, and that they are liable to get scurvy from the former. Most authorities, however, do not agree with this, and experience gained with infants shows that they thrive quite as well on boiled as on raw milk. Even if they do not thrive quite as well, the greater safety more than counterbalances anything else. As regards the danger from scurvy, which, besides being a rare disease, is one that is very quickly cured, and at the same time easily prevented by giving a little fruit juice from time to time.

Some years ago (1900) Escherich was the first to bring forward the view that when milk was boiled, the ferments in it are destroyed and that this hindered the infant from thriving well. Very little was known about these ferments till lately, when Dr Janet Lane-Claypon⁵ investigated the matter in a very able manner for the Local Government Board. In her report she indicates that these ferments are not present in pure milk, but that they are formed from bacteria in contaminated milk. Moreover she suggests that these ferments,

instead of being absorbed by the intestines, are actually destroyed there. As is said in the report, "The oft-repeated assertion of the value to the infant of raw cow's milk fades away when the facts are examined."

The Sterilising of Milk by Electricity.

This process of purifying milk is entirely new and was initiated by the Liverpool Health Committee at the end of the year 1913. It was the result of much study and the originator was Alderman Anthony Shelmerdene. Electricity of high voltage is passed through the milk, and by this means all microbes are killed. The treatment by electricity has the advantage that the taste is not altered in any way. Stringent tests have been made and it is claimed that all tubercular and other contamination is completely annihilated. In Liverpool the sterilisation is carried on at a depôt in the centre of an industrial district and the milk is distributed from here.

If other cities would adopt this plan and sterilise all milk coming in, a great gain would result and there would be less tuberculosis all round. The method is a very cheap one and, if necessary, the sanitary committee of each town might sterilise all milk free of charge, or at any rate do so at a nominal charge.

A Means of providing better Milk.

The fundamental difficulty is how to obtain increased cleanliness at all stages of manipulation without raising the price above the level which the poorer classes can afford. The solution is partly to be found in the principle of grading which is already in use in America. While constant care should be taken, by means of sanitary regulations and bacteriological tests to ensure that the lower grade of milk is a healthy food, a more rigorous test should be applied to the higher grade, which then might be sold under a special designation. The lower grade could be called as in New York "inspected" milk, and the higher grade "certified."

Dairies at present often supply milk under the name of "nursery milk," which is supposed to be specially good, as

its price at 6*d.* a quart reveals. This higher-priced milk is in many cases much more impure than milk sold merely as "milk."

It is undesirable in the interest of the great majority of milk consumers that farmers should be subjected to too complicated regulations for ensuring cleanliness, for the price of milk would inevitably go up, and it would be above a point at which the poorer classes could buy it freely. The minimum test for cleanliness, however, must be vigilantly applied. The institution of specialising in milk would allow farmers and milk-sellers to provide a superior milk at a higher price. This would be appreciated by the better classes, and an official test would plainly stamp this milk as being above the ordinary in purity and richness. The development of the public interest by an official standard of purity is a hopeful means of educating every class in the importance of obtaining clean milk.

Milk in New York.

The medical society of the County of New York, U.S.A., has had for some years a Milk Commission to aid in improving the milk supply for New York. The Milk Commission aims at assisting both the consumer and the producer to ensure that all the milk certified by the Commission has a fixed standard of cleanliness and quality, and it must not be sold as certified milk more than 24 hours after its arrival in New York city.

In order that dealers, who incur the expense and take the precautions necessary to furnish a truly clean and wholesome milk, may have some suitable means of bringing these facts before the public, the Commission offers them the right to use caps on their milk jars stamped "Certified by the Milk Commission of New York." All the milk is most carefully tested and the cows and farms are inspected at frequent intervals. Before the milk can be certified, however, the dealer has to conform to several conditions, some of which are as follows :

(1) The barnyard must be well drained, and the manure must be removed daily and carted several hundred feet away. All objectionable smells are thus avoided, and the number of flies in the summer is much diminished. Flies are an element

of danger, for they are fond of both filth and milk, and are liable to get into the milk after having soiled their bodies by a recent visit to manure.

(2) The stables must be kept scrupulously clean, well ventilated and lighted.

(3) The cows.—No cows are allowed in the herd, except those which have successfully passed a tuberculin test and they must all be tested at least once a year. Any animal suspected of bad health must be removed from the herd at once and her milk rejected, and no cow with a diseased udder is allowed in the herd. The feeding of the cows is looked into and they are groomed daily. Before each milking the udders must be washed and dried with cloths used for the purpose alone.

(4) The milkers must be personally clean, and they must not milk if they have or have been in contact with any infectious disease. Before milking the hands must be washed in warm water, and the milkers must have washable overalls and caps.

(5) The milk—the first few streams from each teat must be discarded in order to free the milk ducts from the milk that has remained in them for some time, and in which bacteria are sure to have multiplied. The milk must be removed from the stable at once to a clean room, where it is strained quickly, cooled and bottled.

Certified milk sells at a higher price than ordinary milk, and naturally so, extra expense having been incurred to get greater cleanliness. This is an advantage to both the consumer, who knows he is getting a good milk, and also to the farmer, who is well repaid by the extra price he obtains for his milk.

BIBLIOGRAPHY.

1. *Report on the Health of Liverpool*, 1904, p. 154.
2. Paper read at the British Medical Association, July, 1910.
3. Milk and Dairies Act, 1914 (4 & 5 Geo. V, ch. 49).
4. The necessity for a more thorough control of the milk supply in combating surgical tuberculosis in children, *Lancet*, August 16, 1913.
5. Report to the Local Government Board upon the "Biological Properties" of Milk, both of the Human species, and of Cows, considered in Special Relation to feeding of Infants, Jan. 1913.

See also Local Government Board Reports (New Series, No. 63), 1912, upon the available data in regard to the value of boiled milk as a food for infants and young animals, by Dr Janet E. Lane-Claypon; (New Series, No. 76) 1913, upon the biological properties of milk, considered in special relation to the feeding of infants, by Dr Janet E. Lane-Claypon; (New Series, No. 56) 1911, on an enquiry as to condensed milks, with special reference to their use as infants' foods, by Dr F. J. H. Coutts; (New Series, No. 80) 1914, on the use of proprietary foods for infant feeding, and their analysis and composition, by Dr F. J. H. Coutts, and Mr Julian L. Baker; (New Series, No. 77) 1913, on bacterial food poisoning and food infections, by Dr W. G. Savage. Report of Departmental Committee of Board of Agriculture on Milk and Cream (1901, Cd 491). Final Report of the Irish Milk Commission, 1911 (1913, Cd 7129). Dr W. G. Savage, *Milk and the Public Health*. (Macmillan and Co.) Dr Graham-Smith, *Flies in relation to Disease*, 2nd ed., 1914. (Cambridge Public Health Series.) J. E. Purvis, A. H. Brehaut and A. C. N. McHattie, Some chemical changes produced in boiled and in sterilised milk (*Jrnl. Royal Sanitary Inst.* vol. XXXIII. (1912) p. 154).

CHAPTER XI

(a) ANTE-NATAL HYGIENE

So far as the race is concerned the health of the mother, especially at the time she is carrying a baby, is of great importance, and for this reason ante-natal hygiene must be carefully considered. Ante-natal life occupies a period of nine months, except in the case of prematurely born infants. During this time the infant is growing rapidly. The mother supplies the necessaries of life during these nine months, and the infant is being prepared for an existence of many years. On looking at the Infant Mortality rate for the last few years, we find that it varies a good deal each year according to the age of the infant, and that it is higher during the first month of life than at any other time. It is also seen that Infant Mortality has decreased more rapidly of recent years during the ages over one month than during the first month of life. The greatest

improvement has been in the second half of infancy, though there has been a remarkable saving even in the first half. It would thus appear that not quite enough attention has been paid to the saving of life during the first month. The word non-preventable has been applied too often to deaths which occur during the early weeks, but directly more attention is paid to the ante-natal hygiene of the mother, we shall be able to remedy this very materially, and in this direction new scope for work is opening up.

Ante-natal hygiene has to do with the health of the mother during the nine months she is carrying the baby, and we have in ante-natal hygiene a great work of prevention, for if the mother lives a normal healthy life during this time, the infant will stand a very good chance when it is born. On the other hand if the mother is diseased, or if she goes amiss in any way, such as by working too hard, then the baby has a much poorer chance in its life to come. By watching and ensuring a healthy ante-natal hygiene we shall help to bring about a more satisfactory state of affairs. During pregnancy the mother has to nourish and direct the development of her unborn infant, and it is of vital importance that she should be able to bring increased efforts to meet these new demands. It is well known that even the most hereditary diseases can often be treated with success after birth, and there is good reason to suppose that disease in the infant can be even more successfully treated during the nine months before birth, a time when the organism is so easily altered. The most common effect of disease on the mother is that the child is prematurely or stillborn; the number of these cases is large, but exactly how numerous they are it is impossible to say without compulsory notification not only of all living births but also of all stillbirths.

Dr Ballantyne says that it has been calculated that there are about 19,000 stillbirths each year in England and Wales. This is only an estimate, and the number is probably a great deal higher. On finding out where these stillbirths occur, we could by visiting and treating the mothers reduce their numbers very considerably, and help to ensure that the next pregnancy is better. Another advantage of registering all stillbirths would be that we should be able to see that all deaths

registered as such were really stillborn. There is at present very little hold on a mother who says her child was stillborn, and there is reason to believe that some of these stillborn children have really lived. The child is perhaps not wanted, and this is an easy way to get rid of it. In Scotland all stillbirths have to be registered according to the Notification of Births Act, and it should be the same in England. In some cities in England, *e.g.*, York, there is a voluntary arrangement with the Registrar of the Cemetery, by which a weekly list of stillborn children buried is obtained, along with the names of those who give the certificates of burial. This list is useful also to check the stillbirths received under the Midwives Act. The authorities can then enquire into the condition of the child at birth, and see that every possible effort is made to prevent future stillbirths.

Again, if we could find out where the expectant mothers are, a great many of the troubles and discomforts of pregnancy could be avoided. The mothers should be encouraged to go to their doctor more often while they are carrying a baby, and not go for the first time just at or before the confinement. Many infants could be saved in this way by a little forethought on the part of the mother, and many mothers could also be saved from having a most anxious and trying period to go through while the child is being born.

Again, the mother may be so deformed by previous disease, such as rickets, that she cannot be delivered of her baby in the usual way, and this is only too often discovered just before the birth of the child. During the last stages of pregnancy the mother may be developing a disease called eclampsia (puerperal convulsions). Both this and any deformity likely to embarrass labour can be found in good time and alleviated, if looked for by a competent person, such as the visitor or doctor, who may have been consulted.

The maternity benefit of the National Insurance Act has done a great deal of good, but the mother often needs the means whereby she can rest or at least discontinue hard work just before the confinement. It is a serious matter to advise a mother to give up work during pregnancy, and she is in most cases much the better for easy work. Moreover, the

extra wages earned help her and the family to have better food just at a time when it is specially needed. Even the well-to-do mother is the better for taking plenty of exercise during pregnancy, instead of leading an indolent life.

This is borne out well at the Infant Consultations, where mothers of all kinds attend; it is nearly always the strong, working mothers who have the healthiest babies. Even if the mothers have been doing hard work in the way of scrubbing or charring, as long as they are healthy, the babies will be like the mothers, well in every way, and not apt to give rise to anxiety at any time. On the other hand, the mother who does little work, and who is, nevertheless, well-nourished is seldom found to have as healthy or strong a baby as her poorer neighbour. A determined attempt to improve ante-natal hygiene is being made in New York by Dr Philip van Ingen. The work is being done in the district of Manhattan, which is the oldest and most congested part of the city, and where there is a very high Infant Mortality during the first month of life. Eight trained nurses are at work under a physician and a supervising nurse. Their duties are to get in touch with all the expectant mothers, and to help and instruct them in ante-natal hygiene. As soon as an expectant mother is found, the nurse sets out to make that woman a friend, and in few instances does she fail. A careful record is kept of home conditions and previous confinements. If any abnormal physical condition is found the woman is advised to consult a doctor or go to a hospital, and it is even the duty of the nurse to go with the patient. The nurse keeps a watch on the mothers all through their pregnancies, and can be found in any emergency. As soon as the baby is born visits are made every two or three days, till the baby is a month old, by which time the mother will have put herself in touch with one of the schools for mothers. It is the persistent friendliness which gains the confidence of the mothers, and directly this is gained the results are far-reaching, not only in their own lives, but in those of their friends and neighbours. Through following the advice given, many who had not succeeded in doing so with previous infants, have been enabled to nurse their babies, and the

pleasure of the mother is very marked when she shows the newly-born baby to the visitor.

Last year 94·1 per cent. of all the mothers were nursing their babies entirely at the end of the first month, and the stillbirth rate of the city was reduced by no less than 23·3 per cent. If this can be done in New York, where conditions and climate are worse than in England in regard to infants, it is reasonable to suppose that by somewhat similar means the same can be accomplished in the British Isles.

