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PROBLEMS OF CONSUMPTION OF AGRICULTURAL PRODUCTS

SECOND OPENING PAPER¹

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THERE has been within recent years a considerable output of literature bearing upon the consumption of food by individuals, by different classes, and by different communities. On its economic side this work may be briefly described from three points of view:

1. Investigations have been made primarily from the standpoint of business expansion such as studies of the market for particular commodities, the characteristics of these markets, the manipulation of demand by means of sales methods, of publicity work, and of efforts to change the consumers' purchasing habits; this would include the efforts of individual firms, industries, and trades to urge upon the community special forms of consumption or their own substitutes for established articles of consumption. Such work often involves an extensive and detailed knowledge of the economic position of different classes in a community and of the characteristics of the standard of living in different parts of a country.

2. Numerous and important social surveys have been undertaken; in Great Britain the pioneer work was Charles Booth's survey of poverty in London under the title *Life and Labour of the People in London* (1889-91); the *New Survey of London Life and Labour* published its first volume in 1930, while the Merseyside Social Survey was completed in 1934; there are a number of local social surveys such as that of Southampton by Dr. Ford on similar lines. The aim of such efforts is not primarily to collect facts regarding expenditure of certain classes upon food but to collect a wide range of facts relating to social problems and social conditions. The data assembled have usually, however, included family budget studies of a fairly extensive kind, and these are highly relevant to discussions upon the consumption of food.

3. A new and distinctive literature has recently sprung into prominence which deals particularly with the nutritional conditions of various classes and countries, how far they must be deemed inadequate, and what problems are raised by such deficiency of food

¹ See note on page 412.

in the standard of living. It may be said that this work is an attempt to create a new line of approach to social policy; it might be termed the nutritional approach to the problems of poverty. I propose to survey this literature from the standpoint of the economist and to consider the problems which are raised. Examples of this kind of work are the League of Nations reports dealing with the problem of nutrition and public health, the I.L.O. publication *Workers' Nutrition and Social Policy*, Sir John Boyd Orr's survey of adequacy of diet in relation to income, entitled *Food, Health, and Income* (1936), and the book entitled *America's Capacity to Consume*, published by the Brookings Institution (1934).

A useful method of approach is to state the line of thought of one or two of these authors who may be considered representative of this trend and then to consider their position from the standpoint of social and economic policy.

I take first the presentation of the argument given in *America's Capacity to Consume* written by Leven, Moulton, and Warburton. They begin by discussing the amount and character of the total national dividend, its division among different classes, its geographical division, and its growth over periods of time. This leads to a consideration of the incomes of families and of unattached individuals. Special consideration is given to the diversity of the family unit and, as is necessary in the case of the U.S.A., to the characteristics of farm and non-farm families. The third step is to examine the expenditure of family incomes. This is done by the usual method of utilizing the available evidence of family budget studies for different levels of income; much of this material is based upon occupational divisions which are difficult to handle. Special attention is given to the broad division between 'consumption' expenditure, covering food, home maintenance, fuel and light, clothing, and other direct purchases, and on the other hand what is termed saving and investment; in the savings of the community are included both individual and corporate resources set aside for capital expenditure. Such calculations should give the net amount available for expenditure upon consumption goods of all kinds by the different income groups.

On these grounds it is then urged that the consumption expenditure of a very considerable portion of the people of the U.S.A. (42 per cent.) falls far short of any reasonable minimum of adequacy, and it becomes obvious that for all the necessary items of expenditure, output would require to rise by percentages varying from 20 to 30. This would give a minimum of comfort, in which there was no substantial margin of safety. To reach the requirements of a reason-

able standard of living, it would apparently be necessary to increase the production of all kinds of consumers' goods by something like 70 to 80 per cent. The authors comment critically upon the view that productive power outran powers of consumption in the 'gay' twenties of this century in the U.S.A. They submit that there is nothing but irony in the statement of a prominent banker in 1930; 'it is a glorious thing to contemplate that as a nation we have too much, rather than too little'. In fact the total productive equipment of the U.S.A. working full time would not have met the demands which the authors consider necessary to the health and well-being of the people even at the minimum scale.

Second, I take the report entitled *Food, Health, and Income* by Sir John Boyd Orr, which discusses the adequacy of diet in relation to income in Britain.

The survey considers optimum and not minimum dietary requirements; these are defined as 'creating a state of well-being such that no improvement can be effected by a change in the diet'. It is admitted to be difficult to lay down precise and detailed criteria of perfect nutrition, and no reference is made to occupational standards. The stages in presenting the material are:

1. A statement is given regarding the total supplies of food, the expenditure upon food, and its relationship to the national income together with certain calculations as to estimated annual consumption per head of certain foodstuffs both in quantities and calories over periods of time.

2. A division of the community into 6 income groups was made. The average income per individual was taken as a guide, the total income of the family being divided by the number of persons it includes. This method is a departure from the usual way of assessing the family unit in terms of adult units.

3. A study of family budget data was made to obtain expenditure upon particular foods at different income levels. This calculation duly weighted for the different income groups should coincide with the national consumption. The conclusions reached were that the consumption of flour and potatoes was remarkably uniform in all groups; cheese and the fats reached their highest consumption in the middle groups; and the consumption of most other foodstuffs rose with income.

4. An analysis of the diets of each group was made to test the adequacy of the constituents to maintain health. Assuming the validity of the standards used, it appeared that the diet of Group I, comprising $4\frac{1}{2}$ million persons, is deficient in all the constituents

considered necessary; Group II, comprising 9 millions, is adequate only in total proteins and total fat; Group III, comprising 9 millions, is adequate in energy value, protein, and fat, but below standard in vitamins and minerals; Group IV, comprising 9 millions, is adequate in iron, phosphorus, and vitamins, but probably deficient in calcium; Group V, comprising 9 millions, has an ample margin of safety in everything with the possible exception of calcium; Group VI, comprising $4\frac{1}{2}$ millions, exceeds the standard requirements in every case.

5. It can thus be argued that 50 per cent. of the population fall below standard. To make the diet of the deficiency groups equal to that of Group IV which is deemed adequate would involve increases varying from 12 to 25 per cent. in the consumption of the more expensive foods such as milk, eggs, butter, fruit, vegetables, and meat.

It is not the purpose of this paper to make any criticism of the studies which have been described, but simply to assume that they represent the trend of nutrition study, and to define from an economic point of view the problem they state.

It is clear that the conclusion to which they point is that to obtain adequate diet large numbers of the people in highly developed industrial countries need more income, even if all allowances are made for badly directed expenditure and deliberate under-expenditure. It has long been a commonplace of economic thought that the main cause of inadequate food supply and inadequate housing is not so much an ineffective use of available incomes as the insufficiency of such incomes, however wisely spent, to provide the standards which the experts deem essential for health and well-being.

To keep this discussion within reasonable compass, attention will, however, be confined to certain lines of policy which may be deemed relevant to the increase required in the consumption of food.

First, it should be borne in mind that if the relation between incomes and prices were to raise the real incomes of the relatively poor, either through incomes rising while prices remained stable, or through prices falling while incomes remained constant, increase in purchasing power would only be partly spent in remedying deficiencies in dietary, since people would attempt to increase their satisfactions on all items in the standard of living and not merely on food. It would require some specific measure of public intervention to secure the whole of the increase for food expenditure. Further, any fall in agricultural prices should tend to extend demand for food as a whole, but much depends upon the movements in the price of other things deemed necessary. The rent item has often attracted the attention of social investigators and has been regarded by some of

them as a serious limiting factor upon food expenditure; in large cities it is often in the nature of a large first charge upon incomes. If it be assumed that relatively low prices of foodstuffs are a basic factor in expanding the capacity of workers' families to buy the food considered necessary, then the importance of certain supply factors affecting price calls for assessment.

Production costs may fall through the influence of constructive ideas upon the efficiency of agriculture. Changing technique with lower real costs of output is the most familiar feature of this process. It must always be a matter of uncertainty how far constructive ideas will lower costs in any generation; historical record suggests that the last century has been notable for the influence of the Law of Increasing Returns in agricultural pursuits rather than for any tendency to Diminishing Returns. A point about the present position which complicates the issue is that nutritionists, and in fact the public themselves, lay increased emphasis upon a changed kind of output. It is the expansion of the supply of protective foods such as milk, meat, fruit, butter, &c., which is required; these have relatively high real costs of production and do not appear as yet to yield opportunities of lowering costs to the same extent as crop production. Changes in the whole productive organization of agriculture may also be involved in efforts to lower costs.

An influence upon prices which has recently attracted widespread attention in many countries is market organization, often termed distributive costs. It is not possible to survey here the large mass of services, such as assembling, storing, grading, transport, finance, manufacture, retailing, which are covered by the term distribution, but it is clear that, interpreting this term even in a narrow sense, the growth of services between the producer and the final consumer has been one of the most characteristic features of recent economic development; such services consist mainly of labour, and the costs are such as often exceed the producers' costs for an article. Whether it is worth while for the consumer to pay for all these services or whether the present organization can be made capable of rendering cheaper service is a matter of trial; there have been notable changes within the last few years both in retail trading, in producers' marketing, in transport, and so on; it can scarcely be said that the law of substitution is not exerting steady pressure; on the other hand, the influence of monopoly and monopolistic ideas has become more obvious, and it may be necessary to consider whether the supply of the essentials of the people's food supply should not be considered a public utility service.

A further factor which could be used to keep prices reasonably near to world levels is a country's commercial, agricultural, and fiscal policy. It cannot be said that recent experience affords any ground for thinking that either European or American countries intend to move in this direction. Most countries are attempting to insulate their agricultural and often their other major industries from world influences, indirect taxation has increased, and the revenue from such taxes is deemed essential by many Governments. If it were to become possible to trade more freely in certain food products by international agreement, a factor favourable to better nutrition would be set in motion.

Turning from certain factors affecting supply price, a brief reference may be made to those lines of social policy designed to raise minimum levels of real income. It is clear greater national efficiency leading to a greater national dividend will favourably influence consumption; the whole code of social legislation embodying social insurance, Trade Boards, collective wage bargains, together with the large transfers of wealth by taxation and similar means from the relatively rich to the relatively poor, embodies a policy which increases the purchasing power of the relatively poor. No doubt such policies depend for their continuance upon the maintenance of the national dividend from which the transfers are drawn.

Much of this discussion may savour to some as belonging to what is known as the economist's conception of the 'long period' effect on nutrition rather than of practical effort. The State or other agency may simply provide better food or additional food for those who are believed to be under-nourished. Such methods may take the form of the provision of milk for school children, the distribution of relief in kind or by food cards, and so on. Reference may be made to a few special cases within this somewhat extensive field of social endeavour.

In so far as members of the lower income groups fail to obtain as high a food value from their expenditure as would be possible by other methods, educational efforts may be used to reshape and alter dietary habits, for example to strengthen the recent tendency towards increased consumption of milk, fruit, vegetables, and other protective foods.

A further field which seems to deserve exploration and experimentation is that covered by the unfortunate term 'mass feeding' or collective feeding. There is a long tradition in most countries of collective feeding in hotels, institutions, canteens, boarding establishments, colleges, and so on; employers have often specialized in

the creation of restaurants and cafeteria for their staffs. Systematic collective feeding has so often been associated with distress measures that this may have prevented attempts to try out the plan on a reasonable economic basis. It is, of course, true that few people in this country would care to take all their meals in a restaurant, but, from the nutritional standpoint, it would often be enough if they were able to eat one good meal in such a club. Such quasi-public bodies might buy cheaply and should have certain economies of large output to help them. The idea has the great merit that it might be developed without any eleemosynary tinge.

A last conception which has recently been given prominence is that of separating markets so that a special price may be charged in each market. In so far as differences in the prices charged for the commodity are due to differences in quality, such separation of markets can exist under competitive conditions. The essence of the scheme, however, is really monopolistic and consists in so separating consumers' markets that one group may be charged one price while another group is charged a different price for exactly the same commodity. The conditions most favourable to this form of charging are (1) monopolistic control of supply, (2) no amount of the commodity sold in one market should be capable of transfer to another, and (3) no demand which should be met in one market should be capable of transfer to another.

The illustrations of this form of charging usually given are the services of doctors, barristers, dentists, and others. A medical man's offer to charge any one set of persons less than any other set cannot lead to the one set becoming middlemen for the services which the other set desires. If doctors charge less to poor people than to richer people, this does not lead to rich people becoming poor in order to obtain cheap doctoring. Cases can also be found of large semi-monopolistic companies which charge different prices to different markets and even to different customers.

How far such a method of price discrimination could be applied to food products sold to different income classes in the community might be considered. The theory would be to sell cheaply to low-income groups and at higher levels to those with higher purchasing power. Few cases are likely to be found which meet the conditions outlined above. That of milk comes at once to mind. The sale of milk in this country has always taken place in multiple markets, namely, for fluid milk, cream, butter, cheese, condensed milk, and milk powder. It has been usual to charge a relatively high price in the fluid milk market to make up for low levels in the manufactured

milk markets. The fluid milk price has been kept relatively high, and recently there has been an attempt to create special markets for surplus at levels lower than the standard rates but higher than the rates for manufactured milk. The unemployed in certain areas might be singled out as a special group, but the conditions of transferability may make this plan difficult to work; even in the case of school children being provided with cheap supplies of milk, the suggestion has been made that it cuts down their home supply and is not a net addition to their dietary.

The real difficulty lies in getting a clear and workable demarcation between markets which would permit of a policy of price discrimination if that were thought desirable. The aim of the monopolist is, of course, not to make his sales less remunerative but to make up on his high price sales anything he loses in the cheaper market; it seems unlikely that this could be arranged in the case of milk.

While the 'New Nutrition' has no doubt stimulated public interest in the relationship between low purchasing power and food consumption and while it has made clearer the serious deficiencies of dietary of a large proportion of the populations of different countries, it seems difficult to say that it represents a new approach to problems of poverty.

These are questions of available real incomes and involve a consideration of the methods and policies by which the incomes, particularly of the relatively poor, may be increased.

