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THE INFLUENCE OF WAR UPON INFANT MORTALITY AND  
ITS MEANING.<sup>1</sup>

By SAMUEL McC. HAMILL, M.D.,

PHILADELPHIA,  
DIRECTOR OF CHILD WELFARE OF THE COMMITTEE OF PUBLIC SAFETY FOR THE  
COMMONWEALTH OF PENNSYLVANIA.

THE factors that determine the population of any country are:

1. The number of children born into it.
2. The number of people that die in it.
3. The number of people that go out of or come into it.

Therefore to prevent a decrease in population or to maintain an increase—the goal of every nation—it is necessary to have a high birth-rate and a low death-rate and to successfully encourage desirable immigration.

All of these problems have received serious consideration in the past.

The birth-rate has shown a tendency to decrease in nearly every country in recent years, and especially in those most highly civilized. France was the one whose future was most seriously threatened before this war.

Through increased governmental activity, and more especially through the establishment of many volunteer welfare agencies, the nations had been endeavoring to compensate for the lowered birth-rate by saving the lives of babies under one year of age—a period of life in which the death-rate was extraordinarily high and in which the diseases causing the death-rate were largely of the preventable

<sup>1</sup> Read before the Philadelphia Pediatric Society, November 13, 1917.

group. Much had been accomplished before the war in some countries, and yet in but few of them could it be said that more than a mere beginning had been made.

New Zealand was the one brilliant exception. In 1907 her infant death-rate was 80 per thousand living births. In 1913 it had been reduced to 38 per thousand living births, thus verifying the opinion that it is possible to save practically 50 per cent. of the babies that are dying today.

What have we been doing in this country to reduce infant mortality?

Our Federal, State, and Municipal Governments have not become sufficiently aroused to the importance of saving human life.

In 1917 the Federal Government made the munificent appropriation of \$296,250 for the work of its Children's Bureau.

In the same year it *increased* its appropriation for the battle against foot-and-mouth disease among cattle by \$2,500,000 and appropriated for the control of hog cholera the sum of \$360,000. These last two appropriations were very necessary. Foot-and-mouth disease and hog cholera should be wiped out. But is their elimination relatively so much more important than the control of the contagious diseases of childhood or the education of the people of the nation in the methods of preventing death and disease among infants and children?

Speaking of education reminds us of the anomalous position in which we find ourselves in respect to the relative amounts appropriated for the maintenance of the health of our people and the education of our children. Health is fundamental to all progress. What is the use of developing the minds of our children if they are not physically equal to the battle of life? And yet the Pennsylvania State Board of Health has recently reported that 71.5 per cent. of the children coming to the public schools carry one or more physical defects of such importance as to modify seriously their efficiency or to threaten interference with their later development.

The recent experiences of the United States Government in its attempt to raise an army to fight the unspeakable Hun have confirmed this experience by revealing the humiliating fact that the number of our young men *physically unfit* for military service is extremely large.

Physically unfit, and yet the city of New York, in 1917, appropriated \$41,430,447 for the *education of its children* and only \$3,326,041 for the *protection of the health of all its people*. Of this amount but \$650,625 was awarded to the Division of Child Hygiene. Out of this latter sum also is taken the salaries of all medical inspectors of the city—including school inspectors.

I mention New York because her health appropriation is relatively very large, and because, with this measly pittance, she has brought about a remarkable reduction in her infant death-rate.

Some conception of the waste of human life that has accrued from the world-wide neglect of the rights of the little child to live can be obtained from some interesting figures that have been gathered in England. If the death-rate of 1914 had obtained in England for the last forty years England would have today, in addition to her present available fighting force, 1,300,000 men between the ages of eighteen and forty years; and had England been able to maintain her birth-rate of forty years ago through this same period these figures would have been doubled. Another group of English figures bears upon this enreless wastage of life. In 1915 there were 875,000 babies born in England. On the basis of the experience of recent years 100,000 of these were due to die before the end of their first year of life and an additional 100,000 before the end of the fifth year. In the same year—1915—the stillbirths and miscarriages in England amounted to 120,000. Therefore, out of a potential birth-rate of 995,000, 320,000, or almost one-third, were doomed to die before the end of the fifth year. It is a perfectly safe estimate that one-half of these fatalities could have been prevented—in other words, that with ideal health conditions established England could have added to her population 160,000 lives in 1915.

