

Solving the Problem of Infant Mortality

BY BURTON J. HENDRICK

EARLY two and a half million babies are born in the United States every year, of whom three hundred thousand die before they reach their first birthday.

Apparently, that is, one out of every eight babies that first see light on American soil is sacrificed to the unfavorable circumstances surrounding its birth. Apparently, too, our first year of existence is the most dangerous in the whole human cycle. A man seventy years old stands a much greater chance of reaching seventy-one than a baby born today has to reach his first anniversary. Enough babies die in this country in ten years to populate a city as large as Chicago, a State as large as New Jersey, or to make up nearly the total population of Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, and Nevada. The United States which is notoriously wasteful of all the natural gifts with which nature has favored her, apparently feels that there is no need to economize in so potential a source of national wealth as its babies. Their destruction takes its natural place alongside the destruction of our forests, our birds, our animals, and our coal; these annual human sacrifices are merely another indication of a deplorable national habit.

This is a serious charge to make against any nation, both from the viewpoint of humanity and efficiency. Previous generations have regarded infant mortality from a fatalistic point of view, as something which cannot be helped and which it is therefore useless to struggle against. But modern science knows better. "Infant mortality," says Sir Arthur Newsholme, "is the most sensitive index we possess of social welfare and of sanitary administration, especially under urban conditions." How, judged by this test, does the United

States stand among the nations of the world? We are not the worst country, though we are a long way from being the best. With a national infant mortality rate which, so far as the statisticians can determine, is 124 per thousand, our record is just a little better than Serbia's. Nations that surpass us are Scotland, Finland, England, Denmark, Ireland, France, and the Scandinavian countries. The nation that makes the best showing is far-away New Zealand, a new and growing country like our own, which loses every year only 51 per thousand of her infants. The most negligent country is Chile, which loses almost exactly one-third of her babies. In all these melancholy statistics there is only one grain of consolation for the United States—our record is much better than that of the nation with which we are now at war. The strangest paradox presented by Germany is her excessively high infant mortality rate; this is 192 per thousand for the German Empire and 146 for Prussia. Here we have a nation which boasts that she has no slums and that her sanitary and general living conditions surpass those of any other people. Yet an indispensable accompaniment of kultur is evidently widespread mortality among babies. The fact that Germany has excellent sanitation and housing conditions and also takes unusual precautions against unemployment and poverty and yet loses her small children at this rate shows that the causes of infant mortality do not necessarily lie upon the surface. What laws regulate their taking off or their survival? What precautions can a civilized community take against a national disgrace of this kind? The matter was never so urgent as now, for our babies certainly constitute the ultimate line of national defense.

Until the last three or four years the United States Government had shown no active interest in this question.

Indeed, we Americans have been so negligent of our babies that we have made no wide-spread effort to register their birth. A few States, particularly New York, Pennsylvania, and New England, have kept these data for years, but in the larger number the citizen who forgets the year of his birth, or the one who wishes to establish the date legally, perhaps for important reasons, such as to qualify as the heir of property, has no way of doing so, simply because he was born in a community which had so little interest in his arrival that it made no permanent record of the event. Five years ago, however, the Federal Government created a Children's Bureau, placing at its head Miss Julia C. Lathrop, for many years an associate of Miss Jane Addams at Hull House, Chicago. This bureau was a wholesome if somewhat tardy recognition of the part which babies and children play in the American social order. It aimed at the improvement of civic conditions at the beginning. And Miss Lathrop has attacked her problem in a fundamental way. She has spent a considerable part of the last five years in seeking an answer to the rock-bottom problem, Why do American babies die? Clearly, we can do little in the way of upbuilding American childhood until we have the facts that answer this question. And the Children's Bureau is studying the situation in practical fashion. In a series of typical American towns it is investigating elaborately the life history of every baby born in a particular year. It has already published the results of these researches in Johnstown, Pennsylvania, Montclair, New Jersey, and Manchester, New Hampshire. Its agents have spent months in these three places, obtaining a complete record of every baby born in a particular year. They visit its home, make complete records of its living conditions, and talk to every mother—in fact, they study all the visible circumstances of its history for the year following its birth. If the child dies before its first birthday—it is only the babies that die within their first year that are included in statistics of "infant mortality"—a complete record of the cause and circumstances of the death is made. This is probably the first

time in any country that the question has been studied so scientifically. In all the places visited the influential public functionaries or organizations—churches, women's clubs, the police, the medical profession, chambers of commerce—have responded to this universal appeal and co-operated in the work. A pathetic feature has been the intense interest shown by the mothers themselves; of the many thousands who have been visited and questioned, many of whom—probably the majority—are poor and ignorant, not more than half a dozen have refused to answer questions or to show great interest in the investigation.

