

NUTRITION.

A

POLICY OF NATIONAL
HEALTH.

By Barbara Drake.

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Introduction by

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Introduction

The necessity of a national policy of nutrition is a case which requires little argument. On humanitarian grounds alone, the widespread evidence of malnutrition on an alarming scale, which is set out in the first part of this pamphlet, should be sufficient to convince us of the necessity of Government action on a considerable scale.

Ironically enough, it has not been mainly humanitarian, nor social, nor even business or economic considerations which have finally placed the problem of malnutrition in the foreground of public affairs, but considerations which are fundamentally military. The danger of war and the strain of modern warfare have forced Governments in this and other countries to see the need for a healthy nation. The alarming percentage of rejections, on grounds of physical unfitness, of applicants to join the Army, gave first-rate political importance to the stream of reports of malnutrition which had been flowing in from Medical Officers of Health all over the country for some time.

There could therefore be no fitter time for the appearance of such a pamphlet as this. There has been ample research into human needs as far as "Minimum Diets" are concerned, and into the prevalence of malnutrition in this country. These researches are summarized and co-ordinated in the first part of this pamphlet. But what has so far received little attention, is the shaping, from the available facts, of a practical and immediate policy. This is attempted in the second part of this pamphlet. The author, Mrs Barbara Drake, Alderman of the London County Council, has devoted herself for many years to the study and practise of social welfare, and brings to her task a wealth of practical experience and a wide knowledge and study. She has, in dealing with her subject, left what may seem to many people a very large gap in her practical policy of nutrition. That is the absence, in her proposals, of any *direct* policy of adult nutrition except for mothers. This omission is deliberate and is made for the following reasons. In the first place, while malnutrition in the years of growth has more disastrous and lasting results than at any other stage of life, evidence of inadequate diet is most common in large families. Secondly, the only real solution to the problem of adult malnutrition is an increase in purchasing power of the adults concerned. For reasons of human dignity, for the avoidance of "charity", and for reasons of administrative convenience, collective feeding for adults is difficult if not impossible; and the

solution of the problem by distribution of food or credit to individuals even greater. What is obviously more desirable, for economic and social reasons, is that by lightening the financial burden of feeding children adequately, the adults of a family should be given the means of purchasing adequate food for themselves in the normal way. This involves no interference with home life and cuts down administrative difficulties to a minimum.

There are a number of ways in which the purchasing power of adults might be increased, apart from communal provision of food for children; for example: family allowances in cash; an economic policy of employment; rent rebates; adequate scales of unemployment assistance; the abolition of the means test. But these do not come within the scope of this pamphlet. The policy outlined here would, we believe, go far towards solving the problem of child malnutrition, and in so doing, materially assist in the solution of the adult problem.

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1 Modern Standards of Nutrition

The ideal of nutrition has been defined by Sir John Orr¹ as "a state of well-being such that no improvement can be effected by a change of diet". While no two physiologists are likely to agree as to what constitutes a perfect diet, it has been found possible to establish standards of basic human needs which are sufficiently accurate for use in practice. A number of different factors must be taken into account, *qualitative* as well as *quantitative*. Of these the most important are the supply of calories, or units of energy, the quantity of "first class" or "animal" protein, and the amount of mineral matter and vitamin content.

The minimum needs of an average adult (male or female) have been given² as 2,400 calories per day, with additions for muscular activity of 50-200 calories per working hour. For practical purposes,³ the requirements of an adult man engaged on moderate work are estimated at 3,000-3,400 calories, and of a housewife at from 2,600-2,800 calories. For children the standard varies according to age from 30% of the adult standard at the age of 1-2 years rising to the full adult standard at the age of 14. Some authorities⁴ put forward the stage of full adult requirements to the age of 12. For nursing mothers, the adult standard needs to be raised by about 25%.

Protein requirements vary again according to age, but are relatively greater at the stage of growth than in adult life. Allowances of total protein have been estimated³ at 3.5 grams per kilogramme of body weight at the ages 1—3, falling to 2.5 at the ages 5—15, and to 1 gram at 21 years and upwards. For expectant and nursing mothers, the corresponding allowance is 2 grams, or twice the normal adult allowance.

It is generally assumed that some of the protein contained in a satisfactory diet should be of 'animal' origin, e.g., meat, fish, eggs, milk, etc. Most authorities recommend that animal, or first class, protein should form not less than 50% of the total protein, and a higher percentage is advised at stages of growth.

Carbohydrates and fats are essential constituents of a satisfactory diet, but the data at present available do not permit a precise statement. Bread, root vegetables, sugar, offer abundant supplies of carbohydrates, and these foods bulk large in working-class diets. Animal fat is an important constituent of children's diet, and the intake should not be low. Infants at the breast receive about half their calories in the shape of fat.

Mineral matter and vitamins are necessary to prevent deficiency diseases, e.g., rickets, scurvy, anæmia, dental caries, but there are no means at present of measuring the exact quantities required of each kind. Milk and milk products, liver, fat, fish, green vegetables and fresh fruit are known to be rich in them, and diets which contain a full share of these so-called "protective" foods will not be found lacking in mineral matter or vitamins. Here again the needs of growing children, and of expectant or nursing mothers, are relatively higher than those of an average man, and a deficiency more dangerous to health. A partial deficiency, for example, in vitamin A (found in fresh milk, liver, green vegetables, carrots) is said to lead in children to a lowered resistance to skin and respiratory infections as well as to general ill-health.⁴ Evidence is accumulating that the development of the teeth, like that of other bony structures, is dependent on a full supply of vitamin D, which is held by many authorities to be a potent factor in the prevention of dental caries—one of the major scourges of modern civilization. Ordinary diets in northern climates are commonly deficient in vitamin D, but it may be found in abundance in fish, liver, oil, eggs, summer milk and butter. For this reason cod liver oil is a valuable adjunct in winter to the ordinary diet of growing children and pregnant mothers.

To sum up, a satisfactory diet must be satisfactory *in all respects*. No quantity of calories, for example, will make good a deficiency in first-class proteins and fats, or in vitamins and salts.

Such a deficiency is most dangerous to health in the period of growth. A diet which may keep an adult leading an unexacting life in reasonable health may be quite inadequate for the needs of a growing child, or of a woman during the stress of pregnancy.

2 Diet and Income

Both the Ministry of Health and the British Medical Association have formulated minimum scales of diet which can be expressed as money values, the figures for an adult man being 5s 11d* per week (B.M.A.) and for a woman 4s 11d. The Ministry of Health figure for an adult man is 5s 1½d, but was meant to be applied to whole communities and institutions, and not to single families. These figures represent *minimum* diets upon which it is possible to maintain health. They are not designed to afford more than the barest necessities, nor to help to improve general health. They also assume that the housewife buys and prepares the food with due knowledge and skill, and pays only a reasonable price. There is no margin allowed for error or waste.

Sir John Orr classifies the population as follows:¹

Group	Income per head per week	Estimated average expenditure on food	Numbers
1 ..	Up to 10s	4s	4,500,000
2 ..	10s to 15s	6s	9,000,000
3 ..	15s to 20s	8s	9,000,000
4 ..	20s to 30s	10s	9,000,000
5 ..	30s to 45s	12s	9,000,000
6 ..	Over 45s	14s	4,500,000
Average ..	30s	9s	

In Group 1, he tells us, i.e. families living at about the economic level of the dole or of the lowest paid class of wage-earners, the diet is inadequate in all respects. In Group 2, the diet is adequate in *total* proteins and fats, but not in *first-class* proteins or fats; in Group 3, the diet is adequate in energy value, proteins and fats of all sorts, but below standard in vitamins and minerals. Complete adequacy of diet is only found in the higher income

* This figure was based on prices in 1932. According to Dr M'Gonigle, the corresponding figure in Stockton, June 1935, would be 7s 1d (+ 20%), or, say, 7s.

groups, where the family income per head reaches 20s to 30s a week, and the average food expenditure per head is not less than 10s a week. If these conclusions are correct, a diet completely adequate for health is only reached at an income level above that of 50% of the population. Further, we are told, it is the lower income groups which contain the greater number of children. Sir John Orr estimates that the 10% of the population with the lowest food expenditure per head are largely children under 14, and that 20% to 25% of the children of the country belong to this category. It is not unreasonable to assume that the mass of working-class families with two or more dependent children fall below the standard of all-round complete sufficiency. This does not mean, as Sir John Orr points out, that the lower income groups are starving, or even suffering from such a degree of ill-health as is recognised in the term disease. The diet may be sufficient to maintain life and a certain degree of activity, and yet be inadequate for the maintenance of the fullest degree of health, which a perfectly adequate diet would make possible.

