

Nutrition in War and Peace

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IT IS A PRIVILEGE TO APPEAR BEFORE THE STATE AND Provincial Health Authorities of North America in this historic city. It is also an unusual opportunity and a heavy responsibility—an opportunity to explore with you new vistas in the promotion of human health and welfare, and the responsibility of doing justice in a brief address to a most important and complex subject.

Let me begin by trying to recreate for you something of the atmosphere of the early 1930's when the world witnessed the spectacle of hunger and malnutrition among vast numbers of unemployed workers and their families, while the world's granaries were bursting with food that could not be sold. Food surpluses haunted the minds of leaders in government while bread lines formed below their windows and the unemployed sank lower and lower into misery. Governments bought up these food surpluses, dumped them abroad, denatured them so that they would be unfit for human use, or destroyed them. In these circumstances, the outbreak of a Second World War could not have come as a surprise to the most casual student of world affairs.

It was at this time that delegates to the League of Nations, together with League officials, launched what came to be known as the world food movement, designed to release the economic jam by emphasizing that adequate diets were essential to human health, and that in supplying the raw materials for such diets, agriculture throughout the world would rise from its depression and in rising carry with it the industries

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needed to supply farm machinery, fertilizers, housing, roads, marketing equipment, and other essentials for agricultural rehabilitation. This movement, led by such men as Sir John Orr, F. L. McDougall, and Lord Bruce,¹ rapidly gained momentum. Studies were made, under League auspices, of the health and nutrition of the unemployed and their families in the depressed areas of a number of countries. At the Assembly of the League, as well as at the International Labor Conference, the need for new food and nutrition policies for each country and for the world as a whole was the chief topic of debate. A committee of physiologists convened by the League set out for the first time in history a table of optimum dietary standards,² and national nutrition committees or councils were set up in more than a score of countries. It was the belief of many that had this movement been started early enough the train of events leading to the Second World War might have been halted. But the current was moving too swiftly; the world was on the brink of catastrophe, and soon plunged into the Second World War. Eight years have been lost in the movement to promote better health and improve social conditions by raising the diets of the peoples of the world to more adequate levels, but in spite of the war, or perhaps because of it, important lessons have been learned which may in the long run accelerate the world's progress on the road to peace and prosperity.

Today for the second time within a generation we stand at the crossroads, one road leading to freedom from want and freedom from fear while the other leads through nationalism and isolation to a third and perhaps final world war. The world situation today resembles so closely that which confronted us after the First World War that it would appear as if some higher power were saying to us: "I hope you have not forgotten your lesson for I am giving you another chance, and on your present choice will depend the fate of your civilization." The choice we have to make today relates to the use to which we put the rapid increases in our knowledge made possible by the advance of science on a wide front.

Sir John Orr³ has said that every advance in knowledge which gives man new powers over nature inevitably brings about changes in the structure of our society. A good example is the invention of the printing press, which was followed by the spread of new ideas about the dignity and the rights of man. When the society of that day refused to accept the new ideas, there followed the American and French Revolutions. History teaches that those who resist these changes always lose in the

long run, and because of the resistance changes come violently rather than peacefully, through revolution rather than evolution. Nowadays knowledge is increasing so rapidly that we are hard put to it to keep track of the advances even in a single field of science. Moreover, the changes brought about by this new knowledge, which once were local or national in scope, now are felt throughout the world because of the great advances in transport and communication. Now that man has mastered some aspects of the release of nuclear energy, the question in everyone's mind, and the unseen influence behind the foreign policy of governments, is whether the new force is to be used for atomic bombs or socially useful purposes; the way mankind answers this question will in the long run determine its fate.

In the drama of solving problems in the field of physical science, we tend to forget that during the last thirty years advances in our knowledge of biology have been even more rapid. This new knowledge is potentially just as dangerous to our society as our ability to manufacture rocket or atom bombs. Biology has taught us how to multiply the production of food from a given acreage; by using this new knowledge a few men on a few farms in a few countries⁴ have increased the world's food production during every decade in the last two hundred years.⁵ By using the new methods on a wider scale, enough of the right kinds of food can be produced to nourish every inhabitant of the earth. And while we have learned to produce an abundance of food, our knowledge of human nutrition has increased so that we understand something of the important relation of food to health. The best fed peoples of the earth live longest, have the greatest physical and mental energy, and possess the most abundant health and the greatest enjoyment in life.⁶ In view of our ability to produce enough of the right kinds of food to feed the entire population of the world, and in the face of our knowledge that the best fed peoples are the most healthy and prosperous, can our society endure once again the spectacle of two-thirds of the world's people malnourished or starving while food surpluses pile up or are destroyed? To ask the question is to answer it; the new powers over nature given us by scientific advance must be used for the benefit of world society or they will bring our civilization down to destruction in revolution and war.