The foregoing figures are taken from English reports rather than our own, because we have no figures for the entire United States—only 31 per cent. of our population comes within what is known as the birth registration area—that is, the area in which the standard certificate is used and at least 90 per cent. of the births are reported.

If there was a great destruction of human life before this war, what can be said of that which has happened since it began. The figures are appalling, and they emphasize the fact that we must dwell upon today and use as the basis of our fight for the rights of the child to live, viz., that the life of the child has a greater economic value than it has ever had before.

The plea of the moral right of the child to live has had but little influence upon the minds of men. Perhaps they may understand the meaning of a child when measured in terms of dollars and cents.

When this war was called into existence by the lord of Kultur it resulted in the sudden withdrawal of millions of men from civil life and the establishing of conditions in each of the belligerent nations that led to a rapid decline in the birth-rate. This decrease has varied in the different countries, but it has been very great in all of them.

At the beginning of the war, as would naturally be expected, the interest of the people and their governments was centered upon problems that were directly connected with the development and maintenance of their armies. The result was that the problems of civil life were neglected. The welfare agencies that were dependent for their existence upon the voluntary effort and contributions of the people lost both their workers and their finances. The contributions

to war loans, the maintenance and carrying out of the work of institutions such as the Red Cross left the ordinary private agencies of civil life stranded. The withdrawal of physicians and nurses trained and working on public health problems handicapped the activities of governmental institutions. Some private agencies went out of business, all of them curtailed their work, the governmental departments became less efficient, as the result of which sickness and death among infants and children increased by leaps and bounds. This experience was common to all belligerent countries.

Coincident with this the casualty lists began.

In short, the various nations found themselves facing the solution of these problems:

1. A decreasing birth-rate.
2. An increasing death-rate.
3. An appalling destruction of adult life on the field of battle.
4. A great maiming of men, thousands of whom were totally incapacitated, and many thousands more who were so wounded as to be only partially capable in the years to come.

What was to be done?

Manifestly the deaths and wounds from battle could not be materially lessened as long as the war continued, and an increase in the birth-rate in war times was impossible. Indeed, as men fall in battle and new men are called to replace them the birth-rate naturally decreases still further.

There was one possible way, however, of stemming the tide of destruction, and that was by so reducing the infant death-rate as to at least in part compensate for the loss in population that the other conditions were producing.

To this end each of the various governments is bending its energies, with varying degrees of success.

What will be the fate of the smaller countries that have quaffed the cup of Kultur served them by the Hun—some with her arm around them, others with her mailed fist against their faces—no man can tell. The clouds upon their horizons are black and they seem to have no silvery lining.

Russia is now engaged—under the gentle guidance of sweet Germany—in destroying herself. Her outlook is unpromising.

Of Italy and Austria we have no authentic information as to the amount of sickness or number of deaths in civil life at any age period. We are entirely justified, however, in assuming, from our knowledge of the conditions in general in civil life, that morbidity and mortality are both high in all age periods.

We have no recent information from the land of the Boche, but prior to the severance of diplomatic relationships with Germany we knew that her infant mortality rate which had been lowered was increasing so fast that the government had forbidden the publication of statistics, and that her birth-rate was very low, being 40 per cent.

less in 1916 than the birth-rate of the year immediately preceding the war—a reduction in round figures of 735,500. We knew further that women and children were being exploited that the war might be won.

In August, 1914, the Reichstag, in order to be freed from all trammels and have opportunity to advance the cause of Kultur, passed an emergency law giving the Chancellor power to set aside all the factory laws and regulations for the well-being of women, young people, and children employed in factories.