Sir John Orr's conclusions are supported by other evidence. Where children's appetites must be satisfied at a very low cost, it is inevitable that the more expensive animal foods—meat, fish, butter, eggs—should be cut down. Cereals (flour, oatmeal, rice), potatoes, etc., on the other hand, are relatively cheap and easy to get. Consequently they bulk largely in working-class diets⁵ "There is abundant evidence," the Chief Medical Officer writes, "that a direct result of poverty is to reduce the amount of protein and fat and relatively to increase the carbohydrates." From an elaborate analysis made by Drs M'Gonigle and Kirby⁶ of the food purchased by 126 working-class families in Stockton-on-Tees, it appeared that, while the relatively well-to-do families (70s to 80s a week) purchased the full minimum allowance of first-class protein as laid down by the British Medical Association, the poorest group (25s to 35s a week) purchased substantially less than half this minimum. In all groups with family incomes below 55s a week the purchase of first-class protein was markedly below the British Medical Association minimum. In the poorer groups there were also grave deficiencies in the purchase of fats.

It is, however, in the protective foods that deficiencies are most likely to occur. Recent dietary surveys made by the Rowett Institute, Aberdeen, and the Market Supply Committee indicate that the consumption of such needed health foods as milk, butter, eggs, fruit and vegetables decline uniformly with a falling family income. Milk is the perfect food for the young. Medical opinion today is practically unanimous that one pint of milk per day is

the minimum allowance for the normal child up to the age of 16. The following table shows the variation in the quantity of fresh milk consumed in relation to income¹:

Income per person	Pints per head per week			
Under 10s	0.70
10s to 20s	1.75
20s to 30s	2.80
Over 30s	3.50

Thousands of children in poor homes never taste fresh milk. A recent investigation into the consumption of fresh milk in Cardiff⁷ gave the following results:

Type of Area	Pints per head per week		Households taking no milk	
Good middle class	..	3.88	..	Nil
Good working class	..	1.65	..	9%
New housing estates	..	1.32	..	15%
Poor working class	..	1.1	..	26%

There is other evidence to show that in poor homes the quantity per head of milk consumed varies inversely with the number of children in the family. An inquiry made by Mrs C. M. Burns into the milk consumption of 1,000 poor families attending infant welfare centres in County Durham⁸ showed that the average quantity per head of fresh milk purchased every week was as low as 0.7 pints in families of three persons, and fell to 0.4 pints in families of five persons, with still lower amounts for larger families. Mrs C. M. Burns concludes that fresh milk is only used in tea and puddings, and "an increase in the number of children to be fed merely results in the use of more water and less milk per head rather than in the purchase of more milk".

It may thus be seen that, while an actual shortage of food-stuffs is found only in families living at about the economic level of the dole or of the lowest-paid class of wage-earners, defective quality of diet is widespread and extends to the mass of working-class families with two or more dependent children. It is in the protective foods that a deficiency is most likely to occur, and is related most closely to income. Such deficiencies are acute in large families where the income has failed to keep pace with the number of mouths to be fed.

3 Evidence of Malnutrition

The terms "state of nutrition" and "malnutrition" have different meanings for different authorities. The individual may be compared with the *average* of his group, or with the *optimum* of his race.⁸ Physicians with different social backgrounds may have very different ideas as to what a healthy, well-nourished child should be. The physiological effects of even a single deficiency are usually of a complex nature. Light weight may thus be associated with sepsis of the tonsils, teeth, ears, etc., but the septic conditions may themselves be secondary to food deficiency, which may be the real cause of low weight.

Lack of food is not the only cause of malnutrition. The debilitated child, as the Chief Medical Officer points out,⁹ may lack fresh air, exercise, rest, but a principal cause is "insufficient, irregular, unsuitable or unappetizing food". Recent investigations made by Dr M'Gonigle and others show that,⁶ where poor families have been removed from slum areas to new housing estates, but an increase in rent has resulted in less money being available for food, there has been a marked rise in the death-rate and the health of the family has deteriorated.

The risks to health from underfeeding are all the more insidious in that deficiencies in the quality of diet may produce no immediately obvious results. "A diet," writes the Chief Medical Officer,⁵ "may be very defective and yet, if sufficient in amount, may satisfy children's appetites, leaving no craving behind, and may maintain apparently normal vigour for a considerable time. The inevitable results of such a diet are, however, ultimately to be seen in its failure to promote a full measure of growth, in lessened immunity to disease and possibly in the presence of some form of 'deficiency' disease."

MALNUTRITION AND MATERNITY

Damage may be done by underfeeding before the child is born. The following table shows the infantile mortality rates for various towns (1933):

Wigan	110	Bath	52
St Helens ..	116	Brighton ..	47
Liverpool ..	98	Oxford	32

The infantile mortality rate cannot obviously be taken as the figure for malnutrition, but it is reasonable to ask why infants should die more readily in poor areas than in well-to-do areas?

A competent authority suggests¹⁰ that the poor-class infants develop anæmia, which they contract from anæmic mothers, and are therefore more liable than others to fall victims of the respiratory diseases. In St Helens in 1933 the infantile mortality rate from respiratory diseases alone was actually higher than the total infantile mortality rate of that year for Oxford.

According to a statement in the *British Medical Journal* (22 April 1933), "the prevention of anæmia in working-class women has become a major problem and one which demands immediate attention". A recent investigation made in Aberdeen covering 1,000 unemployed families showed that 50% of the women suffered from anæmia, which could largely be traced to malnutrition.¹¹ "When you are looking for a place in the family," the Minister of Health has declared (7 July 1933), "where malnutrition will show itself, and where the bad effects will show themselves, look at the mother. . . . It is impossible and beyond the power of any man to prevent a mother depriving herself for the sake of her children."

Evidence of malnutrition in very young children is common in poor areas. In a recent survey of 228 children aged 3-4 attending infant welfare centres in Sunderland and County Durham,³ it was found that 25.6% of the total number showed "subnormal" nutrition, and 3.8% "bad" nutrition. A similar investigation made by Dr Spence in Newcastle gave about the same percentages of "subnormal" nutrition. "Since this high incidence of apparent malnutrition," Dr Spence writes, "is not found in children of better-class families, it is due to preventable causes." Of the two major causes, one is given by Dr Spence as "bad housing which encourages mass infection", and the other as "improper and inadequate diet, which prevents satisfactory recovery from their illnesses".

MALNUTRITION A COMMON CAUSE OF ILL HEALTH

The high incidence of defect in very young children can thus be directly associated with deficiencies in diet. The results of an important survey⁶ of 3,000 "unselected" children between the ages of 2 and 6 showed that, excluding minor dental and visual defects, 27% had some physical or mental defect, or suffered from some definite impairment of health. "This survey," writes the Chief Medical Officer, "may probably be taken approximately as a picture of the condition of children of these ages throughout

the country." Rickets is notoriously a deficiency disease. Of the 809 children classified in the survey as subnormal, 43% showed some degree of rickets. In a special examination of 1,638 "unselected" school children in 1931, quoted by Sir John Orr,¹ 87.5% showed signs that they had suffered from rickets at one time or another.

"The reports from school medical officers," states the Annual Report of the Chief Medical Officer for 1934,¹² "concerning the nutritional state of school children are generally reassuring, though there are exceptions." The figure of malnourished children (including those in need of observation only) is given as 2.6% of all those examined. Intensive investigations in particular areas show results which are less reassuring. In Sheffield, for example, the percentage (including "bad" as well as "subnormal" nutrition) is given as 11.04%; in Newcastle, as 13.46%; in 36 rural schools in Monmouth County, as 14.4% (none of whom were receiving free meals); in six poor schools in Sunderland, as 20.9%; in three colliery towns in Sunderland, as 21.9%. Similar percentages to those in Sunderland were found by Dr Glover in poor schools in Tyneside, County Durham and South Wales. Even in a prosperous seaside town, where it had not been thought necessary to make provision for free meals, Dr Glover found the figure of "subnormal" nutrition to be as high as 15% in a poor area elementary school, though not more than 4.4% in a "central" school in a good area. Of the depressed areas in Cardiganshire, Dr Ernest Jones writes:¹¹ "Undernourishment is very widespread. It was 100% in some of the schools until the institution of the midday meal."