In particular, of course, most people know the causes of infant mortality. That small babies die chiefly from intestinal and respiratory diseases is a fact which the activities of most American health boards have forced upon public notice. But Miss Lathrop's studies have not concerned themselves chiefly with the causes of death which are reported in the physicians' certificates. They have been aimed rather at the underlying circumstances that, directly and indirectly, give the nation so unenviable a record—housing, sanitary surroundings, earnings of fathers, employment, working hours of mothers, and the like. As a result of these investigations we now have accurate data upon practically every condition that can promote the death of infants.

The city of Johnstown is one of the largest industrial centers in the United States. Its population of 55,000 contains in mixture a large proportion of the immigrating races from southern and eastern Europe, and its Serbians, Croats, and Slavs represent those brawny races which have so abundantly proved their usefulness as workers in the steel-mills. The town, because its location has made it one of the great steel centers in the United States, has developed rapidly and in rather haphazard fashion. The present city is really a conglomerate of many villages and towns, all of which have been incorporated with little attempt at co-ordination. For this reason the several factors that underlie social and sanitary conditions in any city—sewerage, paving, refuse disposal, housing—are not

such as promote the highest physical well-being. These circumstances explain the fact that Johnstown has a higher mortality rate than the average of the whole nation. Its rate is 134, against 124 for the United States. But this simple figure explains little by itself, for the infant death rate varies greatly in different parts of the city. One city ward loses only 50 babies per thousand in their first year, while another loses 271. This latter district, known as Woodvale, is not the most populous, neither is it the one that has the largest number of births. Yet its infant mortality rate is twice that of any other ward. It is the section where the poorest people live; its family heads are the unskilled workers of the steel-mills and the mines, the larger part of whom are foreigners, 78 per cent. of the mothers under investigation having been foreign born. The whole section is poorly seweraged, many of the streets are unpaved, in warm weather they are slippery and slimy with mud. If we trace the mortality rates of the other wards, we shall find that these conditions apparently exercise the greatest influence upon it. As housing and street pavements and sewerage facilities improve there is a steady decrease in the rate at which the babies die. "Improve the water-supply," writes one authority, "the sewerage system, and the system of disposing of refuse; introduce better pavements, such as asphalt, and at once there is a decline in infant mortality." Certainly this careful study of conditions in Johnstown and in other cities emphasizes the truth of this statement.

But Miss Lathrop's force have worked out their problem in greater detail than this. They have presented elaborate tables showing the precise relation between the death rate of infants and all the circumstances surrounding their lives. Such details as the source of water-supply apparently had an automatic influence upon the death of the babies. The rate was much lower in the houses where water was piped in than in houses into which it was necessary to carry water from outdoors. The dryness or the dampness of the houses likewise influenced the physical welfare of little

children. Completely compiled statistics showed that fewer babies died in dry houses, more in moderately dry houses, and most of all in those that were classified as "damp." The bath-tub is apparently a safe barometer of infant mortality. Thus, houses that possessed these conveniences had a rate of 72, while houses in which they were unknown had a rate of 164. The rate rose and fell in accordance with the general cleanliness or dirtiness of the yards and houses. Babies born in crowded houses died much more rapidly than babies in homes less crowded. Again, the infant mortality rate was much lower among babies who slept in a room with their parents than those who had to sleep in rooms that contained more than two persons. The rate increased greatly as the number of persons among whom the baby slept increased. The babies who slept in their own separate beds had a much more successful struggle for existence than those who slept in beds with other persons. Among the first the death rate was only 55 per cent., while among the latter it jumped to 108. These studies also show the value of open-window ventilation for infants, for here again the rate rose and fell according to the quantity of the ventilation.