These considerations bring up political, social, and economic questions of the most complicated character, and you may well ask, what have health workers to do with these ideas? The answer is simple; we as physicians and health officers have undertaken the responsibility for

maintaining health and preventing disease among the populations under our care. It is our business to keep abreast of the stream of new knowledge, and to weave into the pattern of our work, the new methods and techniques placed in our hands by advances in the natural and social sciences. In no other field of science has our knowledge advanced more rapidly than in nutrition. The earlier and much of the recent work has been done with animals, whose environment can be readily controlled and whose life span is short enough so that the effects of the different nutrients can be observed in a few years over several generations. For these reasons we know far more about the influence of nutrition on laboratory and farm animals than we do about its effects on human beings. But man too is an animal, and by analogy we can transfer to man the results of carefully controlled animal experiments. Moreover, in recent years an increasing number of human studies have been undertaken, and these have served to confirm the results of animal studies and to emphasize that the beneficial effects in animals of more adequate diets may be equalled or surpassed by the results in man. We know from animal experiments that adequate nutrition insures good litters, and that certain deficiencies in the diets of pregnant females will bring a large and fairly constant proportion of congenital anomalies.⁷ We know that a diet which will keep rats in good health for generation after generation, reproducing normally and living out the normal life span, may give even better results if extra amounts of certain nutrients, such as vitamin A, are added.⁸ On the improved diet the rats will mature more quickly, attain greater stature, remain longer in the prime of life, and live a longer life by about 10 per cent, equivalent to seven years in the human life span.

H.C. Sherman, who conducted many of these experiments, has this to say of the potentialities of better nutrition in human beings:

To a much more important extent than had been supposed, we build our own life histories by our daily use of food.

Through wiser choice and use of food we can build our own and our children's health to higher levels.

It is no exaggeration, it is a simple summary of scientific fact, to say that our new knowledge of food and nutrition brings us a new order of mastery of our life processes, and thus of our life histories.

In fact, what has recently been learned of the relations of food to health constitutes one of the major scientific advances of our times.⁹

These statements received dramatic illustration in the United Kingdom during the war just ended; every health officer should be familiar with the story.

In 1937 there appeared in Great Britain under the title *FOOD, HEALTH AND INCOME* a report on adequacy of diet in relation to income. The report was based upon a survey of 1,152 family budgets, selected so as to constitute as representative a sample as possible. The conclusions of the report caused shocked surprise and aroused antagonism. Fortunately, when criticism and questioning had ended, action followed, and a far-reaching program for better nutrition, particularly of low-income families with children, was adopted and carried out. The result was that when war came the people of the United Kingdom were better fed than they had ever been before.¹⁰ The conclusions of the report, in brief, were as follows:

The average diet of the poorest group (up to 10s. per head per week), comprising four and one-half million people, is by the standard adopted, deficient in every constituent examined.

The diet of the second group (10s. to 15s.), comprising nine million people, is adequate in protein but deficient in all the vitamins and minerals considered.

The diet of the third group (15s. to 20s.), comprising another nine million, is deficient in vitamins and minerals. Complete dietary adequacy is almost reached in the fourth group (20s. to 30s.), and in the still wealthier groups (30s. to 45s.+), the diet has a surplus of all constituents considered.

A review of the state of health of the people of the different groups suggests that as income increases disease and death rates decrease, children grow more quickly, adult stature is greater and general health and physique improve.

The results of tests on children show that improvement of the diet in the lower groups is accompanied by improvement in health and increased rate of growth, which approximates to that of children in the higher income groups.

The lessons of this survey were so impressive, and the memory of the First World War when the British people were threatened with starvation so vivid, that when war broke out in 1939, the Government took steps to carry out a food and nutrition program which would provide for all the people the food needed for their health and working capacity. A

scientific advisory committee on food and nutrition policy was set up by the Cabinet, to which it reported directly. Its recommendations may be summed up in a sentence: everyone, without regard to income, should be supplied with food according to his or her physiological needs. This policy was put into effect and carried out along the following lines:¹¹

A system of rationing was enforced, based on the principle that all the essential nutrients, even if in short supply, should be equally available to everyone to the extent necessary to maintain health, and at controlled prices.

Some common foods such as bread and potatoes were left unrationed, so that the differing requirements of human beings could be met by the individual.