These figures, moreover, do not tell the whole story. The early signs of underfeeding are by no means easy to detect, or appear only after damage has already been done. The high percentage of rickets in very young children has already been remarked. Recent inquiries show that susceptibility to tubercular infection is definitely related to the income level of the family. Mrs C. M. Burns¹⁰ has discovered a direct connection between non-pulmonary tuberculosis and a low consumption of milk. It is now generally believed that there is a close correlation between dietary deficiency and dental caries. "Though there is still some difference of opinion," writes Sir John Orr,¹ "as to the relative importance of the dietary factors involved, there is no longer any doubt that the diets of the lower income groups which are markedly deficient in minerals and vitamins, are not such as to promote the growth of sound healthy teeth." About 80%, he tells us, of British children have imperfectly developed teeth.

To deficiencies in diet must also partly be attributed the low standard of health discovered in young employed persons. A recent survey of young people attending juvenile instruction centres in London showed that of 1,138 boys and girls, 750 were classed as "normal" or "average" nutrition, 268 as "subnormal" or "bad" nutrition, and only 120, or about 10%, as "excellent" or "optimum" nutrition. A deputation from the Association of Boys' Clubs to the Board of Education stated recently that of 500 boys aged 14-18 medically examined, not more than 70 were without physical defect.

POVERTY SAPPING OUR NATIONAL HEALTH

Not less significant of the close relation between diet and health are the comparative figures for rate of growth in children coming from poor and well-to-do homes. Dr Hurd has shown³ that in Manchester, on an average, the mean gain in height between the ages 5-11 years is 14.65 inches in boys living on a suburban estate, but not more than 9.1 inches in boys living in a poor city area. The corresponding figures for girls are 17.12 inches compared with 10.41 inches. The aggregate gain in weights for the same groups is 39.52 lbs for suburban boys against 29.18 lbs for poor boys, and the corresponding figures for girls 40.44 lbs against 29.68 lbs.

In an investigation recently made by Dr Spence¹² into the heights and weights of two groups of 125 children, one coming from poor working-class homes and the other from middle-class homes, it was found that nearly 50% of the poorer children were below standard height, and more than 50% below standard weight. The corresponding figures for the better off children were 5% and 13% respectively. With regard to anæmia, only 20% of the poorer children passed the "satisfactory" test, and 23% were classified as definitely anæmic (hæmoglobin below 65%). None of the better-off children was classified as "anæmic".

In a graph compiled from various sources,¹ Sir John Orr has shown that, at 13 years of age, Christ's Hospital boys (16,031) are, on an average, 2.4 inches taller than council school boys (12,605), and, at 17 years of age, 3.8 inches taller than "employed males" (2,061), who may be taken as belonging to the same group as council school boys. Public school boys (307) of corresponding ages are 2-3 inches taller again than Christ's Hospital boys. While it is obvious, as Sir John Orr points out, that stature is largely determined by heredity, the extent to which a child will attain

the limit set by heredity is affected by diet. When applied to large groups of the same race, comparable figures for height and weight do give an indication of the relative adequacy of the diet of each group.

Even more conclusive are the results of recent experiments in supplementing the ordinary diet of "unselected" children with foods commonly lacking in working-class homes. The well-known experiment of Dr Cory Mann was carried out on boys living under excellent hygienic conditions in a charitable institution, but receiving the ordinary village diet. Six groups of 30-60 healthy children were formed, all of whom received the standard diet, but one group received the basic diet only, and the other groups respectively a supplementary ration of sugar, margarine, butter, watercress and a pint of milk. The supplementary ration caused a substantial increase in weight in all cases, but only milk and butter gave an appreciable increase in height. The group receiving milk showed the most rapid increases in height and weight, and remained relatively free from minor ailments and infections, which were fairly common among the rest of the boys. It was observed that the milk-fed boys, as compared with the remainder, were high-spirited and mischievous. "A casual visitor," Dr Cory Mann writes, "entering the dining hall would never fail to recognise the table of that house which was alone receiving the extra ration of milk, the boys of that house being obviously more fit than those of any other house."

CHILD HEALTH AND THE SCHOOL MILK RATION

Drs Leighton and Clark have experimented in relation to 1,425 school children belonging to average working-class homes, their home diet being of the customary kind of the district. Each group was given, in addition to the ordinary diet, respectively a ration of whole milk, separated milk and biscuit. The experiment was continued for two years. At all ages the children given milk showed markedly greater increases in height and weight than the biscuit-fed group, or the controls. A series of tests on a larger scale was carried out in Scotland by Sir John Orr. About 1,500 children in ordinary elementary schools were given supplementary milk meals of $\frac{3}{4}$ to $1\frac{1}{4}$ pints according to age for a period of seven months. The rate of growth among the milk-fed children was about 20% greater than in the non-milk-fed group, and the increased rate of growth was accompanied by a noticeable improvement in health and vigour. This experiment was twice repeated

by different observers who obtained substantially the same results on numbers up to 20,000 children.

Though it is too soon to be able to measure the full effects of the milk-in-schools scheme, and one-third of a pint is too small a ration in most cases to achieve a maximum result, many school doctors speak with appreciation of its benefits. The following are typical extracts from the reports of school medical officers :³

"I am so much impressed with the value of this measure that I have come to the conclusion that no child, however favourable its home conditions may be, receives full benefit from its education unless it partakes of this morning milk." (Hornsey.)

"The remarks of the teachers (after nine months' continuous provision of milk meals) are extremely valuable and interesting.

'We have all noticed how the children have grown both mentally and physically.'

'There has been a general improvement in physique, mentality and attendance.'

'There has been a notable increase in general vitality.'

"The conclusions of the teachers have been confirmed by the observations of the medical staff. There has been improvement in general alertness, muscular tone, colour and posture, and, in the majority of cases, an increase in weight." (Staffordshire.)

"There has been a substantial improvement in the nutrition of the children since the reduction of milk in schools to half price. The beneficial effect of the free milk and meals given to necessitous children is obvious to the most casual observer." (Gosport.)

It may be said in conclusion that, while the figures of malnutrition, as these appear in the reports of the Chief Medical Officer, do not tell a sensational story, there is a growing volume of evidence as to the prevalence of anæmia in working-class mothers, the presence of deficiency disease in infants and school children, the high incidence of defect in young employed persons, the wide disparity in the rate of growth at different income levels, which cannot be disassociated from deficiencies in diet and can only be viewed with grave disquiet. The same significance must be given to the results of recent experiments in supplementing the ordinary diet of unselected children with foods commonly lacking in working-class homes. All the evidence suggests that the average working-class child does not enjoy "a state of well-being such that no improvement can be effected by a change of diet".

4 Public Provision of Meals

The particular claims of children to protection against malnutrition have been recognised by Parliament in three principal Acts, namely the Maternity and Child Welfare Act 1918, the Provision of Meals (Education) Act 1906, since embodied in the Education Act 1921, and the Milk Act 1934.

ARRANGEMENTS UNDER THE 1918 MATERNITY ACT

Under the Maternity and Child Welfare Act, public health authorities have power to grant extra nourishment to "necessitous" mothers and children under 5 not attending school. The article of diet most conveniently distributed is milk. This was first supplied to nursing mothers and infants only, but more recently the Minister of Health has made it plain (Circular 1433) that the granting of extra nourishment to a pregnant woman is an important function of an ante-natal clinic.

The returns for 1934 show that 351 out of 377 local authorities responsible for maternity and child welfare services make provision for the supply of milk at cost price, or free of charge in "necessitous" cases; and 106 authorities also supply meals, or such special foods as cod liver oil, malt, ergosterol, etc. There are besides between 2,000 and 3,000 maternity and child welfare centres most of which supply milk in one form or another to a limited number of necessitous mothers and infants. According to a statement by the Minister of Health (July 9 1936), some 7,000,000 gallons of milk a year (including dried milk) are distributed in this way at a reduced rate or free of charge.

The arrangements vary widely from one area to another. In Cardiff² free milk is given at the welfare centres to children under a year. This means that there are no special arrangements for children over this age until they attend school. In Rhondda, on the other hand, children attending a welfare centre can receive milk up to the age of 5. In a recent investigation by Dr Wilkins,³ these differences in administration are directly associated by him with the substantially higher figure of malnutrition discovered in children aged 3-5 in Cardiff than in Rhondda schools. The disparity was all the more remarkable because of the relative prosperity of the two areas concerned.

