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PROBLEMS OF INFANT MORTALITY

BY

J. W. SCHERESCHEWSKY, M. D.

OF THE

PUBLIC HEALTH AND MARINE
HOSPITAL

WASHINGTON, D. C.

Printed by the Child-Helping Department of
the Russell Sage Foundation, 105 East
22d Street, New York

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no. 2

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**Address at the Virginia Child Welfare
Conference at Richmond**

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Among ancient tribes a certain form of reprisal was in vogue against weaker tribes who had been so unfortunate as to incur their displeasure. This form of reprisal was then, and in this day, is held to be synonymous with the acme of barbarity.

Its mode of execution was as follows: They simply swooped down upon the unhappy objects of their animosity, and, having captured them, proceeded to put every tenth individual to death.

This process was called "decimation" by the Romans, and even now, the verb "to decimate" carries with it the significance of death run riot.

We speak of armies being "decimated" by war, of a people being "decimated" by pestilence, and, under such conditions, remain aghast at the tragedies of human existence.

Yet, there is a form of decimation, of more than decimation, which has been going on in our midst for uncounted generations. Under the very best conditions, this destructive process amounts to simple decimation; at the worst, not merely to simple, but to double, triple and even quadruple decimation.

This form of decimation which, only till very recent years, has remained practically unnoticed, is the mortality of infants in the first year of life.

In the short space of time at my disposal I can do very little more than to outline briefly the main facts in this problem, and indicate why we are now just beginning to give it the attention it has long since merited.

It is safe to say that very few, except those who are interested in the matter, are aware of the actual status of the mortality attendant upon infants in the first year of life.

The following statements will serve to give you an idea of it.

A new born child has less chance of living a week than a man of ninety;

of living a year, less than that of a man of eighty.

Over 3,200,000 infants of less than 12 months of age perish annually in the countries forming the civilized world, or, at the rate of one in less than ten seconds every hour of the twenty-four.

The science of vital statistics permits us to look into the matter a little more closely.

Thus, as an example of simple decimation of the new born, we turn to the vital statistics of Ireland, one of the countries of Europe possessing a relatively very favorable infant death rate, and we find for the 10 year period of 1895-1904 that out of every thousand children born there, 104 died in the first twelve months of life, or a little more than one in ten. An example of double decimation is shown in the death rate of Germany, where, for the past 10 years, there has been an average of 197 infant deaths in every thousand born, or a very little less than 2 in 10.

Of nearly triple decimation, the Russian empire can be cited as an ex-

ample, with 263 infants of every thousand dying before the completion of their first twelve-month. Triple decimation is actually present in Chii, where 323 out of each thousand of the new born perish in their first year, and in certain sections of the globe, as in the Philippine Islands, the mortality among infants is probably greater than this, as in the city of Manila, where 48 per cent of the total deaths of the Philippine population occur in infants under one year of age.

With respect to infant mortality, the countries most favorably situated in Europe are Sweden and Norway, with averages of 96 and 86, respectively, for the last ten years, although their infant mortality rate has been somewhat lower than this of recent years, reaching in Norway in the relatively extraordinary figure of only 69 out of every thousand born, in 1907.

As to the United States, for that is the country that we are especially interested in, it is a regrettable fact that we can do no more than estimate our infant mortality rate. This is due

to the circumstance that only about 55 per cent of our population live under the effective operation of any vital registration laws whatever, and only a few states pretend to any accuracy in the registration of births.

We can, however, estimate that in this country not far from 150 infants out of every thousand born will perish in the first twelve-months. In many of our cities, however, and particularly in manufacturing towns, the infant death rate is far higher than this, double, in a number of instances.

Somewhere about one-fourth the number of all deaths in any country is made up of little children less than two years old.

It is a notable fact that, living as we are in an age distinguished above all others for the advances which have been made in all the arts and sciences, medical science especially, in spite of our boasted achievements, in spite of the lengthening of the average span of human life by ten years, that our babies still continue to die in the profusion of former years and the infant mortality rate remains at nearly the

altitudinous level of previous generations.