The attempt to improve the mothers in home and personal hygiene, with a view to reducing the high Infant Mortality, is being made in one of the wards of the city of Birmingham. The work is being carried out by the Birmingham Women's Settlement School for Mothers, at the head of which is Miss Fowles. In this ward the Infant Mortality rate has never been below 200, and 79 per cent. of the mothers work in factories from the time of leaving school, and 61 per cent. of these women continue thus to work after marriage, either regularly or in times of stress. Visits are made to expectant mothers to see that all goes well, and afterwards the babies are brought to an Infant Consultation, at which they are weighed and those ailing or requiring advice are seen by one of the honorary medical officers.

These visitors can counteract the ignorance of the poor better by personal contact than by holding classes, and it is only in this way that some of the traditions and superstitions of the poor can be overcome. One of the difficulties of all this kind of work is the dealing with a large population of a moving type, who take furnished rooms for a time, and leave as quickly as they come.

No doubt, in the future, the Infant Consultations and the municipalities will work together more, so that the mother will be helped from the time she is expecting right up to the time the child is beginning to go to school. All such institutions will be the better for being linked up, so that there is no loss of continuity, and no overlapping. The infant is worth doing a very great deal for, but, on the other hand, we must be careful not to take too much of the responsibility from the mothers.

(b) THE NOTIFICATION OF BIRTHS ACT

There are two great questions on which we require information: Where is the baby? And who is looking after it? The first is answered by the Notification of Births Act, while the second is attended to by the health visitors, the midwives, and the Infant Consultations, who help the mothers in every possible way.

In 1907 Lord Robert Cecil's bill for the Compulsory Notification of Births became law, and by the Act we get to know where the babies are, and when they arrive. This is really the starting point of the whole campaign against Infant Mortality. The Act is not compulsory all over the country, but it allows municipal authorities to make it so in the area under their control. It cannot, however, be adopted for any locality other than a rural or urban district. The provisions of the Act are as follows: (1) In the case of every child born in an area in which the act is adopted it shall be the duty of the father of the child, if he is actually residing in the house at the time of the birth, or, in his absence any person in attendance on the mother at the time of, or within six hours after the birth, to give notice of the birth in writing to the medical officer of health of the district.

(2) The notice shall be given by posting a prepaid letter or postcard to the medical officer of health, giving the necessary information within 36 hours of the birth.

The local authority shall supply addressed and stamped postcards for the purpose free of charge to the doctors and midwives in its district.

If the father fails to carry out his duty in notifying the birth of his child, then the doctor or midwife, according to who has attended the birth, is held responsible, and if they do not see that the law is carried out they are liable to be proceeded against and fined. This is one of the bad features of the act; it is wrong that the doctor should be made responsible for the father's neglect and, moreover, the doctor is performing a public duty for which he is not rewarded in any way.

The Act applies to any child which has been born after the expiration of the twenty-eighth week of pregnancy, whether alive or dead. For a time after the Act was put into force there were a good many omissions, but these have gradually been reduced, so that a very high percentage of all births are now notified. It is possible by comparing the births registered with the notifications received to see how many fail to notify, and in this way to keep a check.

Towns in which the Act is not in force rely for their knowledge of the births chiefly on the midwives, or failing them on the Registrar. The midwives are provided with forms, which they fill up directly a child is born in their practice, and post it to the medical officer of health. By this means Salford has been able to hear of 75 per cent. within a week of birth. This town is, however, now adopting the Act.

The notification of births must not be confused with the registering of the birth of the child by the parents; this latter has to be carried out within six weeks of the birth, and most parents do not register their children till the end of this time. It is important that the homes should be visited at the earliest possible date after the birth, and this can be accomplished in places where the Act is in force. Many parents give false addresses to the Registrar of Births, and this, together with the fact that the registration need only be carried out within six weeks, is the cause of many homes being unvisited. Again, many infants die before the age of six weeks, and it is reasonable to suppose that had these been seen directly after birth, some at least might have been saved by medical advice, or by the child being admitted to a hospital. It must be remembered also that a large number of parents do not register their children till after the six weeks, so that, when the health visitor pays her first visit, she finds that the child, instead of being about six weeks old, is often a great deal more. Again, infants are often registered as legitimate but prove on investigation to be illegitimate, and it is these latter who require the most careful supervision.

The percentage of cases notified respectively by the doctor, midwife, and father, of course, varies in different places, but

on the whole the parents notify the most. The percentage of births actually notified in towns where the Act is in force also varies from about 60 per cent. to 90 per cent. and over.

We have seen in previous chapters that excessive Infant Mortality is brought about by many and various causes, such as ignorance, poverty, bad housing, etc., and it is plain that the responsibility of this must be shared by sanitary authorities, landlords, and last, but not least, by the people themselves. It is of no use for only one agency of reform to be at work if the others remain passive. We must have an increase of co-operation in everything which helps to diminish the drain on human life, and in recent years there has been much more working together. The notification of births allows of more linking up of authorities, for if the Act is carried out satisfactorily, every new-born baby is within reach, and the mother can be helped and instructed if necessary by the different agencies, which are at work to diminish Infant Mortality.

“The object of child welfare work is to ensure that each parent has within reach accurate counsel as to the hygiene of childhood, and as to the general and domestic conditions necessary for ensuring its maintenance. From the standpoint of medicine this implies such advice as will conduce to the prevention of minor ailments, to their prompt discovery, and to that early treatment which is essential for the prevention of more serious disease.”

Under the Act, as stated before, information of birth is given to the medical officer of health within 36 hours, and in many towns every child is at once visited, for it is now realised that by this means alone, not only the competent and good mothers, but the ignorant and poor can be reached, and it is these latter who need the most help.

The visiting of infants and the instruction of the mothers as to details in feeding and general hygiene, form an important part in the infant's welfare, and it is the recognition of their value in bringing the skill of doctors and nurses to needy families, which is important. Care and tact have to be in evidence when this first visiting is done, and all houses should be visited if the home circumstances are such as to make it

probable that any advice given will be acceptable or necessary. It is impossible to draw up a hard and fast rule, but it is well to avoid a house where a medical man is in attendance, unless his consent has been obtained.

At the present rate of progress it will not take long before the Act is almost universally in force throughout Great Britain, for over 60 per cent. of the population are already under it. According to the Local Government Board report on Infant and Child Mortality, 1912-13, the Act has been adopted by 74 out of 98 of the large towns, and 67 out of 111 smaller towns in England and Wales. Voluntary notification is also in working in some other towns, and some of these are now adopting the act making notification compulsory. There is a question as to whether the present interval of 36 hours between the birth of the child and the notification is satisfactory, or experience gained gives any indication that a longer interval should be allowed.

Dr Newsholme has asked the opinions of 170 medical officers of health throughout the country, and over half of these are in favour of leaving the length of time (36 hours) as it is. The reasons given were mainly two :

- (a) That if the time is extended, the notification would, in many cases, be forgotten ;
- (b) That there are in some places unsatisfactory local midwifery arrangements, thus making it important that the infant should be visited by a health visitor as early as possible.

Those in favour of postponing the interval give as their reasons :

- (a) That the local midwifery arrangements were good, and the infants can be left to the midwife with confidence ;
- (b) That friction is at times caused with the doctor or midwife, when the visiting is begun too soon, and also because the overlapping is undesirable.

It is suggested by some that the notification of births and the registration be combined into one, and that this be done within 3-4 days of the birth of the child. After experience the Act may need altering, perhaps only for certain districts, but there is no doubt that the present time limit is working satisfactorily in most places.

The question now comes : When should the first visit be paid to the house from which a birth has been notified under the Act ? The workers who pay these visits may be termed health visitors, though the term includes many besides those whose training has been specially that of health visiting. These visitors may be either paid or voluntary. As we have seen, there is a variety of opinion existing in different towns as to when the first visit should be paid ; the chief cause of this is due to the question whether it is advisable for the health visitors to visit the homes while the doctor or midwife is still attending. This overlapping may cause friction, and if the midwife is willing and capable of advising the mother well, there is no need for health visitors to go to the home till the doctor or midwife has ceased attending, which is usually at about the tenth day. If this is so the midwife must be a woman who can be relied upon to report all disorders and all cases of ophthalmia in the infants at once. It is clear, however, that this cannot be ensured in all districts, for midwives are found to neglect reporting cases of ophthalmia, and the mothers are not always instructed properly or encouraged to breast-feed their babies. Some of the mothers would have continued to breast-feed their babies if the midwives had been more intelligent or taken more care to impress upon them how important it is for the baby. Maternity work is without doubt improving very rapidly, and perhaps in a few years the standard will have risen so that there will be no overlapping in any district.

If the Health Visitor has plenty of tact and takes great care at the time she is visiting before the midwife has finished her full time of duty, friction should be prevented, but the Health Visitor must always keep in mind that she is as it were intruding before the tenth day after the confinement.

The Maternity Benefit of the National Insurance Act.

The working of the maternity benefit has, on the whole, been without doubt satisfactory. The object of the benefit is to enable the mother to have a little extra money at the time of childbirth, for at this time she has extra expenses, such as

the midwife's fee. Moreover, at this time the mother should be enabled to rest and get plenty of good food.

As Alderman Broadbent says in the *Pall Mall Gazette*: "First of all there must be absolute security for safety in birth, that is the mother should have skilled medical attention. But the life is not yet independent because the mother has the key to the baby's food, and the most part of the maternity benefit must be conditioned on the mother feeding the baby. With these two essentials adequately secured, probably the 30s. will be exhausted." The good of the maternity benefit is of course dependent on the money being spent in a proper way. There are in every district parents who have not received the benefit, though their needs were great, but it is generally either by reason of non insurance or by their own neglect that they have not received it. Before the benefit can be received the necessary number of contributions (26) must have been paid by the parent before the birth of the child, and the contributor cannot pay up any arrears there may be in order to receive the benefit. The maternity benefit is thus not on the same lines as the sickness benefit, where the contributor can make up his arrears and receive his sick pay.

The maternity benefit would be exceedingly useful to many non-insured persons who are no better off than the insured, and the reason they are not insured is that the husband is often his "own master," which class includes the small shopkeepers, hawkers, etc. All these latter would receive great benefit from the money. The maternity benefit is at present paid to the husband, but in a few cases the Insurance Society retains part of the benefit to pay the midwife, or the maternity hospital direct, while a few societies pay 15s. immediately after the confinement and 15s. a fortnight later.

In some instances, where the woman makes application to the society and explains that the husband will certainly abuse the benefit if it is given to him, direct payment is made to the woman. Payment "in kind" is never made by the societies, except in a few cases, as explained, to the hospital or midwife direct. The parent who belongs to an approved society is very much better off than when he is a deposit contributor,

for in many cases the latter's benefit only amounts to a few shillings instead of the 30s. of the former. This is now being realised by the deposit contributors, who are largely transferring to the approved societies. In some instances both parents are insured, and while the husband's society pays the maternity benefit, the wife's society pays sickness benefit for two weeks before and after the confinement, and in this way quite a good sum is received.

One effect of the Act is that midwives are now more certain of their fees, as the people are better off at the time, but it has also had the effect of raising midwives' fees. These have in many cases been raised from 10s., the old charge, to 12s. 6d. or even 15s., and on these accounts midwives are eager to take as many cases as they can get. This raising of the fees is often a hardship to those who are not receiving the maternity benefit and also to the deposit contributors who are not receiving the full 30s. It is essential that the benefit should be paid directly after the confinement just when it is most wanted, as any delay in payment may lead to the money being spent in other ways and not on the necessities of the confinement. The money is generally paid from about three to fourteen days after the confinement, and a common cause of delay in the matter is the non-claiming of it through ignorance by the insured person. There is unfortunately much abuse of the benefit, generally by the husband, who spends part at least of it in drink or in buying new clothes. At times the rent is paid with the money; or, again, the husband has a fortnight's rest from work. Lately there has been an agitation to get the benefit paid direct to the mother instead of to the father, in the hope that the money may be better spent, and at the conference on Infant Mortality held in London in August, 1913, the following resolution was passed unanimously: "That this conference urges that the maternity benefit be made the property of the mother, both in practice and in law."

On the opposite side there are many, including some societies like the Ancient Order of Foresters, who think the husband should have control over the money and that it is an unwarrantable interference with domestic life to change and make the

benefit payable to the mother. In legislation we must be guided by normal conditions, and it is always bad to legislate for the abnormal. If it is found by experience that the benefit is being wasted or badly spent by the husband, we should change the law, and allow the mother to receive it direct. Surely, however, the bad husbands are in the minority, and if this is the case, we should be able to trust the greater number to do all that is necessary and possible for the wife and child at this time. On the other hand, the mother should have plenty of opportunity before the confinement of making application for the money to be paid direct to her if the husband is not to be trusted with it. These applications on the part of the wives would, of course, need very careful investigations.