The Battersea Municipal Council has for many years had a scheme which includes infants up to 5 as well as expectant and nursing mothers. In 1935, over 200 mothers and 845 children received fresh milk under the scheme, and 155 infants dried milk. Altogether 147,816 pints of fresh milk and 3,000 lbs of dried milk were distributed during the year, for the most part free of charge. The method of distribution is as follows: The mother applies to the welfare centre and is granted an order on a local dairy for a prescribed quantity of milk, which is delivered at her home in the usual way. The dairy is chosen by herself but from an

approved list. The milk is supplied, free of charge, or at a reduced rate, according to the family circumstances. The ordinary retail price is paid in either case by the authority to the dairy. The usual allowance of milk is one pint a day, but one-and-a-half or two pints may be granted on the doctor's recommendation. The order must be renewed every four weeks.

ARRANGEMENTS UNDER THE 1921 EDUCATION ACT

Sections 82-85 of the Education Act 1921 give powers to local education authorities to make such arrangements as they think fit for the supply of meals to children attending school, but authorities must not incur expense in respect of purchase of food unless they have previously resolved that there are children attending school who are "unable by reason of lack of food to take full advantage of the education provided for them", and that voluntary funds are not forthcoming for the purpose. The full cost of the food must otherwise be recovered from the parents. Over 200 out of 316 local education authorities have taken steps to exercise their powers to provide meals, free of charge, to "necessitous" children. In 1934-35, 68,000,000 meals were supplied under the Act to 400,000 children. The figure represents not more than 7% of the elementary school population, and only some of this number received meals throughout the school year. Rather less than two-thirds of the meals were milk meals and about one-third dinners. About one-eighth of the cost of the food was recovered from the parents.

Methods of selecting children for free meals vary widely from area to area. Some authorities rely entirely on the recommendation of the school doctor, while others make their selection primarily on an income basis. It is usual in this case for an application to come from the parents, and "each case is decided on its merits". Some authorities, however, have adopted a definite income scale below which a child is classed as "necessitous".

Though the Board of Education have not questioned the reasonableness of these scales, they have in recent years made it plain that they cannot regard the fact that "the parents' income falls within an authority's scale as by itself justifying the provision of free meals" (Circular 1443). They consider that the selection of children for free meals should be made by a system of medical selection, though they would regard it as proper that children should be selected who show any sign, educational or

physical, however slight, of subnormal nutrition. This development of policy has been challenged by the Association of Local Education Committees on the ground that the Board are trying to impose conditions not specified in the Act, and so to interfere with the discretion of local authorities. The old excuse of administering an Act "according to the intentions of Parliament" does not avail in this case. For the original Act was passed in 1906 when the school medical service had not yet come into existence. Further, the Association point out (*Education*, October 1934) that in hundreds of cases there is convincing evidence of financial necessity, but no clinical symptoms of subnormal nutrition. "Are these necessitous children really to wait," it is asked, "until they exhibit definite symptoms, however slight, of subnormal nutrition?" In a considered resolution the Council of the British Medical Association (November 1934) has expressed the opinion that "the onus should not be placed on a medical officer of determining in every case that a scholar is presenting evidence of subnormal nutrition before free milk or meals are provided."

ECONOMY OF FEEDING ARRANGEMENTS

Methods of feeding necessitous children vary again widely from district to district. Some authorities have established their own central kitchens and dining centres, but most authorities make use of caterers. In London, about half the children receiving free meals obtain them from the school cookery centres, but this method is unusual and suitable only in the case of very small numbers. Use in London also is made of caterers, and more recently the Council has established central kitchens and dining centres of its own. Authorities have to use as dining halls such accommodation as they can get, and this consists too often of dark, ill-ventilated rooms with no proper cloakroom arrangements or washing facilities. Some authorities have been able to convert a disused school hall or classrooms into a suitable dining hall, which may serve two or more schools in the district.

It is usual for the dinner to consist of two courses, namely a meat dish or soup made with meat stock, potatoes and one other vegetable (dried peas or beans, carrots or turnips, a green vegetable), with a sweet pudding to follow. The meal is commonly a substantial one, but may be open to criticism on the ground that it lacks variety, that the food is unappetising and stodgy,

or aims only at satisfying appetite, and that milk puddings, green vegetables, fresh fruit, are too often absent from the menu. More recently, however, great efforts have been made by authorities to improve their dietaries. In the new L.C.C. dining centres, no dish is served more than once a fortnight; there is a roast joint at least once a week, a fish dinner once a fortnight, green vegetables and salads in season, and a variety of puddings and fruit. The feeding arrangements are in charge of a special officer working under the supervision of the school doctor, while specimen meals are examined periodically by the Council's chemists so as to check at once any deficiency in the dietary. It is advised by the Chief Medical Officer that the school dinner should contain not less than two-thirds the child's total requirements of animal protein, and most authorities today aim at an approximation to this standard.

Where meals are provided by the authority on a large scale and the food bought through a centralized organization, costs have been reduced to a minimum. The following figures show costs per head for dinners supplied through central kitchens in various towns :

			Total Cost		Food Only
London ..	..	..	4.1d	..	1.9d
Bradford ..	..	..	3.2d	..	1.2d
Manchester ..	..	..	3.9d	..	1.8d
Burnley ..	..	..	2.7d	..	1.5d

The charges made by caterers vary from town to town. In London the charge is 6d, in Sheffield it is 3d. The general view is that, where meals are supplied on a large scale and the authority does its own catering, a better meal can be supplied at a lower cost.

Authorities have power to grant meals to necessitous children during holiday periods, and some do so. It appears that at least 18 authorities grant milk to necessitous children in the holidays, the milk being distributed at the schools or dining centres with the assistance of voluntary or paid helpers. The percentage of the number of children receiving milk who attend varies considerably. These percentages range as a rule between 60 and 80, but drop in some cases to between 30 and 40.

In special schools for crippled and delicate children who remain at school all day, it has always been the practice to provide a hot midday meal. A charge here is made to the parents, but remitted partly or wholly in necessitous cases. In open air

“recovery” schools, and in nursery schools, regular and nourishing meals form an essential part of the routine, and it is usual for breakfast on arrival and tea before departure to be given in addition to the midday dinner. Where an open-air class is attached to the ordinary elementary school, meals as a rule are not supplied, and these classes have been criticised by some medical authorities on the ground that, unless accompanied by proper nourishment, fresh air and physical exercise may do actually more harm than good.

School dinners also are provided for payment in grant-aided secondary schools and in other places of higher education, the school being equipped in this case with its own dining hall and kitchen, and each school making its own arrangements. These canteens are run so far as possible on a self-supporting basis, and teachers as well as pupils make use of them. The charge made for a hot two-course dinner is seldom less than 10d or 1s, and beyond the means of the poorer section of the scholars. The organization is seldom on a large enough scale to permit the most economical arrangements.

The same practice has been followed by the selective central schools, which draw their pupils from a distance. Most L.C.C. central schools are equipped with some sort of kitchen, or make use of a local cookery centre. The charge here made to parents is 4d, 6d, or up to 9d per head. More recently again school canteens have been established in connection with reorganized senior schools which draw their pupils from a distance. Many village schools today provide a hot midday meal which is enjoyed by at least a section of the pupils. A charge is made to the parents, but is not generally expected to cover more than the bare cost of the food. Each school as a rule does its own catering, and costs vary considerably. Where the school grows its own vegetables or is able to buy direct from local producers, it has been found possible to provide a nourishing meal at a food cost as low as 1½d or 2d per head. Where the charge made to the parents exceeds 2d or 2½d per head, experience shows that it is only the better-off children who take advantage of the service. The poorer children bring their own sandwiches from home, or make do with a hot drink of tea or cocoa from the canteen. An objectionable practice has grown up in some schools by which children receiving meals are separated into “necessitous” and “non-necessitous” groups. Thus, children granted free dinners, or even free milk, must attend at a separate feeding centre to the others, or the meal is served in school under a separate arrangement.

ARRANGEMENTS UNDER THE MILK ACT 1934

Apart from meals supplied by local authorities, the Milk Act 1934 authorises the Minister of Agriculture to grant a temporary subsidy from public funds, so that milk may be supplied at a cheap rate to school children. Under the present scheme of the Milk Marketing Board, some two-and-three-quarter million children, or rather less than half the total school population, are receiving a daily ration of one-third of a pint of milk at the reduced rate of $\frac{1}{2}$ d.* Since the scheme was started in October 1934, and the charge reduced from 1d to $\frac{1}{2}$ d a bottle, the number of school children voluntarily receiving milk for payment has about trebled. The scheme is administered by the teachers as a voluntary measure, and no cost is entailed on the authority.