We can realize from the foregoing that we have, all of us, run desperate chances in being born at all. Those born in this country run a little worse chance than 1 to 5 dying before the end of the first year, while in Russia our chance would be about 1 in 4.

In other words, the average man runs a far better chance of not dying from an attack of typhoid fever, let us say, than he does from dying an infant, and, in certain countries and in manufacturing towns, he would have decidedly better chances with a severe attack of pneumonia.

If, then, the mere business of being a baby must be classified as an extra hazardous occupation; if all the perils which ever encompass human existence are never so bitterly emphasized as in the first year of life, why is it, then, that we have heard so little of this in previous years?

With the advent, however, of our modern social conditions, the increasing complexity of our present life, the higher cost of living, the concentra-

tion of population in the cities, and the increasing age at which marriages are contracted, there has been a steady diminution practically throughout the entire world in the annual number of births.

In some countries, largely agricultural in character, the birth rate is still sufficiently high, while in others, such as France, it is very low. Indeed, in the latter country, the births are insufficient completely to offset the total number of deaths.

We are, therefore, at the present day, face to face with the problem of the gradual depopulation of the earth.

Under present social conditions it is hardly likely that we can do much towards increasing the number of births. Therefore, with the menace of racial extinction ever looming larger before us, we must adopt the policy of saving of what we have.

It is by no means certain that any great increase in the annual number of births is even desirable. Quality, not quantity, is what we are after. A necessary sequence to a high infant

mortality rate is the larger number of children, who, having weathered the storms of the first year, reach the haven of comparative safety of the other years of life in a battered, weakened and crippled condition, such as forever handicaps them in becoming efficient social units.

It is, therefore, in the nature of an axiom that in the degree to which the infant mortality rate is lowered, to a far greater degree will we diminish the great army of defective and degenerate children among us.

What measures shall we adopt to meet the indications of this problem?

In the first place we have to find what makes all those infants die.

Some years ago this question occupied greatly the attention of two French physicians, Balestre and Gileta de St. Josef. They went over the death returns of some 2,500 French cities and towns and analyzed the causes of death of all the infants dying under one year of age .

They found that out of one thousand such infant deaths, 385 died of gastro-intestinal disorders, 171 died of

congenital debility, 147 died of disease of the lungs, 50 died of infectious disease, 25 of tuberculosis, and 222 from all other causes.

We see, then, that diseases of the digestive system, congenital weakness, and diseases of the respiratory passage are responsible for 70 per cent of all infant deaths. The analysis of the cause of infant deaths in other localities gives substantially the same results.

We are, therefore, furnished by this analysis with something definite towards which to direct our efforts. Let us see if our statistical observers can furnish us with further information with respect to these three great causes of infant deaths.

Taking the first mentioned cause, gastro-intestinal disease, for instance, we find that there is a tremendous seasonal variation in the deaths from this class of disorder.

While the death rate from this cause remains moderate during the winter and fall months, it takes a sudden upward spring in June and reaches towering heights in August.

In giving specific instances, however, of this peculiarity, we must have recourse to the statistics of foreign cities, as those of our own country are not sufficiently developed for our purpose.

Take, for instance, the city of Leipzig, Germany. In the year 1906 this city had a general infant death rate for the entire number of 222 per 1,000 born. Over one-half of the total number of infant deaths were due to gastro-intestinal disease. For the month of February the infant death rate sank to the relatively low level of 131, of which only 28 per cent died of diarrheal disease.

In the month of August, however, the general infant death rate shot up to 570 deaths per thousand births, and the infant death rate from gastro-intestinal disease alone was 430 per thousand born and constituted the cause of 75.6 per cent of the total number of infants' deaths.

Illustrations of this character could be multiplied almost indefinitely.

Further investigation has taught us that an overwhelming proportion of

all babies dying of intestinal disease are bottle-fed babies.