DISCUSSION

F. L. MACDOUGAL, *Australia House, London.*

I am very sorry to have missed Professor Cathcart's paper this morning and I only arrived in the middle of Professor Forrester's paper, but I had had the good fortune to be able to read the draft of Professor Forrester's paper. I want to suggest to the Conference that the only rational solution of the world's agricultural problems is to increase consumption, and I think that this statement can be put forward quite unhesitatingly for four main reasons. First of all we are now all of us aware of the evidence of a great increase in productive capacity of agriculture throughout the world. We have had the evidence of the existence of surpluses, but, much more important than that, we are all aware of the immense advances which have been made by the impact of biological science upon agriculture. There has been great progress in the science of plant and animal nutrition. There has been progress in almost all lines of

agricultural technique, but probably much the most important advance affecting the productive capacity of world agriculture has been the achievements of the plant breeder. It is not necessary for me to go into that in the slightest, for you are all aware that the new wheats, the new sugars, the new root crops, the new grasses, and legumes, which are now available to farmers—available probably for almost every type of soil and climate—have enormously increased the productive capacity of the world, and yet we are still only at the beginning of what can be achieved through the application of science to agriculture.

That is the first evidence. The second evidence is the evidence of under-nutrition. Again it is unnecessary here to go into it at any length. We have the evidence that has been so admirably arrayed in the report produced at the International Labour Office, under the title of *Workers' Nutrition and Social Policy*, the reports of the League of Nations Committee, and the report of Sir John Orr on conditions in this country, to which Professor Forrester made reference in his paper. I think we can sum up the evidence in this way, that in all countries without exception the consumption of protective foods falls far below the desirable level, whereas in many countries the total consumption of all food, whether protective or merely energy producing, is too low.

The third set of reasons are the social evidences. I just want to suggest to the Conference quite briefly that the spread throughout ever-widening circles of the community of the knowledge of the world's ability to produce more, to produce all that we require, must inevitably lead to a growing insistence in the demand that every one should be able to receive something approximating towards an optimum diet. Failure by the nations to realize this position must inevitably lead to social unrest.

The fourth reason is an international one. It is quite legitimate to suggest to this Conference that the most hopeful method of improving the political relations between countries is through bringing about a revival of world trade. A revival of world trade, after all, very largely depends upon the resuscitation of the purchasing power of the agricultural exporting countries, whether those countries are in Europe or overseas. If we take the countries which are dependent for the power to purchase manufactured goods upon their exports of primary products, whether agricultural or mining products, we find that those countries have not less than 80 per cent. of the world's population, so that the revival of the purchasing power of the agricultural countries is probably the key to the revival

of world trade. I should like, extremely briefly, to refer here to the position of Australia which is typical of many other overseas agricultural countries. Australia has commenced only really since the War to change over from a concentration upon extensive agriculture to a beginning with intensive agriculture. Now, without adding a single acre to the area at present under crops or under special grasses, there is no doubt that this intensification of agricultural production which is now going on in Australia would lead to perhaps a doubling of the production of agricultural products. That would make it possible for Australia to export enormously larger quantities than she does to-day of most of her products (not of wool, but leaving wool and wheat on one side), and that without making allowance for fresh settlement of new people on any great scale.

Australia, Argentina, New Zealand, and many other countries look at the world and ask where they can possibly find the markets for this production which they are most anxious to produce. They look at the markets of the United Kingdom, and they see that these markets are very imperfect, but that they are already absorbing a very great deal. They look at the United States of America and see that it is perfectly clear that American agriculture is so important to America and is also capable of such large expansion itself that there is very little possibility of markets there. Then they look at the Far East and they recognize that in the future the East may become an important market for international trade in agricultural products, but it must be in the far future. They come to the conclusion that the one hope would be in Europe.

If we are right in thinking that the main solution of agricultural marketing problems must be increased consumption, it is then necessary to consider the methods whereby increased consumption can be brought about. I think the methods could be summarized under three heads: first, to bring about increased real purchasing ability for the masses, particularly in the industrial countries of the world; secondly, by decreased costs; and, thirdly, by measures of social provision. The method of increasing the real purchasing power of the masses is probably much the most important method, but I rather take it that that is somewhat outside the scope of this discussion. I should like, therefore, to turn to the consideration of the heading of costs.

Decreasing costs might be regarded as falling under two heads: decrease in production costs and decrease in distribution costs. Taking production costs we are, of course, all aware that since the

depression, at least until the last few months, world export prices of agricultural products have been low, in many cases too low to cover the costs even of efficient production in the low-cost producing countries, but the very phrase 'world parity' to-day has hardly any meaning because so very few countries are allowed to obtain their supplies at such prices. I imagine that almost every member of this Conference is familiar with Sir Frederick Leith-Ross's Memorandum which was published as an annex to a report issued by the Economic Committee of the League of Nations last year. That report of Sir Frederick Leith-Ross still merits the closest study, since it shows the tremendous discrepancies between export prices and wholesale prices which are being paid for agricultural goods in many countries. What I want to point out, however, is that even in the countries of low costs, or relatively low costs, there still exists a very great scope for further lowering of costs. Professor Richardson of the Waite Institute in Adelaide, who is a great authority on wheat production in Australia, is responsible for the statement that, if the average farmer in the wheat areas of South Australia was as efficient as the best 10 per cent. in the same areas, the result would be a doubling of the wheat production of South Australia with a very little increase in cost. But after all the main cause of high cost of production from the world point of view is to be found in the national policies of many countries aiming at national self-sufficiency in agricultural production. I am sure that very few people to-day will quarrel with the national determination which is found in every country in the world throughout Europe, in this country, in America, everywhere. The national determination is to maintain a contented peasantry as a basis of national life, and we should all agree that that point of view is sound for social and for political reasons. But if the demand for agricultural products in the world and in these countries was really inelastic, then the existing policies of insulation of the market in order to maintain the agricultural prosperity of the farmers within the frontiers might have some rational justification. But I suggest that there is the clearest evidence that there is a real physiological necessity for demand, particularly for the protective foods, to be greatly increased.

The Governments of the industrial countries which are adopting policies of extreme agrarian protection have before them a perfectly sound alternative, namely, to maintain a prosperous agriculture based on the production of the more perishable forms of the protective foods and to avoid the concentration of effort upon the production of wheat, sugar, and other crops, which can be so much

more easily and readily obtained from the low-cost producing countries whether in Europe or overseas. In the list of the protective foods which science is urging as desirable, we have milk, dairy products, eggs, vegetables, and fresh fruit. It has been shown that if the liquid milk consumption of this country were to be brought up to a reasonable level, not the optimum level which has been urged, but a reasonable level from a physiological point of view, the result would be that it would be necessary to increase the cow population of this country by something like a million. That would mean roughly, I think, about 40 per cent. increase in the dairy herds. It would also mean that the amount of land devoted to the production of grass or other crops for dairying purposes would have to be greatly increased. If we apply that sort of figure to Europe we get quite startling figures. There appears to be any amount of scope, provided the increased demand for the protective foods can be made effective, for the agriculture of Europe and of this country to be quite highly prosperous without the present reliance upon the crops which can be so much more easily obtained from elsewhere.

The opportunity is, therefore, in the hands of the great industrial countries, who are all anxious to export their manufactured goods, to maintain their agriculture, and yet to see a revival of world trade in many of the great agricultural staples. If that is to be done it is quite obvious that the question of production costs must be regarded as a factor influencing agricultural policy, and governments ought deliberately to consider the nutritional condition of their people as one of the factors in their agricultural policy.

Then there is the question of distribution costs. Mr. Forrester has already gone into that question, and I do not want to take up your time by going any further into it in great detail. I only want to point out that although this question of the spread between the price which the producer receives and the price which the consumer pays is a very old story, one which I suppose has been examined in almost all countries, both officially and unofficially, academically and by governments, yet the more we look at it, the more it appears that there is still scope for much more careful, large-scale work. In this country it appears that in certain instances the margin between the producers' and consumers' prices is really very narrow, and that applies to such commodities as butter, cheese, and sugar. On the other hand, when we come to milk, meat, fruit, such as apples and oranges, all the soft fruits, all the fresh vegetables, we find that the margins are quite enormous. All that I can do at this stage is merely

to urge that members of this Conference should give constant attention to the question of economies in the distribution system.

As regards social provision I do not want to take up the time of the Conference except to suggest that, if we really want to bring about a great improvement in national health and at the same time to assist the world agricultural position and the national agricultural position, the question of social provision as a method is well worth the closest study. I think that a further development of the milk-in-schools scheme along some such lines perhaps as those that have been adopted in Scandinavia, where the breakfast for school children has been playing an increasingly important part in nutritional campaigns, would be well worth studying.

I would like in conclusion to say that this Conference would be serving an extraordinarily useful purpose, first from the point of view of national agriculture, secondly from the point of view of international agriculture, and thirdly from the point of view of the revival of world trade, if it were possible for members of the Conference to do everything in their power to assist the further examination of these problems in their own countries.

E. M. H. LLOYD, *Market Supply Committee, London.*

I welcome the opportunity of contributing to this discussion because I believe in the importance of further study of food consumption and food distribution from the point of view not only of health but of agriculture. It is a remarkable fact that, considering that food is one of the main preoccupations of mankind and the mainspring of economic activity, there is only one Food Research Institute in the world. I suggest that this Conference might well signalize the importance of this aspect of agricultural economics by recognizing the existence of a new branch of economics which we might term 'food economics'.

If one tries to picture the programme of research of a World Institute of Food Economics, what is the sort of field that opens up? I suggest that its main task would be to bring together and analyse critically two sets of statistics, each of which is woefully imperfect as it stands but can be constantly improved; on the one hand, estimates of supply based upon production statistics, trade statistics, statistics of stocks, and agricultural estimates of bulk consumption or disappearance, and on the other, the results of individual family budget inquiries and dietary surveys showing what are the actual food habits of the people. It is from the union of those two that we shall gradually advance towards a more accurate measure of this

problem of consumption and demand. Of course, to make full use of family budget inquiries and dietary surveys such as the very interesting ones which Professor Cathcart illustrated to us this morning, we require to know what relation those particular 100 or 1,000 household inquiries bear to the whole population, and there we have to call upon other branches of economic inquiry. We have to go to the statistician who can give us some estimate of the total national dividend and even an estimate of the probable distribution of the total national income and of food expenditures at different income levels.

Then we have to pay regard to national and regional differences and to study seasonal differences. Nearly all these family budgets and dietary surveys are confined to one particular week or fortnight or month, and one cannot generalize from one week's inquiry. By this means we shall gradually begin to learn more about the market for food and in that respect supplement and make use of those specialized market studies, to which Mr. Forrester referred, by advertising agencies and others interested in sales promotion. It will be possible to throw light for the benefit of the economist, particularly the agricultural economist, on consumer purchasing habits, on elasticity of demand and substitution, on saturation points for particular foods, on the potential capacity for increasing consumption of particular foods, and on such important points as the reaction of consumers to variations in quality and methods of preparing particular foodstuffs. All this obviously opens up a vast field of new knowledge which will never be fully comprehended and can only grow gradually if, and when, and to the extent that, its importance is recognized. It is the long-range, fact-finding activity of statisticians and trained economic investigators, and I believe myself that there is a great future for that branch of applied economics which I have suggested we call 'food economics'.

What bearing has this on agriculture? Agricultural economists are to be congratulated in so far as they have emphasized the need for increased consumption rather than restriction of production. But I sometimes feel, listening to the discussion here, that the speakers regard agriculture as primarily a way of life for the producer. That is obviously true, but one must not forget also that the primary end of agriculture is to provide food for the community, and this aspect sometimes tends to be overshadowed. I have already spoken on the need for more research into demand, consumption, and distribution in framing agricultural policy, but I would like to end with one other aspect which I believe is of enormous importance and links up with previous discussions at Bad Eilsen. The question of

under-consumption and over-production is an aspect of the trade cycle, unemployment, and monetary policy. The study of food economics must be related to the study of the trade cycle, and one of the fields for research outside the purely fact-finding and statistical work is an attempt to study food consumption and trade in food in relation to the trade cycle. Food economists will need to co-operate with those studying monetary and economic aspects of the trade cycle in getting an improved diagnosis with a view ultimately to getting better control of these fluctuations.

F. VON BÜLOW, *International Labour Office, Geneva.*

During the discussion reference has been made on several occasions to the report published by the International Labour Office, *Workers' Nutrition and Social Policy*. I took my part in the preparation of that book, and I am still to some extent responsible for the handling of that question by the International Labour Office. I want, therefore, to stress that I speak here absolutely in a private capacity, not involving my Office in any way.

The subject I want to talk upon is the effect of improved nutrition on the situation of agriculture. I have discussed this subject during a year and a half on many occasions and especially with Mr. MacDougall. I must confess that I am not so optimistic with regard to the good effects of such an improvement as he is. I think we have to realize when we examine this question that it is not simply an academic question, but that owing to the influences exerted we stand perhaps at the beginning of definite government policies with regard to the problem. We must, therefore, measure the importance of the movement. If the movement is not going to be important, I do not think there will be any special agricultural problems involved, but, if we are going to see a really organized improvement in the standard of living of the populations, I think we shall have to come to the conclusion that some of its effect on agriculture may be good, but that it may also cause certain difficulties which it is better to consider in time. I had the honour to express my opinion on this subject before the International Commission on Agriculture, meeting in Norway a few weeks ago, and, with your permission, I will repeat shortly the ideas I expressed on that occasion.