An investigation made in September, 1915—a year later—by the German Metal Workers' Union as to the conditions under which women were working, revealed appalling conditions; 36 per cent. of the women were found to be working fifty-four hours in the week and 63 per cent. over sixty hours. In many cases they worked from seventy-five to eighty-four hours, and the shift workers sometimes worked from seventeen to twenty-four hours at a stretch.

Regarding France and England we have more accurate information. The experiences of France are probably suggestive of what is transpiring in Austria, Italy, and possibly in Germany. At the same time they stand as a warning of the destructive possibilities of modern warfare.

France has been an invaded country since the beginning of the war. The blow that struck her was severe, and in its suddenness unexpected. Her initial casualty list was enormous. These facts, together with the overwhelming problems of the future, demanded the immediate utilization of every resource to place the army in a position to withstand the onslaught of the Hun. The inevitable result was neglect of the civil population and the withdrawal from civil life of the people qualified to maintain the welfare of the civilian. From the very beginning of the war the drain upon the medical and nursing professions was most severe. As the war progressed this situation became more and more serious until in February of the present year there was only one physician to every 8000 of the civil population and no such thing as a public health nurse outside of military service. Until recently, when the American Red Cross began to supply physicians and nurses, the health of the civil population was largely under the guidance of volunteer workers. France has never been able to react from the effect of the original blow.

What has been the result? The birth-rate in France in 1913 was 18.8 per thousand of the population. In the year 1916 it reached the astounding figure of 8.6 per thousand. This meant a decrease of approximately 405,294 births in a single year. Before the war the birth-rate equalled the death-rate. It has been estimated that this decrease in the birth-rate plus the increase in the death-rate in civil life and the added death-rate of military life will result in a reduction in the population of France for the year 1917 of 790,000, or more than three-quarters of a million. Her losses in 1916 were 788,000—only 2000 less than the estimated loss for the present year.

What has happened in England?

England has never been invaded. Her military development has been more gradual, which means that there has been a less rapid withdrawal of men from civil life. This procedure has had a less sudden and severe influence upon her birth-rate. In general, England has had a much better opportunity to adapt herself to the changing conditions. Nevertheless, in England, as is inevitable in any warring country, the casualty list and the decrease in birth-rate has happened. As has been said, England also experienced a sudden and striking initial increase in her infant death-rate, due to the same causes that were active in other countries, namely, the diversion of the interest and activities of the government and her people from the problems of civil life to the preparation of her army for military service.

In 1914 the infant death-rate in England and Wales was 105 per thousand living births, in 1915 it was 110 per thousand—but England saw the handwriting on the wall. The decreasing birth-rate, the increasing infant mortality, the civil deaths of other age periods, and the fatalities of battle were spelling depopulation. Her response to this situation was the perfecting and extending of her machinery to save the lives of her infants.

All government agencies were rendered more efficient, her health visitors were increased to 1 to every 500 infants born, and all of her private welfare agencies were voted grants of money, so that instead of curtailing they might extend their work. The result has been most striking. England's infant death-rate for 1916 was reduced to 91 per thousand living births, a saving over the previous year of 19 lives in every thousand born.

In this way England has been able, in large part, to compensate for her decreasing birth-rate.

If England is able to maintain this standard and end this hellish war with a relatively small decrease in her population, of all the European countries involved England's future is the most assured. There will be less shortage in man power in the years to come, and England will have established on a firm basis the machinery with which to ensure to the children born to her a place in which they can dwell in safety.

In every warring country the number of children born will continue to decrease in proportion to the number of men called to arms, the number of women taken into industry, and the increase of poverty in the essentials in life.

The casualties of battle—the killed and the wounded—will continue as long as the war holds.

The influence of these new conditions added to the factors which contributed to sickness and death before the war can yield but one result—a rapid decrease in population.

It is such a procedure as England is following that will compensate in part for such losses and justify the statement—"that the answer to the question, 'Who has won this war,' will be given twenty or thirty years from today." Naturally it will be the country that so maintains the nutrition of its people to yield the highest degree of efficiency and most nearly maintains its rate of increase.