In Berlin, where they take a great deal of trouble in investigating such matters, they discovered that out of 43,423 infant deaths of less than one year of age, in which the mode of feeding could be ascertained, only 3,995 were breast-fed children, whereas the remainder, 39,428, were bottle-fed. The experience in other cities has been quite similar. Moreover, careful analysis of the deaths from gastro-intestinal disease, by months, throughout the year, and in relation to the method of feeding, shows that in the case of breast-fed infants, the death rate from diseases of the digestive system remains at a constant low level throughout the year, and the mortality from this cause among them is very little, if any, greater in the heated term than in the winter months.

The great increase in the mortality in the summer months is almost wholly made up of the deaths of the artificially fed.

The reason for this is obvious. The human breast, besides automatically

regulating the character of its supply, both to the infants' needs and the weather conditions, furnishes a perfectly fresh and sterile food. These are conditions which can be but faintly approximated even by the exercise of the greatest skill and care in the artificially fed. Judge, then, of the possibilities for havoc among the bottle-fed babies when a dirty and contaminated milk is fed by the hands of ignorance.

That bottle feeding is indeed the chief cause of the high death rate from diseases of the gastro-intestinal system is well brought out by the investigations of McLaughlin and Andrews into the infant mortality in the city of Manila in the Philippines. Although these authors find the infant mortality there to be extraordinarily high, the tremendous loss of life is not in a large part due, as in most other localities, to the diarrheal death rate, but to other causes. Owing to the prevalence of maternal nursing, the death rate from gastro-intestinal disease in the first year of life is a negligible factor in that city.

The conclusion is, therefore, irresistible that the method of feeding is the most potent single factor influencing the fate of the new born child.

From the second great cause of death among the new born, congenital debility are 17 to 18 per cent of all infant deaths.

What does it mean? Simply that these children are born too weak to live.

This unfortunate result is brought about by a number of causes, all of them more or less intimately correlated to our existing social conditions.

Prematurity and syphilis are, perhaps, the two most prolific sources of congenital debility, and their existence is in turn due, in large part, to the social environment of the mother.

Too early marriage, hard work up to the day of confinement, infection of the wife by the husband with venereal disease, all play a commanding part in the evolution of the premature infant.

The effect of manual labor upon the expectant mother is well illustrated in the case of mill towns, where, gen-

erally speaking, the number of still-born children is double that in other congenital debility proportionately higher.

This is unquestionably due to mothers who remain at work in the mills, often up to the day of delivery. In justice to them, it must be said that they are not to blame, but the blame must be laid, rather, upon our industrial system and the stern conditions imposed by poverty.

A necessary sequence in the fate of children born weaklings under such conditions, is the early return of the mother to her toil, leaving the child to the care of some stranger during her absence at work. What chance has it, then, if born weakly and bottle-fed beside?

The third great cause of infant death, disease of the lungs, is mainly fostered by overcrowding, insanitary conditions and stimulated by inclement weather.

Thus, while we find in the heated months a tremendous increase in our death rate from intestinal diseases, the deaths from pulmonary disease reach a

very low level, while in the winter months, although the total number of infant deaths is considerably lower than in the summer, yet a high proportion of these deaths are due to pulmonary disease, while a relatively important part are due to intestinal disease.

Too much emphasis cannot be laid upon the fact that four-fifths of the infant death rate occurs among the poor. The children of the well-to-do largely escape the perils of the first year.

This is well illustrated by Dr. Helle's observations in the city of Graz, where, out of 170 deaths of infants in 1903, he found that not one of them belonged to a rich family, but 9 to well-to-do families; 49 were poor and 112 very poor.

Again Dr. Newman, in Berlin, found, in 1903, out of 2,701 infant deaths which he investigated, that in 1,792 instances the family lived in a single room; in 754, in two rooms; 122 in three rooms, and only 93 in larger dwellings.

We are now prepared to summarize

roughly the main factors in the production of the numberless infant deaths.

Bottle feeding, the employment of mothers in industrial occupations, the ignorance of mothers in general with respect to the care of infants, improper housing, social misery, and the unsatisfactory control of the milk supply.

What can be done to ameliorate these conditions? They all seem of a fundamental character, requiring deep-going reforms for their elimination.

A good deal has already been done as a beginning. The nation of France has early taken an interest in the mitigation of these factors by reason of her falling birth rate and the interest is now spreading all over the world.