We must not think there are only bad men and no bad women in the world. All social workers know of men who cannot allow their wives to handle any more money than they can help, for if they did the well-being of the whole household would suffer. The maternity benefit may be taken to mean that some sense of the importance of the care of the mother-to-be and the mother-that-is has at last been expressed in legislative enactment.

Lately a suggestion has been put forward that the Public Health authorities should have the administering of the maternity benefit. Every mother would have to report to the medical officer of health for the town, or his deputy, the fact that she was going to give birth to a child. The women would then be watched and cared for during the latter part of pregnancy and the money paid directly the child is born. The advantage of this would be that there would be supervision during pregnancy and childbirth, and, moreover, the arrival of every baby of an insured person known about.

The Influence of the Midwife on Infant Mortality.

We have seen in the previous section how we find out where the baby is, and we now require reliable information about—Who is looking after it? Midwives attend by themselves, or with doctors, a very large proportion of the births in this country, and for this reason we must do all within our power

to see that they are thoroughly efficient in carrying out their duties. The midwife has a very responsible duty to the mother and child at the critical time of birth, and it is important for us to know how many mothers and infants are cared for by midwives alone and with what results as far as they are concerned.

The Midwives Act, 1902, has helped to make midwives much more efficient than they were before, and they are now all carefully supervised by lady inspectors, who see that they carry out the requirements of the Act and the rules of the Central Midwives Board, who examine and control midwives. This has been of great service to the country in raising the standard of midwifery, for the local supervising authority has power to censure and suspend any midwife for neglecting to comply with the rules of the Central Midwives Board. By spending money and time on midwives, we shall be working on preventive lines, and the more we spend on the mother and child at the time of birth, the greater will be the economy in later years. We shall lose fewer children and the mothers will pass through childbirth with less danger to themselves. Midwives should be proficient in infant hygiene, so that they can give suitable advice as to the feeding of the child until the Health Visitors take on this duty, generally about the tenth day after birth.

It has been pointed out under the Notification of Births Act that in the places where the midwives are really efficient there is no need for the Health Visitor to visit till the tenth day after the birth of the child. This is an advantage, as it makes the Health Visitor's work lighter.

By looking up regularly all births we can supervise the confinements attended by midwives, and it is possible in this way to direct special attention to those midwives who are incompetent or careless. Every district has a certain number of these, who have had little training because they had been in *bona-fide* practice before the Midwives Act came into force. Year by year the number of these is becoming reduced and the majority of midwives are now efficient.

It is the duty of the midwife, who is engaged for a case,

to examine the pregnant mother at intervals before the confinement in order to see that all is going on well and that abnormalities may be discovered before it is too late. The midwife succeeds or fails according to the number of difficulties she prevents and not by the number of cases she attends. She must be competent to diagnose all dangers which may threaten the mother and child during pregnancy, but it is the duty of the doctor to supervise the treatment of the abnormalities, or the woman must be sent to a maternity hospital. It is a disgrace to a midwife if she is always finding among her cases abnormalities, such as contracted pelves, just when labour is beginning. There are also the cases of ophthalmia neonatorum in infants, and it is generally recognised that a large proportion of the blindness in the country is caused by this disease. It is in the hands of the midwives to prevent almost certainly the whole of it by recognising the symptoms at once. The midwife has also a great responsibility with regard to the baby. She has to overcome the difficulties about breast-feeding and to persuade the mothers to persevere with this although it may appear hopeless at the start. Many more mothers than at present do so could feed their babies if they would only persevere in the attempt a little longer. If the baby cannot be breast-fed it is the duty of the midwife to advise how it should be fed and also to see if it is thriving. Artificial feeding for the baby at the beginning is an all-important subject.

All these duties are not learnt at once, as our continental neighbours—France, Italy, Belgium, Holland, etc.—have found out, for in these countries a two years' training for midwives is demanded. In England a three months' training is considered sufficient, and before we can demand a longer and more efficient training we must see that the midwife has better pay and that a superior class of women take up the work. Under the Insurance Act more and more cases will be handed over to midwives, and for this reason alone we must see that they are adequately trained.

There should be supervision of the pregnancies of the poor as well as those of the rich, and there should be plenty of

maternity wards in our hospitals, so that all complicated cases, which cannot be treated efficiently at home, can get relief from their sufferings and be enabled to bear a living child.

There are many women whose several pregnancies have ended in premature or stillbirth but who when looked after carefully in a hospital have borne a living child.

In country districts, where Health Visitors are few, midwives are generally the supreme authority on the bringing up of children, and they thus need a careful study of infant feeding and management.

In towns we should try to promote co-operation between the midwife and the Health Visitor. Friendliness between the two would be an incentive to the midwife to hand over her charge not only in good condition but with its feeding arranged on a scientific basis and justified by an increase in its weight since birth.

There is also the subject of ophthalmia neonatorum (eye disease in the new-born), as stated before, which requires the special attention of the midwife in every case she attends. Any neglect in attending to the child's eyes immediately after birth may result in permanent blindness. Some 50 to 60 per cent. of the blind from childhood are without sight through simple and elementary causes, which wider knowledge and matured intelligence ought to remove. It is within the power of the midwives to remedy this to a very great extent. When we have, as we now have, so many children, men, and women going about sightless because of the lack of simple care at birth, we must concentrate our attention upon the children early.

During the time the mother is laid up the midwife can often help to make the home routine go easily, although, of course, this is not exactly her duty and she has little time to spare. Very often the neighbours, who are good to each other, will help at this time.

CHAPTER XII

THE CHILDREN ACT—INFANT LIFE PROTECTION—
INFANT LIFE PROTECTION VISITORS*(a) Children Act, 1908.*

To help to remedy the huge Infant Mortality among the illegitimate the Government passed the above Act in 1908, and this, together with the work done by the Infant Life Protection Visitors, has greatly improved the life of these children.

The new Act is a decided improvement on the old one of 1897, for it is much more strict and binding on all who take for reward any children under their care.

Unfortunately it frequently happens that the mother has to go out to earn her living, with the consequence that she has to be separated from her infant. This is a great difficulty, and the remedy chiefly utilised is to board the child out in a house for a weekly payment; in many cases, however, it is very hard to find a suitable home for the child.

The chief points in the Act of 1908 with regard to the boarding out of infants are as follows:

A. (1) Where a person undertakes for reward the nursing of an infant away from its parents, notice in writing must be given to the local authority (Guardians) within 48 hours of so doing.

(2) The notice has to give particulars regarding the child and the person receiving it, etc.

(3) If the person who has undertaken the nursing of an infant for reward changes her residence she has to give notice to the local authority and also to the local authority into whose district she goes.

(4) If the infant dies or is removed from the care of the person who has undertaken its nursing, notice has again to be given within 48 hours.

(5) Failure in giving any of these notices is punishable by fine or imprisonment.

B. (1) Every local authority must carry out this Act and make enquiry as to whether there are persons in their district taking infants for reward.

(2) If there are persons taking infants for reward, then the local authority shall appoint one or more persons of either sex to be Infant Protection Visitors, whose duty shall be to see that the Act is carried out, and they shall give advice as to the nursing and maintenance of the infants.

(3) In the case of the death of any infant coming under this Act, notice has to be given by the person, who had charge of the infant, to the coroner within 24 hours of death. The coroner then decides as to whether an inquest must be held.

(4) No life insurance on any of these infants is allowed.

With so many illegitimate children born each year little imagination is needed to see that there is a great opportunity for wholesale traffic and dealings of all kinds with these babies. There are many mothers only too willing to be rid of the baby, and hence the need for the Children Act and the Infant Protection Visitors, who see that all goes as well as possible with the baby.

There are two ways by which a mother can get rid of her infant—she may either board the child out and pay so much a week, or else she can pay a lump sum down and part with her baby permanently. The former is by far the commoner method adopted. In Manchester during 1913 there were 370 children boarded out, and of these only 4 had been adopted for lump sums. The boarding out of infants for a lump sum is extremely bad and leads to much corrupt practice. It is evident that it is in the interest of the person who takes the child for a lump sum to let it die or otherwise dispose of it as soon as possible: the sooner this takes place the greater the profit. These people, or “baby farmers” as they are called, do their work as secretly as possible, not only because the whole business is illicit but also because if their methods were widely known there would be a great outcry against them. The Children Act, 1908, has without doubt largely diminished

their trade ; an interesting account of how it was formerly carried on is to be found in a book¹ written by a director of the National Society for the Prevention of Cruelty to Children. This society is doing a large amount of good work for these children.

(b) *Infant Life Protection.*

This section is concerned with the mortality among illegitimate children and the means taken to reduce it. Reluctance to look the stern facts in the face has in the past characterised many efforts to protect these children, and, moreover, it is a very difficult problem.

One of the reasons for mentioning these children, of whom we all know there are many in every town and country throughout the world, is that the Infant Mortality among them is very much higher than among the legitimate ; in many places it is twice or even three times as high.

In Manchester during 1911 the Infant Mortality was 156 per 1000, but while it was 148 per 1000 among the legitimate it was 336 per 1000 among the illegitimate.

These infants are not wanted by their parents, and, in consequence, die in larger numbers ; it is good, however, to know that England compares well with other countries in this respect. But the proportion of illegitimate children in England and Wales is not decreasing as quickly as one would like ; it has only decreased about 10 per cent. in the last 30 years. However, some of them are subsequently made legitimate by the marriage of the parents.

As I have said, the mortality among illegitimate children is very much higher than among the legitimate. This is especially so during the first month of life, and is due to the fact that illegitimate children have not only to contend with the causes of death common to all infants, but they have also against them the fact that the mothers are often indifferent to them, and, as said before, do not want them.

It is a doubtful and difficult point to settle whether illegitimate children, taken as a whole, are less healthy at birth than the legitimate. From the fact that the parents are often so

young, their environment frequently very bad, and the mother often working hard till the day the child is born, makes it probable that these children are in many instances under weight

LEGITIMATE AND ILLEGITIMATE.

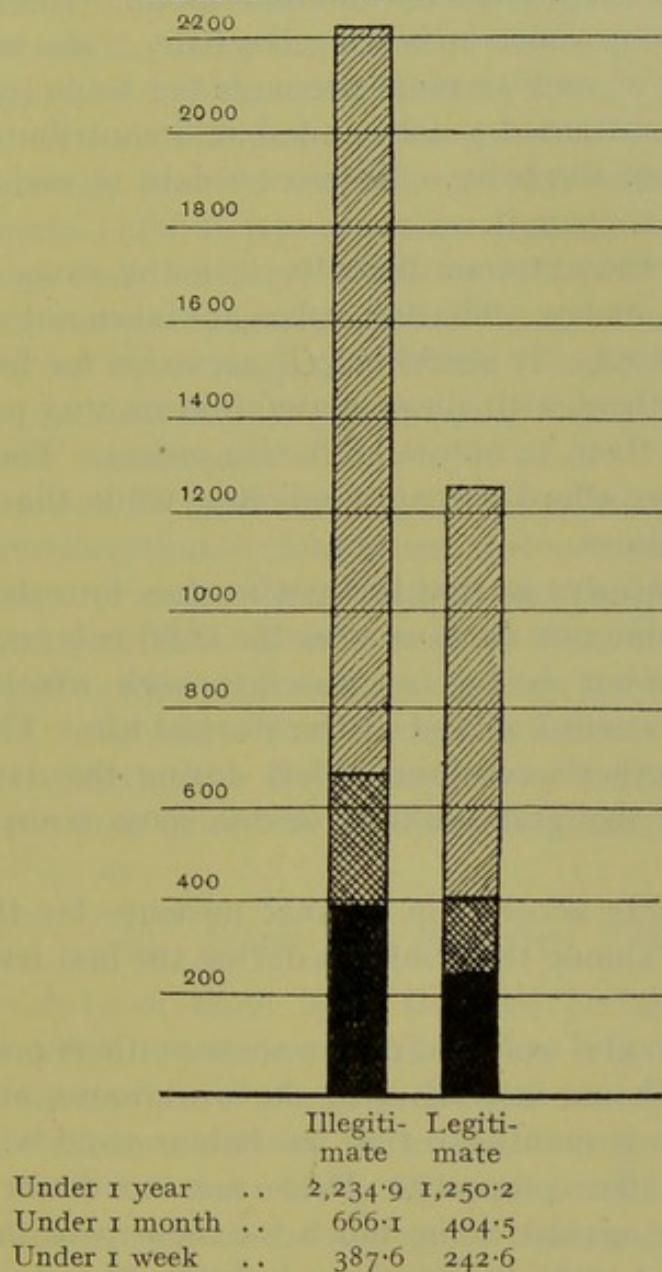


Fig. 9. Infant Mortality rates per 10,000 births among illegitimate and legitimate children in London and certain rural counties in 1902.

and feeble. Experience bears this out, and it is found that a large number are born weakly and unfit to stand much hardship or strain in the early days after birth.