For nutritional and transport reasons, bread was made from 85 per cent extraction flour instead of the usual 70–72 per cent extraction.

Expectant and nursing mothers, infants and school children were assured of an optimum diet regardless of their purchasing power. This meant that these groups had priority in the supply of such essential foods as milk, eggs and fruit. Cod liver oil and foods rich in ascorbic acid were also provided for these groups. School meals were made available in all the schools. Over a million and three-quarters of these were served in 1945, this amounting to 36.3 of the total school attendance.

By the end of the war three-quarters of all school children were receiving milk at school either at one-third of the market price or free. For adolescents working in factories so-called National Milk Cocoa was made available at a nominal price.

Margarine was fortified with vitamins A and D, calcium was added to flour and vitamin D to dried milk.

The well-to-do could buy extra meals in the regular restaurants, and to equalize the position and provide for the greater needs of working people British restaurants were set up where substantial meals of nourishing food could be obtained at cost. Similar provision was made for factories, and those which employed 200 or more workers were required to provide canteens or cafeterias. Special arrangements were made for the inmates of institutions and for invalids. The essential feature of the whole scheme was that each individual, regardless of income, had a right to the food necessary to maintain his health.

Having made the best possible plans to feed the people adequately the next step was to see that they were working out properly. For this purpose a complete system of dietary, weight, and clinical surveys was

inaugurated. Dietary surveys revealed whether representative samples of the population were receiving adequate diets, weight surveys showed whether the calorie content of the diet was satisfactory, and clinical surveys identified the presence or absence of nutritional deficiencies. The clinical surveys were of two types: the rapid examination by medical officers of hundreds of persons weekly to detect clinical signs indicative of a deficiency, and the more thorough survey including biochemical examinations of the blood and urine of several hundred people in a town by a mobile team from the Oxford Nutrition Survey. A few words about the results of these assessments are pertinent here. These "suggest that the nutritional state of the nation was not worse at the end than at the beginning of the war, and as regards children was somewhat better." Again, "Although the child at the end of the war was bigger, more resistant to disease, better nourished and in every way had borne the strain of war better than his predecessor of the last war, much remains to be done before the average elementary school child can be assured of that physical development which he is inherently capable of attaining."

As regards anemia in women and children "it seemed fairly certain that no greater degree (was found) than in the limited number examined before the war, and that in certain groups there was probably less."¹²

In the program to maintain the health of the entire population by means of adequate diets, two other factors deserve mention. One was the setting up of a Ministry of Food which had control of the production, import, pricing, and distribution of food, and the other a systematic campaign of education in nutrition. Time does not permit me to more than mention these factors. Many detailed reports are available to the interested reader, and a short account of the work of food management in the United Kingdom during the war is to be found in the first of five technical reports prepared by the Interim Commission for the Quebec Conference of the United Nations on Food and Agriculture.

What have been the results of the wartime policy respecting food and nutrition in the United Kingdom? I give them to you in the words of Sir Wilson Jameson, Chief Medical Officer of the Ministry of Health, and of Dr. H.E. Magee, Deputy Senior Medical Officer of Food, Dietetics, and Nutrition. Here is the story as told to the British people over the radio by Sir Wilson Jameson in December, 1944:

After five years of war we still have a good story to tell. The most sensitive index of a nation's general health is probably the proportion

of infants dying in the first year of life. In the last war it rose steadily. During the last three years it has declined steadily and last year, was the lowest ever recorded. The most risky time for a baby is its first month of life. Well, we've got a new low record there; and as for the tragedy of babies born dead (stillborn as we say) I can tell you that the chance of this happening is only three-fourths of what it was five years ago. The death rates for children up to ten years of age were last year the lowest on record, as was also the proportion of mothers dying as a result of their confinements. As the war has gone on, the vital statistics for mothers and children have continued to improve and in the fifth year they're the best we ever had. This can't be just an accident. All that's been done to safeguard mothers and children must have had some effect—such things as the national milk scheme, vitamin supplements for mothers and children, the great extension of schemes for school meals and milk in schools. There are doubtless other factors—full employment and higher purchasing power in many families, especially in the old depressed areas; as well as the careful planning from a nutritional point of view of the restricted amount of food available for the nation.

The following is taken from a lecture by Dr. Magee:¹³

The war-time food policy was the first large-scale application of the science of nutrition to the population of the United Kingdom. . . . A diet more than ever before in conformity with physiological requirements became available to everyone, irrespective of income.