The institution of apparently simple measures in many places has already had a beneficent effect upon the local infant mortality rate.

Thus, in 1892, Professor Budin, chief of the obstetrical service of the great Charite Hospital in Paris, was struck with the frequency with which mothers, who had been delivered there

of lusty children, and who had been discharged with both mother and child in a blooming state of health, when asked, upon their return to the clinic for a second pregnancy, "What has happened to your first child?" answered, "Why, it is dead." Or, on other occasions, mothers discharged with their babies in perfect condition, returned at the end of a couple of weeks with the baby very sick.

What had happened?

Well, all kinds of faults had been committed. Possibly, instead of continuing to nurse the child, the mother had put it on the bottle and gone to work, or it had received a cabbage soup, or actually been fed on solid food; in fact, anything might have taken place; the result of ignorance, conjoined with superstition.

Budin, therefore, determined, if possible, to keep the babies born at the clinic under medical supervision at least during their first year.

The mothers were strongly urged to bring their babies back to the clinic for weekly inspection and weighing, and, at the same time, they received

medical advice and supervision in properly bringing up their children. They were encouraged in every possible way to continue to nurse their infants.

Professor Budin called these weekly clinics consultations for nurslings, and succeeded later in opening one at the Clinique Tarnier and at the Maternite Hospital.

The results were remarkable. Out of one lot of 716 babies at the Clinique Farnier but 26 deaths took place, and of these 26 but one of gastro-intestinal disease. In other words, the death rate among these children was less than twice the general death rate of adults, whereas, under ordinary circumstances, the death rate of infants in their first year is from 7 to 10 times as great.

The most potent factor in contributing to this favorable result was the way maternal nursing was encouraged among the mothers attending the consultation.

Since the introduction of the consultation for nurslings by Professor Budin, many others have been insti-

tuted in various localities with the same happy results.

Another powerful agency in the local diminution of the infant mortality rate has been the establishment of infant milk depots, both abroad and in this country, at which the mothers of infants who must be artificially fed could obtain suitable and sanitary milk for this purpose, either free or at nominal cost.

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This idea was due to another French physician, Dr. Dufour, who, in 1894, established at Fecamp, in France, the prototype of the infant milk depots which have since become numerous all over the world.

He gave his institution the highly suggestive name of "Gout du Lait" or "Drop of Milk." He was careful, however, to emphasize that artificial feeding, at best, is but a poor substitute for the mother's breast; so each little basket in which the milk bottles were taken from the depot bore the legend, "For Want of Better."

Since the establishment of the "Consultation of Nurslings" of Paris and the "Gout du Lait" at Fecamp, simi-

lar institutions have sprung up all over the world. In this country there are, perhaps, no dispensaries which exactly parallel the "Consultation for Nurslings" of Budin. Dr. Schwarz' clinic in New York comes the nearest I know to that, but milk depots such as those of the New York Milk Committee, the Boston Babies' Milk and Hygiene Association, the Infant Welfare Society of Chicago, Straus Laboratories in New York and Washington, the Babies' Hospital and Dispensary of Cleveland are fairly numerous in this country.

Although the number of babies reached by such institutions is only a drop in an ocean, still the presence of consultations for nurslings and milk depots has effected a small but decided drop in the infant mortality in the localities where they are situated.

The mortality among babies attending these institutions is usually one-half that of the city in general. In addition to this, by reason of the gradual dissemination of knowledge in the care of infants obtained by the moth-

ers from the advice they have received, the general infant mortality rate has been somewhat reduced in sections of cities where such institutions are established. In addition to the work of the consultations for nurslings and infant milk depots, other forms of activities have been established to which I can only briefly refer.

In order to assist mothers in nursing babies, many infant milk depots adopt the plan of feeding their milk to the baby through the mother, that is, they give the mother the milk to drink, thus assisting her to an abundant supply from the breast.

In France there are restaurants for nursing mothers where they may obtain two good meals a day, gratis, and no questions asked, the only qualification required being that she is actually engaged in nursing a child.