The Report of the Chief Medical Officer pays a tribute to the whole-hearted cooperation of the teachers without which the scheme would have been unworkable, but the extent to which it is operated varies necessarily from district to district and from school to school. According to figures given by Mr Ramsbotham (House of Commons, 17 February 1936), in some counties 87% of the children use the scheme; in others the figure falls much below 50%, in one county 36%, in another 25% and in another 20%. Nor is it plain that the children most in need of milk do, in fact, get it under the scheme. The evidence suggests, on the contrary, that thousands of children belonging to large families cannot afford to pay even $2\frac{1}{2}$ d a week. An inquiry made by the London Education Committee showed that of those children not receiving milk, 25% gave the reason as poverty. It was sometimes explained by the teacher that, "although all children in a poor family do not have milk every day, one or more of the children may have it in turn, the money available for milk being thus shared amongst the children over a week". Under the Board's present regulations, such children cannot be granted free milk unless they are able to show "symptoms, however slight, of malnutrition".

Briefly, the position is this. While authorities have power to provide meals for "necessitous" mothers and children, those who actually receive them represent only a fraction of the mother and child population. Nor is their number likely to increase under present methods of administration which insist on a

* Under a recent arrangement between the L.C.C. and the Milk Marketing Board children may be supplied daily with two bottles of cheap milk instead of one bottle, equivalent to two-thirds of a pint.

“medical” test. There is growing up, on the other hand, in connection with certain types of school, a system of school canteens which provide for payment a hot midday meal as part of the ordinary school routine. In addition to meals supplied by local authorities, milk is available at a cheap rate for children attending school. Where, however, a charge is made to the parents, the tendency is that only the better-off children take full advantage of the scheme.

5 The Case for Collective Feeding

PREVALENCE OF MALNUTRITION

“Nutrition”—to quote again from the Chief Medical Officer¹⁹—“is everything in childhood. Childhood is the one and only occasion when it is right to put nutrition in the front rank. Indeed, it stands unique, for it is the only foundation of growth.” It is infinitely more important to feed a child than to teach him. Yet for every £1 of public money that we spend on teaching him, we spend only a few ha’pence on feeding him. Nor does a system of distributing income without regard to the number of mouths to be fed secure that parents are able to perform one duty more than the other. We are told, on the contrary, on the unquestioned authority of Sir John Orr, that 20% to 25% of the children in this country live on diets which are deficient *in all respects*, and that the mass of working-class children live on diets which are deficient in one respect or another.

Recent attempts to throw the blame on the housewife for this deplorable state of things are not supported by the facts. Dr M’Gonigle warns us (*The Times*, 26 March 1936) “to beware of the dicta of persons who for long denied the existence of any considerable amount of malnutrition, and who now attribute its incidence to the housewife’s ignorance of food values and of cooking”. From an analysis of numbers of working-class budgets, he is able to show that “insufficient purchasing power and not ignorance of food values is the dominant cause of malnutrition”. Other inquiries made by the Committee on Nutrition of the British Medical Association point to the same conclusion. “The average housewife,” the report states, “with no expert knowledge of calories, proteins, etc., does, in fact, purchase by rule of thumb methods foodstuffs which broadly approximate to dietaries considered by physiologists to be satisfactory.” This, however, is subject “to her purchasing power proving adequate to the needs of the family”.

ECONOMIES OF COLLECTIVE FEEDING

An explanation nevertheless is needed of the wide disparity which exists between the estimates made by Sir John Orr and others as to the minimum cost to the housewife of a satisfactory diet, and the very low food cost at which public authorities are able in practice to provide suitable meals in their own feeding centres and residential institutions. Thus, the L.C.C., as we have seen, can supply an excellent two-course dinner, containing a full quota of animal protein, green vegetables, fresh fruit, etc., at a food cost of less than 2d per meal, and a gross cost of 4d per meal. In L.C.C. residential schools and children's institutions, the average weekly cost of foodstuffs required for the full maintenance of children up to the age of 16 is just below 4s per head. The gross weekly cost, including the handling, preparation and cooking of the food, may roughly be estimated at not more than 5s per head. The dietary includes, for breakfast, bread (white or brown) and butter, fish, bacon or egg; for dinner, meat (fish once a week), two vegetables (greens three or four times a week), milk puddings, stewed fruit, etc.; for tea, bread and butter, jam, tomato, cheese, raw salads, etc.; and, in addition, raw fruit every day and one pint of fresh milk for every child under 10, or about two-thirds of a pint for older children who are expected to make good with extra rations of meat, raw salads and fruit. The explanation is a simple one and lies in the opportunity offered to a great authority to adopt mass methods of catering. Taking all foods together, the margin between wholesale and retail prices is 40%. It is lowest on groceries, and highest on perishables, such as milk, meat, fish, fruit and vegetables, where the great deficiencies occur in children's dietaries.

According to Mr Emil Davies, Chairman of the L.C.C. Supplies Committee, the two main conditions which make it possible in a public institution to provide a satisfactory diet at a very low cost are (*New Statesman*, 21 March 1936): (1) Centralized purchasing of foodstuffs; and (2) the feeding of a large number of persons under one roof. What can be done in the former respect would be a revelation to the man in the street. "By reason," Mr Davies writes, "of the enormous quantities required (50 tons of foodstuffs go in and out of the central depot every working day), and the regular continuity of its needs, a bulk-purchasing organization can enter into the most advantageous contracts, in most cases with actual producers or manufacturers. The supplier is able to make his arrangements far ahead, and in the case of a state or municipal organization is free from all risks of bad debts. For

fear of losing so important a customer, he is at pains to maintain the quality of his products and his zeal is strengthened by the knowledge that the purchasing organization takes special pains to see that it gets what it pays for." Thus, meat can be bought direct from the producer or importer, middlemen's profits being almost eliminated, and the best quality meat procured at the lowest wholesale price. Fish can be obtained at "port" prices, which may be one-half or one-quarter those prevailing in local markets. Milk can be bought at a low contract rate, or little more than half the retail price paid by the housewife to the local dairy. Fruit and vegetables again can be purchased on favourable terms direct from the producer or importer. In London, where the L.C.C. buys on a large scale, qualified inspectors go round and inspect such consignments of meat, poultry, vegetables, as are delivered direct from the various suppliers, while groceries, cereals, dried fruits, etc., are bought at the bottom of the market, and stored in and periodically distributed to the various institutions from a central depot.

Other considerable economies can be effected by means of mass methods of cooking. The central kitchen may well be compared with a factory. Where live steam is used, not more than one furnace may be needed to cook several thousand two-course dinners. Power-driven machinery for dough-mixing, sausage-making, potato-peeling, etc., is not only advantageous from the labour-saving point of view, but it can always be relied upon to give the proper result. Variety again is an important element in diet. The range of dishes within the knowledge and skill of a single housewife must necessarily be limited. Some of the most economical dishes take time to prepare, and the already overworked housewife, with a young family on her hands, may have little or no time to spare. Cooking, moreover, is a highly-skilled job, for which the mother's previous training and experience as factory worker, shop assistant, typist, professional woman, may have done little or nothing to equip her. Nor is it always an easy matter to devise a suitable and varied dietary for a very small household. The same dietary is not that necessarily best adapted to older and younger members of the family, or to different "dietary types" within the same household. Where meals are prepared on a large scale by a skilled cook in a well-equipped kitchen, not only is it possible to provide a constant change of diet from day to day, and week to week, but a choice of diet can be offered on every day so as to meet the varying requirements of children at different stages of growth, or of different dietary types. Where the dietary comes directly under medical supervision, the oppor-

tunity further is given to experiment in the use of unaccustomed foodstuffs, to train children in good habits of diet and to wean them from bad ones. "The food supply is not only valuable for its nutritive content," writes the Chief Medical Officer in connection with nursery schools,¹² "but it fosters the taste for good and suitable food, avoiding highly-flavoured dishes which are all too frequently supplied in poor households." An important function of the school dinner is to habituate children to proper feeding. Experience shows that milk, green vegetables, fat, which a child may refuse at home, will be readily eaten by him under skilful management and in company of companions of his own age.