Illegitimate children are not worthless, and if looked after at the start of life often grow up to be the best of citizens, and for this reason alone we should give them every chance. Now the best chance consists in keeping the mother and child together for some time after the infant is born. The mother has had a great experience in bearing the baby ; she will gain much by keeping it, and we must persuade her to do so. The father has also contracted a debt and should contribute regularly to the keep of the baby. He owes a debt to society and should be made to pay it.

There is also the extreme difficulty in many cases of supporting the child, as few affiliation orders are taken out and few of these are enforced. It would help if provision for free legal assistance to mothers with illegitimate children was provided in order to assist them to obtain affiliation orders. The father can almost always afford to pay a solicitor, while the mother can hardly ever do so.

What often happens is, that the mother goes into the workhouse, only to come out 14 days after the child is born, and as soon as she comes out she has to go back to work, which means that the baby is weaned almost at the start of life. The baby also loses the mother's care and is left during the day to be looked after by the grandmother or by some irresponsible person.

The above facts account in a great measure for the high rate of mortality among these infants during the first few weeks of life.

It would be good if we could detain these mothers preferably in some kind of home instead of in the workhouse, and keep them there for some months so that the babies could be breast-fed and looked after properly. There are, no doubt, many social arguments against doing much for these poor mothers ; however, it is not only the mothers but also the children of whom we have to think, and it is quite unfair to visit the sins of the parents on the children. It is on these unfair lines that some maternity hospitals are run, where single women are not admitted, and I know of a lady subscriber to such a hospital who wrote saying that she was withdrawing her subscription

as she had heard that a single woman, who was about to have her first baby, was going to be admitted.

The fact that there is a higher Infant Mortality among illegitimate children than among others shows us that it varies according to the care bestowed, especially during the first few weeks. One cannot help thinking that very much of this deplorable leakage could be prevented.

It is conceivable that, given an improvement of environment, after the first few weeks the average health of the surviving illegitimate child is not less than that of any other, for the weaklings and those not cared for will have died. This loss, however, cannot by any stretch of imagination be called good, as many of the strong and healthy illegitimate children will have succumbed or been permanently injured by the hardships they have undergone.

There can be no doubt that many of the men and women who have illegitimate children are feeble-minded, and in a large percentage of cases their children are also feeble-minded. It is a great pity that these have been allowed in the past to go about just as they pleased, producing feeble-minded children at short intervals. The Mental Deficiency Bill, 1913, will help to restrain the feeble-minded in a greater degree, with the result that there will be fewer illegitimate children in the future.

(c) *Infant Life Protection Visitors.*

The duty of these is to see that certain sections of the Children Act, 1908, are carried out, and practically every large town has one of these special visitors. They are in nearly every case ladies working under the Board of Guardians, and as the work does not usually fill up their whole time, they have other duties, such as those of cross visitors for out-relief cases of widows with children under the Guardians.

It has been pointed out that almost all nurse-children are illegitimate, and thus nearly all the work of the Protection Visitors is with this class of child. Since notice has to be given to the local authority, the Infant Life Protection Visitor knows exactly where every one of these children is. She has to watch

very carefully for any infringement of the Act, for without very careful and frequent inspection many of these luckless children could be allowed to die or be moved quickly on to another town where nothing would be known about them.

The visitor has to report each month to her committee as to the suitability of all the applications received from people wishing to receive and maintain infants for hire or reward. If she reports that the proposed foster-parents are unsuitable, then the license is withheld, and in some cases the license is withdrawn from the foster-parents on account of their not looking after the child in a proper manner.

Nearly all these children are nursed in congested districts, but it is satisfactory to know that many of the foster-parents have excellent homes and are thoroughly capable of undertaking the care and feeding of infants, although there is often a great difficulty in regard to the placing out of nurse-children; especially is this the case in finding homes in the more healthy suburban districts, as persons here are unwilling to undertake the care of children for less than 7s. to 8s. a week, and the mothers, in the majority of cases, can seldom pay more than 5s. a week. For this reason most of these children are placed in homes situated in the crowded streets of our large towns.

A good foster-parent does not mind being inspected; on the contrary, she often makes good friends with the visitor and realises that she comes more as an adviser than as an inspector. Again, an affectionate mother appreciates the protection the child gets from the visitor.

We have now to consider how it is that foster-parents are obtainable at so small a sum as 5s. a week. In the great majority of cases these children are taken in order to swell the family income, or, at any rate, with the idea of doing so. It is easily realised that there can be but little profit, as an artificially fed baby costs anything from 2s. 6d. a week for milk alone, and the milk bill is larger when the baby is a few months old. Not only this, but the child needs caring for and watching throughout the 24 hours. In many instances the money received helps to pay the rent, and it is thought that one more or less in the home does not matter. The consequence

of this is that the foster-baby gets, only too often, insufficient and unsuitable food, and sleeps with many others in an overcrowded room. The parents in some cases fall into arrears with their payments or manage to leave the town, and unless the foster-parents are willing to take the risk of being paid later the child has to go to the workhouse.

Foster-parents willing to take a lump sum of money down for a child often employ the money so obtained in setting themselves up in a small business, or they take the child because they are in financial difficulties, which they hope the money will enable them to overcome. Now if we make a calculation as to what this lump sum should be, it is found that at the very cheap rate of 5s. a week for the child till he or she is 16 years old it amounts to £208. Very few sums of this size are paid, for the reason that a large number of the children will not survive and that sooner or later the lump sum falls into the agent's hands. The less the child is cared for, the greater the profit and the less the incentive to do the best for it. This is not so in the case of the weekly payments, and this latter method is by far the safest and least open to corruption. Every human instinct seems blunted when the demoralising effect of the lump sum premiums takes place, for the money element is a grave source of danger. But nurse-children are at times taken by persons simply for the love of the child ; this happens even among the poor. The foster-parents in most of these cases are devoted to children, but have none of their own.

Sometimes it happens that people are anxious to adopt children with a view to their becoming useful in their homes, but these are generally older children, who can be made useful at once.

Many people are still unaware of the Children Act, although posters have been issued and other means of advertising it have been used to make it public : the provisions of the Act would become better known if fresh posters were issued after each prosecution, and this would have the effect of preventing people from unknowingly contravening its provisions.

The visitors can at times help the mothers to the procedure necessary to establish paternity and secure payments, for it is

only right that the father should take a share in the responsibility. An argument that has found favour with many people interested in the welfare of children is that when a foster-mother takes more than one child greater profit is made, and it thus leads to a good deal of underhand dealings. This is not borne out by the experience of the Infant Life Protection Visitors, whose opinion is that most of the women who take two or three of these infants are very good foster-mothers to them.

The Empress Catherine II of Russia seems to have been one of the first to refuse to hold these children responsible, and in consequence she built a foundling hospital for them. There was always a basket with warm clothes ready day and night outside the hospital to receive these babies, about whom no questions were asked.

The Children Act unfortunately does not apply to those who take children by the day, when the mother goes out to work. Such mothers are on the whole better than those who put their children out altogether. Crèches fill a want for these, for the babies and children are much better cared for during the day in a crèche than in a small home.

Feeble-minded Mothers and Infant Mortality.

By a feeble-minded person we do not mean that a person is an idiot but is one who is not capable of looking after himself or herself. Few facts are more sure or better known than that a great many of the illegitimate children are feeble-minded and born of feeble-minded women. It is admitted that among the ranks of the feeble-minded there is little resistance to temptation and from their lack of ability to protect themselves these people fall an easy prey to vicious influences². In the time of their trouble they go into the workhouse and after a short interval come out leaving their infants behind. This in many cases takes place several times, so that a mother may in the course of a few years give birth to a number of children, who have to be supported out of the rates. Not only this, but most of these children are feeble-minded like the mothers and will probably

repeat the same process when they grow up if they are not cared for.

Feeble-minded women are exceedingly prolific; this fact is well illustrated by a case in which there are no less than 40 descendants of a feeble-minded couple all in the workhouse, all feeble-minded and two-thirds illegitimate.

Why should we allow these children to be born and grow up degenerate? They are seldom able to support themselves and they are a considerable expense.

The new Mental Deficiency Bill, 1913, which came into operation on April 1, 1914, will help to control these unfortunate people and to reduce their numbers.

Feeble-minded fathers need placing under control just as much as the mothers, and on no account must all the blame be put on the latter².

BIBLIOGRAPHY.

1. *The Baby Farmer*, R. J. Parr. N.S.P.C.C. 6d.
2. *Report of Royal Commission on Care and Control of the Feeble-minded*, vol. II. p. 142, 1913.

CHAPTER XIII

THE EDUCATION OF GIRLS IN DOMESTIC SUBJECTS

The last century was one of extraordinary and rapid change. The introduction of machinery brought about an alteration in the way workpeople did their work. For hundreds of years civilised nations used much the same kind of tools, such as saws, hammers, looms, etc. Now the people are engaged in workshops and factories where the greater part of the work is done by machinery. Another great change has taken place in education. Before 1870, when the Education Act came into force, children went to work at the age of 6-7 years; they did not attend school, consequently they could not read or write and there was an obvious lack of mental development.

After the Education Bill was passed schools were built, teachers found, and a great revolution inaugurated. Parents looked upon their children as "producers" from the time they could be of any help, and yet the most striking fact about it was that they were "bankrupt"—they could not produce anything at all. The same idea prevails among the poor at present, but in a less degree, for the children must now attend school up to the age of 14 years.

Previous chapters have shown how mothers can be helped and taught about the home and the baby. What is far better is that our girls should be taught home management before they are married; in this way they will at least get a good start and be prepared for the duties to come hereafter, for among the girls attending school are to be found the future mothers of the nation.

"To run" a home smoothly and well is an achievement of which any woman may well be proud; it has been taken for granted far too long that the proper management of the home and the infant comes as it were by instinct. It is a most promising fact, however, that people on all sides are now realising that the education of the future wife and mother should not be left to chance and that it is wrong to allow girls to leave school able to do many things that do not matter but quite incapable of doing the few things that do matter. Before we can justly be indignant with the mothers, especially the poor, we should see, while we are able to do so, that they have some opportunity of learning their business. This should be done during the last year or so in their school life and by classes after they leave school. They must learn in the home and in the school, but as opportunities often do not occur in the former, we must see that they do occur in the latter. We must teach girls about the proper care of infants and about household management in the same place in which we teach them other things, namely in school. Few girls have mothers who are in a position to train them in household management, and the home conditions generally render this difficult.

School education may roughly be divided into three divisions. There is first the primary education lasting till the

age of 13-14 years. After this comes secondary education, which finishes between the ages of 16 to 18 years, and this is followed by the tertiary, the higher or university education. The distinction between the three kinds of education is one of age, ability and curriculum, and it should not be limited to one social class alone.

"Time, which brings all things, has brought to the mind of England the suspicion that the idols it so long worshipped and the ideals by which it was so long deluded are no longer true¹."

The phrase sums up the present attitude towards education, and especially towards the education of girls. We have been on the wrong track too long. Education changes human beings, or we should not give so much thought and attention to it. The normal work of woman is to be the maker of a home, to be a wife and above all a mother, and a liberal education alone can fit her for this. Women have to live their own lives independent of men, whether as economic rivals or as possible wives, and to enable them to do this they must develop their intellectual faculties.

Mr Birrell, the Minister of Education, speaking at Leeds so long ago as 1901, said: "Still more would one regret if the vulgar notion were to get embodied in anybody's mind that elementary education was something for the children of artisans and agricultural labourers: that secondary education belonged to the children of the shopkeeping and middle class, while university education was the luxury of the rich. That would be a detestable idea."

As a matter of fact, however, the children of the poorer classes are obliged to go to work earlier, and thus age and cost in the three kinds of education bring in a certain amount of class distinction. There are, however, many scholarships, etc., which enable clever boys and girls to go to secondary schools and to the universities. As Miss Burstall² says, it is a real advantage to have a limited number of scholars from public elementary schools in an ordinary high school. These girls have a spirit of earnestness and hard work which is of great value to the tone of a form.

It is now understood not only that education must be given to girls as well as to boys, but that the subjects taught to each should be different. "What is sauce for the gander is not also sauce for the goose." Girls must be educated to fill in a first-rate manner the places they are intended to fill: as we have said, a woman's business is in the home, and for this she needs good administrative ability, judgment and foresight. A woman's knowledge of earning money need not be as extensive as a man's, but it is essential that she should know how to spend it. It is a shame to a boy if he cannot earn, and it should be a shame to a girl if she cannot spend to advantage.