It appears from the record of the Technical Committee, to which Professor Cathcart belongs and to which he has made reference, that the hygienists in general consider that from a quantitative point of view the nutrition standard of populations in western and central Europe is satisfactory but that it is lacking in regard to quality. The

study carried out by the International Labour Office and based on family budget inquiries shows that even from the quantitative point of view the situation is not so satisfactory as hygienists seem to believe. Further, it shows, and this is an interesting fact, that with increasing purchasing power the working classes themselves improve their nutrition in the direction wanted by the hygienists. An improvement in the economic conditions of the working classes may, therefore, lead first of all to increases in the quantities consumed but will soon also lead to a change in the qualities. I believe that this fact of the change in the composition of the diet is the most important in the whole matter, as also stressed by Mr. MacDougal. On the other hand the history of agriculture shows us that it is much easier for agriculture to enlarge its production than to change its direction. We cannot think here of agriculture as one big unit, because the consequences of a change in consumption habits work themselves out in each agricultural region and on each individual farm. If we are going to eat less wheat and more vegetables, we cannot expect all the wheat-cultivating regions to become truck-farming. Natural conditions are against that.

If, therefore, a change is taking place with very great speed, it may cause difficulties to certain forms of agriculture. Even during the expansion period of economic wealth during the nineteenth century, it was difficult for agriculture, and especially for certain types of agriculture in Europe, to adapt itself to the new situation. The countries had an opportunity then to make the change which now Mr. MacDougal says may be the result of an improved nutrition, namely, that the more protective foodstuffs are produced in the industrialized districts, and the more calorie-furnishing foodstuffs are produced abroad. The effect on agriculture in Europe at that time was so strong that most countries preferred to protect their agriculture instead of taking advantage of that improvement in the nutrition standard of their populations which really was offered to them. We have all seen that during the post-War discussion of the agricultural crisis the difficulties of wheat producers were explained not only by the increasing production of wheat but also by the changes in consumption habits. It is, therefore, of the greatest importance to agriculture to know, in addition to the natural trend in the consumption habits which would result from improving economic conditions, what measures Governments will take to improve nutrition directly. We do not know yet what these measures will be if the question is tackled in a really organic way on a large scale, not only plans of a wider scope such as milk distribution to

children, to expectant mothers, &c., but also steps to raise the purchasing power of the consumer classes as such, or measures of a general character. What the measures will be, we do not know at all. But the measures taken may, according to their nature, have very different effects on agriculture. There may be measures which will be contradictory to the development which is expected, as in the case of special protective foodstuffs. We have had committees set up in various countries—often as a result of the discussions going on in Geneva—which study the nutrition problem. If we examine the suggestions they intend to make to improve the quality of foodstuffs at the disposal of the population, we shall find in several cases these committees have only got so far as the question of bread in their consideration. They want to assure the population a bread which is a more protective foodstuff than the bread that is baked to-day. This way of looking at the problem may be directly satisfactory to cereal-producing countries, but it is not the development which theoretically has hitherto been advocated. If the population is going to have a more full-wheat bread, a smaller quantity of cereals may be needed for satisfying the consumption. This example shows directly opposite effects to what is expected of the whole movement. Other solutions may be found as for example adding vitamins to margarine.

What all these things show—and this was the conclusion arrived at in Oslo by the International Commission of Agriculture—is that it is most important for agriculture to take an active part in the whole movement for better nutrition and not simply to sit down and wait for the good results of the propaganda and the steps taken by others. I think there is room for active collaboration by agriculture; hygienists ask us to eat more protective foodstuffs, but they give us in fact a large choice in regard to what kinds of foodstuffs are wanted. It ought to be the task of agriculture itself to study what foodstuffs, desirable from the hygienists' point of view, are the most easy to produce and which would cause least disturbance to agriculture in its actual structure.

What role the agricultural economists will have to play in this, I cannot say at present, but I am convinced that their collaboration will be necessary.

HAZEL K. STIEBELING, *Bureau of Home Economics, Washington, D.C. U.S.A.*

Before contributing the paper which I have prepared for this Conference, I wish to make a few general remarks regarding the subject of to-day's discussion.

In 1886, just fifty years ago, there was published in America the first account of the adequacy of diet of any population group. In the annual report of the Massachusetts Bureau of Statistics of Labor (1886), Prof. Atwater of Wesleyan University gave a summary of the content of the diet of wage earners and its nutritional adequacy in so far as it was then possible to evaluate it. One of his comments is of as much interest to us to-day as it was in 1886: 'It is undeniably true that much money is wasted in the purchase of food which is lacking in the elements of nutrition, and that the income of the working classes might be made far more effective if it were expended in accordance with the results of scientific research.'

Since 1886 there has been much interest in the United States in the content of the diet of various groups of the population. In 1893 Congress appropriated the sum of \$10,000 for the study of human food and human nutrition. The paper which I have prepared gives a brief graphic report of food consumption habits of American village and city dwellers who spend different amounts for food. The upper part of each page of charts indicates the quantities of food purchased at different levels of food expenditure as shown by dietary studies made between 1914 and 1933; at the bottom of each page of charts is a similar array of information from a 1934-5 study of the U.S. Bureau of Home Economics in collaboration with the U.S. Bureau of Labor Statistics.

The preliminary data from the latter study are from records collected in the spring of 1935 from white wage-earning families in industrial centres. Shortly we shall have information on seasonal food consumption habits of city wage-earning families living in different parts of the country and spending at different levels for food. Within a year or so we expect to have the results of another study now in progress showing comparable information on food consumption not only for wage-earning families but also for other occupational groups.

We have computed the nutritive content of the diets described in the graphic report on the basis of average figures on the composition of American food materials and have compared these results with our best estimates of the quantities of various nutrients needed for good nutrition. We find that families who spend more than \$130 *per capita* per year for food (1935 price level) are quite likely to get diets which meet or improve on average minimum requirements for good nutrition. Those that spend between \$100 and \$130 per person per year are somewhat on the border-line. Families who spend less than \$100 per person per year for food are likely to get diets which fail

to meet even minimum requirements in one or more nutritional essentials. American dietaries are usually much better fortified in calories and protein than in calcium and in vitamin B, according to our present standards. I fully agree with Professor Cathcart when he says that we know far too little about nutritional requirements; however, if we can persuade families to take account in their food selection practices of what is known without waiting for precise information, we shall have made decided advance.

Early in his work Professor Atwater was concerned with putting the available information on food values and food costs at the disposal of the public. In 1894 he prepared for publication by the Department of Agriculture the first popular interpretation of laboratory findings on food values and body needs. The popular dissemination of knowledge is a policy followed by the U.S. Department of Agriculture, the State Agricultural Colleges, and the State Experiment Stations. I think you might be interested in the latest publication which we have issued on this subject: *Diets to fit the Family Income* (Farmers' Bulletin 1757, U.S. Department of Agriculture, 1936). This bulletin was prepared for distribution among city housewives who write to the Bureau for information on how to get the most for their food money. It is a popular interpretation of the more technical Circular 296, *Diets at Four Levels of Nutritive Content and Cost*, issued by the Department in 1933. If we compare the diet recommendations in these publications with the information on diet habits presented in the graphic report, we find that in some respects there is considerable divergence between the two. Diets purchased according to the suggested diet plans of the bulletins will yield for \$80 to \$100 per person per year a food supply as good nutritionally as is likely to be purchased for \$130 per person per year by housewives when they follow customary food selection habits. It is very difficult, with present food habits, for people who spend less than \$100 a year to get diets which meet nutritional standards; some city families have too little money to spend for food to secure fully adequate diets through the usual retail outlets, even if they had all present knowledge of food values at their disposal. Many, however, now fail to secure adequate diets for sums which could provide a nutritionally satisfying food supply if it were purchased with due regard to food values, retail prices, and bodily needs.

If every city family could have an adequate diet selected in accordance with present food consumption habits, it would mean an increase in the urban demand for agricultural food products of some-

thing like 20 per cent. over all, with most of the increase in fruits and vegetables other than potatoes and dried legumes, in milk, in butter, eggs, and lean meats. There would probably be very little increase in grain products or in fats other than butter. The charts based on American dietary habits show that with increasing *per capita* expenditures for food there is very little increase in purchases of these items between the lowest and the highest levels of food expenditure studied, whereas there is a fivefold increase in the consumption of eggs and butter, and a sixfold increase in the consumption of succulent vegetables and fruits.

The problem of supplying desirable amounts of protective foods to low-income groups is a difficult one to which economists and administrators should continue to give constructive thought. It is not a question to be resolved in terms of agriculture alone, but calls for a better understanding of all industry and commerce, and particularly of the relationship between agriculture and other kinds of productive activity. It is a matter of great importance because dietary adequacy is closely related to human health and efficiency.

[Dr. Stiebeling then presented to the Conference the following paper:]

DIETS OF URBAN AND VILLAGE FAMILIES IN THE UNITED STATES:
1914-36.

A knowledge of the food consumption habits of different population groups is needed in dealing with many of our current social and economic problems. The inter-relationship between diet and health is gaining recognition by the public, so that lively interest attends discussions of what constitutes an adequate diet, and how much a suitable food supply costs. The appraisal of present dietary habits in the light of modern knowledge of food and nutrition is basic to educational programmes in food selection. Quantitative information on present food habits is also indispensable in determining the foods to be priced and the weight to be assigned to each in developing cost-of-food indices, and in pricing food budgets. In addition, information regarding consumption at different economic levels serves to indicate the probable shifts in consumption as barriers to free choice are lifted. These are matters of interest to consumer, labour, farm, and business groups, as well as to civic and government agencies.

For more than forty years, the U.S. Department of Agriculture has concerned itself with the content, cost, and nutritional adequacy of American diets, and from time to time has collected detailed information on family food consumption. The U.S. Bureau of

Labor Statistics and other public and private agencies have also collected many data on family food expenditures and on food consumption patterns. Many of the studies on American diets made in the past are not useful in making a complete summary of food consumption, because the data have not been published in sufficient detail. Some reports give information on the quantities of different foods consumed, but not on cost; some present expenditures only; some deal with nutritive value only; some give information only on certain food items rather than on the diet as a whole.

During the twenty-year period 1914-33, six studies of city and village family food consumption have been made from which detailed data were available to the writer on the kind, quantity, and cost of food consumed by individual families. One small study was published in considerable detail. The others are still unpublished or only partially published; but the original records were put at the disposal of the writer. Altogether these six studies furnished 1,020 records. About two-thirds of these records were secured from families of business men and professional workers; about one-sixth were from families of wage-earners; and about one-sixth from low-income, semi-dependent families. Supporting these data there are two averages reported by the U.S. Bureau of Labor Statistics, and representing 12,000 families of wage-earners. One of these averages is from data obtained in 92 cities located in 42 States in 1917-19; the other from a small study made in Detroit, Michigan, in 1929.

All of the materials described above were considered in arriving at an approximation of food consumption trends with changing levels of expenditure for food. Every season of the year and different regions of the country were represented, but not equally well. From these data it appears that families spending comparable amounts for food buy much the same kind of diets regardless of the occupational classification. The diets of families of wage-earners appear to be much more like those of families of professional workers if the levels of expenditure for food are similar than are the diets of families of wage-earners of different economic levels. Because of the relatively small number of dietary records available, all of the data were combined, without reference to type of occupation, to show the effect of level of expenditure for food upon the consumption of different important food groups.

Between December 1934 and March 1936 records of food consumption at each of four quarters of the year were obtained as part of the Bureau of Labor Statistics study of the disbursements of wage-

earners and lower-salaried clerical workers, made for the purpose of revising its cost-of-living indices.¹

The families included in the study of disbursements as a whole were carefully selected to represent a cross-section of the families of employed white wage-earners and lower-salaried clerical workers (in certain sections of the country the study included Negro and Mexican families). All of the families included had one or more workers who worked a minimum of 1,008 hours in at least 36 weeks during the year. An exception was made in the case of families in which the chief wage-earner was employed in an industry distinctly seasonal. Such families were included if the chief earner had employment for $3\frac{1}{2}$ eight-hour days in each of 30 weeks.

Since the data were being obtained primarily for the purpose of providing a basis for indices of living costs, it was important that they should not reflect the distorted spending of families whose incomes have been abnormally low or irregular. On that account, no data were included from families whose incomes were under \$500 a year, or from families who received relief during the year.

The records of weekly food consumption were obtained from 2,746 families included in the large random sample, who were willing to co-operate in this phase of the work. These families were living in 32 cities scattered throughout the United States. It is believed that the group of families willing to keep food records was fairly representative of the group included in the study as a whole.

Over a period of many years the total volume of food disappearing into consumptive channels has been fairly constant, although the relative importance of different groups of food has shifted. For example, there have been decreases in the consumption of grain products, potatoes, and meats, and increases in the consumption of sugar, milk and cream, citrus fruits, and some of the succulent vegetables, such as lettuce, spinach, cauliflower, snap beans, and celery. In the main, these changes have come about fairly gradually. They are due to improved facilities for transportation, storage, and marketing of the more perishable goods and the consequent availability of a wide variety of foods in great abundance, as well as to the emphasis which the newer knowledge of nutrition has placed

¹ Plans for obtaining the information relative to food consumption were made co-operatively by the Bureau of Labor Statistics and the Bureau of Home Economics. The field work was supervised by the Bureau of Labor Statistics. The statistical analysis from the standpoint of the content, nutritive value, and economy of diets was supervised by the Bureau of Home Economics. Both Bureaux conducted their work, in part, as Federal works projects in co-operation with the Works Progress Administration.

on milk, vegetables, and fruit. During the years 1931-3 the apparent consumption of food was about as high as during 1925-9, notwithstanding the great reduction in consumer incomes. There was practically no decrease in the total volume of food produced. In order to move this undiminished volume into consumptive channels, food prices were adjusted to what consumers could pay, and the general level of food consumption was well maintained.

Within a relatively stable national supply there have always been wide variations in the quantity and kinds of food consumed by family groups. In part these variations reflect individual needs, in part acquired food habits, and in part adjustments which are enforced by economic limitations. The very liberal supply of food enjoyed by some groups of the population raises the national average, but does not confer any benefit on those families whose circumstances do not enable them to secure a food supply fostering a full measure of health and efficiency. How great these variations are from family to family can best be learned through studies of the food consumption of individual families.