Perhaps the greatest lesson these studies among foreign mothers teach us is the effect of hard work upon infant mortality. The extent to which prospective mothers increase the family revenue apparently regulates the extent to which their babies die. These women add a few dollars a week to their husbands' earnings, but they pay a dreadful penalty in the loss of their children. Among foreigners those nationalities which limit their women's work to household duties, such as the English and the Germans, have the best luck with their babies. Those peoples, such as the southern and eastern Europeans—Slovaks, Poles, and Serbo-Croatians—who regard their women almost as much as their men as family bread-winners, lose their infants to a much greater degree. And, as though in obedience to a hitherto undiscovered law, the races whose women work hardest pay the greatest penalties of this kind. Italian mothers,

it is true, have a higher infant mortality rate than certain eastern Europeans despite the fact that, in the main, they are not heavy laborers; but these women have poor physiques, and are thus not good natural candidates for maternity. The contrary is true of the Polish, the Slovak, and the Serbo-Croatian women. Their fecundity is well known; the Polish mother, indeed, was the greatest enemy that Bismarck feared in dealing with his Polish problem, for the ability of the Polish women to produce soldiers he looked upon as a constant military menace to the German Empire. In the mining regions of western Pennsylvania, however, though the Polish and Serbo-Croatian birth rate is high, their infant death rate is likewise high. Miss Lathrop's investigations present one startling paradox—that is, that those foreign babies who, on strictly biological grounds, ought to have the best chances of survival, apparently have the worst. These are the Serbo-Croatians, who have the highest infant mortality rate—264—of any nationality so far studied. It is the Serbo-Croatians, indeed, who give the Johnstown foreigners their exceedingly high rate and who are mainly responsible for the fact that the city as a whole has so discouraging a record. A mere glance at both the Croatian men and women immediately shows that nature intended them to be the progenitors of sturdy children. The men are large and powerful, and the women are big, handsome, graceful, and strong. They are so strong, indeed, and so proud of their strength, that they like to parade it recklessly. It is not uncommon to see them walking barefoot, with huge, graceful strides, over the ice and snow, even when they are approaching motherhood, and they work longer every day and work harder than their husbands. They do not labor in the steel-mills, but transform their homes into huge boarding-houses. They fill every cranny of their rooms with beds, which are rented to both day and night shifts of workmen, who also have to be served with meals at practically every hour of the day and night. There is thus hardly any moment when these Serbo-Croatian women are not working; this explains the fact that, out of every four Croatian children

born, at least one dies before completing its first year.

The Johnstown study revealed other suggestive information. The fact, recorded by other observers, that girl babies have greater vitality than boys is substantiated here, for the death rate of the male children was considerably higher than that of the female. Why it is that boys have a greater tendency to die in the early months of life than girls is evidently an inscrutable secret of nature; at least this record sheds no light upon the question. The infant death rate was also very much higher among women attended by midwives than among those attended by physicians. Babies of illiterate mothers had a higher rate than those whose mothers could read and write. English-speaking mothers had greater success with their children than those who spoke a foreign tongue. The death rate of illegitimate babies was twice that of babies born in wedlock—probably because they were more likely to be neglected. Residence in the United States apparently exercised a strong influence upon a baby's chances of survival; thus those whose mothers had been in the United States for more than five years died at the rate of 156 per thousand, while those whose mothers had lived here less than five years had a rate of 214. What is the most propitious age for motherhood? According to Johnstown's experience, it is from twenty to twenty-four; at least children born to mothers between these ages stand the greatest chance of living through their first year. Infant mortality, strange to say, is higher in Johnstown among children of mothers whose ages range from twenty-five to twenty-nine than from thirty to thirty-nine. Any age under twenty, these records show, is an unpropitious age for maternity, while the highest rate of all, as might be expected, is among children whose mothers have passed their fortieth year. These investigations emphasize once more the great advantages of natural over artificial feeding. An inexorable Nemesis punishes the women who decline their natural office—in the wholesale slaughter of their innocents. Probably never before have carefully compiled statistics brought out so conclusive-

ly this truth. But this factor affects children usually in the tenderest period—the first few months of life. At the end of the second month the naturally fed infant has a mortality rate of 72 and the one who is artificially fed a rate of 236; certainly we could not ask more convincing evidence in favor of nature's method. At the end of each succeeding month, however, this discrepancy disappears, indicating that the artificially nourished child, having secured an increasingly strong grip on existence, is more successfully combating the disadvantages of its diet. At the end of the ninth month the bottle-fed baby evidently thrives just as well as the nursing—indeed, according to these statistics, somewhat better. Another factor that apparently regulates the death rate is the earning capacity of the father, the rate uniformly decreasing as his income increases. When the family head earns \$521 or less a year, the infant mortality rate in his family is 255 per thousand; when he earns \$1,200 or more, this death rate becomes 84—an extremely low one.

