NUTRITION UNDER WARTIME CONDITIONS

V. P. SYDENSTRICKER, M. D.

It is not to the credit of the democracies that during peace the nutritional status of their populations was determined by family income, prevailing customs in commercial distribution of essential foods, local agricultural trends and regional food habits. The advent of "total war" has forced the problem of providing adequate nutrition for every member of the commonwealth upon previously complacent governments. The only possible way to provide for an equitable distribution of food is by rationing. Our own experience with the ration is as yet too short for effects to be apparent but since our scheme of rationing seems to follow that of England, it may interest you to hear how the British have fared under their system.

There are many things which make our problems quite different from theirs, particularly the matters of production, transportation and distribution. In England distribution is a minor problem on account of the small size of the country. Transportation of supplies from the Western allies is a crucial matter and home production of many essential foods in adequate quantities is impossible. With us production is assured if manpower is available, transportation and distribution are major problems on account of the great size of our country.

The whole background of wartime nutrition in England is reflected in the life of the people. Normal living has been interrupted to an extent greater than you may imagine. The blackout may seem a minor nuisance but during winter months, when it lasts from half past five in the afternoon until almost nine o'clock in the morning, it becomes more than a nuisance; it is depressing and it interferes, sometimes seriously, with the daily travel necessary for millions of workers. Bombing has destroyed or damaged one of every five houses in England. The bulk of the damage has been in the cities and large towns but there are few small towns without scars. Though very many damaged houses are still occupied, there
are millions of people who have been made homeless and who are living with strangers, often in houses or flats already comfortably crowded. Even now evacuees from heavily bombed areas crowd many rural villages. Heavy bombing may not recur, but no day passes without hit-and-run raids by a few fighter-bombers; so air-raid precautions have to be maintained everywhere. All civilians have their civil defense duties which are no longer voluntary. Fire-watching is required of practically all adults. All able-bodied men between the ages of sixteen and sixty-five who are not in the services are in the Home Guard. Heavy and light rescue squads are made up of men under and over military age who are accustomed to heavy labor. Repair and demolition squads are composed of men from the various trades whose technical knowledge fits them for such service. Emergency feeding and transport is largely in the hands of volunteer organizations of women. It may be said that everyone in England has two jobs, a regular one and a civil defense activity. When "incidents" do occur Civilian Defense may take up all the hours ordinarily spent in sleep but that does not excuse anyone from the "regular job" the next day or night for it is the "regular job" which will win the war. This does not mean that the British are regimented. I believe that they resent restrictions of personal liberty much more than we do, but they have learned to cooperate in all things. This brings me to rationing, for nothing requires more complete cooperation than successful rationing and successful rationing means adequate if not optimal nutrition for all.

The wartime food program of British begins where all food programs should, in the ground. During peace approximately sixty per cent. of England's food was imported. In addition, much of the phosphatic and potassic fertilizers used came from overseas. By various means the area of land under cultivation has been increased by about fifty per cent. and home production of fertilizers greatly augmented. Crop loss from sodden land, plant diseases and insect pests has been reduced by extensive drainage projects and the application of measures to control bacterial and virus diseases of plants and to limit the propagaton of destructive insects. The results of this effort have been impressive. The production of potatoes has increased by eighty per cent., of cereals by fifty per cent. and there has been a great increase in the vegetable crops. On a tonnage basis the British have increased home production of food to about sixty-five per cent. of total consumption. This increase, however, has been largely confined to carbohydrate foods and green vegetables. Sources of protein and fat, with the excep-
tion of milk, have not and cannot be increased. It was recognized from the beginning that human food was of paramount importance and that domestic animals must not be fed food fit for human consumption. Pigs and chickens are direct competitors for food which people can eat; so their numbers were rather drastically reduced. Dairy cattle, on the other hand, are most efficient converters of food unfit for human consumption into milk; so every effort has been made to increase the number of milch cows. Pigs and chickens are still kept but mostly in small herds and flocks which can be fed on scraps and garbage. In addition to the great increase in land under the plough, every family is urged to cultivate an "allotment", the prototype of our victory gardens. There are millions of these allotments yielding potatoes and all sorts of vegetables which contribute significantly to the national food supply. With all this increase in home production Britain is dependent upon imports for most of the wheat and a tremendous proportion of the meat and fat upon which it must subsist.