Each available study or group of studies of family food consumption has been classified by the Bureau of Home Economics according to the amount of money spent for food per person per year. (Food expenditures were adjusted to a common base period by means of the U.S. Bureau of Labor Statistics retail food index.) Families were grouped together that were spending less than \$30 per person per year for food (at January 1934 price level), from \$30 to \$60, from \$60 to \$90, and so on up to those that were spending \$240 or more per person per year for food. The average quantities of the various foods consumed were obtained for all of the families in the study spending comparable amounts for food, and for each class of foods a scatter diagram or a bar diagram has been made showing *per capita* consumption in each study or group of studies.

The first two charts (Charts 1 and 2) show the trend in consumption of fruits and vegetables (other than potatoes and dried legumes) and of meats, both by level of expenditure for food and by the successive periods of time.

The first chart (Chart 1) tells something of the variations in the consumption of vegetables and fruit. Crosses, representing consumption in the decade 1894-1904, are usually near the bottom in each classification by level of expense for food, whereas most of the symbols near the top represent consumption during the period 1925-34. Even in recent times, when the food value of vegetables and fruit has been given more recognition than formerly, only small quantities

CHART 1. ESTIMATED YEARLY *PER CAPITA* CONSUMPTION OF VEGETABLES
(EXCLUDING POTATOES AND DRIED LEGUMES) AND FRUITS BY NON-FARM
FAMILIES

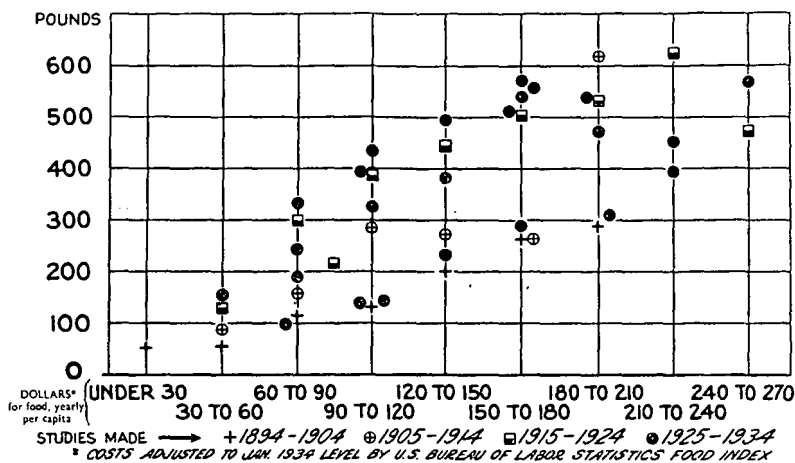
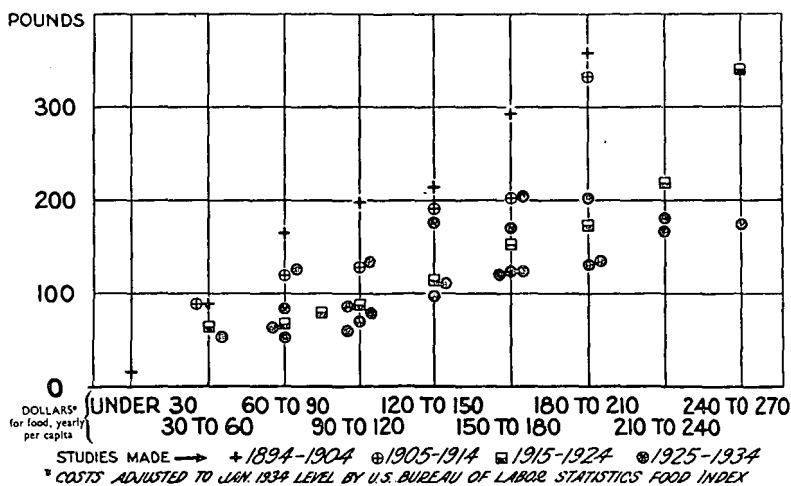


CHART 2. ESTIMATED YEARLY *PER CAPITA* CONSUMPTION OF LEAN MEAT,
FISH, AND POULTRY BY NON-FARM FAMILIES



(Symbols of different shapes are used to represent studies made in different periods. Crosses represent food consumption in the decade 1894 to 1904; the encircled crosses, food consumption of families studied between 1905 and 1914; the half squares, studies made between 1915 and 1924; and the black circles the studies which were made between 1925 and 1934.)

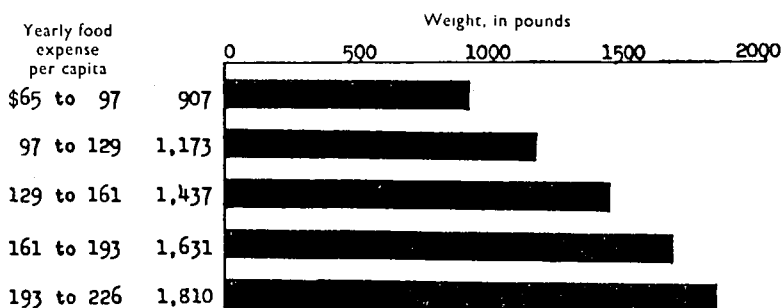
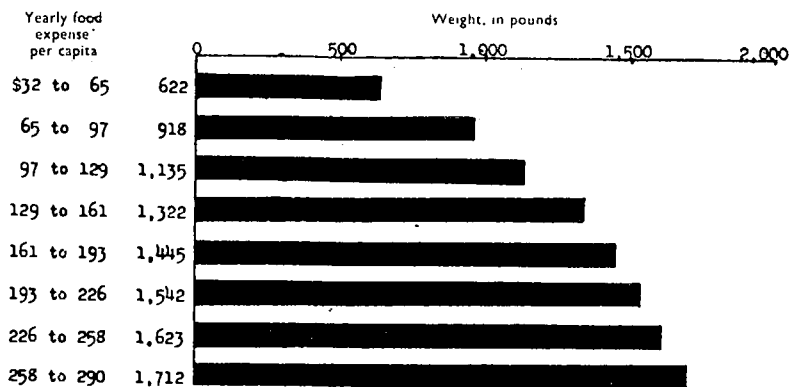
are purchased when there is less than \$60 per person per year for food. But years ago, as well as recently, the trend was the same—more vegetables and fruits when there is more money for food.

CHART 3. WEIGHT OF FOOD CONSUMED

(a) upper part of chart, 1914-33, estimated *per capita* per year non-farm families.¹

(b) lower part of chart, March-May 1935, weekly *per capita* consumption by families of employed wage-earners and salaried workers, multiplied by 52.

¹ Food expenses 1914-33 adjusted to March-May 1935 price level.



The second chart (Chart 2) tells something of the variations in the consumption of lean meats and fish. The crosses, representing consumption in the decade 1894-1904, show a higher than current level of meat consumption at each level of food expenditure, and a *rate* of increase in meat consumption with increasing expenditures for food more accelerated in the earlier decades than during the last.

Both charts show that there is considerable variation in consumption at any one level of expenditure, but the trends are definite and unmistakable.

The abundance and variety of the American food supply is reflected

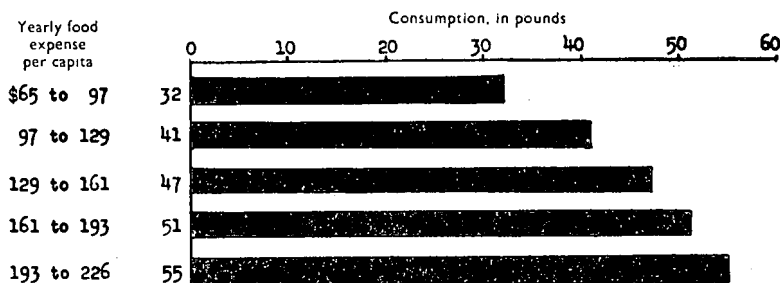
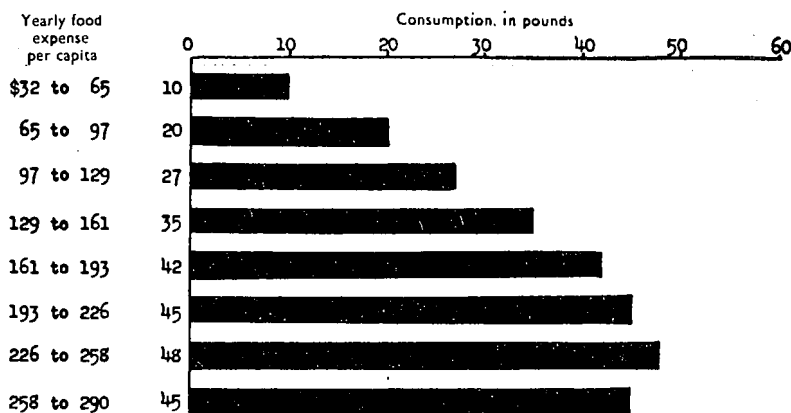
in diets at all levels of expenditure for food. The seven charts (Charts 3-9) indicate at different levels of expenditure for food about how much is consumed of each of several important types

CHART 4. CONSUMPTION OF EGGS

(a) upper part, 1914-33, estimated yearly *per capita* consumption, non-farm families.¹

(b) lower part, March-May, 1933, weekly *per capita* consumption by families of employed-wage-earners and salaried workers, multiplied by 52.

¹ Food expenses 1914-33 adjusted to March-May 1935 price level.



of food as shown by family dietary studies. The figures are from studies among urban and village families between 1914 and 1933, and from preliminary data based on spring records from a current study of diets of employed wage-earners. In the latter case the average weekly figures have been multiplied by 52 in order to make them of an order of magnitude to compare with the 1914-33 data. In so far as there are seasonal variations in consumption, as in the case of vegetables and fruits or eggs, this point should be kept in mind.

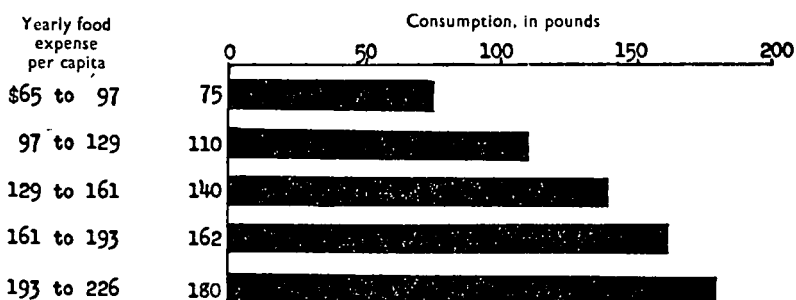
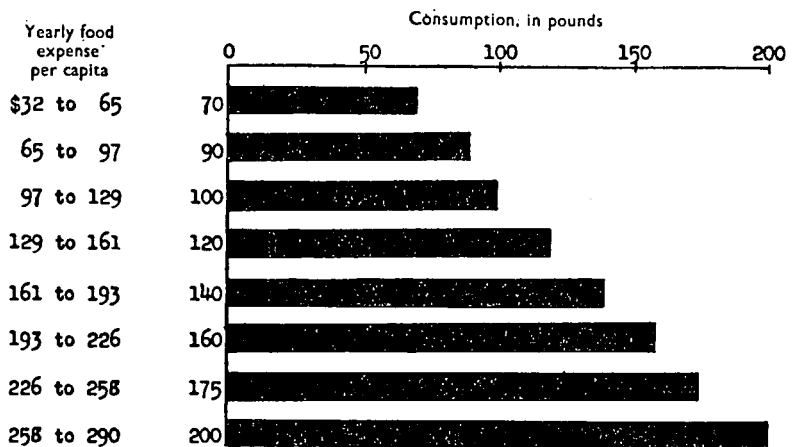
In all cases the averages refer to quantities available to the household for consumption rather than the quantities actually eaten.

Probably from one study to another the differences in averages for any food group would be less if the data referred to actual consumption rather than to available supplies. Families at the higher eco-

CHART 5. CONSUMPTION OF LEAN MEATS, POULTRY AND FISH

- (a) upper part, 1914-33, estimated yearly *per capita* consumption, non-farm families.¹
 (b) lower part, March-May 1935, weekly *per capita* consumption by families of employed wage-earners and salaried workers, multiplied by 52.

¹ Food expenses 1914-33 adjusted to March-May 1935 price level.



nomic levels tend to waste much more food than those at lower, but differences are great from family to family at every level.

With increasing expenditure for food there is a marked increase in the total amount of food purchased. These increases are not evenly distributed from one group of commodities to another. They are especially noticeable in eggs, meats, milk, butter, and the succulent vegetables and fruits, and much less pronounced with respect to grain products, potatoes, dried legumes, and fats (other than butter).

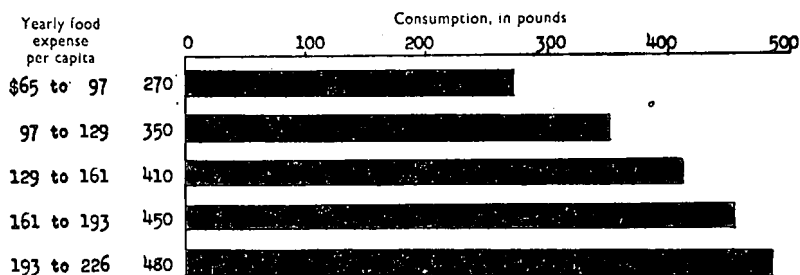
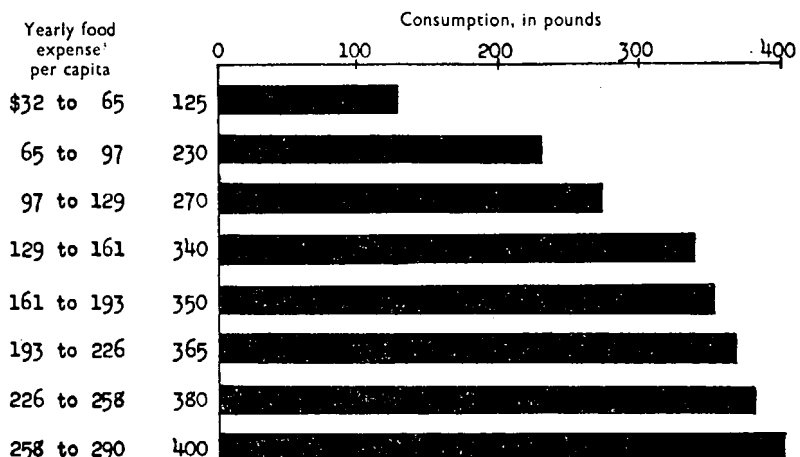
The percentage of the grain products purchased in ready-to-eat form increases as there is more money for food. Also with increasing food expenditures, a higher percentage of the fats are in the form

CHART 6. CONSUMPTION OF MILK

(a) upper part, 1914-33, estimated yearly *per capita* consumption, non-farm families.¹

(b) lower part, March-May 1935, weekly *per capita* consumption by families of employed wage-earners and salaried workers, multiplied by 52.