Unfortunately the girl has become almost as much a wage-earning asset to her parents as the boy, and here comes the conflict between the educationalists on the one hand and the parents on the other. The former rightly urge that girls should, after they have left school, continue to train as housewives and mothers, while the latter require them to become wage-earners at once. So many, especially among the poorer classes, are not always clearly convinced that the adequate and intelligent fulfilment of domestic duties is a form of active citizenship or that it calls for any training. The short training in the period of school life cannot offer sufficient time, and it is essential, if the girl is to have any real knowledge of domestic duties, that she should continue to train after she has left school. Although girls attending the elementary schools are too young to be given anything beyond simple practical training in regard to the healthy infant, they are quite capable of profiting by suitable instruction. Many of them are used to caring for their younger brothers and sisters, so that the knowledge gained can be made use of at once. Instruction in the care of infants and young children is now becoming much more general than it was formerly³.

Time must, however, be given for the girl's development and her interest excited before much good can be done in the way of any higher training on these lines. Opposition by the parents to this training in the schools does not exist to the same extent now as in the past. It is extremely desirable that

after girls have left school they should attend a six or eight months' course of technical training in housewifery. The girls are then at an age when they are beginning to realise the importance of things and are able to be of real use to their mothers at home. They will often carry new ideas from the school to the home, and, when they start homes of their own, they should be able to manage things in a more efficient manner than their mothers did when they were first married.

Private schools are also now teaching girls cooking and household management to a greater extent than they did before. There are also many institutions throughout the country where girls from well-to-do families can obtain a thorough training in domestic economy.

As the education of the girls improves, they will realise the fact that apparently trivial illnesses may have far-reaching consequences and that often a little care at the beginning of an illness will ward off much more serious trouble later. This is well illustrated by a disease like measles, in which, if it cannot be actually prevented, much can be done to reduce the great risk of the child contracting bronchitis and broncho-pneumonia afterwards. Again, a little care at the onset of summer diarrhoea will materially shorten and diminish the severity of the attack.

The Principles of Teaching Infant Care and Management.

Dr Janet M. Campbell⁴ makes it very clear that some general principles must receive attention. First, the teaching of infant care and management should form part of a course in domestic hygiene and home management. All the instruction should be practical and the training in infant care should be connected with the cookery, laundry work, and housewifery, where classes exist for these. Secondly, teaching in all these subjects should be postponed till as late as possible in the girls' school life. Thirdly, all the teaching should be given in a practical way and in the ordinary class-room unprovided with much special apparatus, for what can be done in the class-room can most likely be done at home.

At the end of a course in infant care the girls should know how to wash and dress a baby; how to clothe it; the

advantages of natural over artificial foods; how to prepare the "bottles"; how to provide a suitable cradle, etc. Little mention need be made of disease, for this is not specially desirable or needful.

The teacher from the regular school staff is as a general rule better than an outside teacher. The former knows the girls and can better link up the training with the rest of the school work. She also knows the mothers and can impress upon all that the teaching must be made use of in the homes.

Many towns now have specially trained ladies, who visit the schools in turn and give these lessons on cookery, domestic economy, etc., and this plan is found to work well. No doubt these special lessons are better taught by the trained teachers. In most towns regular instruction on cookery, laundry and domestic subjects is now given to all girls in the elementary schools. In Manchester this is most thoroughly done, and it is well it should be so, for these subjects are likely to be of far more value than ordinary lessons to the class of girls attending the elementary schools, and instruction in them should be given directly the simpler and earlier subjects, such as reading and writing, are grasped. The cookery and laundry classes are held in rooms adapted for these subjects, and all lessons are made as simple as possible, nothing being taught which the girls cannot do in their homes. The domestic subjects are taught at small houses dotted throughout the city, so that the girls have not too far to go. The houses are small and similar, or in some cases rather better than those lived in by the girls at home and the subjects taught are contained in the Syllabus of Instruction given by the Manchester Education Committee.

The aim of the work is to show the girls, in a simple and practical way, how to arrange and do the week's work of an ordinary cottage home. The teachers reside on the premises and the girls attend for a continuous course of seven, eight or nine weeks' duration, during the whole of the ordinary school hours. Choice is made (as much as possible) of girls who are shortly to leave school. A continuous period of instruction enables them to get a much better grasp of the subject than would be possible if isolated lessons were attended.

The general instruction throughout the whole of the two courses consists of the following :

Housewifery. The qualifications of a good housewife. Importance of cleanliness and order in the home. Care and cleaning of sitting-room, kitchen, scullery, bedrooms, stairs, passages, wash-house, etc. Cleaning of flues, blackleading, laying and lighting fires. Washing-up. Care of glass, silver, knives. Care of linoleum and oilcloth, carpets, mats, etc. Care of household brushes. Laying and clearing table. Sewing, darning, household mending and patching, making aprons, etc. Home hygiene, simple first aid. Laying out money to the best advantage.

Cooking. How to plan and prepare the week's dinners. Marketing. Tea and coffee making. Bread and cake making. Jam making (when possible). Cost of dinners and household accounts.

Laundry. Preparation for week's wash. Sorting, mending, removing stains, steeping clothes, etc. Washing of household and body linen, and flannels, etc. Drying, folding, mangling, ironing, and airing clothes.

Lectures are given on two or three afternoons per week by the teachers on the following subjects :

Choice of a house. Drainage. Ventilation. Division of income. Keeping of accounts. Thrift. Management and care of household linen. Choice of food and clothes. Choice and care of carpets and floor coverings. Treatment of scalds and burns. Bandages.

Special lessons are given on the feeding and tending of infants and young children.

BIBLIOGRAPHY.

1. "The Education of the Middle-class Girls," *National Review*, Dec. 1913. Miss Edith Barnett.
2. *English High Schools for Girls*, Miss S. A. Burstall, M.A. Longmans, Green and Co.
3. See Annual Report for 1913 of the Chief Medical Officer of the Board of Education, p. 328.
4. *Memorandum on the Teaching of Infant Care and Management in Public Elementary Schools*, 1901, p. 5. His Majesty's Stationery Office.

CHAPTER XIV

FLIES AND THEIR RELATION TO DISEASE—THE REGULATION OF THE SALE OF FOODS AND DRUGS FOR INFANTS

Flies and their Relation to Disease.

From time to time various writers, without bringing forward any definite proof, have connected swarms of flies with epidemics of disease, but it is only of late years that it has been shown what a danger flies are and how they carry germs of disease. Until recently little trouble has been taken to procure definite evidence in regard to their relationship to disease and to investigate their habits and life-history. All these points have been carefully worked out by G. S. Graham-Smith¹, M.D., at Cambridge, who publishes some very interesting results. The Local Government Board has also had reports made by experts on flies as carriers of infection².

The common house-fly (*Musca domestica*) breeds in all parts of the world and belongs to the species most commonly found in houses. It is of the variety generally caught on sticky papers and in traps. These flies breed mainly in refuse of all kinds, especially in piles of manure which the females visit to lay their eggs and to feed. Under favourable conditions the life-cycle from the egg to maturity is completed in three to four weeks.

The study of flies as infection carriers first came prominently into notice in connection with enteric fever in the American-Spanish War, when they were confidently spoken of as transmitting infection from the excreta of the sick to the healthy. English observers in the South African War were strongly of the same opinion. It was, however, not until 1903 that much was done to verify this. Dr Niven³ then began to make observations on the subject and systematic captures of flies were made and their habits studied.

Flies can be marked either with paint or coloured chalks, liberated and then caught again at places varying distances

apart. They can also be easily kept in captivity and closely watched. Feeding experiments with coloured syrups have enabled their anatomy and digestive systems to be studied. They can travel considerable distances, even up to 1000 yards at least in open districts with a favourable wind, but they probably do not travel far in towns.

Flies have numerous hairs scattered over their bodies and legs, by which means they are well adapted for carrying bacteria from place to place. This they do when they fly from refuse into our houses and settle on food. Bacteria, besides being attached to their bodies, are carried very readily in their alimentary canals, especially if the flies have been feeding on refuse, and the bacteria thus ingested remain virulent for several days. Flies do not appear to be themselves affected by the bacteria which are harmful to man.

They have a habit of regurgitating a portion of their crop back many times at short intervals if they have fed well. Others then suck up this vomit and infect themselves with any bacteria that may be present. They also defecate very often after each feed, and by this means and by the vomit it is easy to see that infectious bacteria can be easily carried about.

Evidence clearly points to flies being the carriers of infection in certain outbreaks of infectious fevers, such as typhoid fever, and there is now evidence to show that flies are the factor which causes the autumnal increase of this disease in the country.

In temperate climates, however, epidemic diarrhœa is the most frequent disease which flies are supposed to transmit, and there are unlimited opportunities for them in this kind of disease. There is a close relationship between the rise and fall of epidemic diarrhœa and the rise and fall in the number of flies. This disease is so fatal among infants, especially the bottle-fed ones, who, as we should expect, are most liable to get the infection from milk polluted by flies, that anything we can do to diminish the number of these pests will do untold good, and save many lives. A hot dry summer, such as we had in 1911, allowed flies to breed quickly, and in consequence there was a very large amount of diarrhœa. The infection is not always carried into the house directly by flies; it may

come in milk, syrup, bread, fruit, etc., which they have visited in the shop. It is thus very necessary that serious attempts should be made to destroy flies, even though it be at considerable expense. A great deal can be done by having all refuse and manure, etc., removed from the vicinity of houses, for by this means the breeding places are destroyed and the flies are not attracted to houses. Sanitary authorities are now realising this, and all refuse is carted away at frequent intervals. The water system in all sanitary conveniences is also becoming much more general. Flies themselves are subject to only one serious disease, caused by a fungus, *Empusa muscæ*, which every autumn destroys them in large numbers. If we could only devise some means whereby flies could be artificially infected by this disease we should have a ready method of destroying them.

The advent of motor traffic should in future years diminish the number of flies, for the need for horses will be less and there will be fewer mews and less manure for them to breed in.

The Regulation of the Sale of Foods and Drugs for Infants.

There can be no doubt that the unrestricted use of proprietary foods, soothing syrups and teething powders is responsible for much harm to infants. These are all factors with which we have to reckon when we are enquiring into the causes of Infant Mortality, and they are not such as we can attribute to indifference or unsatisfactory hygiene, etc. No doubt, however, they are used in ignorance to a certain extent and the parents are often unaware of the harm they may be doing.

The reason of the popularity and wide use of drugs by the poor is partly to be explained by the extent of advertisement now made use of both in the daily papers and on placards, etc., in our thoroughfares. These secret remedies⁴, as they are called, are pressed upon the public simply by advertisements telling of wonderful cures produced. Their sale is a most remunerative one, and as the ingredients of the drugs cost practically nothing, the advertisements are the only outlay involved. There are dozens of soothing syrups and powders which anybody can purchase from a chemist and which

contain powerful drugs, such as morphia, mercury, acetanilide, etc. Besides this, anybody is at liberty to buy a pennyworth of soothing syrup or drops containing opium provided the word "Poison" is printed on the label. Penny packets are especially popular, for they are exempt from stamp duty and can be bought in smaller quantities than in the case of proprietary remedies. The temptation is often great for a mother to give her baby a soothing powder or a dose of medicine in order to get a good night's rest, and the habit once begun soon leads to abuse. Again, the constituents of the powders and syrups, etc., vary a great deal; thus a dose from one may be innocuous while a dose from another may be extremely harmful. The quantities vary, owing to unchecked and careless mixing, and the manufacturer of a secret remedy is absolutely free to alter the ingredients from time to time, against which the buyer has no protection. There is thus a great lack of control over the sale of proprietary medicines and in this way little protection for the poor. The public sale of secret remedies is forbidden in many countries, such as France, Germany, Italy, Austria, Holland, Belgium, Denmark, Norway and Sweden, and it would be good if we copied these countries in this respect.

If we could persuade some of our influential journals to take the matter up and cease from inserting advertisements, we should have accomplished a great deal, for without advertisements this sale would quickly diminish. The proprietors of newspapers, however, make so much profit from these advertisements that it is a difficult matter on their part to forgo their profit by refusing to insert them.

Infants' Foods.

A good deal of what has been said about proprietary drugs also applies equally well to infants' foods. These, in some cases, are all very well for a time, but as regular food they are most harmful. Infants fed on patent foods soon display symptoms of rickets and become delicate⁵. The advertisements for these foods generally picture a fat baby, which has a superficial appearance of health, but these fat babies are often most

deceptive. Babies fed entirely on these foods have little resistance to disease later on and often succumb to such ailments as bronchitis, convulsions, etc.

In the belief that they are doing their very best for their babies by giving them one of these foods, the poor often deprive themselves of some of the necessities of life in order to buy one. Cow's milk is far preferable to any patent food and, moreover, it is cheaper and the babies thrive much more satisfactorily on it. We shall do much by seeing that our milk supply is satisfactory and that all, even the poorest, can obtain a good and clean supply and so minimise the necessity for patent foods.