The whole problem of rationing in England is much simplified by the facts that the Ministry of Food has control of supplies of foods at their sources and over most of the channels of distribution. The Ministry purchases all rationed food and some important ones which are not rationed from the producers. In addition, there is control of the distribution and price of practically all important unrationed foods. Distribution is largely effected through regular trade channels and most of the administrative problems of distribution are handled by representatives of the various food industries. Even when the government requisitions stocks of certain foods, they are not taken away from the dealers but the Ministry assumes control over the disposition of the stocks. Control begins with the licensing of the original buyers of all food products and the prohibition of sale to any but a licensed buyer; these licensed buyers are almost always agencies representing or appointed by the Ministry of Food. The prices paid for a number of important foods are subsidized by the Government in order to stabilize the retail prices.

In the case of wheat, all purchase, importation and disposal is under the control of the Ministry of Food though the actual business is accomplished by the Federation of Corn Trade Associations under a subsidy. The milling industry also is controlled by the Ministry of Food and since March, 1942, no flour other than the National Wheatmeal of 85% extraction has been produced. The baking of bread and biscuits and the manufacture of various
breakfast cereals is controlled by licensing. Only four types of loaves can be produced by bakers and wrapping and slicing of bread has been stopped.

Oats, barley, rye, rice and dried pulses are under control orders similar to those for wheat. The use of cereals for brewing and distilling is regulated as well as licensed. The bran from milled cereals is rationed for stock feeding as are supplies of unmillable grains.

The control of meat is very complete. The bulk of the supply originates outside England and is bought and imported by the Ministry of Food. Domestic food stock must be registered with the Ministry of Agriculture, when ready for sale the owner must notify the Ministry of Food. The cattle, hogs or sheep are then brought to central markets for grading and sale and are butchered at Government-controlled abattoirs. The auctioneers who conduct the sales and the owners of abattoirs are paid by the Ministry. Domestic bacon is cured by registered firms under license from the Ministry of Food. The exception to complete control of meat production is that the owner of hogs can secure a license to slaughter two animals a year for use in his own household. It is specified that the animals must have been owned for more than two months.

The country is divided into eight Wholesale Meat Supply Areas in each of which the wholesale dealers are associated in Meat Supply Associations which, in turn, supply the retail dealers in their respective areas. Poultry, rabbits and fish are not rationed, but all wholesalers are compelled to be licensed and retail prices are controlled. The distribution of fish is controlled by zoning in order to save transport.

Milk has been a special problem. The policy of the Ministry of Food has been to encourage consumption and to attempt to increase home supplies of fluid milk and imports of condensed and dried milk to meet the increased demand. Milk was controlled before the war by the Milk Marketing Board, this body has been maintained as the administrative and distribution agent though prices are fixed by the Ministry of Food and all imported condensed and dried milk is bought and imported by the Ministry. The direct consumption of milk has actually increased by about 20 per cent. during the war though production has not been greatly augmented. This has been accomplished by prohibiting the use of fluid milk in baking, ice-cream manufacture and other food industries where dried skim-milk could be used. Dried skim-milk is also made
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available for household cookery. Both production and distribution of fluid milk are heavily subsidized and very little is allowed to be used for any manufacturing purposes. The resulting great curtailment in home production of cheese and condensed and dried milk has made these products items of great importance in the Lend-Lease program and in the scheme of imports from the Empire.