In Montclair, New Jersey, a rich and prosperous suburban city, practically the same factors regulate the taking off of children. Montclair, since it is not an industrial but a residential community, had no such death rate as Johnstown; it was only 84, much less than that of the United States in general, and one of the lowest municipal rates in the whole country. But Montclair has its poor section, and there the same circumstances of sanitary conditions, illiteracy, artificial feeding, employment of mothers, and the like influenced the rate at which the babies died.

Far more significant were the studies made in Manchester, New Hampshire, a typical industrial community of New England. It is the unfortunate distinction of these New England factory towns that they have the highest infant mortality rates of all urban communities in the United States. Thus Lowell leads with a rate of 231, followed by Holyoke, with a rate of 213, as contrasted with New York City which, with all its tenements and slums, has a rate of 129, only slightly larger than that of the nation as a whole. Manchester loses, in the first year, 193 out of every one thousand babies born.

We find this partly explained by the fact that Manchester's chief industry is the manufacture of textiles, in which women are engaged in large numbers. The Serbo-Croatian women of Johnstown offered an opportunity to study the influence of the mother's excessive household drudgery upon the vitality of newly born children. Similarly the Manchester textile mills shed conclusive light upon the results of factory work. Indeed, this single investigation shows the wastefulness and the wickedness of this industrial system. What does it avail to gain a little economic wealth in the shape of spun cotton and textiles when, as Miss Lathrop's work now conclusively shows, this is at the expense of babies' lives? These mothers toil day after day in the cotton-mills, their average earnings amounting to \$250 a year. They frequently keep at work almost up to the very days their babies are born, and the consequences are shown in the statistics now published. Among these gainfully employed women the baby's death rate is 227, while the Manchester rate, for mothers not so employed, is only 133. Probably cold, hard-headed statistics never painted a tragic truth more eloquently than do these figures. The simple fact, of course, is that babies born under these conditions are robbed of the first primordial right of humankind—a mother's care. The mothers return to the mills soon after their children are born, with the consequence that their infants are artificially fed, and are generally neglected during those earliest months when their fate is decided.

But Manchester sheds the utmost light upon one of the most excitedly discussed questions of the time—that of large families. Is the married couple with two or three or four children serving the state as completely as our oft-quoted great grandparents, who did not mind having ten or a dozen? The bearing of large or small families upon the infant mortality rate is perhaps only one phase of this question, though certainly it is an important phase. Manchester furnishes an excellent opportunity to study this question, since one-fifth of its population is composed of French-Canadians.

Parts of the city, indeed, are as completely French as sections of Quebec or France. Here the streets bear French names—Notre Dame, Cartier, Alsace; French is the language commonly spoken; there are French newspapers, French convents, French churches, French orphanages, and the large department stores have to engage French interpreters. In the main, these people make valuable citizens; they are generally thrifty, sober, and self-respecting, representing a much higher social and economic order than the Poles, Greeks, and Syrians who form considerable elements in the city's population. Now these French-Canadians present a contradiction to practically everything already said in this article. Their sanitary surroundings are good; their homes are neater than those of the other foreign peoples; their womenkind, for the great part, are not gainfully employed; the father's earnings are the highest of any of the foreign-born residents; the French-Canadians, that is, possess all the advantages that should give them a low infant mortality rate. Yet the extent to which their babies die is fairly appalling. Whereas the English, Irish, and Scotch mothers lose only 66 babies per thousand the first year, and the Polish mothers, whose rate is high everywhere, 189, the French-Canadians lose 248. It is this bad showing of the French people that gives Manchester its high rate as a city; without it, the city rate would drop to 130, which is not much above normal in the United States. Artificial feeding explains these fatalities to a considerable extent. The prevalence of large families among the French-Canadians is the one thing that distinguishes them sharply from other peoples. In Manchester there were 32 mothers, in the year studied, who had had more than 12 children, and of these 30 were French-Canadians. This investigation clearly indicates—that was also shown in Johnstown—that the larger the family is the greater is its mortality rate. The interesting fact is brought out that the second-born child stands the greatest chance of survival. In Manchester families which have 3 children per mother the infant death rate is 148. From this it steadily in-

creases as the number of children increases until, in families of from 13 to 15 children—not unusual among French-Canadians—the rate becomes 241. We know that, whereas seventy-five years ago native American families had large broods of children, they also had a high death rate, and we now understand that there was some connection between these two facts. The argument for small families is apparently pretty conclusively made. Certainly the experience of the Manchester French-Canadians is a sordid story of maternal martyrdom.