¹ Food expenses 1914-33 adjusted to March-May 1935 price level.



of butter, and a higher percentage of the milk is in fresh fluid form rather than in canned form. The share of the succulent vegetables and fruits that have special nutritive values, as tomatoes, citrus fruits, leafy, green and yellow-coloured vegetables, varies from region to region and from season to season.

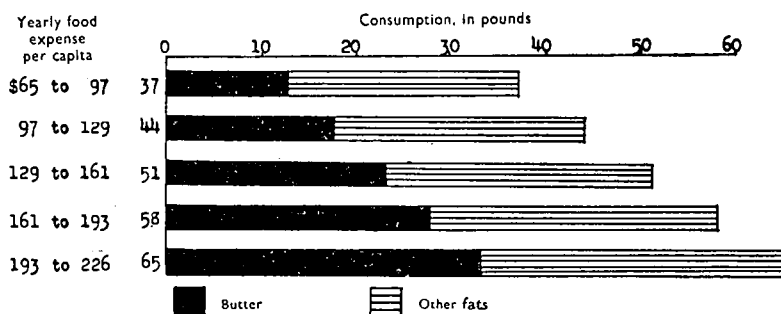
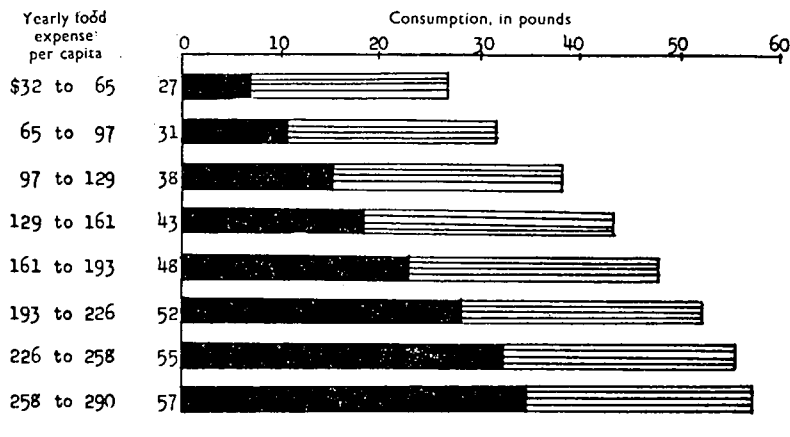
According to present knowledge, food must supply some thirty or more different nutrients, in order to provide the needed proteins of high quality, the essential minerals and vitamins, as well as the necessary energy-yielding food. Fortunately, many of these substances are so widely distributed in common foods that there is little

danger of shortage in freely chosen diets. But some are very unevenly distributed and unless care is taken in food selection will be meagrely supplied.

CHART 7. CONSUMPTION OF BUTTER AND OTHER FATS

- (a) upper part, 1914-33, estimated yearly *per capita* consumption, non-farm families.¹
 (b) lower part, March-May 1935, weekly *per capita* consumption by families of employed wage-earners and salaried workers, multiplied by 52.

¹ Food expenses 1914-33 adjusted to March-May 1935 price level



In so far as the necessary data are available, dietary analyses include estimates of the quantities of nutrients present in food which are significant in appraising quality in diet. In the studies here presented, the energy value of the diets and their content of protein, calcium, phosphorus, iron, and vitamins A, B, C, and G (flavin) have been computed. The figures on food composition used in the calculations have been compiled from several published sources and from unpublished data.

In the main, the available data on food composition refer to the

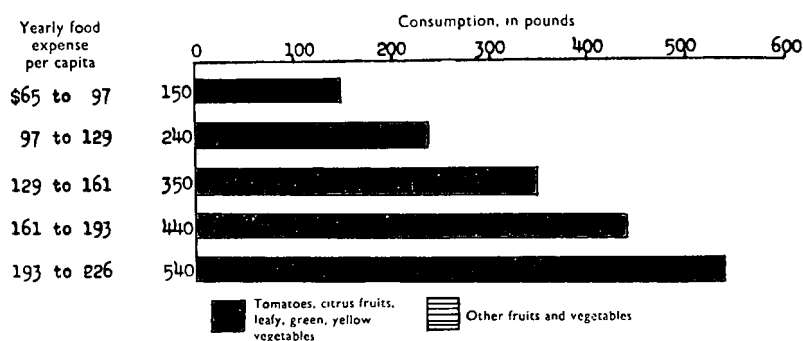
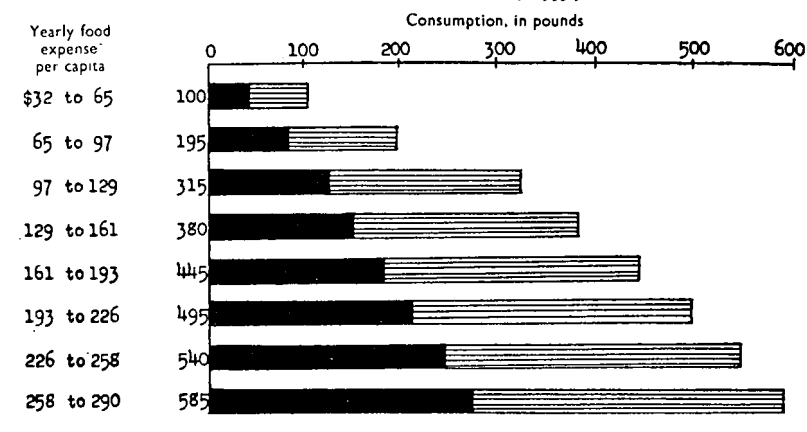
raw, untreated food materials. The nutritive content of foods, especially so far as the fat, mineral, and vitamin values are concerned, may be altered greatly by the treatment to which food is

CHART 8. CONSUMPTION OF FRUITS AND VEGETABLES (exclusive of potatoes and dried legumes)

(a) upper part, 1914-33, estimated yearly *per capita* consumption, non-farm families.¹

(b) lower part, March-May 1935, weekly *per capita* consumption by families of employed wage-earners and salaried workers, multiplied by 52.

¹ Food expenses 1914-33 adjusted to March-May 1935 price level.



subjected in preparation and service. This point should be kept in mind in interpreting the results of this study.

In general, the nutritive value of family diets increases as more money is spent for food. In large measure this is due to more plentiful food supply purchased. However, the more expensive diets are also somewhat richer in protein, minerals, and vitamins. The quality of the diets of the higher income groups depends on what is eaten and what is wasted, or the choice that is made in the abundance.

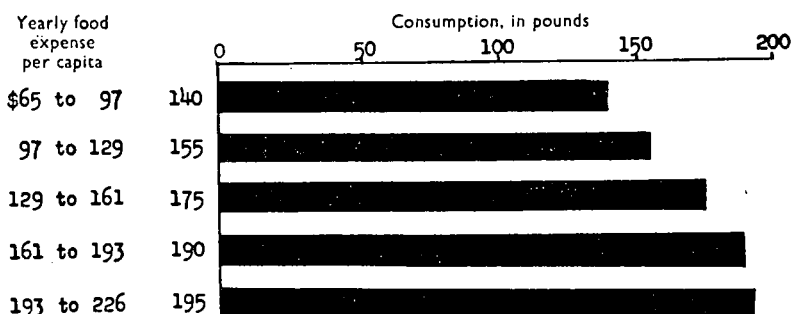
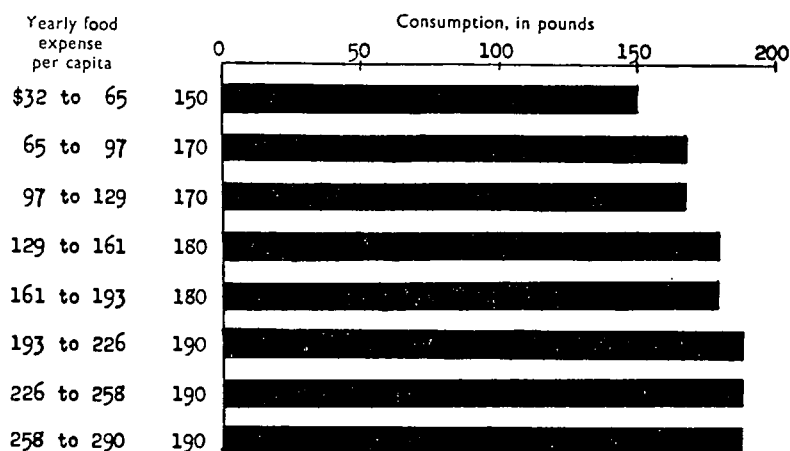
Calorie for calorie, the food supply of families spending the largest amounts for food are only slightly higher in proteins, minerals, and vitamins than diets of low-income groups. If, however, the milk,

CHART 9. CONSUMPTION OF GRAIN PRODUCTS

(a) upper part, 1914-33, estimated yearly *per capita* consumption, non-farm families.¹

(b) lower part, March-May 1935 weekly *per capita* consumption by families of employed wage-earners and salaried workers, multiplied by 52.

¹ Food expenses 1914-33 adjusted to March-May 1935 price level.



vegetables, and fruits purchased are almost completely consumed, whereas considerable waste occurs in the fats, sugars, and grain products, the food actually eaten by the higher income groups may be considerably richer in minerals and vitamins than the diets of low-income groups.

Charts 10, 11, and 12 (pp. 455-7) present average figures on the chemical composition of diets consumed in spring and summer months. With increasing expenditures for food the protein content

and the potential energy value of the diets increase at about the same rate; hence the percentage of calories derived from protein is fairly constant. From 40 to 60 per cent. of the protein comes from animal sources.

The amount of fat increases more rapidly than the amount of carbohydrate. At the lower levels of expenditure it appears that protein foods are given preference over fatty foods, so far as can be judged by the rate of increase in consumption with increased expenditures for food.

Of the three mineral elements considered, calcium is the one in which low-cost diets are likely to be most deficient. It is in this element that the rate of increase in the content of the diet is most accelerated as the expenditures for food increase. But not until a level of food expenditure of \$97 to \$129 *per capita* per year (March-May 1935 retail food price level) is reached, is the average calcium content of the diet above probable minimum requirements for good health. The diets of most families spending less than \$65 per person per year are deficient with respect to all three minerals. The diets of many families spending less than \$100 *per capita* per year are inadequate with respect to one or more of these mineral elements.

Of the four vitamins considered, vitamin A is probably most abundantly supplied with reference to need and vitamin B the least. With increasing expenditure for food the rate of increase in the vitamin B content of the diets is the least accelerated of the four.

As yet much more is known about the kind of nutrients that should be included in the diet than about the exact amount required of each essential substance. This is particularly true since it is recognized that there are different planes of nutrition within the range commonly considered 'normal'. Diets that are good enough to keep families in average health may not be good enough to promote the best health, or to enable individuals to attain the best physical development of which they are capable. Much research will be needed before all of the nutritional requirements of human beings can be defined with a high degree of precision. It is instructive, however, to compare and appraise everyday diets with reference to some of the more significant factors for which some information is available regarding human requirements. As a working basis for this comparison suggested dietary allowances are shown in Table I.

The suggested energy allowances are set fairly close to probable average requirement because the consumption of a surplus of energy-yielding food results in the storage of fat, and an excess of body fat is burdensome. Of other dietary factors, a margin of safety over

CHART 10. PROXIMATE COMPOSITION AND ENERGY VALUE of diets of families of employed wage-earners and low-salaried workers. May-August 1935.
(30 industrial cities, 12 States, U.S.A.)

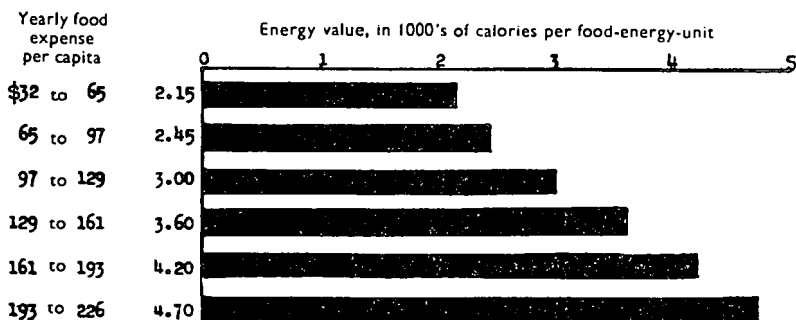
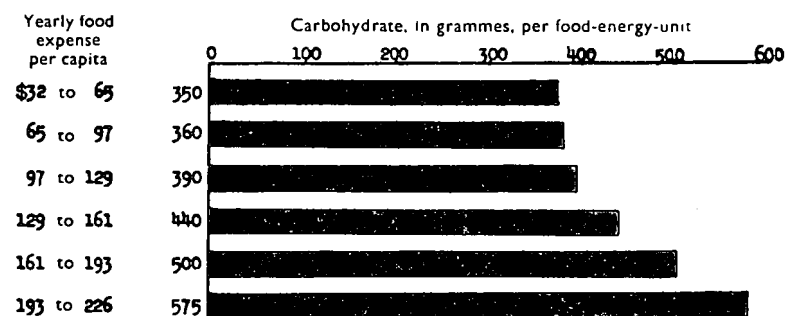
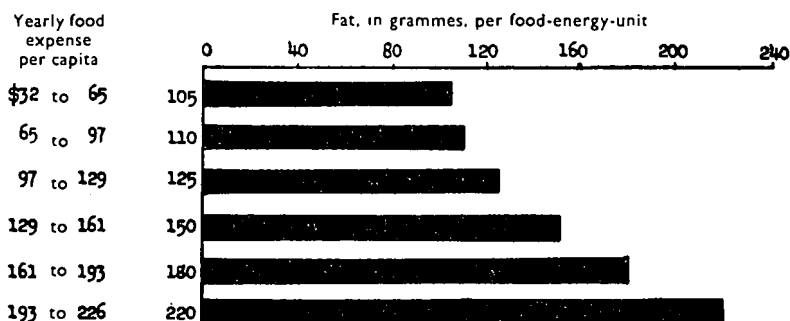
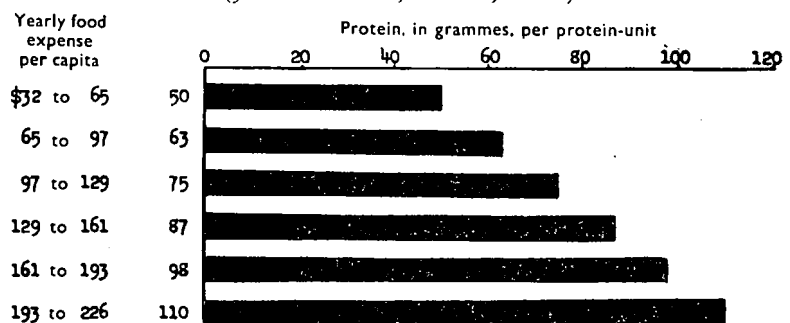


CHART II. MINERAL CONTENT of diets of families of employed wage-earners and low-salaried workers. May-August 1935.
(30 industrial cities, 12 States, U.S.A.)