The other environmental factors which might influence the public health had, on the whole, deteriorated under the stress of war. The public health, so far from deteriorating, was maintained and even in many respects improved. The rates of infantile, neonatal, and maternal mortality and the stillbirth rate reached the lowest levels ever. The incidence of anemia declined, the growth-rate and the condition of the teeth of school children were improved, and the general state of nutrition of the population as a whole was up to or above prewar standards. We are therefore entitled to conclude that the new knowledge of nutrition can be applied to communities with the expectation that concrete benefit to their state of well-being will result.

In view of these results it is no wonder that Sir Wilson Jameson has come to the conclusion that "Nutrition is the very essence and basis of national health."¹⁴

The great progress which has been made in public health work during the last forty years has been based largely on the work of Pasteur and his disciples, who taught us the specific causes of many of the diseases

which constituted the chief health problems in the twentieth century. If public health work is to win new triumphs, its achievements must be based in future on advances in our knowledge of biology, particularly as these relate to man's dietary requirements and the influence of good nutrition on health. Here is a sure foundation upon which to build, for the new knowledge comes from carefully controlled experiments in animals and human beings and it has been put to the most rigorous test among large populations in wartime. The influence of this great store of new knowledge is being felt throughout the world. It was responsible for the insertion in the Atlantic Charter of one of the four freedoms: freedom from want. It led to the establishment of United Nations Relief and Rehabilitation Administration, Food and Agriculture Organization of the United Nations, the International Emergency Food Council, and the International Children's Emergency Fund. One of the most important problems facing the United Nations today is that of adapting agricultural production, economic and fiscal policy to a world in which the fear of unsaleable surpluses of food exists side by side with hunger and malnutrition among something like two thirds of the world's population. There can be no political security, no peace in the world until this problem is at least on the way to a reasonable solution. We, who are devoting our lives to a public health career, may shrink from stepping outside of our accustomed role. But in the world as it exists today, every profession which has something to contribute to the stability of society has responsibilities which cannot be evaded. It is the task of professional health workers to keep abreast of the advances in biology, and to devise the mechanisms—the ways and means of utilizing these advances for the promotion and maintenance of the public health. In the face of the experience I have cited, health workers can no longer be content with desultory programs of education in nutrition and superficial systems of medical inspection of school children. The maintenance of a good state of health, which is one of the results of an adequate diet, is surely no less important than the prevention of specific diseases. Yet in the modern state lack of income is no bar to immunization against smallpox and diphtheria; while there is no similar general provision for giving pregnant women whose diet is inadequate the nutrients necessary to maintain the health of mother and offspring.

I cannot in the limits of this paper describe a complete public health program in nutrition even if I were qualified to do so. Such programs must be evolved by experience and adapted to the conditions and needs

of particular regions. But I can point to successful war experience in the field of nutrition and suggest that the most useful items in that program should be maintained in peacetime. We need to compensate for the social and economic losses suffered in the war by preserving and maintaining any benefits which may have come from that terrible experience. Some of the agencies in the wartime program of food and nutrition which deserve to be retained are the following:

1. *National Food Administrations.* The Ministry of Food in the United Kingdom has done notable work in the field of what has come to be known as food management.¹⁵ In the United States of America experience during the war revealed the need for a War Food Administration and one was finally set up, but it has been discontinued. In many countries much of the work of a food administration is carried on by the Ministry or Department of Agriculture. But in the Department of Agriculture the emphasis is quite properly on the needs of agriculture whereas the food administration should be concerned with all consumers of whom farmers constitute a larger or smaller percentage according to the development of agriculture in a particular country. Briefly, it is the task of a national food administration to see that the food needed for the health of the people is provided, either by indigenous production or import, at prices the different income classes can afford to pay. The food administration should be guided by the national department of health, which will determine dietary standards, and by appropriate dietary and clinical surveys, keep its finger on the pulse of the people insofar as nutrition is concerned.¹⁶
2. *National Nutrition Committees or Councils.* On the proposal of an advisory committee set up by the League of Nations before the war, many governments set up national nutrition councils or committees. These consisted of high representatives of the different government agencies concerned together with university scientists and consumer representatives. It was the business of these councils to advise the governments on nutrition policy. The final responsibility for such policy rests upon the government of the day, but it is of great advantage to the government to have the views of independent persons who are not subject to the pressures which every government agency must bear. The secretary for health, chief medical officer, or national health commissioner

is usually the chairman of such a council. A National Nutrition Council did useful work in Canada during the war, and in the United States this function was performed in a limited way by the Food and Nutrition Board of the National Research Council. The United Nations Conference on Food and Agriculture held at Hot Springs in 1943 emphasized the need for such councils, and Lord Horder, chairman of FAO's Standing Advisory Commission on Nutrition, is now urging governments to set them up. The National Nutrition Council of the Government of the Union of South Africa has furnished an excellent account of the organization and work of such councils.¹⁷