If a milk dealer sells milk which has had water added to it or from which the cream has been taken, he is prosecuted, but on the other hand anyone can sell a proprietary food no matter what the constituents are or how weak and unsuitable in nutritive properties it is. As long as the virtues of a food are bolstered up, so long will people be found to believe in it. Patent foods are often claimed by their proprietors as being substitutes for human milk. This is, however, absolutely wrong, though in many cases mothers are brought to believe it, and, in consequence, to wean their babies.

BIBLIOGRAPHY.

1. *Flies in relation to Disease, Non-Bloodsucking Flies*, 2nd edition, G. S. Graham-Smith, M.D. Cambridge University Press, 1914.
2. Reports to the Local Government Board, Nos. 16, 53, etc. Further Preliminary Reports on Flies as Carriers of Infection, etc., by Dr Copeman, Mr Jepson, Dr Graham-Smith, etc.
3. "The House Fly in Relation to Summer Diarrhœa and Enteric Fever," James Niven, M.B. *Proceedings of the Royal Society of Medicine*, 1910. John Bale, Sons and Donaldson, Ltd., 1910.
4. See *Secret Remedies, What they Cost and what they Contain*, British Medical Association. Price 1s.
5. Local Government Board Reports (Food Report, No. 15), 1911. Dr Coutts' Report on an enquiry as to condensed milks, with special reference to their use as Infants' foods; (Food Report, No. 18), 1913, Dr W. G. Savage's Report on bacterial food poisoning and food infections; (Food Report, No. 20), 1914, Report by Dr Coutts and Mr J. L. Baker on the use of proprietary foods for infant feeding and the analysis and composition of some proprietary foods for infants.

CHAPTER XV

CHILDREN 1-5 YEARS OF AGE

On the completion of the first year the infant becomes a child, and it is clear if the child begins this period of life with good health he stands a much better chance of continuing thus than if he has had a hard and strenuous struggle for existence during infancy. The chance given to the infant during its first year is thus all-important for the health of the future child. It has been pointed out in Chapter II that those counties which have a high Infant Mortality also have a high mortality during the ages 1-5 years. In those places there is also a greater number of infants in a poor state of health at the end of their first year. These infants are, as it were, "damaged" and are liable to succumb to illness in the next few years.

Growth during childhood continues to be very active, though not proceeding at the same rate as during infancy, but disturbances of all kinds are common, especially those of the digestive system. Infectious fevers are specially prevalent at this time and do much harm in the poorer parts of our large cities. The mental faculties are now developing and the child begins to take notice of everything going on around it.

Infant Mortality is a great deal higher than the mortality in later years, and this latter becomes less as age advances. During the age 1-2 years the mortality is roughly about one-third of the Infant Mortality and after the second year it decreases even more rapidly.

Table showing the Infant Mortality and death rates for each of the next four years of life¹.

		Average death rates at ages per 1000 at each age.				
		0-1	1-2	2-3	3-4	4-5
1871-75	..	154	59	28	19	14
1876-80	..	145	58	27	17	13
1881-85	..	139	53	23	15	12
1886-90	..	144	53	22	14	10
1891-95	..	151	52	21	14	10
1896-1900	..	156	49	19	13	9
1901-05	..	138	41	16	11	8
1906-10	..	117	35	14	9	7

It is only of late years, however, that direct observations on the health of children, ages 1-5 years, have been made, but, with the extension of medical inspection, this point will be more fully investigated. A contribution to the subject has been made by Dr W. G. Parker², Assistant School Medical Officer of Somerset, and his results indicate that children belonging to families in which there has been a high Infant Mortality are not so well nourished as children who have not been exposed to the causes of a high Infant Mortality. Dr Chalmers³, in a paper on "The House as a Contributory Factor in the Death Rate," also gives statistics to show that in tenements where there is a high Infant Mortality there is also a high mortality of children whose ages range from 1-5 years.

At the age of five years every child is compelled to go to school, then for the first time, and afterwards at regular intervals, the children are medically inspected in order that defects such as dental caries, sight, chest complaints, etc., may be found out and treated at once. Before the age of five years nothing of this kind is done. Large numbers of children, healthy in every respect at birth and even at the end of the first year of life, become within five years the physically defective entrants whom the Education Authorities are required at no small cost to restore to health again. Most of these cases are preventable if taken in time, and it is far cheaper to see that children reach school age in a better state of health.

Children may be accepted for kindergarten instruction at the age of three years, and, in the poorer quarters, where children are numerous and the accommodation at home limited, they are usually despatched to school at the earliest possible moment. There must, however, be three years of liberty at home before school is begun.

Home life among the poor in a large family is not all that can be desired: the rooms are small and closely packed with furniture and the mother has to endure the constant presence of the children. The consequence is that the younger members of the family are delivered into the charge of an older sister, who wheels them out in a kind of perambulator and amuses them.

These little girls devote all their spare time out of school to the younger members of the family ; they do their duty well, and, moreover, quite enjoy it. The children are as it were "dragged up," for the mother, being busy cleaning, washing and cooking, is unable to give them proper attention.

All day long they interrupt her in her work and make her worried. All the evils of weak discipline creep in, and the children grow up without obedience, making matters very hard for the school authorities at the time they come in contact with them. There is far too little difference between the child and adult, and the former soon loses respect for the latter. The children are fed on such food as their parents are having ; even the youngest has a "bit of everything there is going." The lack of suitable food is a great drawback to young children, the staple diet being bread and jam, tea with unwholesome extras such as pastry, tinned foods, etc. The clothes are often a mere bundle of cotton, tied with tape or string, and in many homes the child is encased in the same garments from day to day. There is generally no proper bedtime and no regular time for sleep, such as children need so badly. They are to be seen out with their parents at all hours in the evening, for the latter cannot leave the home without taking them. The absence of the mother from home is equally bad for the young children as for the infants. This lack of proper upbringing allows any tendency to disease or any physical deformity to gain an easy start, and this is the reason so many are found to be ailing in one way or another when they first go to school at the age of five years. The out-patient departments of our hospitals swarm with small children ailing simply because the primary conditions of health at home have been omitted.

With all these disadvantages the children retain their imperturbable good spirits during these days of early childhood ; they quickly forget any little event which breaks the spell of happiness and their high spirits soon come out again.

The child during his first five years is in the imitative stage of life and he imitates anything in the home that pleases him. There is, however, in the home much that can harm the child, and the infant school is very useful in preventing this evil.

influence. Among the poor the infant school is the only place where the imitative faculty can be controlled, and much can be done to make the instruction in the schools attractive. Formal teaching is not needed here, but rather habits of order, cleanliness, and obedience should be taught.

The school can, however, do little to improve the physique of children until the social conditions under which the poor live are improved: the narrow streets and the overcrowding, etc., are all active forces preventing the full and free development of the physical powers of the child.

The problem of dealing with children of the ages 1-5 years cannot be solved by any but a national scheme providing for a continuous medical supervision from birth to school age. How this is to be done is a debatable point, and whether the Sanitary or the Education Authorities should be responsible is a difficult matter to settle. At present the Sanitary Authorities with the Medical Officer of Health and the Health Visitors, etc., undertake all work connected with maternity and Infant Mortality, so that it would seem best for them to continue their work with all infants and young children up to school age, and then hand them over to the Education Authorities.

If funds would allow, Infant Consultations could do much good by keeping in touch with all poor infants till they reach the age of five years. These institutions are in a position to follow up the infants, and could easily do so; it is a pity that their activities should cease abruptly with the close of the first year of life.

The mothers would also benefit, for they need training and teaching about the care of young children. The latter need periodic weighing and medical supervision just as much after as they do during infancy, and by ensuring this we shall nip in the bud defects and ailments which if left to grow will cost us dearly later on.

The Westminster Health Society in June, 1912, opened a medical inspection centre for children under school age, with the result that much good is done. The children are brought to the centre on the advice of the Health Visitors who on their daily round come into contact with them.

BIBLIOGRAPHY.

1. *Infant and Child Mortality*, Local Government Board Report, 1912-13, p. 49.
2. "Infant Mortality and the Health of Survivors in Elementary Schools," *Public Health*, April, 1913.
3. *Proceedings of the Royal Society of Medicine*, 1913, vol. VI.

CHAPTER XVI

CONCLUSIONS

The foregoing chapters have but sketched the lives of infants, and in them a few suggestions for improvements have been given. If the child's lot is cast among the town poor, he is probably born in a world of untidy and unprosperous streets; his parents have not endowed him with any abundance of strength, and in many cases his life is one long struggle. His early years are spent in small stuffy rooms, his food is often not what it should be, and his mother makes many mistakes with him. If he grows up he will, in many cases, marry and become the father of similar children, who in turn pass through the same cycle. Many, however, drop out, as the high Infant Mortality rate shows, and many survive in a poor state of health. With all this, however, happiness nearly always predominates, and troubles, which follow quickly on one another, are soon forgotten. What is wanted is that there should be not such a separation between the people of the west end and those of the east end of the town; both will in the end benefit much by mixing more. The former will by this means begin to understand the latter, take interest in them, and, in consequence, help them to a larger extent. The latter will stand to gain and learn much, and more will grow up to be honest hard-working citizens. "The land of dividends is roughly in the West; beyond the Bank or across the bridges is a vast unknown land of wages¹." The isolation of the classes is carried further than this, for the children in the West are kept in their own quarters, they go away to school and to the

Universities, where they meet only those in the same class as themselves. In due time some become managers and employers of labour. As a rule they do not understand their workpeople till after much experience gained at the expense of the latter. If the upper classes could only work, even for a short time, among the poor, how much better it would be for both parties! The man who begins to learn something of another's need wants to do something for him, and directly this is the case he is brought much more in contact with him.

The better-to-do will soon find among the poor many with indomitable courage, anxious to serve and learn, and they will also find some who are weak and more sinful than they can believe. There will be fewer loafers and wastrels, for whom little can be done and on whom time and money are often wasted. It is these who drag the lower classes down. The actual loss of life is sufficiently appalling to compel all who wish success to the nation to take notice of it. The physical waste among those who survive is a further loss and a great expense to the nation. There is abundant strength and endurance in the normal child if we can only give him a fair chance in his early days. Proper food and healthy surroundings would produce a nation as hardy as any to be found in the world. We in England have the right material to work upon, if we will only take care to use it properly. There are many who bewail this lack of vitality in the working-people, but we all, either as employers of labour or publicly as citizens, can remove the causes which turn healthy children into weaklings. Not only is there loss in physical strength, but there is a leakage in mental power. The minds of many are stagnant and degenerate because they have no chance of being developed.

The parents who are striving against poverty are eagerly anxious for their children to be up and earning at the very first moment. On the other hand, the mothers and fathers among the poor are most unselfish towards their children, and it is generally ignorance which prevents them giving the children the best chance. Not only so, but the poor are often most generous one to another when necessity demands. It is the unwritten duty of one family to help another less well off,

and they never think of any return for the kindness. This is real charity, and shows that there is at the foundation of all a very large amount of good. The mothers who are fighting against adversity in the way of poverty seldom give way to despair, and, though poverty brings many temptations, the majority will never break the law, though few have the help of any real religion. All this shows that the material is good, and only needs an opportunity for development.

The annual mortality of children closely resembles the mortality of individuals over 60 years of age, while the mortality of infants is a great deal higher than that of any other period. The weakly frame of the infant is less able to battle with adverse circumstances, and in consequence a high percentage (95 out of every 1000 born died in 1912) never complete the first year of life.

A high rate of Infant Mortality means not only a great wastage of life, but also that illness is prevailing which is only too likely to leave many of the survivors in a weakly or damaged condition. Until the year 1905 the Infant Mortality of the country remained stationary, but since that year the interest of the nation has been awakened, and the efforts put forth in consequence have resulted in a steady, if not very rapid decrease of the Infant Mortality of the land. This state of affairs has no doubt partly been due to the fact that the birth rate of the country is also diminishing, which fact makes it still more important that every possible baby should be saved.

It is a fallacy to think that it is only the fittest of the infants who survive. Many of the healthiest succumb and many of the weakest survive, and the elimination is by no means selective.

During the last 25 years or so there has been a remarkable influx of people from the country to the towns, and this makes it all the more difficult for us to reduce the Infant Mortality, as the conditions generally found in towns are far more inimical to infant life than those in the country. As, however, towns become cleaner and healthier, and as the mothers gain more knowledge in caring for infants town life will not necessarily be bad for infants.

Infant Mortality varies in its magnitude throughout the country, and counties where the population is densest have, as a rule, the highest rate of Infant Mortality, and, *vice versa*, sparsely populated counties a low one. Thus the towns in the large industrial centres such as Lancashire, Durham and Staffordshire have a bad record in this respect.

Different parts of a town also vary in their Infant Mortality rate, one district being quite good, while another is very bad. This point is well shown in the map of Manchester. It is an interesting fact that the quarter of a town which is inhabited by Jews has a low Infant Mortality for the reason that the Jewish parents look after their children so well, and set an example in this respect which others might copy with advantage.