In recent times Britain has always been dependent on imports for adequate supplies of butter and other edible fats, and margarine has had a much greater place in the average diet than in this country. Because fortified margarine is a fair substitute for butter, no great effort has been made to increase imports of butter during the war. It is much more economical to increase imports of vegetable and marine oils from which margarine can be made. At the beginning of the war all edible fats were brought under the control of the Ministry of Food and the manufacture of margarine put under license. All margarine is fortified so that it contains approximately 5,000 units of vitamin A and 400 of vitamin D per pound.

Control of eggs proved more difficult perhaps than that of any other essential food. After several unsuccessful schemes had been tried the present arrangement was put into effect with apparently satisfactory results. All keepers of poultry owning more than 50 hens are required to sell all eggs more than those to which they are entitled by the ration to licensed buyers or packing stations. The price paid is more than the retail ceiling price so there is little incentive for “black marketing”. The loss is covered by Government subsidy.

Potatoes, onions, carrots and tomatoes are directly controlled by the Ministry of Food. Potatoes are the most important food crop in Britain, the great source of cheap calories and, at the present time, even more essential to the diet than bread. The Ministry guarantees the growers price for potatoes and buys up surpluses. Distribution is effectively controlled and executed. Carrots and onions are bought from producers by the Ministry and distributed in a manner similar to that employed for potatoes. Tomatoes are one of the few good sources of ascorbic acid produced at home and every effort has been made to increase production. Practically all tomatoes are hot-house grown and owners of hot-houses are required to devote them to the culture of tomatoes for at least six months of the year. Tomatoes may be sold only to licensed or specified buyers.

Of fruits, only plums and apples are controlled, plums can be
sold only to licensed buyers and apples only to specified classes of purchasers. The sale of berries and other soft fruits is not regulated, but prices are so fixed that it is profitable for growers to sell their crops to the jam manufacturers rather than to the public. Jam is an important rationed food and great effort is made to keep home production of it up to the requirements of the ration. To save small crops of soft fruits in rural areas many local preserving centers have been set up, sugar is supplied and the jam making done by voluntary workers. All the jam is taken over by the Ministry of Food. Oranges are imported in small quantities and are reserved for children.

All fresh vegetables which are in sufficient supply to make them of significance in the diet have price ceilings and during the season when they are available there is supervision, even direction of distribution. Efforts are made to foresee local surpluses and to provide for their distribution. Allotment gardeners are urged not to produce more than can be used in their homes; but when allotment surpluses do occur, there are arrangements for their diversion into established channels of distribution. Small surpluses of this kind may be sold directly by allotment holders to less fortunate neighbors.

All imported canned meats and canned or dried vegetables and fruits are bought and imported by the Ministry of Food for distribution under points rationing. The bulk of domestic canned and dried foods also are reserved for distribution on points.

Sugar production has been greatly increased during the war so that the domestic supply almost meets requirements. The situation has been greatly improved by drastic restriction of the use of sugar in manufacturing and by the rationing of sweets as well as of sugar. The manufacture of chocolate and cocoa is licensed and restricted, and sweet chocolate is included in the candy ration.

Allocations of supplies of foods to wholesalers vary with the types of foods handled. Rationed foods and foods for which consumers must register with a dealer are supplied in accordance with the dealers' registrations. Unrationed foods are distributed on the "datum period" principal by which a dealer is supplied with a certain proportion of the food which he disposed of during a chosen period prior to the establishment of restrictions. Retailers in turn are supplied by wholesalers on the same principle. When there are significant shifts in population from one locality to another, both wholesalers and retailers are advised so that supplies can be diverted to meet demand.
Consumers’ registration has been mentioned, this procedure further simplifies the problem of rationing. Each holder of a ration book is required to register with a retail dealer for all rationed foods except tea. It is required that one register with the same dealer for butter and margarine and for sugar and jam, no one is permitted to register with more than one dealer for any one article of food. This scheme enables the dealers to stock supplies in the most economical manner and at the same time assures the consumer of securing his ration when it is needed. It also increases the difficulties put in the way of “black marketing” since retailers can secure no more rationed foods than their customers registrations entitle them to requisition from the wholesalers with whom they, in turn, are registered.