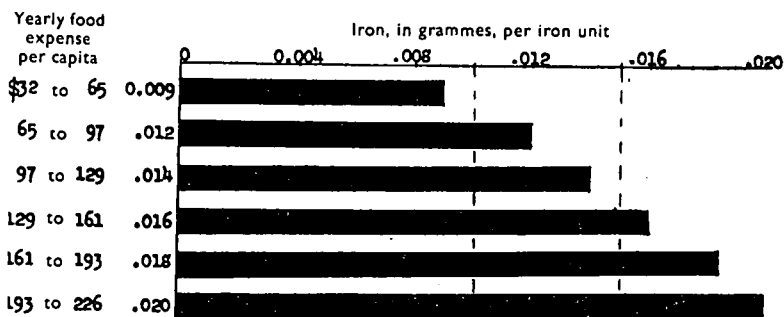
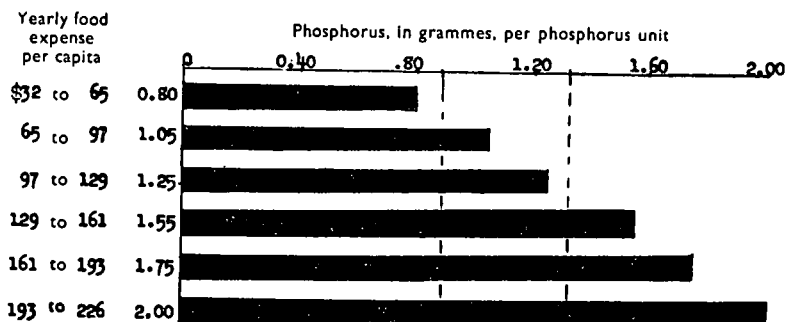
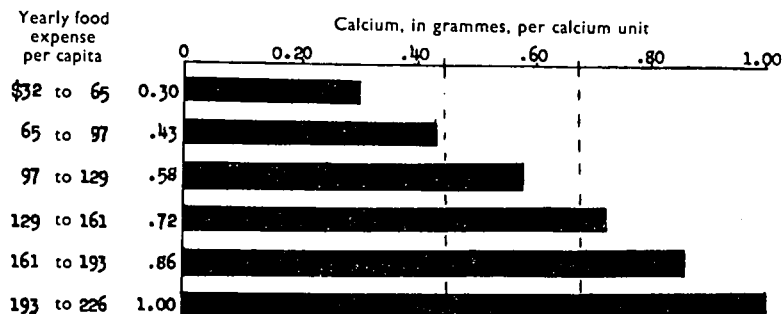
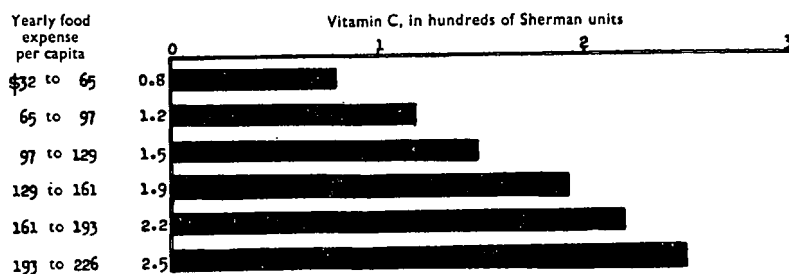
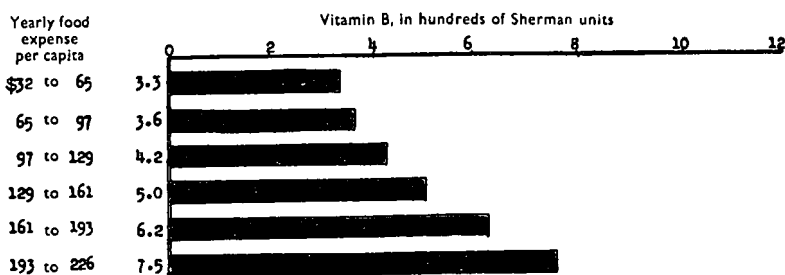
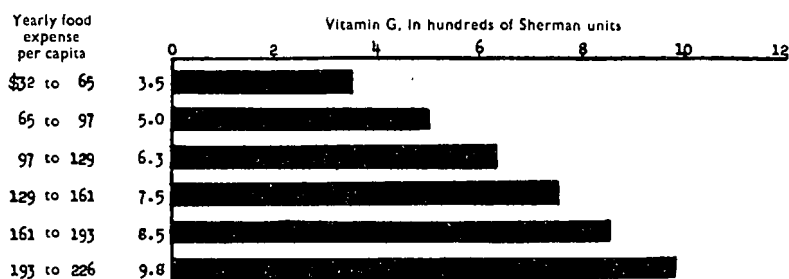
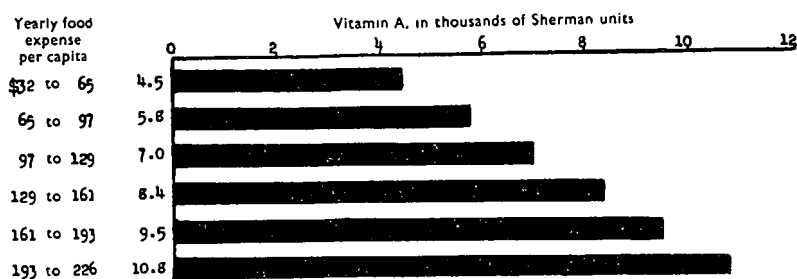


CHART 12. VITAMIN CONTENT of diets of families of employed wage-earners and low-salaried workers. May-August 1935.
per nutrition-unit per day.

(30 industrial cities, 12 States, U.S.A.)



probable average minimum requirement is indicated. How wide this margin should be for different nutrients is not yet known. But in determining the margin of safety which the diet might well carry, possible losses due to improper methods of preparation and to incomplete utilization by the body should be considered, as well as the variations in human requirement and in food composition.

For protein, calcium, phosphorus, and iron, the figures allow a margin of approximately 50 per cent. over average minimum requirements for maintenance. Present consumption habits give an even greater prominence than this to protein, and there is evidence that the consumption of twice as much calcium as is obviously needed for maintenance contributes to general well-being. A range is suggested for iron. The lower quantities probably are fully adequate if the iron in the food as eaten is present in available form.

A margin of 50 per cent. or more over minimum requirements is indicated for each of the several vitamins. In the case of vitamin C, the higher values are suggested for use in evaluating diets when the computations of nutritive value are based, in the main, on factors representing the composition of untreated raw products. The vitamin C content of foods in their fresh, natural state may be greatly lowered during storage and cooking. In the case of the other vitamins, the smaller quantities probably are sufficient to maintain an average state of health, while the larger quantities represent conservative estimates of what might be called good investments in better-than-average nutrition. These more generous allowances are entirely feasible for large groups of the population. They represent levels that can be afforded by many families if careful selection is made among available food supplies. It is possible that future research may show that for some constituents the margin of safety included in the figures of Table I are unnecessarily generous; on the other hand, still wider margins for others may later be found desirable.

While many people subsist on diets that fail to meet these nutritional levels, without suffering from hunger or a degree of ill health recognized as 'disease', it is desirable to set dietary standards high enough to maintain the fullest degree of health which a completely adequate diet would make possible.

Figures showing variations within the averages presented graphically for spring and summer months are not yet available. In a detailed study of winter diets of wage-earning families living in North Atlantic cities, it was found that all of the families spending at a level of \$193 to \$226 *per capita* per year obtained food supplies that met or exceeded the 'minimum' nutritional needs of the families.

Over 80 per cent. of those spending \$129 to \$161 *per capita* yearly were equally fortunate. But less than 25 per cent. of those who were spending between \$65 and \$97 *per capita* yearly had diets that met or exceeded 'minimum' requirements in every respect.

Of all nutrients, calcium and vitamin B appeared to be least abundantly furnished with respect to need; and protein, most abundantly.

Chart 13 (pages 460-1) shows for five different geographical regions consumption during the spring months of 1935 of families who were spending the same amount for food. This level of expenditure for food is well above the median for employed wage-earners. It represents families in the third quartile when they are arranged by level of expenditure for food. It is probable that more marked differences may appear when families who spend comparatively little for food are compared.

During the spring months, for families spending at a level of \$129 to \$161 *per capita* yearly for food, the differences in consumption of milk from region to region are less striking than one might expect to find. The east south-central region which is usually considered to fall short in milk consumption gives a report about as high as the average for other regions. Probably this can be explained by the fact that this comparison is made between comparatively well-to-do families in every region. The low consumption of milk, which is considered to be characteristic of the south, probably reflects the high percentage of low-income families living in that area. Their milk consumption is far below the average for the country as a whole.

There appear to be marked differences in the consumption of butter and other fats from one region to another. The consumption of total fats in the east south-central region is conspicuously high, whereas the consumption of butter tends to be low. The total consumption of butter and other fats is higher for the east south-central and Pacific regions than for others. This fact may be significant taken in connexion with the figures on lean meat, poultry, and fish. The two regions in which the consumption of fats is high show a lower than average consumption of lean meat, fish, and poultry. This fact has also been observed in other studies. Apparently either fat or meat is required to give a sense of satisfaction to the American consumer. Where the consumption of fat is very high, the consumption of lean meat often is lower than average.

The part of Chart 13 dealing with grain products suggests that families living in the east north-central region eat somewhat more than average, and families in the mountain region somewhat less than the average quantity of grain products. Whether this will be

CHART 13. REGIONAL DIFFERENCES IN FOOD CONSUMPTION of families of employed wage-earners and low-salaried workers spending \$129 to \$161 yearly *per capita* for food. March-May 1935.
(26 cities in 12 States in U.S.A.)

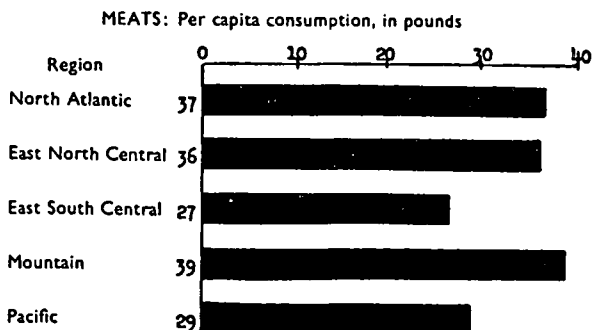
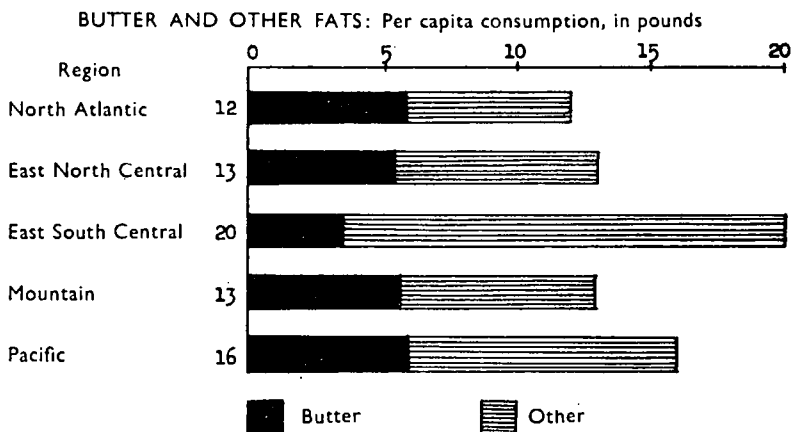
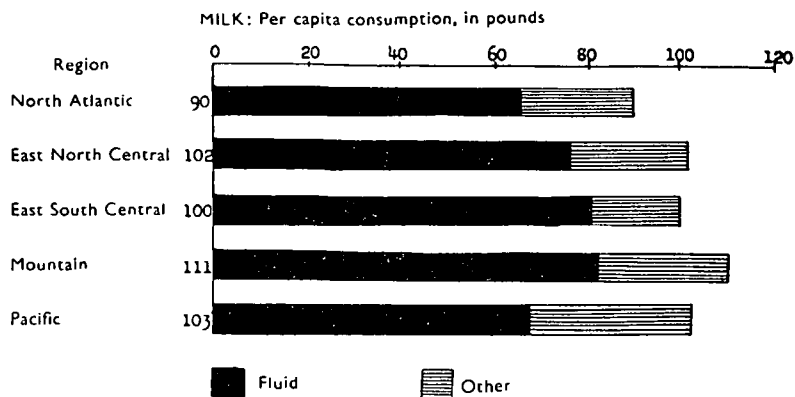
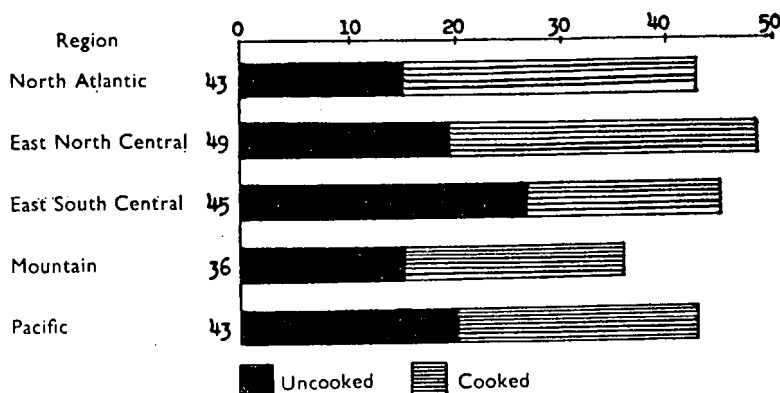
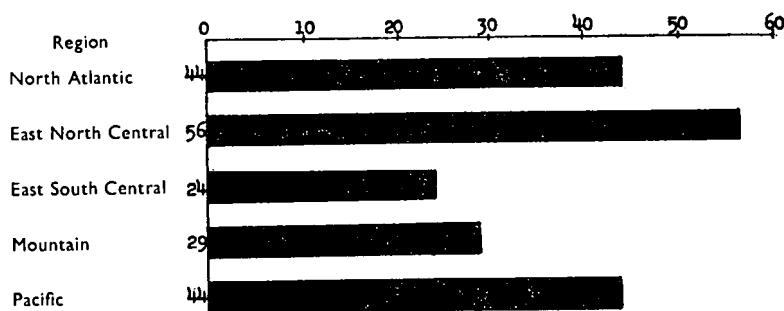