Here, then, are the scientifically collected facts from three typical American cities which answer the question, Why do the babies die? But how can we prevent their dying? Evidently any attempt to recast our whole economic and social order, which, at first glance, seems to be an essential preliminary to reducing infant mortality, is hardly feasible, at least immediately. Yet the experience of other communities which have deliberately attempted to preserve their children indicates many things that can be done.

Let us turn, for example, to New Zealand, the country which has the lowest infant death rate in the world—51 per thousand. What explains this excellent showing? New Zealand's death rate has always been low, but in the last ten years it has steadily gone down. The fact is that New Zealand, as a nation, has consciously willed that its babies should be spared and has adopted the most energetic and enlightened means to preserve them. This nation of something more than a million people has been described as one large family, and certainly the interest which it shows in protecting the existence of its babies substantiates this description. It has the one fundamental preliminary to infant conservation—something which, as already said, we have only in certain parts of the United States—a complete system of birth registration. A nurse in New Zealand, interested in preserving the life of babies, does not have to start on a tour of exploration through the poorer quarters in the hope of stumbling upon the newly born, as she does in many of the cities of our own country, but finds complete records in official

places. The Government also keeps under the closest supervision midwives, maternity hospitals, infant asylums, and nurses. It teaches the science of motherhood at all times and in all places where it is most needed. In the public schools girls are instructed in the responsibilities of married life; in the poor quarters expectant mothers are visited and advised concerning the care of babies. One of the most famous institutions of New Zealand is the so-called "Plunket nurse." These are the field agents of the "Society for the Health of Women and Children," which, because of the great interest manifested in it by the governor-general and his wife, Lord and Lady Plunket, is generally known as the "Plunket Society." The Government contributes to the support of this organization and also carefully supervises it. It is New Zealand's great instrumentality for keeping down the infant mortality rate. The commonwealth is divided into a number of districts, each one of which is a field for the operations of a Plunket nurse, who periodically visits it and also keeps in constant touch in other ways, such as correspondence and the columns of the newspapers. Each district also has its local committee, which arranges for the visits of the nurse and makes it its business to see that her instructions are completely carried out. The nurse visits the schools, attends mothers' meetings, enters the homes of expectant mothers or of mothers with small babies, gives demonstrations on all matters pertaining to infant health, and even takes live babies into school-rooms for the instruction of school-girls—New Zealand's potential mothers. The Plunket nurse corresponds with the mothers in districts too remote to be visited, and parents everywhere are encouraged to write freely for advice. She regards it as her first duty to encourage natural feeding, and makes unceasing war upon the long-tube bottle and the "dummy." In all parts of New Zealand one of the most popular parts of the local newspaper is a column headed "Our Babies, by Hygeia," which has this for its motto, "It is better to put a fence at the top of a precipice than to maintain an ambulance at the bottom."

The column also contains the address and telephone numbers of the Plunket nurses. This column, published once a week in nearly every newspaper of the dominion, contains the most modern, up-to-date advice on the care of babies as well as queries and answers to correspondence. The work of this society has had the greatest effect in reducing the infant mortality rate. The year in which it began operations New Zealand's record was 83; in ten years this was reduced to 51. Dunedin, a city of 41,000, makes the best showing of any municipality in the world. While Paris loses 120 babies per thousand in their first year, Berlin 150, London 100, and New York 120, Dunedin loses only 40. Making all allowances for the larger size of these world capitals and their complex human and economic problems, the record of Dunedin is fairly astounding; it shows what the most enlightened educational methods can accomplish.

We have proved the same thing in isolated cases in this country. Montclair, New Jersey, stimulated by the investigations of the Children's Bureau, has introduced a "Baby Clinic," with results that have become immediately apparent. This clinic meets weekly for consultation with mothers on matters of feeding and general infant hygiene. About the first attention each mother receives after the birth of her baby is a card inviting her to attend these weekly meetings. In general this clinic performs for this small city just about the same services that the Plunket Society performs for New Zealand. And the result has been a considerable decrease in the infant mortality. The majority of clinic babies come from the ward in which the poorest people live and which has the sanitary conditions least conducive to good health. When the clinic began work this ward had the highest rate—130—of any section of Montclair; now its rate is lower than that of the city as a whole—84. Other communities are starting work of this kind. The one thing evident is that there is no natural necessity for the annual slaughter of infants in the United States, that it forms a blot upon our civilization which enlightened methods can—and will—remove.