And now our beloved country is at war. The experiences of other warring countries are soon to be our experiences. The present plan of our Government calls for an army of 5,000,000 men. When 5,000,000 men are taken out of civil life the influence upon the birth-rate of the land will be tremendous. It is no argument to the contrary that the majority are unmarried. Unmarried today, yes, but many of them would have been married in another year.

The casualties of battle are coming to us too. Soon the black band of mourning will be common to our eyes and soon our tears will be shed with the blood of our sons.

It is easy enough to talk of the casualties that are coming to us. It will be another thing to face them. Do you ever stop to think upon what we are likely to face? Do you realize that Russia with her millions upon millions of men to whom the Allied nations looked for powerful and continued help has been eliminated from this war? Do you know that Italy is weakening and that noble France is fighting on sheer nerve today? Finally, do you understand the meaning of these things?

Upon the shoulders of England and America will fall the greater part of the burden of this conflict in the years to come. What that burden has meant to the nations that have borne it since August, 1914, we know.

Most assuredly will we add to our lowered birth-rate the casualties of battle.

Deaths as they have happened before the war must continue.

God forbid that through neglect of our civil problems we should add to this list an increase in the death-rate of the civil population—especially of our infants and children!

Without war we have a child problem in the State of Pennsylvania.

In 1915, with a death-rate of 110 per thousand living births, we had the distinction of having next to the highest infant death-rate of any of the States in the registration area.

We also harbored the town of Shenandoah, which, with a death-rate of 196 per thousand living births, had the highest rate of any town or city in the registration area.

What is to happen to us in Pennsylvania if by neglect we lessen the efficiency of the manifestly inadequate institutions that have prevented our death-rate from going higher than it now is?

Dare we become so deeply involved in the problems of war as to neglect this most vital of our civilian problems?

England's neglect in increasing her infant death-rate from 105 per thousand living births in 1914 to 110 per thousand in 1915 added to her casualty list for that year the lives of 4375 infants under one year of age.

For every child that dies four are ill. So England's increased casualties were not *only* of the dead, but, in addition, there were four times 4375 or 17,500 wounded.

This country faces a grave situation. Its man power is threatened. Immigration has ceased and probably will never again be a very potent factor in the increase of our population. We have established literacy laws which in normal times would have caused a great decrease, but what is of much more significance the loss of men in the countries which were once the source of our supply has been so great that these countries are considering the advisability of placing a permanent embargo upon emigration which will practically end this source of increase.

We will be dependent therefore upon our own resources.

Today we have not enough men to do the work of our industries. If men are to be killed in battle or maimed for life, if our birth-rate decreases and by any chance our infant death-rate is permitted to increase, we will create conditions that will require generations to overcome.

What can we in Pennsylvania do to offset this possibility? War is upon us—our men are falling on the battlefield—we cannot check the guns of our common enemy—the deaths and wounds of battle are inevitable.

As in all the rest of this warring world our birth-rate will decrease in proportion to the number of men that are called to fight in the cause of liberty. This is the law of battles.

Is there nothing that we can do to protect our beloved country against the influences of these inevitable things?

The answer to this question has already been given.

The present infant death-rate in Pennsylvania is 110 per thousand living births. New York City, with its desperate problems of alien population, poverty, overcrowding, immorality, and crime, maintained an infant death-rate for the first seven months (up to and including July 28) of the present year of 83 per thousand living births.

If that is possible in New York it is possible in any great city of the land, and should be easily attained in the great cities of Pennsylvania. In our smaller cities and rural districts we should establish the figures of Australia, Sweden, Norway, or even New Zealand, in which in the year 1913 the infant death-rate was 38 per thousand living births. If but 25 per cent. of the possible 50 per cent. reduction could be accomplished in Pennsylvania we would save each year the lives of 27 babies in every 1000 born, or, in round figures, 5938 babies' lives.



By what procedure can such results be reached?