COLLECTIVE FEEDING AND HOME LIFE

To the suggestion that the unity of the home will be undermined by withdrawing the children from the family meal, there is an easy reply. School dinners are already a time-honoured custom in day secondary schools, both public and private, yet no one here is worried over "the break up of the family". Most middle-class parents, indeed, who can afford to do so, send their children to boarding schools, where they remain for three months at a time! Where meals are supplied in nursery schools, the home is said definitely to gain from it. "The nursery school," writes the Chief Medical Officer,³ "liberates the mother without usurping her place. Parents do not feel that they have lost contact with a child by placing him in such a school. In fact, they tend to become more interested in him." Testimony from parents can be quoted as to the improved standard of table manners and orderliness which the children have acquired at school. Far from lessening parental responsibility, it is found that the nursery school child demands a higher standard of service from his parents, so that parental responsibility may actually be increased.

An examination of the facts thus suggests that, where meals are supplied by a public authority on a large scale, it is possible under centralized management to effect such economies in the purchase and preparation of food as may enable a suitable meal to be supplied at a cost much below that at which the same meal could be supplied by the private housewife. The dietary can be placed at the same time directly under medical control, and the children trained in good habits of diet. In the interests of economy and education alike, it seems that the best way of making good the present widespread deficiencies in children's dietaries would

be such an extension of collective feeding as would secure to every child the essentials of a satisfactory diet.

6 Outline of a Scheme

"It is a matter of common knowledge," writes the Chief Medical Officer,* "universally accepted, and in no need of further investigation, that milk is the necessary food of suckling infants, the best food for young children; and an invaluable food for elder children and adults." The time is already overdue when every expectant or nursing mother, and every child up to the age of 16, should be secured a full ration of milk.

INCREASED DISTRIBUTION OF MILK TO MOTHERS AND INFANTS

Experience shows that milk can conveniently be distributed to mothers and infants attending ante-natal clinics or infant welfare centres by means of orders on local dairies. A simple plan would be that an order should be granted to every mother attending an institution of this kind which would entitle her to receive from an approved dairy (or farm), in respect of herself as an expectant or nursing mother, or of any child under 5 not attending school, a prescribed ration of milk. Where no clinic or centre was within convenient reach of the home, the order could be granted through the health visitor, or other agent of the public authority.† The order should be renewed, say, at least once a quarter. The authority should refuse to approve a dairy unless the medical officer was satisfied as to the safety and quality of the milk.

Medical opinion is practically unanimous that one pint of milk a day is a minimum allowance for a child up to the age of 16, and two pints are not too much for a nursing mother. The ration could be supplied by the authority at a reduced rate, or free of charge. According to Sir John Orr, an all-round sufficiency

* *Health of the School Child*, 1933. Board of Education.

† Under the Notification of Births Act 1907, it is the father's duty at once to notify the birth of a child to the Medical Officer of Health of the district, and public health authorities have power to appoint health visitors to visit in the home and to instruct the mother in infant care. Such appointments are now general, though in some areas the duties of the health visitor are delegated to the District Nursing Association or other voluntary agency. The field covered by the health visitor corresponds roughly to that of the school attendance officer.

of diet is not reached by families with an income per head of less than 20s to 30s a week. Such an income-limit is about equivalent to £5 a week for a family with two or more dependent children, and the great majority of mothers attending infant welfare centres and similar institutions may be expected to come within it. Milk meals in their case should clearly be given *in addition* to the ordinary dietary, and it would be undesirable to make a charge which might result in cutting down expenditure on other necessities, or in excluding altogether from the scheme children whose parents were unable to pay, but reluctant to write themselves down as "necessitous". It is proposed that public health authorities should be required to organize in their areas an adequate milk supply for mothers and infants attending appropriate institutions or coming within the sphere of the health visitor. It may be desired for financial or other reasons to restrict the scheme at the initial stages. In this case, the normal ration per person could be limited at first to, say, two-thirds of a pint a day, and a small charge made to parents corresponding with that under the milk-in-schools scheme and remitted in "necessitous" cases. Such restrictions, however, even if they have to be accepted at the outset, should be abolished at the earliest moment. Where authorities have been backward in establishing efficient maternity and infant welfare schemes, the Ministry of Health should bring pressure to bear on such authorities to complete these schemes.

EXTENSION OF THE "MILK IN SCHOOLS" SCHEME

Under the "milk in schools" scheme, cheap milk is available for children attending school, but, as we have seen, the scheme has been applied with very varying zeal by local education authorities, and there are startling differences between area and area in the percentages of children receiving milk. "This is," as *The Times* points out (31 March 1936), "because the present scheme is only permissive, and is ranked not as a health measure, but as part of a milk publicity campaign." For most children, one-third of a pint is not nearly enough. For many children 2½d a week is too much. There is urgent need that the scheme should be made compulsory on authorities, and extended in such a way that every child attending a grant-aided school would receive a daily ration of milk rising in due course to a full pint, while the charge made to parents would remain the same, namely ½d per ration, until such time as all charges could be abolished. Any

child persistently refusing milk, or unable to digest it, should be referred to the school doctor, who could advise an alternative diet. Similarly, the school doctor should be free to increase the normal ration of milk in special circumstances. It might be desirable in the case of young children that part of the ration should be consumed at home. It should be open in this case to the school doctor to issue an order which would entitle the child to receive from an approved dairy that part of the ration not consumed at school.

Another serious gap in the milk-in-schools scheme is the absence of provision at week-ends and during the holidays. One of two methods might be adopted. Either the milk could be distributed as usual at the school, with the school nurse, caretaker, or other responsible person in charge, or else the mother could be granted an order on an approved dairy, and the child receive his ration at home. The latter method would have the advantage that it could conveniently be administered on Sundays as well as on weekdays, and would not involve the journey to and from school.

MILK PRODUCTION FOR HUMAN NEEDS

One pint of milk per day for every mother and child coming within the scheme would be about equivalent to 400,000,000 gallons a year; and the relatively low consumption per head of milk in this country*—not more than one-half of a pint a day and much less in working-class areas—suggests that the new demand created by the scheme would be little less than this figure. The question, therefore, arises as to how far the milk industry would be able to meet a new demand representing an increase of between 40% and 50% on the present total consumption. The surplus for the year 1935 has been estimated at not more than 301,000,000 gallons, and varies widely from month to month. Thus, the surplus available in January is less than half what it is in June. Since, on the other hand, the operation of the "pool" system which secures to the farmer a fixed price for the whole of his produce, so-called "surplus" milk, *now sold for manufacturing purposes*, has shown remarkable powers of expansion. *During 1935, the volume increased by no less than 56%.* In order, however, to maintain a safe margin as well as to limit the cost during a transitional period,

* Figures for consumption of milk per head per year for various countries show:

Great Britain	24	gallons
United States	54	"
Switzerland	60	"
Sweden	63	"

it would be desirable that the scheme should be undertaken in three stages with intervals of two or more years. In the first stage, the ration would be limited to, say, two-thirds of a pint, a charge being made to parents at the rate of $\frac{1}{2}$ d per ration or 6d a gallon. This stage may be expected to absorb an additional 220,000,000 gallons per annum. In the second stage, the ration would be increased to a full pint, but the same charge made to parents, the rate per gallon falling from 6d to 4d. This stage would absorb another 180,000,000 gallons per annum. In the third or final stage, parents' payments would be abolished.

PROVISION OF MEALS FOR OLDER CHILDREN

While the total food requirements of infants and young children may very largely be met by means of an abundant milk supply, a more substantial and varied dietary is needed for older children. This need becomes increasingly urgent as the child grows into adolescence, and his food requirements approximate to, if they do not exceed, the adult standard. The case for collective feeding has already been discussed. Here again the scheme could be undertaken in stages. The more pressing need is that of children over 11 whose food requirements impose an increasingly heavy burden on the family income. The concentration of such children in senior or "central" schools has already compelled authorities in many areas to provide a hot midday meal for children travelling from a distance, but the system is by no means universal, and the charges made to parents are too often beyond the means of the poorer families. The time has now come when education authorities should be required at once to establish school canteens in connection with all schools for children over 11, and within a limited period to extend the scheme to junior and infant schools.