CHART 13. REGIONAL DIFFERENCES IN FOOD CONSUMPTION of families of employed wage-earners and low-salaried workers spending \$129 to \$161 yearly *per capita* for food. March-May 1935.
(26 cities in 12 States in U.S.A.)

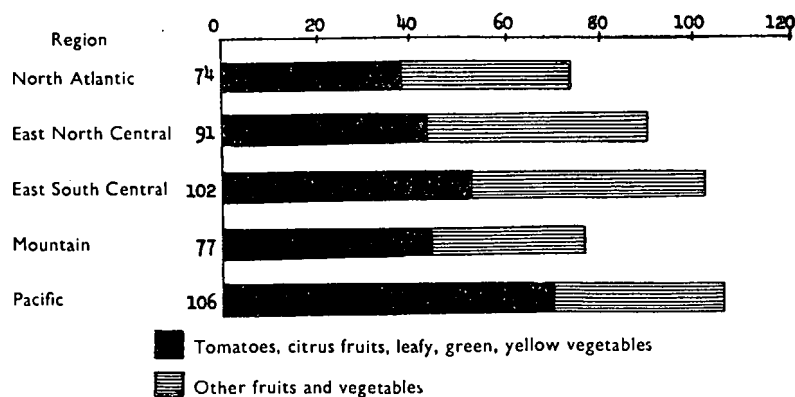
GRAIN PRODUCTS: Per capita consumption, in pounds



POTATOES, SWEET POTATOES: Per capita consumption, in pounds



FRUITS AND VEGETABLES¹: Per capita consumption, in pounds



¹ Exclusive of potatoes and dried legumes.

borne out as data become available referring to other economic levels or other seasons of the year remains to be seen. The percentage of the grain products purchased in uncooked form is conspicuously high in the east south-central region. This probably reflects the amount of wheat flour purchased for hot biscuits and the amount of corn meal and grits consumed.

In the spring months the consumption of vegetables and fruits appears to be lower in the North Atlantic and mountain regions than in the south and in the Pacific regions. This undoubtedly reflects differences in local supplies and prices. Vegetable and fruit production is high in the south and in California during these months; prices are lower than for the country as a whole. A high percentage of the vegetables and fruits consumed in the Pacific region belong to the group noted for special nutritive values, tomatoes, citrus fruits, leafy, green and yellow vegetables.

The consumption of potatoes and sweet potatoes varies greatly from region to region during the spring months. It is high in the north and low in the south. This situation is probably tied up with the fact that sweet potatoes, which form a large share of the total potato consumption (i.e. potatoes and sweet potatoes) in the south, are not in season during March, April, and May; whereas the supply of white potatoes, used chiefly in the north, is still fairly abundant and prices are low.

The last chart (Chart 14) shows the percentage of the urban and village families, studied between 1914 and 1933, whose expenditures for food fell at each of the ten levels indicated, together with a comparable distribution of employed wage-earners and low-salaried clerical workers studied in 1935-6. Only one-sixth of the families in the latter group were in the three lower levels of expenditure for food, whereas one-fourth of the group studied earlier were.

Families spending at these three lower levels are very likely to have diets deficient in one or more nutritive factors. Almost 30 per cent. of the families of both groups fell in the fourth group. The diets of these families tend to be on the borderline of 'minimum' requirements,

About half of the families fell in the six highest groups. These families were spending enough for food to obtain adequate diets, if reasonable care were taken in the selection and preparation of food. It should be remembered, however, that 'minimum' requirements are probably far below optimum.

The quartile of the non-farm population spending the most for food consumes about one-third of the milk, fruits, vegetables

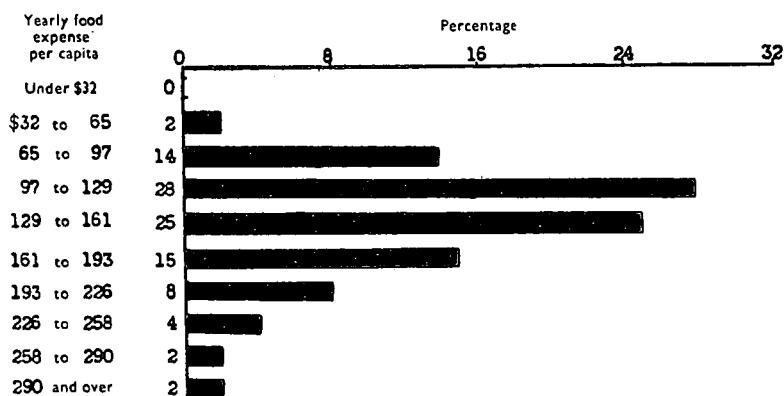
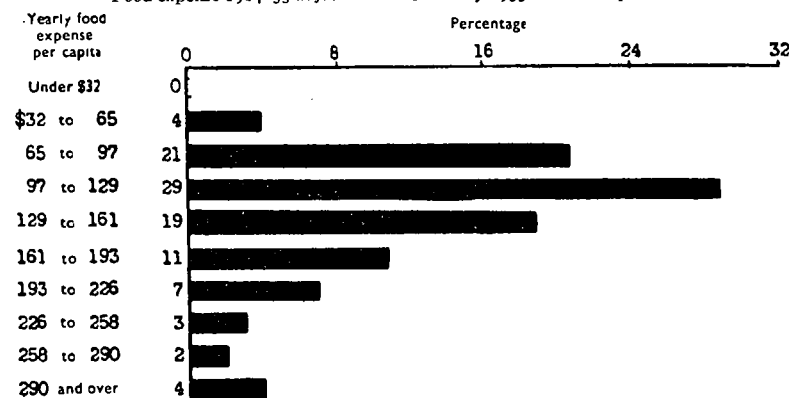
(other than potatoes and dried legumes), meat, fish, and eggs, whereas the quartile spending the least for food consumes about one-sixth of those products. How much the urban demand for

CHART 14. DISTRIBUTION OF FAMILIES BY LEVEL OF EXPENSE FOR FOOD

(a) upper part, 1914-33, non-farm families supplying records (1,020 families in cities and villages of 44 States and the District of Columbia).¹

(b) lower part, 1935-6, families of employed wage-earners and low-salaried workers supplying records (2,746 families in 32 industrial cities in 13 States). Preliminary figures.

¹ Food expense 1914-33 adjusted to March-May 1935 retail food price level.



different products would be increased if the level of expenditure for food were increased, or if the food prices to consumers were reduced, is a question of considerable interest. If the entire non-farm population were really adequately fed without deviating more than necessary from current consumption habits, there would be need for greatly increased supplies of food, particularly of fruits, vegetables, butter, milk, eggs, and possibly meats.

The statements on food habits of urban families in this report are based on all data available at the moment. It is recognized that these are rather fragmentary. The analysis of diets of employed wage-earners is still in progress. When completed, our knowledge of American dietary habits will be greatly extended. Also, a study of consumer purchases, now under way as a Federal Works Project (co-operatively undertaken by the Bureau of Home Economics, Bureau of Labor Statistics, National Resources Committee, and Works Progress Administration) will furnish more authoritative figures, both on differences in the food consumption habits of different socio-economic groups spending the same amounts for food, and on the share of the native white families of different types spending at different levels for food. We look forward to a broader base for evaluating the adequacy of diets of the population of the United States.

GRAF FINCK VON FINKENSTEIN, *Valais, Switzerland.*

Much of the discussion of the consumption of agricultural products has dealt with the influences on agricultural depression, but I should like to point out that it has also a relation to the means of combating cyclical depressions.

An investigation of the development of production in German agriculture over the period of the last 130 years has shown—apart from the presence of cyclical phases, i.e. of alternating periods of expansion and depression in agriculture as a whole and in its various branches—a long-phase basic movement, with a starting-point, a culmination, and a depression. This process is a structural process of development, which is caused by changes in the internal structure of agriculture, whereas cyclical changes are due to external influences.

Around this structural basic trend with a phase of more than a century, the cyclical changes swing as secondary phenomena with a phase of 9 to 12 years and with annual fluctuations. Cycles have therefore a lesser significance in the growth and course of the present depression than is generally assumed.

Further, a comparison between the course of the long-phase trend of market prices and that of the development of production proves that the development of market prices for agricultural products apparently stands in no causal relationship to the dynamics of the development of production. Nevertheless, there are connexions, indeed, very close connexions between prices and production in agriculture, if the investigation is not based on market prices but

on the receipts of the farmer per 100 kg. of his market production. For the ruling factor to the farmer is not the price development in certain categories of the market, but solely the total receipts which he obtains for his annual production. This sales volume is, however, very different in composition, amount, and quality. Composition, amount, and quality are determined by the structure, and thus structural influences take effect in the field of the markets, prices, and cycles.

In the course of the 130 years investigated, agriculture has passed through two severe structural crises. The development from the rigid forms of the three-field system to the intensive and individualistic systems of alternating cropping was in Germany the fundamental alteration of structure in the nineteenth century. Since the beginning of the twentieth century our agriculture has been once again involved in a severe structural crisis. The causes cannot be efficiently combated by the usual methods of cyclical stimulation or support of prices. This structural crisis can only be overcome by structural evolution.

M. K. BENNETT,¹ *Food Research Institute, Stanford University, California.*

Professors Forrester and Cathcart, whose admirable papers we heard this morning, devoted their attention principally to broad problems of consumption of food in general. I propose to consider only wheat. My purpose is to survey historical developments in world utilization of wheat during the past fifteen years, concluding with the prospective trend over the next decade.

'Utilization' of wheat means 'physical disappearance' taken annually by crop years. Wheat physically disappears as grist for the mills, as seed, and as feed for live stock and poultry in the form of grain either whole or chopped, but not milled. The sum of disappearance in these three categories would represent wheat utilization.

Very few countries, unfortunately, publish statistics designed to measure utilization in these categories. Instead, they supply us with statistics of domestic production, of imports and exports, and—sometimes—of stocks carried from one year to the next. With accurate statistics of this sort, one can measure total utilization of wheat indirectly, but not the separate categories of food use, feed use, and seed use. It is, nevertheless, important to distinguish between the several types of use.

For several years I have been trying to arrive at reasonably reliable

¹ The special title of Dr. Bennett's address was 'Trends in World Wheat Consumption'.

estimates of annual food use, feed use, and seed use in each of 40 countries. These 40 countries constitute the 'world' in the terminology here used. Twenty-five countries lie in Europe west of Russia; 2 in North America; 3 in South America; 5 in Africa; 5 in Asia and Australasia. A statistical problem of some magnitude and interest has had to be faced. But the statistical problem does not lend itself to brief discussion. For those who are interested in the methods used, I would refer to the issue of *Wheat Studies*, copies of which I have circulated.¹

The picture of world wheat utilization which emerges is one of rather steep increase from 1921-2 to about 1931-2, followed by a sharp break, and then by approximate stability in the past four crop years. Little, if any, more wheat was used in 1935-6 than in 1928-9, in spite of growth of population over the interval. The level in 1935-6 was roughly 4 per cent. below the peak, but was still about 10 per cent. above the level of 1921-2, a decade and a half earlier.

In two principal respects this post-War course of world wheat utilization was peculiar, judged in relation to pre-War trends extending from 1885 to 1914. First, the increase in the decade following 1921-2 was exceptionally rapid. Second, the flattening, even decline, of the course of world wheat utilization during the five years just past represents a phenomenon without precedent in the three decades preceding the War.

The influences which have caused world wheat utilization during the past fifteen years first to rise with exceptional rapidity, then to stabilize or even decline, are of course numerous and difficult to appraise. Difficulties arise because the world is made up of countries differing widely in living standards, trade status, and food preferences and habits. But in general the factors that seem to govern the course of world wheat utilization may be classified as either accidental, episodic, cyclical, or trend influences.