The actual ration has a considerable degree of flexibility. Meat is rationed by price rather than by weight, adults are entitled to one shilling and two pence worth of meat a week, children to half this amount. The average price of meat makes this worth approximately a pound a week for adults. If ground lean meat such as we call “hamburger”, but the British call “mince”, is bought, the amount is somewhat over a pound and there is no loss from bone. If cuts with bone are selected the buyer voluntarily takes the loss in edible return for his ration coupon. Most of the other rationed foods are dispensed by weight. Four ounces of bacon or ham, eight ounces of edible fat, usually distributed as two ounces of butter, four of margarine and two of cooking fat; eight ounces of sugar and two ounces of tea are the weekly allowance. The cheese ration varies with supplies available from four to eight ounces a week. Syrup, jam, honey and marmalade are rationed by the month, one pound per person. Usually there is choice between the available sweet spreads. At Christmas mincemeat is available on the jam ration coupons and suet for plum puddings on the fat coupons. Milk and eggs are rationed on a priority scheme which will be mentioned later. All canned fish and meats, vegetables, fruit and some canned soups as well as rice, dry breakfast cereals, tapioca, dried fruits and pulses are rationed on “points”. No registration is required for “points foods” and the demand for them is adjusted to supplies by frequent changes in the “points” value of different items. Foods in short supply have a high points value, slowly moving articles are often sold by lowering their points value, and it is possible to slow up consumption of popular foods by raising their points price. The number of points coupons issued for different ration periods may vary with the supplies in hand. At the start
of points rationing only 16 coupons a month were issued to each ration-book holder, late in 1942 24 coupons a month were available.

The British scheme of rationing, like ours, is aimed at providing everyone with an equal amount of food. There are certain provisions made for altering the ration for specific groups of the population. Children get only half the amount of meat allowed adults but are given priority for milk and eggs. Diabetics are allowed extra amounts of meat and edible fats for which they surrender their sugar coupons. Persons with hypoglycemia can get extra sugar; those with nephrosis, extra meat. Patients with sprue and steatorrhea are allowed additional meat for which they give up their edible fat coupons. Suffers from peptic ulcer, dysentery and various conditions interfering with swallowing or mastication have priority for milk and eggs, and provisions are made for the various dietary requirements of patients in hospitals and sanitoria. Vegetarians are permitted extra cheese rations, but must surrender their meat and bacon coupons. Workers in various trades and occupations who have no access to hot meals in the middle of the day are given 12 ounces of cheese a week in addition to the regular ration. Miners, forestry and agricultural workers, Land Army girls, railway and canal workers and charcoal burners are some of the groups receiving the extra cheese ration. During the harvest season farmers are allowed special amounts of tea, sugar and margarine to enable "tea" to be served to the workers in the field, and owners of buildings and businesses can secure extra tea for fire-watchers on duty on their premises.

An interesting and significant part of the rationing program is the milk policy. It is the purpose of the Government to increase the consumption of milk as much as possible by those who need it most. To this end, milk is distributed by priority. Normal adults can obtain two pints a week if supplies are abundant; if supplies are short, they may get part or none of this, all available milk then going to priority consumers. The priority groups are children, expectant and nursing women, invalids and certain classes of workers. Infants under a year old get seven quarts of milk a week, children between one and six years old and pregnant and nursing mothers get seven pints and children six to eighteen years old get seven half pints a week. Invalids may have what the doctor orders up to seven quarts a week. Workers in certain munitions and chemical factories are provided with one-half pint of milk a day. Milk for children under five and for nursing and pregnant women is
sold at the nominal cost of 2d (4 cents) a pint and if the family income is below 40 shillings a week, can be obtained free.

In addition to this “free and cheap milk scheme” which is part of the war rationing, the school milk program, which was in force before the war, is being continued. This furnishes each school child applying for it 1/3 of a pint of milk a day at a cost of 1s. 2d (24 cents) a month, children unable to pay this nominal price receive the milk free. At the request of the school physician any child is furnished an extra 1/3 pint free. The entire cost of this program is borne by the Government.