Rest Homes for expectant mothers, where they may go and obtain, free of charge, rest and good food before delivery, have been established. In this way they obtain freedom from the depressing effects of toil at a critical period, with the result of effecting

not only a notable increase in the weight and strength of the child at birth, but also of increasing the mother's ability to nurse the child.

Various associations have also been formed, such as the American Association for the Study and Prevention of Infant Mortality, to devise ways and means of grappling with the problem.

In certain countries, such as France and Italy, certain laws have been passed, such as the Roussel law in France, having for their direct object the safeguarding of infant lives.

It is manifest, however, that the chief causes of infant mortality are these two: Poverty and Ignorance.

As the elimination of these would involve the subversion of our present social order, it would seem futile to talk of the reduction of the infant death rate to reasonable limits unless we can at the same time do away with these great evils.

Shall we say, then, "What is the use?" By no means. The gradual awakening taking place over the world to the needless sacrifice of children is of the happiest augury.

The work of the pioneer is ever slow and groping, the progress made unsatisfactory and delusive. Yet, over and over again, has the world witnessed that the propaganda of the few has become the religion of the many.

What is needed is the active co-operation of the federal, state and municipal health authorities.

For instance, it is futile to talk of reducing the infant mortality rate in this country until we have an apparatus, that is, a full, complete and country wide system of birth and death registration for its measurement.

At this point I venture to point out that the federal government is preparing to take an active interest in the investigation of this great question.

There are, at present, bills pending in Congress, the one for the establishment of a Bureau of Child Welfare in the Department of Commerce and Labor, the other for the operation of a milk laboratory in the District of Columbia by the Public Health and Marine Hospital Service.

It is needless to say that the entry of

the government into such a field immediately connotes the overwhelming importance of the question to the national economy, and acts as a powerful stimulus in awakening interest in the matter throughout the land.

In conclusion, I will roughly formulate the problem which lies before us, for us and our children to solve.

It is not to bring a multitude of children into the world only to see them wither and die in the short space of a twelve-month, but to surround those which are born to us, in fewer numbers, maybe, than those of yore, with such efficacious safeguards as to ensure the passage of the greatest number through the fatal year of life with constitution unweakened by the manifold accidents of this period of existence.

As specific measures to this end, the following may be enumerated:

1. Every mother must conceive it her duty to nurse her child at least nine months.

2. The education of the mother should commence in early girlhood. Instruction in the care of infants

should be part of the public school curriculum in every state.

3. In order to give the fullest opportunity, especially among the poor, for the medical supervision of nursing mothers and their infants, "Consultations for Nurslings" should be freely established in every city, and mothers urged in every possible way to enroll their infants and attend with them regularly for inspection and weighing.

4. As soon as practicable the system of the registration of births and deaths should be extended throughout every state. I cannot too greatly emphasize the importance of this, as it is our only means of judging of the effectiveness of our campaigns and of the need of the local reinforcement of our measures.

5. The laws against child labor in our factories might well be extended to include pregnant mothers. Inasmuch as it is obviously impossible for weakly mothers to bring forth and fully nurture healthy children, the hours of laborious occupation for women, in any occupation which entails prolonged standing or sustained

physical effort, should be materially reduced.

6. The ravages of alcohol and syphilis must be restrained.

7. In view of the fact that unfortunately a certain proportion of infants must be artificially fed, steps must be taken to control the milk supply as to insure its reaching the consumer in a condition fit for the consumption of infants.

Part of the instruction of every school girl should relate to the proper care and preservation of milk in the home, and milk depots should be freely erected where the poor may obtain suitable milk of infant feeding, either gratis or at reduced cost.

8. While much work has been done on the medical aspects of the question, the results still leave much to be desired, and much is yet to be accomplished. Thus, the technic of maternal nursing is far from being fully developed. No adequate study has been made of this, the pre-requisite qualification of the successful mother, or of methods to aid her in its accomplishment.

9. Finally, not only our children, but the general public must be educated to the full realization of the meaning of infant mortality; that the children are the capital of the state, its only capital, from whose lives spring forth all the material and spiritual wealth, progress and accomplishment of which that state is capable.