Among the poor the best age for the mother to be at the birth of her child is between 25–30 years, for at this age she is physically stronger, does not go out to work so much and is more likely to be sensible and not be led astray by the advice so freely given her by older relations. The ante-natal condition of the mother also has a great effect on the child.

The causes of Infant Mortality are many and vary in different parts; what is a large cause in one district is often quite a minor cause in another. Poverty is perhaps the greatest factor, and the one generally underlying many of the other cases. Unlike the others, it acts on the child both before and after childbirth. It leads to poor health, lack of energy and less than an average intelligence, so that these children of poverty have the greatest difficulty in competing with those born in better circumstances. Low wages are extravagant both to the employer and the employed, and one of the problems which is bound to come up in the future is—how can we make the employed worth a higher wage? Poverty forces the mother to go out to work, which again is bad for the children. The degree of intelligence in the mother has much to do with the child's chance in life, for the latter is dependent for a much longer time on the former than is the case among other living creatures. All mothers with few exceptions are most anxious to do what they can for their children's welfare; failure is generally due to ignorance. It is quite wrong to think that

mothers know by instinct what is right and best for their children. They must be taught, and by teaching the young mothers about infant management and infant feeding we shall go a long way towards reducing our Infant Mortality.

Married and widowed women are employed in labour of one kind and another in most districts, but especially in the industrial centres, where there are factories and mills. These women go to work to supplement the family income, which is generally deficient either because the husband earns poor wages or because he is ill. Now, the absence of the mother from home means that the children do not get proper attention, some incompetent person being more often than not put in charge. Work itself in the mill or factory, as long as it is not too strenuous, does not harm the mother if she stays away from her work for some weeks before and after childbirth. After birth, however, the seriousness for the child is plain; the mother, being employed, is prevented from breast-feeding her child, and this is perhaps the most weighty argument against the employment of women. Directly the baby is artificially fed trouble is likely to begin and the child is at once handicapped.

Again, girls and women who have been employed all their lives in factories and mills are for the most part ignorant of household management. What is needed in the interest of the baby is that the mother should not go back to work for some months after her confinement, but this is most difficult to compass. If there is great poverty at home, it is surely better for the mother to go to work in order that the whole family may live in more comfort, and it is of no use for the mother to stay at home in these circumstances, for if there is insufficient food the mother cannot breast-feed her baby and it has to be weaned whether she be at home or at work.

Legislation preventing the employment of women altogether is undesirable, but we should legislate against the employment of women in a factory both before and after confinement for a longer time than is now required (four weeks). If we legislate too strictly on this matter, women will refuse to bear children and our already diminishing birth rate will be still further reduced.

The housing of the poor has a very direct bearing on the Infant Mortality, especially as towns are becoming more and more crowded. Sanitation, it is true, has improved of late years, and this will in the future be a great help. The general conditions of a city tenement make it very difficult for a mother to rear a family with success, and there are as yet far too many wretched dwellings in our large cities. Rents are high even for bad dwellings and there is a crying need for better and cheaper houses. There should be a clearing away of the foul areas and a re-housing of the poorer classes under more healthy and comfortable surroundings.

There can be no doubt that alcohol influences Infant Mortality, for the reason that the family has without any extra expense all too hard a time to make both ends meet, and when part of the income is wasted, has to go short in one or other of the necessaries of life. There may be little actual drunkenness, but the expenses of drink are apt quickly to assume a more serious proportion than can be properly afforded. Alcohol taken by the mother may have a bad effect on the child before birth, but it has a much more disastrous effect afterwards. It is then that the pinch of poverty is felt, and the mother who drinks is only too likely to become indifferent to her children and their wants. We must not, however, ascribe too much to drunkenness, though it is a most difficult thing to fight against, and the type of parent addicted to it is hard to influence.

The special causes of Infant Mortality may be divided roughly into three groups, namely, the Preventable, Partially Preventable, and the Non-preventable. Among the first group is diarrhoea, and so great is this a cause of death, especially during a hot summer, that it accounts for about one-fifth of the total Infant Mortality. It results from the continual administration of bad or contaminated food. Breast-fed infants suffer very much less from it, and of those who do get it very few succumb. Each year the mortality from this disease begins to rise about the middle of July, reaches its maximum at the end of August, and then gradually falls as the weather becomes cooler. The hotter and drier the summer, the greater the Infant Mortality, for the reason that the growth of bacteria

is favoured and the child's food becomes infected. It is because of this that the bottle-fed infant suffers so much. Flies are the probable means by which the milk is infected, for they carry bacteria on and in their bodies. Milk, especially condensed milk, because it is sweet, attracts flies, and thus is very liable to become contaminated.

Overlaying or suffocation in bed by one of the parents is absolutely preventable. The baby should always be put to sleep in a cradle or box by itself. Deaths from overlaying are commonest at the week-ends, when wages are paid, and this points to drink having a good deal to do with them. Rickets and dyspepsia are also preventable if the baby is fed in a proper manner. These diseases are important from the fact that they do not themselves so often cause death as leave the children weakly and liable to succumb later to other diseases.

Deaths from malnutrition and wasting, bronchitis and pneumonia, are all partly preventable. The former two occur in babies which have been improperly fed, either because the mother is ignorant or careless or else because she has gone to work and left the baby in the care of some incapable neighbour. Deaths from bronchitis and pneumonia are specially common among the poor because the infants are unnecessarily exposed to cold and are not properly cared for after they have had infectious diseases, such as measles and whooping cough. The truly non-preventable deaths are few, but they include causes such as congenital malformations and some premature births.

Of late years it has been proved that flies as carriers of infection are a very great danger. As we have seen, flies are the means by which summer diarrhoea is carried. They feed on refuse, and the bacteria then ingested remain virulent for several days. A great deal can be done to limit the number of flies by removing their breeding places or making them unsuitable. Sanitary authorities are now fully alive to this fact. All refuse is carried away at once, and the water system of sanitary conveniences is becoming general.

All foods are more or less unsatisfactory substitutes for human milk, but the best is no doubt some modification of

cow's milk. Milk often comes into the town from long distances and is liable to become contaminated, not only at the farm, but also in transit by rail and delivery cart and in the home. All these dangers must be guarded against while we aim at getting the poor to use more cow's milk than they do at present; at the same time we must keep the price as low as is compatible with its purity. A large percentage of the cows in this country are infected with tuberculosis, and if the udder is affected with the disease the milk is sure to contain tubercle bacilli, which are a source of great danger to the infant and child. The best way of eliminating this is to boil the milk, and lately a new method has been invented of doing so by electrical means.

Of all the means we have of reducing Infant Mortality the work done by Health Visitors is perhaps the most useful. These Health Visitors must be suitable persons and must have had a good practical training. They can then get into touch with the mothers and teach them.

Infant Welfare Centres are of different kinds but their objects are all the same, namely, to attempt to check the high rate of Infant Mortality by instructing the mothers in the care and feeding of their infants, and by providing at low charges meals to expectant and nursing mothers. The infants are weighed at regular intervals and a medical practitioner looks after their health. Classes in sewing, cooking, etc., are also held for the mothers. No treatment by medicine is given at the centres, for that is no part of their work. There is generally a paid superintendent at the head, and each day she is helped by voluntary workers. One of the best and most useful features of these institutions is the provision of good cheap dinners for the mothers, and by this means they are enabled to nurse their infants more successfully. The provision of a good wholesome meal in a poor home is most difficult and the dinners supply a great want. The French have made milk depôts a feature of their work, but these have not been so successful in England, generally on account of expense. Day Nurseries or Crèches are now being widely used under the direction of the National Society of Day Nurseries. Their objects are to make provision during the day for those children

whose mothers go out to work, and to advise the mothers on the feeding and care of their children. Crèches are of special benefit in large industrial centres, where the mothers are often ignorant and where they frequently go out to work. An excellent Day Nursery exists in Southport, at which excursionists can leave their children while they have a day's holiday.

It is now realised that the ante-natal hygiene of the mother is very important for the baby-to-come, and if we can improve it there will be fewer stillbirths in the future. The universal adoption of the Notification of Births Act will also help by knowing at once where each newly arrived baby is, the Health Visitors can get into touch with the mother and see that everything is satisfactory from the very start. The maternity benefit of the National Insurance Act is a step in the right direction, as it gives the mother a little extra money at the time when she most needs it. The good obtained is, of course, dependent on the money being spent in a proper way, and also on its being given to the insured directly after the confinement.

The Midwives Act of 1902 has helped to make midwives more efficient than they were in the past. The Central Midwives' Board now examines and controls all midwives.

The domestic education of girls in our schools has of late been taken up more seriously than of old, and there can be no doubt that much benefit will be derived from this. Girls will be trained on proper lines in household management, etc.

If funds would allow, Infant Consultations, etc., could do much good by keeping in touch with all infants till they reach school age (five years). The age 1-5 years is most important, and little has been done up to the present for children between these years.

BIBLIOGRAPHY.

1. *Across the Bridges*, Alex. Paterson, p. 178. Arnold, 1913.

APPENDIX

COUNTY BOROUGH OF SALFORD
DIRECTIONS FOR THE MANAGEMENT OF INFANTS
 (BREAST FED)

WASHING AND CLOTHING

Babies should be washed all over daily with warm water. They should be lightly and warmly clad, especially during the night. Clothing should be woollen or flannel. Stockings should come well up the legs, the dress have long sleeves and fit well into the neck. Flannelette should not be used unless guaranteed to be unburnable.

AIR AND EXERCISE

Fresh air is constantly needed. Take them out whenever the weather is fine. Open the windows at least twice a day.

SLEEP

Babies require plenty of sleep. Up to three years old a morning and afternoon sleep at fixed hours is necessary. Accustom them to going to bed while yet awake, and avoid nursing them to sleep in the arms. If possible the child should sleep in a cot by itself.

On no account give Soothing Syrups or Teething Powders.

SUCKLING

The mother's milk is the natural food of infants up to seven months. If the mother has plenty of breast milk no other food should be given.

Up to six weeks old the child should be suckled every two hours during the day, and every four hours during the night.

From six weeks to three months old, every 2½ hours during the day, once during the night.

From three months to six months old, every three hours during the day.

From six to seven months old, every 3½ hours during the day, then gradually begin to wean, ending by the ninth month.

On no account keep the baby at the breast after it is twelve months old ; to do so weakens the mother and child.

Mothers are warned against taking malt liquors in order to increase the amount of breast milk.

Do not use a dummy teat.

WEANING

When the child has reached the age of seven months it should have five meals a day, three of which should be of milk thickened with biscuits, oat-meal, or well-boiled bread. The two other meals should consist of twelve tablespoonfuls of milk only. From nine months the yolk of an egg or a little beef tea may be added to the diet.

It is not advisable to wean the infant during the months of July, August, and September, as the change of food during those months may bring on Diarrhœa.

Young babies should not have cornflour, bread, arrowroot, sago, rusks, or any starchy food, and it is a great mistake to give children under two years old "JUST WHAT YOU HAVE YOURSELVES."

Do not think that when a child cries it is hungry ; it is sometimes owing to overfeeding.

Mothers should take great care to keep the breasts and nipples clean ; also the baby's mouth should be regularly sponged out with clean warm water after each meal. These two precautions are a great preventative of thrush.

C. H. TATTERSALL,
Medical Officer of Health.

TOWN HALL, SALFORD,
 February, 1914.

COUNTY BOROUGH OF SALFORD

DIRECTIONS FOR THE MANAGEMENT OF INFANTS (ARTIFICIALLY FED)

WASHING AND CLOTHING

Babies should be washed all over daily with warm water. They should be lightly and warmly clad, especially during the night. Clothing should be woollen or flannel. Stockings should come well up the legs, the dress have long sleeves, and fit well into the neck. Flannelette should not be used unless guaranteed to be unburnable.

AIR AND EXERCISE

Fresh air is constantly needed. Take them out whenever the weather is fine. Open the windows at least twice a day.

SLEEP

Babies require plenty of sleep. Up to three years old a morning and afternoon sleep at fixed hours is necessary. Accustom them to going to bed while yet awake, and avoid nursing them to sleep in the arms. If possible the child should sleep in a cot by itself.

On no account give Soothing Syrups or Teething Powders.

FEEDING

If the child is artificially fed, great care should be taken in the preparation of its food. The best artificial food is cow's milk and water sweetened with a little sugar, in the following proportions:

Up to six weeks old: two parts water, one part milk. Amount: four tablespoonfuls of the mixture every two hours during the day, every four hours during the night.

From six weeks to three months old: one part water, one part milk. Amount: eight tablespoonfuls of the mixture every 2½ hours during the day, once during the night.

From three months to seven months old: two parts milk, one part water. Amount: eight tablespoonfuls of the mixture every three hours during the day.

When the child has reached the age of seven months it should have five meals a day, three of which should be of milk thickened with biscuits, oatmeal, or well-boiled bread. The two other meals should consist of twelve tablespoonfuls of milk only. From nine months the yolk of an egg or a little beef tea may be added to the diet.