3. *Division or Bureau of Nutrition.* Every national health administration should have a division or bureau of nutrition, headed by a physician with special training and experience in biochemistry and clinical nutrition. Such a division or bureau should also be set up in large city health departments. For work in the field qualified physicians as well as nutritionists should be employed. But something more than qualified staff is needed; the health officer himself must know enough about nutrition to provide the proper kind of encouragement and support. Therefore, in addition to the training received by undergraduates in medicine, courses in nutrition should be required in all public health schools. It seems absurd that some such schools now give degrees in public health to students who have never received any advanced training in nutrition.

So much for some important elements of the organization required to carry out programs of nutrition. As for the programs themselves, the subject is so vast that I must confine myself to the merest outline, emphasizing a few essential activities:

- A. Research and investigation are two of the most important items in such a program. Leaving out the kind of fundamental research which advances our knowledge of the science of nutrition, I emphasize the need for investigation of the problems which confront the health officer. What is the state of nutrition of his people? How adequate is their diet? Which classes in the community require special attention? These and similar questions can be answered by dietary, clinical, and biochemical studies of representative

samples of the population. Experience teaches that classes which are under pressure or stress from any cause are most apt to be malnourished. This at once draws our attention to pregnant women, infants, school children, adolescents, invalids, convalescents, and the aging, particularly as these are found among the lower-income groups.¹⁸

- B. In carrying out nutrition programs a good beginning can be made with pregnant women, who should receive an adequate diet from the beginning of pregnancy. Here it is not sufficient to attempt to educate the pregnant woman in good food habits; if necessary, she should be supplied at public expense with the supplements which investigation shows are necessary to bring her diet up to adequate levels. Many animal and human studies have demonstrated that a good nutritional status during pregnancy will reduce the toxemias, cut down maternal mortality, lessen premature births, and greatly reduce infant mortality from this cause.^{19,20} I can think of no better way for the health department of a large area to demonstrate the potentialities of a modern public health program than a campaign to raise the diets of all pregnant women to adequate levels. In Wales during the war the death rate from prematurity, which was at an unusually high level, was reduced to one of the lowest in the United Kingdom by this means.²¹
- C. Special attention to the diets of industrial workers is also worth emphasizing. The issue of the late war depended as much on the output of munitions as it did upon the result of military and naval engagements. When this came to be realized in the United Kingdom, in Canada, and in the United States, special machinery was set up to ensure that workers were well fed. In all countries the results were excellent. In the United States, as a result of the campaign, proper facilities were provided in large plants for feeding many millions more than before the war or in the first war years. Industrial feeding programs lend themselves readily to programs of education in nutrition; employers and management cooperate gladly because they have found that the provision of suitable facilities for feeding their workers is an important factor in improving labor relations. Special attention should be paid to workers in the heavy industries, whose caloric expenditure is high.

- D. A fourth most important item in the program is the school meal. Many children who are entitled to the free schooling provided by the modern state are unable to profit because of their poor state of health resulting from under or malnutrition. Numerous studies have shown that well-balanced school meals improve the health, growth, and learning power of the pupils. Students of population have suggested tentatively that school meals provided at public expense to every pupil would be a proper first item in a population policy adapted to the declining fertility of Western civilization.²² In combination with school gardens the school meal may be used in teaching biology as well as in inculcating good food habits. It is a powerful means of building health into the structure of our society.

I must bring this long address to a close before I try your patience too far. My purpose in accepting your invitation was to show you that great opportunities exist for the health officer who undertakes to apply in his district even a small part of the new knowledge of food and nutrition that is now available for his use. The formulation and carrying into effect of a sound nutrition program will bring new life to public health departments; it will widen their scope and increase their influence and prestige. The public health workers concerned will be refreshed by their closer association with the research workers who have made new knowledge available, and whose contribution was never so important to society as it is in this critical age; they will be joining in the attempt to give the public the benefit of advances in science which otherwise would bring critical pressures to bear on our society. Let me close with a quotation from my friend Dr. James S. McLester who has done so much to make physicians understand the importance of nutrition in medical practice:

In the past, science has conferred on those peoples who availed themselves of the newer knowledge of infectious diseases, better health and a greater average length of life. In the future, it promises to those races who will take advantage of the newer knowledge of nutrition, a larger stature, greater vigor, increased longevity, and a higher level of cultural attainment. To a measurable degree, man is now master of his own destiny, where once he was subject only to the grim hand of Fate.²³

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