The requirements for fluid milk for women and children are such that little is available for cooking purposes, these are provided for by making skimmed milk powder available on a non-priority basis.

Eggs, like milk, are distributed by priority. At best eggs are in very short supply, the ordinary consumer is allowed two eggs a month. Children under six and nursing and pregnant women, together with invalids suffering from specified diseases, get four eggs for each one allocated to the ordinary consumer. In practice shell eggs simply are not available for normal adults, the entire supply being required for the priority groups. During the last year supplies of dehydrated eggs from this country and Canada have made it possible for ordinary consumers to secure a tin of egg powder per ration period in lieu of fresh eggs.

Priority distribution also is applied to the distribution of oranges and other rich sources of ascorbic acid as well as to codliver oil. Oranges are reserved for children under six; and when shipments are not sufficient for distribution over the whole country, a rota system of supply is applied, oranges as they become available being sent to different sections of the country in rotation. In theory oranges on sale are for children under six only for the first five days of the week, if any are left on Saturday they may be purchased for adults. In practice the supply never lasts for five days so that adults, unless they steal from children which they never do, do not taste oranges. Black currant juice and puree are reserved for infants under two and since December, 1941, these products have been distributed free. Rose hip syrup, another excellent source of ascorbic acid, is also available for infants, and in 1942 concentrated orange juice prepared in this country was added to the “free or cheap” sources of vitamin C for infants. All children under two
receive codliver oil free. Codliver oil and one of the vitamin C preparations are available everywhere through local Maternal and Child Welfare centers and the Local Food Offices.

Unrationed foods are most important in the British food scheme. As has already been mentioned, fish, shellfish, poultry, rabbits and game are off the ration. All “offals” and the 45 per cent. meat “war sausage” also are unrationed, as are bread, potatoes and all vegetables and fruits. Fish are not abundant because of the requisition of most of the fishing fleet by the Admiralty. Available poultry is made up of cockerels and superannuated hens. Rabbits are abundant, in fact they are a serious pest to farmers and furnish a significant contribution to the meat supply. Game is scarce and distinctly a luxury. Variety in vegetables is small; cabbage, brussels sprouts, peas, string beans and broad beans, spinach, beets, turnips, carrots, tomatoes and leeks are usual ones available and of these, cabbage, sprouts and carrots are the only ones produced in adequate quantities. Still it is the unrationed foods that enable Britain to carry on.

Another important phase of the British food policy is the development of communal feeding. The Ministry of Food has promoted communal feeding because it saves fuel and waste of food and also saves much time for workers of all types. In addition, it improves the nutrition of the entire family of each person eating at a communal feeding place since all meals served in “British Restaurants”, works canteens and school canteens are “off the ration” and increase the amounts of food available for the family at home. What is still more important from the standpoint of the war effort, it enables hundreds of thousands of women to be engaged in war industries by freeing them from the necessity of preparing a noon meal.

The establishment of “British Restaurants” is at the discretion of local authorities but the Ministry of Food finances the conversion of premises, covers losses in operating expenses and furnishes expert culinary and dietetic advice. The Ministry also maintains a central pool of cooking and dining equipment for distribution to feeding centers and aids in securing priorities for materials of all sorts.

Factories employing more than 250 persons are required to maintain canteens to furnish a hot meal at noon and if necessary at midnight. Smaller factories often club together to provide a common feeding place. The Ministry of Food cooperates in establish-
ing them. Not infrequently where there are a number of small factories some distance apart a communal kitchen is established where food for all is cooked and distributed in insulated containers to the factory messes.