The basis of all health work is education. England was able to reduce her infant death-rate from 110 per thousand living births to 91 in a single year by multiplying her educators. The Government financed every private agency of standing and multiplied her health visitors—the women who go into the homes of the people to tell them how to care for their babies and children—so that she had 1 to every 500 children born. New Zealand attained her results by the education of all classes—especially of the mother in the home—and in answer to this question which I recently addressed to Dr. S. Josephine Baker, Director of the Bureau of Child Hygiene in New York—"To what do you attribute the striking reduction in the infant death-rate in New York accomplished in 1916?" I received the following reply:

"The feature of our work which I feel to have been of most value in 1916 in reducing the infant death-rate was the widespread emphasis that was given to the education of the mothers. You will remember that during that year we had the epidemic of poliomyelitis. Mothers became more than ever anxious to get information which would help them to care for their babies. This gave us an opportunity to carry on a very definite health campaign for the prevention of infant mortality, and we made every effort to get the coöperation of every agency in the city which was engaged in any work which related to infants. The results were most encouraging, as we had 1052 fewer deaths of babies under one year of age in 1916 than in 1915 and 324 fewer deaths of children under five years of age in 1916 than in 1915, notwithstanding the fact that the greater proportion of our deaths from poliomyelitis in 1916 were in children under five years of age."

Whatever is to be done in Pennsylvania must be accomplished also through the education and coöperation of all classes of society, but above all through the education of the mother in the home. Unfortunately we cannot do what England has done. We are dependent upon our State and Municipal Governments for our appropriations. Our State bodies do not meet annually, and therefore we cannot secure financial assistance from the State until our Legislature is in session and even then we have the barrier of politics to penetrate.

Ultimately governmental assistance will be given, but we dare not wait. We dare not neglect the problems of our civil population.

The one that is most urgent and most promising of results is the infant mortality problem. Infant mortality is a community problem, and therefore is an index of the health of communities. The conditions that cause sickness and death among infants also cause sickness and death in all age periods. Therefore the removal of the agencies which cause infant mortality contributes to improvement in the health of all the people.

For the present the solution of this problem is largely dependent upon the services of the volunteer.

It becomes our duty as citizens—just as great a duty as that we owe to any of the activities directly connected with the creation and maintenance of our armies—to give of our time and our money to the institutions that have been or will be created for the protection of the lives of our children. Let us not add to the casualties of battle the casualties that will inevitably follow the neglect of these little ones. Pennsylvania is now calling to her citizens to see to it that her people are protected in such way as to make it possible for them to give the best that is in them to the work they are doing so that the highest efficiency at home may contribute to the efficiency of our armies abroad. What will be your answer?

When Harry Lauder was in Philadelphia a few weeks ago he said that when he went into the trenches and asked the boys how they were the answer was, "How are we? Oh, we are all right; but how are the folks at home?" "*How are the folks at home.*"

Do you believe they want the answer to that question to be the babies are dying, the children and grown-ups are sick, the efficiency of the workers has been reduced, and the supplies that should come to you will be delayed because the civil population has been neglected?

Remember what they are sacrificing that we may be saved. It is not alone the giving up of the home and the loved ones that dwell there, but the supreme sacrifice of life itself.

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### THE PROPHYLAXIS OF MALARIA.

BY CHAMPE CARTER McCULLOCH, A.M., M.D.,

COLONEL, UNITED STATES ARMY; SOME TIME PROFESSOR OF MILITARY AND TROPICAL MEDICINE, ARMY MEDICAL SCHOOL, WASHINGTON, D. C.

FOR an Army man, venturing into print, especially at this time, it seems hardly excusable to write on any subject not related in some important way to the existing war. Malaria has not been reported as having given great trouble along the Western front, where our Army will no doubt be mainly employed, yet it seems well to review our knowledge of the subject at the present time. We have not yet received the complete reports of the disease incidence there, and it may have been greater than we know. It is quite conceivable that malaria might appear in a troublesome way if any carelessness were shown in our own sanitary arrangements, and it certainly seems important, or liable at any time to become important, in view of the many large cantonments and camps that we are now preparing in this country for our big new American Army, some of which are of necessity situated in districts not entirely free from suspicion of malarial endemicity.