SCHOOLS AS "CENTRES OF HEALTH"

The best plan seems that each school, or group of schools, should be equipped with its own dining hall and kitchen so that the meal could be freshly cooked and served on the premises. New schools should be required to provide the necessary accommodation. Old schools would offer a more difficult problem which would vary widely from area to area. Where space is not too cramped, it should be possible to build on a dining hall, or another story could be added to the original building. At other times,

in congested urban centres, the decline in the school population may give the opportunity to convert disused classrooms. Or use could be made temporarily of the school hall or of neighbouring premises. The purchase of food, on the other hand, should be undertaken by the authority through a centralized organization. A modification of the scheme would be desirable in country villages, where the school could grow its own vegetables or buy directly from local producers. The meal should include in every case a full allowance of first-class protein, fat, fresh fruit and vegetables. Some of the teachers, as in secondary schools, may be expected to dine with the children, but teachers should not be asked to accept any responsibility for the service. It would be an essential part of the scheme that all the arrangements should come directly under the school medical officer, who should have special dietetic qualifications. The schools would thus become centres of health education and dietetic research.

PAYMENT FOR PUBLICLY PROVIDED MEALS

The parents could be required to pay the cost of the food and the charge be remitted as now in "necessitous" cases, or the meal could be supplied by the authority free of charge. The difficulties experienced in selecting children for free meals suggest that the latter method should be preferred. The weakness of a medical test has already been described. An income test is open to other objections, and children most in need of free meals are not necessarily those whose parents apply for them. Nor can a method be viewed as satisfactory which divides the school into "necessitous" and "non-necessitous" groups. Any charge made to parents should be regarded as a temporary measure only and made subject to prescribed conditions. For example, the charge should not exceed what the poorer section of parents may be expected to spend on a dinner at home, say, 2d per meal, or the bare cost of the food at wholesale prices. The child would thus enjoy a good dinner at a cost much below that at which the most competent housewife could provide the same meal at home. The number of "necessitous" cases would at the same time be reduced to a minimum. Other essential conditions are that no distinctions in school should be made between "necessitous" and "non-necessitous" children, and no child refused a meal because his parents were unable or unwilling to pay. Any payment due from the parents could be recovered afterwards by the authority,

It would be desirable in this connection that the Ministry of Health, in consultation with the Board of Education, should draw up an income scale, to be based on the physiological needs of the family, below which parents would be exempted from payment. In secondary schools which include a proportion of fee-payers as well as scholarship holders, it would be desirable to add the charge to the fee, or to deduct it from the scholarship, rather than to make distinctions between different types of school or pupil.

SCHOOL HOLIDAY ARRANGEMENTS

While parents who could afford to do so would no doubt prefer to keep their children at home at week-ends and during the holidays, it would be important for others that dinners should be continued on non-school days, and the dining centres should be kept open for this purpose at least on weekdays. From an administrative as well as the social point of view, the Sunday dinner, if possible, should be eaten at home. Where the school lies at a distance from the home, it would be necessary in some cases to make special holiday arrangements. Either the child could be transferred for the holidays to a school more conveniently situated, or use in emergency could be made of caterers. In order to secure regular attendance at the dining centres on non-school days, it would be advisable that parents wishing their children to take advantage of the holiday service should be required to make a small deposit beforehand, and that this should be forfeited where the child failed to attend regularly without reasonable excuse.

The carrying out of a scheme as outlined above would involve some amendment of the present law. The clauses of the principal Acts relating to provision of meals are now *permissive* only. Authorities should be made directly responsible for the proper state of nutrition of children in their areas, and the statutory duty imposed on them to undertake schemes for this purpose. Thus, authorities responsible for maternity and child welfare service should be required to organize in their areas an efficient milk supply for mothers and children under 5 not attending school, while it would be the duty of education authorities to provide a milk service in the schools and also a service of school dinners. The clauses of the Education Act 1921, which impose on authorities the obligation to recover from parents able to pay any expenditure incurred in respect of the purchase of food, should be repealed.

RECOMMENDATIONS

The main proposals of the scheme may be stated as follows :

(1) Public health authorities to be required to organize in their areas an adequate supply of milk for mothers and infants attending infant welfare centres and other appropriate institutions, or coming within the sphere of the health visitor.

(2) The milk-in-schools scheme to be made compulsory instead of optional and extended to all types of grant-aided school.

(3) The milk scheme to be undertaken in three stages. In the first stage, every mother and infant and every child attending school to receive two-thirds of a pint of milk per day at the rate of $\frac{1}{2}$ d per ration or 6d per gallon, this charge being remitted in "necessitous" cases. In the second stage, the ration to be increased to a full pint, but the charge made to parents to remain the same, the rate per gallon thus falling from 6d to 4d. In the third stage, parents' payments to be abolished.

(4) Education authorities to be required to establish school canteens in connection with all types of grant-aided school, and to provide a hot midday meal.

(5) The dinner scheme to be undertaken in three stages. In the first stage, school canteens to be established in connection with all schools for children over 11, and a hot dinner supplied at a charge of 2d per meal, this charge being remitted in "necessitous" cases. In the second stage, the scheme to be extended to junior and infant schools. In the third stage, parents' payments to be abolished.

(6) The Ministry of Health, in consultation with the Board of Education, to draw up an income scale below which parents would be exempted from payment at all stages of the scheme. This, in releasing some proportion of the family income for the needs of the older members of the family, would help towards the solution of the problem of adult malnutrition.

7 Cost of the Scheme

The scheme would involve two main items of expenditure, namely: (1) The cost of a cheap or free milk supply for mothers and infants attending maternity and infant welfare institutions and for children attending school; and (2) the cost of dinners supplied in school at not more than the bare cost of the food, or free of charge.

COST OF THE MILK SCHEME

The costs of the milk scheme may be considered in two sections, production and distribution. Since the coming into operation of the Milk Marketing Board, the price which farmers have received for milk has nearly been equalized between different districts and types of farm, but varies with the season. The average price received by farmers in 1935-36 was about 10d a gallon. In the previous year it was about $\frac{1}{4}$ d a gallon higher. At this level of prices, there was an increase in output of 9% over the previous year, and it clearly covers the farmers' costs of production.*

This price, however, is obtained by averaging liquid sales at 15d per gallon and manufacturing sales at $5\frac{1}{2}$ d per gallon. An increasing proportion (in 1935 33%) is sold for manufacture. The average price of $5\frac{1}{2}$ d paid by manufacturers includes manufacturers of cream, etc., paying a fairly high price, and manufacturers of butter and cheese paying only $3\frac{1}{2}$ d- $3\frac{3}{4}$ d. If the Milk Marketing Board knew that the milk-for-children scheme would not adversely affect the volume of their liquid-consumption sales at 15d,† it would be worth their while (though they themselves might deny it) to sell milk at something like the manufacturing price. In order, however, that the milk supplied under the scheme should not be subsidized at the expense of other consumers of liquid milk it is suggested that a reasonable average contract price to the farmer would be 10d a gallon.

PROBLEM OF MILK DISTRIBUTION MACHINERY

Costs of house-to-house distribution are necessarily high, but substantial economies could be made where the dairy entered into a contract for the regular delivery of large quantities of milk. The present margin between wholesale and retail prices is from 11d to 1s a gallon. The problem of delivering milk to mothers and infants is how to simplify the service. It is obviously unnecessary that half-a-dozen dairies or more should deliver milk in the same small street or block of buildings, and dairies contracting under the scheme should be required to cooperate in a

* Average costs of production in 1934-35 have been estimated at $9\frac{1}{2}$ d a gallon.

† It is interesting to note in this connection that since the coming into operation of the milk-in-schools scheme, the consumption of liquid milk has been increased by almost exactly the amount provided under the scheme.

unified service. An alternative plan would be for the authority to set up its own distributing machinery. It should be possible by this means to reduce costs of home distribution from 11d to, say, 8d a gallon, and so to fix the average retail price to the authority at 1s 6d a gallon.

Under the milk-in-schools scheme, the Milk Marketing Board allows the dairy 6d a gallon distributing costs (including 2d-3d for pasteurization, bottling, etc.) *plus* any difference there may be between the 1s a gallon paid by the children and the contract price of milk. If the volume of school milk could be increased to three or four times the amount, as contemplated under the scheme, overhead charges would be greatly reduced, and the present 6d could be brought down to, say, 5d. Assuming an average wholesale price of 10d a gallon, a fair price for milk supplied in schools would thus be 1s 3d a gallon.