School feeding of sorts was common in England before the war but has been greatly expanded by the combined efforts of the Board of Education and the Ministry of Food. It serves the double purpose of increasing the food intake of the children and of freeing their mothers to perform essential work in industry. A majority of the larger schools have their own kitchens and the preparation of the school meal is part of the training of the older girls in Home Economics. Small schools usually secure food already cooked from a communal kitchen which, in many instances, is a nearby British Restaurant. School meals are subsidized up to 95 per cent. of their cost by the Board of Education.

The food served in these various communal feeding places is much alike, dinner consists of soup, a full ration of meat or a liberal portion of fish, potatoes, one vegetable, often a salad, a dessert, bread, margarine and tea. Meals usually are good, quite as good as are found in the cheaper commercial restaurants. British Restaurants and works canteens charge from 10d (18 cents) to 1s. 2d (24 cents) per meal. School canteens charge from 4d to 6d and provision is made for free meals for "necessitous" children.

It is difficult to estimate the contribution to the wartime efficiency of England that is made by the community feeding centers. Millions of meals are served "off the ration" daily, conserving equal amounts of rationed foods for home consumption. The morale effect is great; untold millions of man-hours and woman-hours have been saved for vital war industries. School children are assured of a hot nourishing midday meal that makes no demands on the family rations or on the time of a mother who may be engaged in important war industry.

The only serious objection to communal feeding is that the food is cooked in such quantity that it is very difficult to use methods that are conservative of the heat labile vitamins. Green vegetables and potatoes are cooked in steam kettles, then held in hot-boxes, sometimes for hours before being eaten. When food is cooked in communal kitchens and distributed in insulated containers the situation is even worse. It is likely that at least fifty per cent. of the ascorbic acid in all foods is destroyed in the cooking and when hot storage is employed the loss may reach 100 per cent.
So far I have discussed the British rationing scheme and the devices employed to better the general nutritional status of the nation during wartime. You may be interested to hear how people actually fare under the British ration.

At home the chief difficulty is the meat ration. If the family ration is conserved a “joint” can be bought on Saturday if the dealer has one and roast meat can be served for dinner hot on Sunday, cold on Monday and as hash on Tuesday, after that rabbit, fish, offals, poultry and “points” must be depended upon for the rest of the week for the main meal. For breakfast, oatmeal, bacon or “sausages”, bread and jam and tea are the rule. For lunch, soup made from vegetables, a very small portion of meat, either cold from the Sunday joint or mince, potatoes, cabbage, sprouts, carrots or turnips, pudding and tea. For dinner, more soup, perhaps leftover meat from lunch, lacking that, perhaps fish or rabbit or a scramble of eggs made from egg powder, potatoes, perhaps a vegetable as at lunch, pudding again and bread and butter and tea. Cheese is often substituted for meat either at lunch or dinner.

At ordinary restaurants the menu is much the same, often even more restricted. Breakfast is a difficult meal for a restaurant liver in England because variety is almost impossible. Restaurant lunches almost uniformly consist of soup, mince in some form, cabbage or sprouts, potatoes and some dessert, usually a pudding. Dinners are not materially different from lunches except that cheese is frequently provided for dessert. Rarely points meats are available in restaurants.

In luxury restaurants where heavy cover charges are made the cooking is apt to be better and much use is made of “off the ration” items so that really excellent meals can be obtained if one is willing to pay the price. There many types of sea food and vegetables neither rationed nor controlled may be had and such things as gulls eggs, out-of-season asparagus and mushrooms, winter tomatoes and real salad can be found.

Restaurant meals are rather rigidly controlled though they are all off the ration. Five shillings is the maximum price which can be charged for food at any meal and in any one meal no more than one “main dish” and one “subsidiary dish” or two “subsidiary dishes” may be served. A “main dish” is one containing meat, poultry or game (excluding soups containing not more than 33 1/3 per cent. by weight of fish or eggs (excluding scrambled eggs or omelettes made from dehydinated eggs). A subsidiary dish is one containing
less than 1/3 by weight of fish or eggs, cheese counts as a subsidiary
dish when taken for dessert. Hotel meals are subject to restaurant
regulations and no one is allowed to remain in a hotel for more
than five days without turning his ration book over to the manage­
ment. Restaurants procure food under license and receive allot­
ments based on the average number of meals served in a datum
period.