The milk should be boiled and kept in a clean jug covered over, and only a small quantity should be got ready at a time. It should always be warmed before giving it to the child, by standing the bottle in a bowl of hot water.

Never give a child sour milk—sourness is detected sooner by smell than taste.

Do not think that when a child cries it is hungry; it is sometimes owing to over feeding.

Condensed milks, especially skimmed milk brands, and foods which need no fresh milk should NOT be given to infants, as these have been proved to give rise to rickets and infantile scurvy.

THE BOTTLE

The bottle should be boat-shaped, with an india-rubber teat fitting over the mouth of the bottle. This can be easily turned inside out and properly cleaned. India-rubber tubes should be avoided. After each meal the bottle and teat must be thoroughly rinsed out, and it will be safer to put the bottle in a pan of cold water and put on the fire to boil, so as to thoroughly sterilise the bottle.

Young babies should not have cornflour, bread, arrowroot, sago, rusks, or any starchy food, and it is a great mistake to give children under two years old "JUST WHAT YOU HAVE YOURSELVES."

Do not use a dummy teat.

If the baby's mouth is regularly sponged out with clean warm water, it is a great preventative of thrush.

C. H. TATTERSALL,
Medical Officer of Health.

TOWN HALL, SALFORD,
February, 1914.

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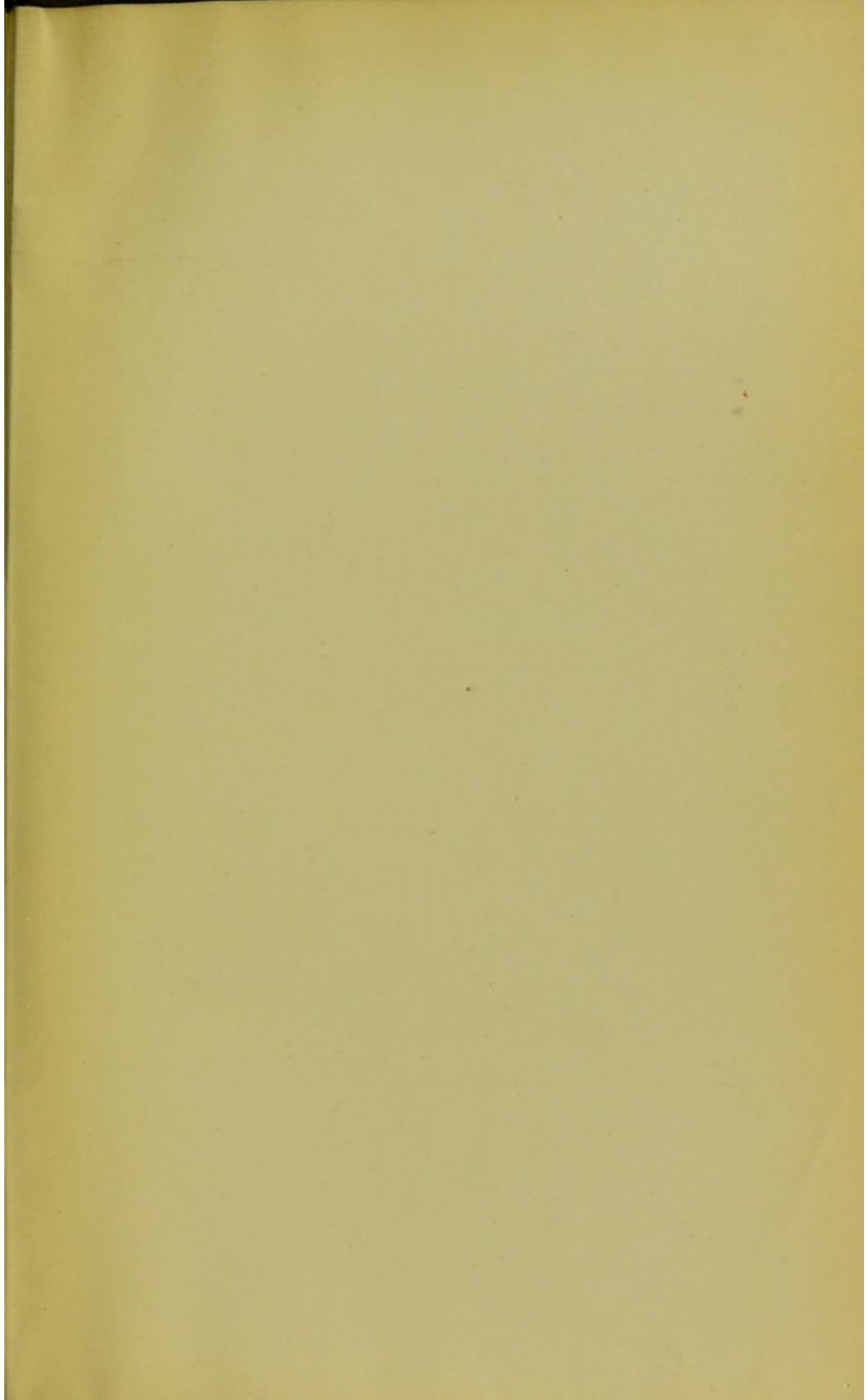
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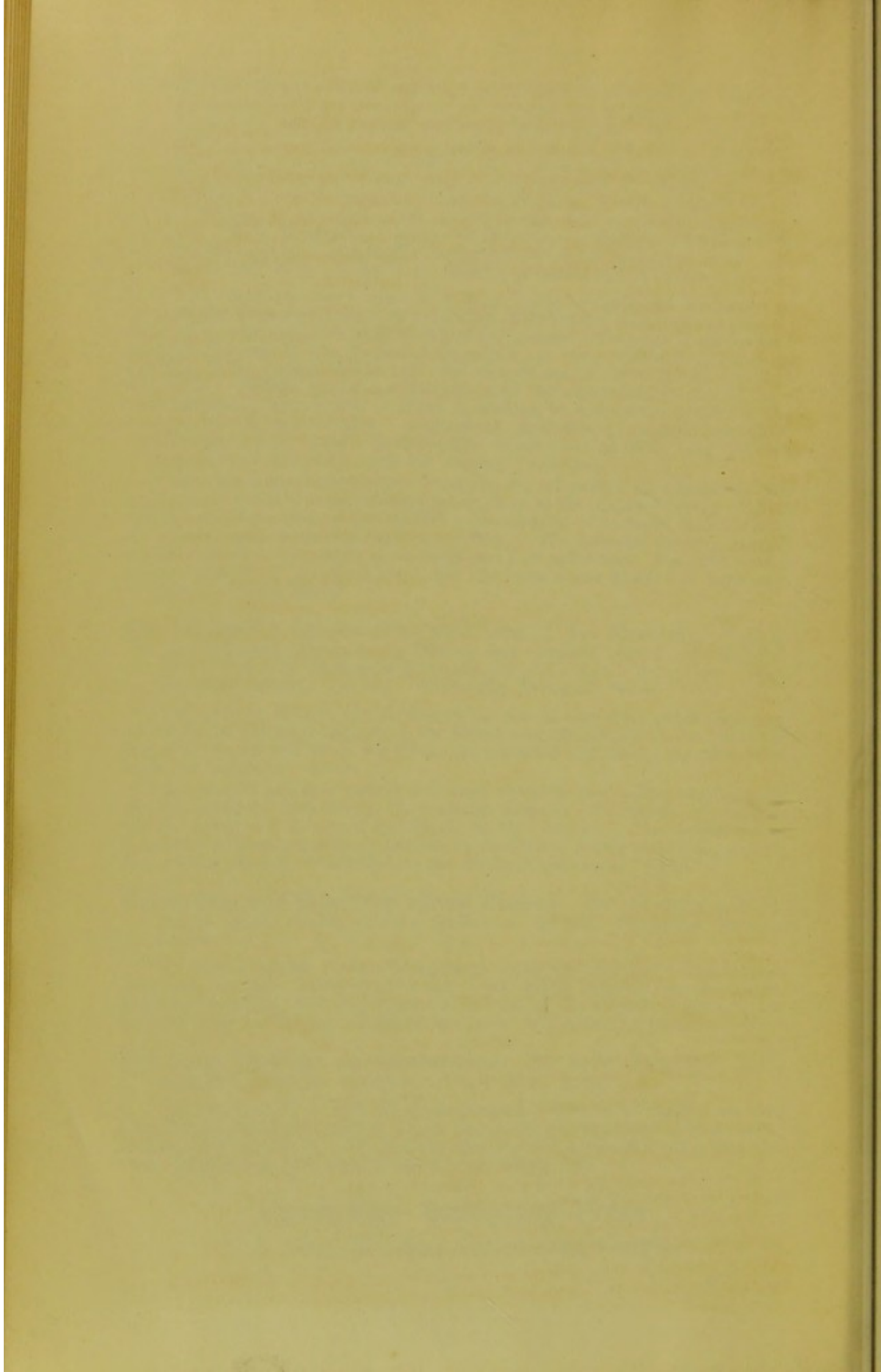
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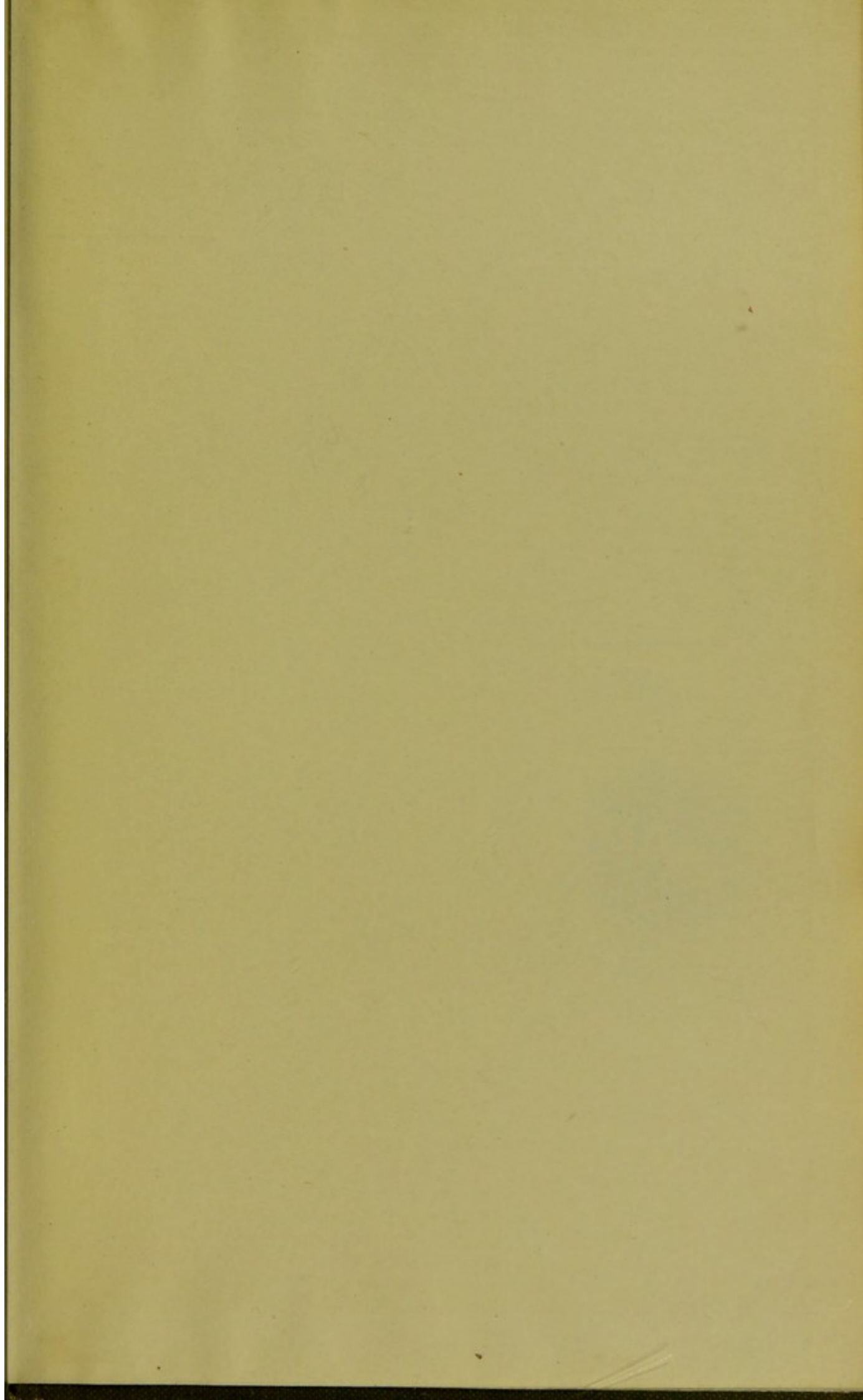
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