The number of expectant and nursing mothers coming within the scheme may be estimated at 500,000 and the number of children under 5 not attending school at 2,500,000. On the basis of two-thirds of a pint of milk per day delivered at home at 1s 6d a gallon, the cost would be roughly £7,200,000 a year, or, on the basis of a full pint per day, £10,800,000 a year. If a charge were made to parents at the rate of 6d a gallon in the first stage of the scheme, and 4d a gallon in the second stage, the figures in the earlier stages would be reduced to £4,800,000 and £8,400,000 in the first and second stage respectively. The number of children attending grant-aided schools is, roughly, 6,000,000. On the basis of two-thirds of a pint of milk per child received at school on each school day at 1s 3d a gallon, the cost would be £6,800,000, or, on the basis of a full pint, £10,400,000. After deducting parents' payments in the earlier stages of the scheme, these figures would be reduced to £4,200,000 in the first stage, and to £7,600,000 in the second stage. On the basis of two-thirds of a pint of milk delivered at home on non-school days, at 1s 6d a gallon, the cost would be £5,400,000 a year, or, on the basis of a full pint, £8,100,000. After deducting parents' payments in the initial stages, these figures would be reduced to £3,600,000 in the first stage, and to £6,300,000 in the second stage. The total cost of the milk scheme may be stated as follows:

	First Stage	Second Stage	Final Stage
Mothers and Infants ..	£4,800,000	£8,400,000	£10,800,000
School Children ..	£9,800,000	£13,900,000	£18,500,000
	<hr/>	<hr/>	<hr/>
	£14,600,000	£22,300,000	£29,300,000

The gross cost of school dinners, including food and overhead charges (but not capital expenditure on buildings), has been estimated by Mr Oliver Stanley (House of Commons, 19 February 1936) at 5d per head. Of this sum, about 3d would be available for food expenditure, or a sum 50% higher than the corresponding L.C.C. figure. Under methods of bulk purchase and preparation of food, the estimate should allow for a full share of "first-class" protein, fresh fruit and green vegetables, with a substantial margin to spare for special diets, experiment, etc. The number of children attending all types of grant-aided school may roughly be estimated at 6,000,000, of whom about 2,400,000 are children over 11. On the basis of 5d per meal, the cost of 2,400,000 dinners supplied on each school day to children over 11 may roughly be estimated at £12,000,000 a year, or of 6,000,000 dinners supplied to all children at £30,000,000 a year. Assuming that one-half the children concerned receive dinners also on Saturdays and on weekdays during the holidays, the additional cost would be £1,400,000 for children over 11, and £6,000,000 for children of all ages, making total figures of £13,400,000 and £36,000,000 respectively.

These estimates are made on the assumption that no part of the cost would be recovered from the parents. Assuming that a charge were made during a limited period of 2d per meal, the cost of the dinners would be reduced to £9,000,000 at the first stage (children over 11 only), and to £22,500,000 a year at the second stage.

The total cost at each stage of the full scheme may be stated as follows:

	First Stage	Second Stage	Final Stage
Milk Scheme	£14,600,000	£22,300,000	£29,500,000
Dinners Scheme	£9,000,000	£22,500,000	£36,000,000
	£23,600,000	£44,800,000	£65,500,000

This cost would be shared between state and local authorities. In order to relieve the poorer areas, it would be desirable that the greater part or whole of the burden should be thrown on the National Exchequer. One way would be to raise grants-in-aid in respect of provision of meals from 50% to 75% of every 100% of net expenditure. Another way would be to follow the precedent of the milk-in-schools scheme, and to provide a Government subsidy in respect of all milk and other foodstuffs supplied to mothers and children through local authorities.

8 Conclusion

In considering how far the country would be able to meet a new charge on public funds of £23,000,000 a year, rising ultimately to £65,000,000 a year, the important question to be asked is what value would be received in return? The close relation between diet and health has already been discussed. Malnutrition, as we have seen, is closely linked with "deficiency" diseases, such as anæmia, rickets and dental caries, while it leads also to undue susceptibility to tubercular and other infections. *What we save today on food we must spend tomorrow many times over on sickness.* In his presidential address to the Institute of Municipal Treasurers (1931) Sir John Bray estimated that we spend nearly £200,000,000 a year on the treatment of disease and combating its results. There is besides the loss of productive power that ill-health causes. A very conservative estimate by Sir Francis Fremantle, M.P., puts the total annual cost to the nation of ill-health at no less a figure than £300,000,000. There is clearly here a wide margin for saving as the result of improved nutrition.

Not less important from the economic standpoint would be the *new markets to be created for British agriculture.* It is in the "protective" foods—milk, dairy products, eggs, fish, fresh fruit and vegetables—that the greatest deficiencies occur in children's dietaries, and these are just the foods that this country is eminently fitted to produce. Yet not merely do we restrict supplies from abroad, but we fail to consume large quantities of our own home-grown produce, or turn it to inferior uses. Sir John Orr has estimated* that to bring consumption in the lower income-groups up to the existing level of families with incomes of 35s per head a week would mean large increases in the purchase of essential foodstuffs, these increases amounting to milk 42%, butter 24%, eggs 27%, fruit 53%, vegetables 47%. It is, moreover, the lower-income groups which form the children's market. Mr Colin Campbell, presiding at a meeting of the National Provincial Bank (June 30 1936), is reported as stating: "It has been estimated that, if the under-nourished classes in this country were able to enjoy a full diet, there would be an increased trade in foodstuffs amounting to about £200,000,000 a year, giving revived activity to British farming without harming overseas trade or shipping." It has already been observed that the recent rise in the consumption of fresh milk—the key to prosperity in the milk industry—corresponds almost exactly with the quantity consumed under

* Address on "Economics of Diet" to the British Association, Sept. 1935.

the milk-in-schools scheme. Not merely would the proposed extension of the scheme create all the year round a greatly increased demand for fresh milk, but the intelligent planning of school dinners should enable the summer surplus—which is now sold by the farmer to the manufacturer at a heavy loss—to be used up in the schools. Summer milk is rich in vitamin D and has in consequence an exceptional food value for children. It is also less costly to produce than winter milk. Extra milk puddings, milk soups, junkets, cream cheeses and ice-cream could be added to the dietary in the summer months, and would form a welcome change from more substantial fare. Egg dishes again are a useful alternative to meat in children's dietaries and have valuable "protective" qualities. In the earlier part of the year eggs are a glut in the market, and large quantities are preserved which could more profitably be eaten fresh. Thousands of children have never had a fish dinner, or have had one only in the form of "fish and chips". Yet, if freshly caught and properly cooked, fish makes a most excellent meal and one much enjoyed by children. The quantity of fish that our fishing industry can market is well known to be much below its productive capacity. A fish dinner once a week (or twice a week in some seasons of the year) for 6,000,000 school children would revolutionize the prospects of the fishing industry. A variety of nourishing dishes can be made from rabbit meat, which may be a valuable substitute for chicken in children's dietaries. The damage done by rabbits to agriculture in this country has been estimated at millions of pounds a year, and recently a proposal has been made to destroy rabbits by means of gas, thus rendering them unfit for human consumption (*Times*, 20 April 1936). A rabbit dinner in the schools once a week would about double the present consumption of rabbit meat, and make it worth while for those who are pestered with them to keep them properly in subjection. Owing to high retail prices, green vegetables and salads form today a grave deficiency in children's dietaries, and young people are now growing up who have learned to do without them. Yet this country is well fitted to grow excellent and ample supplies. A new and assured market for green vegetables and salads extending to every town and village should give the opportunity which is now lacking to train unemployed men for the land. It would always be open to the Government to make it a condition of grant that a preference in the children's market should be given by the authority to home-grown produce. A generation would, meanwhile, grow up with a taste that it would not afterwards lose for fresh, wholesome, home-grown food. A beginning would have been made

in the deliberate planning by the community of children's dietaries so as to utilize to the full the food resources of the country in building up the health and physique of the nation.

REFERENCES

- 1 *Food, Health and Income.* Sir John Orr, 1936.
- 2 *Report on the Physiological Bases of Nutrition.* League of Nations, 1935.
- 3 *Health of the School Child,* 1934. Board of Education.
- 4 *Nutrition and Public Health.* League of Nations, 1935.
- 5 *Health of the School Child,* 1931. Board of Education.
- 6 *Poverty and Public Health.* G. C. M. McGonigle and J. Kirby, 1936.
- 7 *Consumption of Milk in Cardiff.* Welsh Journal of Agriculture, Vol. X, 1934.
- 8 *Study of Milk Consumption in County Durham.* Journal of State Medicine, Vol. XLI, No. 7.
- 9 *Health of the School Child,* 1928. Board of Education.
- 10 *Public Ill-Health.* C. E. McNally. Committee Against Malnutrition, 1935.
- 11 *Evidence of Malnutrition.* Children's Minima Committee, 1934.
- 12 *Health of the School Child,* 1932. Board of Education.