Luxury restaurants are permitted to levy cover charges which
may run to twice or even three times the five shillings maximum
charge for food. In theory these cover charges are to provide
music and other entertainment, in fact they pay for the unrationed
variety foods which are procurable. This practice is winked at by
the authorities on account of the high morale value of these bright
spots in the blackout and also because the foods which they feature
are in such short supply that no general distribution of them would
be possible. All such establishments are under constant surveillance
for black market practices and if found to be violating the law they
are subjected to extraordinarily severe, usually confiscatory penal­
ties which combine loss of license, imprisonment of the proprietor
and a huge fine.

It is true that the rich man in England can still buy more to
eat than the poor man, but what he can buy is more variety than
nutritional value. The ration has, in truth, leveled out the diet
for all practical purposes. The rich certainly eat less and the poor
eat more of the foods which are essential to good nutrition. For an
overwhelming majority of the people the diet under rationing is
incredibly monotonous. The British cannot raise a great variety of
vegetables and fruits on account of climatic conditions. Imports
have been reduced to a minimum to release shipping for the trans­
port of our men and the munitions necessary for them to wage a
successful war. Many national dishes are impossible to prepare
under wartime conditions. Roasts and steaks are out of the question
under rationing. Fish and chips are a luxury on account of the
scarcity of fish and cooking fat. Clotted cream is illegal and the
fine English cheeses are only a happy memory because the demand
for fluid milk has almost eliminated the production of cheese.
Wiltshire bacon and hams are not found in the market because large­
scale hog raising is not possible and all cured pork is on the ration.
Oatmeal, a little bacon or "sausage", a little jam or marmalade, bread,
margarine, occasionally some egg powder as scrambled or omelette,
a little meat, usually "mince", fish or rabbit occasionally, potatoes,
cabbages, brussels sprouts, carrots, boiled puddings and cheese, these are what the average Briton lives upon. In summer there are a few green vegetables, peas, broad beans, string beans, with now and then a treat of fresh fruit or salad. The British people do not like it any more than would you but they carry on in a most exemplary fashion.

However monotonous the diet under rationing may be, the nutritional status of the British people has not yet been seriously depressed. It is the opinion of all Medical Officers of Health with whom I have talked that the general health has improved during the war. It seems to be true that there has been a definite loss in weight among the well-to-do class, but against this there is evidence of improvement in the nutrition of the working class. Poverty such as we know in our large cities and in our backyard rural areas does not exist in England. Food habits there are, in the main, good. Bread and potatoes furnish the bulk of the calories in the diet, both the 85 per cent. extraction bread and potatoes are good sources of the B group of vitamins and potatoes are an important source of ascorbic acid in the quantities in which they are eaten. In fact during the winter months potatoes and vegetables of the cabbage family are practically the sole sources of vitamin C for the entire population with the exception of children under six. Animal sources of protein and of vitamin A are not abundant. The amount of meat available furnishes approximately 18 to 20 grams of protein a day, the intake of vegetable protein is ample to bring the total protein of the diet up to requirements. Butter and margarine furnish relatively small amounts of vitamin A, the weekly ration does not contain one day's requirements but the amounts of carotene available from carrots, cabbage and sprouts are probably adequate. The fat content of the ration is quite low, this probably accounts for the weight-loss among the higher income groups of the population. Iron and calcium are also at what are thought to be minimal levels for adequate nutrition and there is a strong feeling on the part of some the British nutritionists that the amount of phytic acid present in the 85 per cent. flour may interfere with the proper absorption of these elements. In short the British ration is ample in calories but low in animal protein and in fat. The average intake of vitamins is, with the exception of the B group, considerably below the levels regarded as desirable, it is doubtful whether the average adult secures more than 1500 units of vitamin A and 20 milligrams of ascorbic acid daily.

In spite of having subsisted on this ration for three and a half
years, the people appear to be well fed and there are no definite clinical evidences of vitamin deficiency diseases. My own observations were entirely clinical and were confined to selected groups of the population chosen because there was reason to suspect that their nutrition was below the average. Nearly five thousand people were examined in various parts of England and Scotland, nearly half were older school children and adolescent workers. Three elderly people had typical Bitot's spots without other evidences of deficiency of vitamin A. Mild folliculosis was common among children and women but could not be related to deficiency of vitamin A. I saw one mild pellagrin and eight women who showed characteristic lesions of riboflavin deficiency. Approximately thirty-five other persons had corneal vascularization of the pattern that may be due to riboflavin deficiency but showed no other evidences of malnutrition. No scurvy was seen. Gingivitis is exceedingly prevalent in most parts of the country and is associated with severe dental caries in many instances. The relation of this gingivitis to low intake of ascorbic acid is not yet established. Medical officers of health, dentists and school medical officers with whom this matter was discussed were unanimous in the opinion that neither gingivitis nor caries are more prevalent than before the war. Therapeutic tests with ascorbic acid have so far been negative except for one test carried out in Dundee in one of the large hospitals, there the gingivitis of a number of patients was definitely improved by large doses of vitamin C. Many children in Scotland show evidence of old rickets but it seems unlikely that any of the findings I have mentioned are related to the present ration.

Where biochemical methods and physiologic tests have been employed in conjunction with clinical examination, some suggestive results have been obtained. Dr. A. P. Meiklejohn found exceedingly low values for plasma ascorbic acid in subjects examined in South Wales in the early spring of 1942, as the season progressed and green vegetables and a small supply of cherries became available the values increased to reasonably satisfactory levels. In the same locality a small group of women with marked folliculosis had low blood levels of vitamin A, amounts of the order of 60 I. U. per 100 cc. of blood while the average for the community was 90 I. U., no person in this group had any defect of dark adaptation or other evidence of deficiency of vitamin A. The same observer found that a small number of the women examined in Lancashire as well as in Wales had slight reduction of plasma protein values but no edema was found which was attributed to hypoproteinemia. A number of
observers in various sections of England and Scotland have reported an apparent increase in simple hypochromic anemia during the past year. The subjects examined have been older school children and young women. The grade of anemia observed has not been severe, hemoglobin values were of the order of 13.0 to 13.5 grams per 100 cc. of blood. Extensive surveys of hemoglobin and red cell values in many localities are now under way.

The general health of the British people has remained good. There have been no epidemics, in fact, the ordinary infectious diseases have been somewhat less prevalent than during the pre-war period. There has been a definite increase in the incidence of pulmonary tuberculosis among young women and of tuberculous meningitis among young children. This may in some way be related to nutrition but may also be explained by the crowding together of great numbers of girls in factories and hostels and by the increased consumption by children of unpasteurized milk.

It may be said in conclusion that the Ministries of Agriculture and of Food have rendered a tremendous service to the British people in providing a ration which has leveled out the food habits of the nation and provided enough of everything for everybody. There seems to be no question that the poorer section of the population has benefitted from rationing. Poor children are getting more milk than ever before and very many are getting more oranges and other sources of ascorbic acid. People everywhere have become interested in practical nutrition and have come to depend on the information furnished by the Ministry of Food regarding the best use to make of foods of all descriptions. It must be repeated that the diet is monotonous and that well-to-do people are not nearly so well fed as was their habit before the war, but the lessons learned from wartime rationing promise to make a lasting improvement in the nutrition of the British in the days when sea lanes are open again and an orange can be had to replace those daily pounds of potatoes.

(No formal bibliography can be furnished. Free use has been made of information contained in various reports of the Ministry of Food and the Ministry of Health. Much factual information regarding the ration is from the brochure, “Food Control in Great Britain”. The International Labour Office, Montreal, 1942).