These are familiar statistical terms, but I use them with rather specialized meanings. By accidental influences I mean such events as a yield per acre of wheat exceptionally low in an area too poor to bring in imports to supplement the short domestic crop, or a yield per acre of some other cereal so small as to lead to exceptionally small price differentials between it and wheat. By episodic influences I mean specifically the rebuilding of agriculture especially in eastern Europe from the chaos existing after the War. By cyclical influences I mean the shorter-term rise and fall of national real income that coincides broadly with swings of general price levels, trade, indus-

¹ *Wheat Studies*, vol. xii, no. 10, June 1936, Stanford University, California.

trial production, and employment. By trend influences I mean persistent slow-moving forces—population growth, gradual long-term rise in national standards of living, and slow spread of knowledge.

This list of influences does not explicitly include change in price relationships between wheat and other foodstuffs. Implicitly, however, such changes are included, especially under the head of accidental influences. I doubt if changes in price relationships are of dominant importance in explaining the long and moderately long-term drifts in world wheat utilization. These longer drifts, especially when expressed in terms of *per capita* food use of wheat, seem to respond fundamentally to change in standards of living, conceived as the flow of goods and services into consumption. This seems to dominate the long-term changes in *per capita* wheat utilization; but accidental and episodic influences may be significant over shorter periods. Established food preferences, perhaps traceable to biological or climatic circumstances, place limits upon the effects which can be exerted by change in standard of living.

To illustrate: There is, I believe, a 'normal course' of *per capita* food use of wheat over a long period of time. If a nation enjoys a persistently rising standard of living, starting from moderate poverty, and if in that nation wheat is the strongly preferred cereal food, then with passage of time wheat will practically displace all other cereals in the diet, and *per capita* food use of wheat will, for a period, persistently rise. But at length a 'saturation point' is reached. This usually appears, I believe, when the level of *per capita* food use of wheat lies between $5\frac{1}{2}$ and 8 bushels. Thereafter, with continuing rise of living standards, *per capita* use of wheat tends for a time to fall. The mechanism is that *per capita* intake of all foods measured in calories falls with urbanization and less arduous work; the total cereal intake, which now represents intake of wheat, falls more than the total intake of food calories; and *per capita* intake of non-cereal foods rises, especially the intake of the so-called protective foods. Ultimately the *per capita* food use of wheat in such a country might fall as low as 2 bushels annually, a level that has probably been reached in some high-income groups.

Such a 'normal course' of *per capita* food use of wheat, involving gradual rise to a maximum level of about 8 bushels, followed by gradual decline to perhaps as little as 2 bushels and stabilization there, could not be expected to appear everywhere. It would not be the course in areas where wheat was not the strongly preferred cereal food. I suggest that rye perhaps stands roughly as high as wheat in

the esteem of some populations of central and eastern Europe; and that rice stands higher than wheat in the esteem of some populations of Asia. If so, the saturation point of *per capita* food use of wheat would be reached at a much lower level amongst such populations than in areas where wheat was the strongly preferred cereal.

This line of reasoning helps to explain why the levels of *per capita* food use of wheat to-day vary so widely from country to country—at the extremes, from less than half a bushel in Chosen to over 7 bushels in France. It helps also to explain why, as between countries where general standards of living are more or less the same, the *per capita* food use of wheat may differ considerably in amount; here the degree of preference for wheat may be important. It aids in the explanation of trends in wheat utilization. Needless to say, a good many puzzles remain unsolved. Too little seems to be known about present differences in national standards of living and historical changes in them, and about degrees of preference for wheat among the cereal foods.

Leaning on these somewhat nebulous theories, I interpret the course of world wheat utilization since 1921-2 as follows. Accidental influences largely determined the timing of the peak about 1931-2; this came because feed use of wheat was greatly enlarged through exceptionally short yields of maize in the United States. Barring this accident, and other things equal, the peak of world wheat utilization would probably have come in 1928-9. The sharp progressive increase of world wheat utilization up to 1928-9 rested in very large part upon episodic recovery of agriculture in central and eastern Europe. But it also reflected progressive enlargement of feed use of wheat in Britain, the Netherlands, Belgium, and Scandinavia, and upon rise in standards of living in a long list of countries. This enlargement of feed use of wheat seems to have concealed tendencies for *per capita* food use of wheat to decline in several countries where relatively high standards of living prevailed. Such countries had entered the phase of the normal course of *per capita* food use of wheat in which decline is characteristic.

The subsequent course of world wheat utilization presents greater difficulties of interpretation. After 1928-9, if we disregard the accidental effects which gave rise to a bulge in 1930-1 and 1931-2, there was no increase whatever. This flattening occurred in spite of influences which tended to maintain the level, notably population growth and substantial diversion of wheat to feed uses in north-western Europe and North America. Thus total world food use of wheat tended to decline rather persistently after 1928-9. The decline

of *per capita* world food use of wheat was, of course, even larger in percentage terms. This fall in *per capita* food use of wheat has perhaps tended to be explained, by those who were aware of it, mainly as an effect of economic depression and of government policies.

I suggest that it is easy to attach undue weight to the adverse influences both of depression and of government policies. Evidence and reasoning suggest that such influences were relatively unimportant in a rather long list of countries, including the British Isles, Australia, Canada, New Zealand, the United States, France, Belgium, Switzerland, the Netherlands, Denmark, Sweden, Norway, Spain, Portugal, Japan, and India. Of another group of countries I cannot form an opinion. These are Greece, Chile, Uruguay, Chosen, and South Africa. Adverse effects of depression and government policy on *per capita* wheat consumption, however, seem clearly in evidence in central and eastern Europe, including Germany; in Italy; and in Egypt, Tunis, Algeria, and Morocco. Even in some of these, decline of *per capita* wheat consumption, or slackening in its rate of increase, seems explicable by reference to the possibility that the saturation point was reached during the past seven years. In still others of this group, the fall in *per capita* wheat consumption was partly an accidental effect following low wheat yields in countries unable to import. In any event, there was no reason to expect as rapid a rise of *per capita* wheat consumption after 1928-9 as had occurred before in eastern Europe, because episodic recovery had spent its force. Thus the adverse effects of government policies and depression upon *per capita* wheat consumption seem to me easily susceptible of exaggeration. I am not now speaking of their much larger adverse effect upon world distribution of wheat acreage, or wheat prices, or on international trade in wheat.

There is no purpose in exploring the prospective trend of world wheat utilization over the next decade except under stated assumptions. But what assumptions shall be made concerning prospects for war, currency stabilization, trade barriers, price movements, and the trade cycle? Developments in these fields will surely affect the course of world wheat utilization much more in some areas than others. What is probable, what improbable, lies beyond my grasp. But for purposes of exposition, I shall take the optimistic view and assume that the next decade will be peaceful and will, on the whole, witness an upward turn of world trade and shrinkage of the huge superstructure of government control.

Such developments would favour increase of *per capita* wheat

consumption in many countries, especially central and eastern Europe, Italy, and northern Africa. But the principal point I wish to make is that total world utilization of wheat cannot be expected to increase spectacularly even in a broadly favourable economic environment. Only a small increase can be expected in seed use and feed use together—say 4 or 5 million bushels per year. These uses now constitute about 20 per cent. of total use. The other 80 per cent.—food use of wheat—is likely to be affected by influences working in opposite directions. Increase of population will tend to enlarge food use, though further slackening in the rate of population growth seems probable. Increase of *per capita* food use of wheat is likely to occur in some countries, under my stated assumptions. But more countries, with larger aggregate population, seem to stand either in the phase of declining *per capita* food use of wheat, or close to the saturation point, which is followed by the declining phase. The history of the past fifty years is, I believe, that one country after another has joined the group wherein decline of *per capita* wheat consumption is characteristic. The process is probably continuing. It is possible that at present countries in this phase outweigh the shrinking list of countries wherein *per capita* wheat consumption continues to increase. In short, the saturation point and the declining phase of *per capita* wheat consumption may be present, or nearer, over a larger fraction of the world population than we have been inclined to suppose.

I shall not attempt to translate these ideas into precise quantitative terms. The next decade, however, cannot witness an increase of world wheat utilization as large as that which occurred in the seven or eight years preceding 1928-9, when the increment of trend was close to 50 millions a year. There will be no episodic recovery to prompt a rise in the next decade, and there will be slower growth of population and wider incidence of normal decline in the *per capita* use of wheat as living standards rise. I doubt if the annual increment of trend in total wheat utilization can equal the increment of the three decades preceding the War, which was 40 million bushels. In my opinion an annual trend increase of 30 million bushels is quite the largest that can reasonably be expected for the next decade, even with a favourable economic environment.

This means that the world is probably geared to produce, on the present acreage with normal yields per acre, more wheat than will be necessary to fill normal requirements, at least in the first few years of the next decade. A new world wheat surplus might appear. My view of the immediate future is thus even a little more gloomy than

that of Mr. Cairns, as I understand him to have expressed it last Wednesday, for his assumptions about general revival of trade and relaxation of government controls were more pessimistic than mine. With respect to the more remote future, we perhaps differ. I should expect the world wheat situation to adjust itself within a decade even to normal decline of world wheat utilization, provided that governments could begin soon to turn away from their manifold controls of economic life. Wheat acreage might then redistribute itself geographically and even contract in total without unbearable repercussions on producers. There is now no quick cure of the sickness in the world wheat situation except the accident of weather. There is, in my opinion, not even a long-term cure if the medicine continues what it has been in type if not in specific ingredients. This medicine undermines the patient's vitality, increases his obesity, and causes a new sore to appear as soon as an old one has disappeared. But the patient might eventually regain his health if he could be left alone in a favourable climate.

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During the second Conference of Agricultural Economists in Ithaca, N.Y., I presented a paper entitled 'The Agricultural Depression in East Europe with Special Reference to Poland',² where I called attention to the fact that Poland, more densely populated than the other agricultural countries of our continent, could easily make use of all the products sold abroad. Yet we are selling them because we cannot afford to consume them.

As to the future development, I expected in 1930 that the pressure of Polish agricultural exports would show an increasing tendency. This would come about, as I was convinced, even at the expense of further lowering of our standard of living. 'Debts'—I said—'will have to be paid off. Tax requirements must be met in some way. Finally, industrial articles will also have to be imported, unless, of course, foreign capital comes in and helps to develop our own industries.'

Was I right in making the above statement? I shall start this small contribution to to-day's discussion of consumption problems with a brief examination of this question.

First of all, it must be recalled that—while rye and potatoes are the principal crops grown in Poland and hogs her main animal pro-

¹ The special title of this address was 'Consumption Problems and Purchasing Power (Social Income) in Poland'.

² *Proceedings of the Second International Conference of Agricultural Economists, 1930.*

duct—small grains, sugar, bacon, butter, eggs, and lumber form the characteristic features of agriculture's share in Polish foreign trade. The latter is comparatively very high, and the export quota of agricultural goods—some smaller items included—reach up to 50-60 per cent. of the external trade. Let us, however, leave lumber aside

TABLE I. *Index Numbers of the Volume of Exports**
Agricultural Products

(Three-year moving averages)

1927-1929 = 100

	1928-30	1929-31	1930-2	1931-3	1932-4	1933-5
Wheat†. . .	1,561	2,769	4,407	4,023	4,792	4,869
Rye . . .	284	432	355	346	501	596
Wheat and Rye . . .	308	475	430	414	581	675
Barley . . .	160	168	140	120	156	195
Sugar . . .	117	107	72	46	34	32
Butter . . .	116	117	74	45	21	36
Eggs . . .	94	90	80	63	47	39

	1927	1928	1929	1930	1931	1932	1933	1934	1935
Pork volume . .	74	121	105	99	94	77	54	41	38
Pork value‡. .	100	123	140	143	120	84	77	67	60

* Calculated from official publications of Główny Urząd Statystyczny, Warszawa.

† Up to 1927 Poland was a net importer of wheat.

‡ Corrected for the purchasing power of money.

and confine ourselves to small grains, sugar, bacon, butter, and eggs. It is upon them that the situation of agriculture in the greater part of the country depends. Especially important here are bacon, butter, and eggs, which can be taken as indicators of the prosperity of the peasant farmer.

Table I represents the growth and decline of the volume of the most characteristic export goods. The respective index numbers were calculated by use of a three-year average, with 1927-9 as their base. Three-year moving averages were used—with a few exceptions—as the method most suitable for making comparisons with production. The latter is, of course, dependent on weather conditions and may change sharply from one year to another so that it can hardly be measured unless the annual fluctuations have first been removed.

These figures are so striking that they hardly need any comment. Special stress should be laid on the increase in the items, rye and wheat. I do not share the very widespread opinion that they were

accomplished mainly by means of bounties. The system of bounties—though obviously very expensive—could not under prevailing conditions have exercised an influence on the volume of exports to such an extent as was thought of and which it was blamed for.

TABLE II. *Total Production of the Principal Crops**

(Three-year moving averages)

In million quintals

	1927-9	1928-30	1929-31	1930-2	1931-3	1932-4	1933-5
Wheat . . .	16.8	18.8	20.9	19.5	19.2	18.6	21.2
Rye . . .	63.3	66.9	65.5	62.5	62.9	65.4	67.1
Barley . . .	14.9	15.5	15.3	14.4	14.4	14.3	14.5
Oats . . .	25.2	25.9	25.3	23.5	24.6	25.4	26.1
Potatoes . .	287.2	301.0	312.1	306.2	297.6	305.9	314.3
Sugar-beets .	44.9	48.6	41.5	32.8	23.3	22.6	23.0

* Calculated from official publications of Główny Urząd Statystyczny, Warszawa.

Exports of small grains are undoubtedly those in which the pressure to sell regardless of price could primarily manifest itself during the years of depression.

There was no similar movement in the export of live-stock products, and this, at any rate, is due to the failure of objective pressure in selling at cut prices. As a matter of fact no room was left for our exports of those goods in international trade owing to the restrictions put by importing countries in whose markets we used to sell our live-stock products. The shrinkage in the sugar exported, on the contrary, was accompanied by the immensely declining production, which at the time of prosperity was boosted by dumping.

When we look at the production figures we are struck at once by a remarkable increase in crops during the years 1927-30. High yields obtained in these years were a result of the previous adoption of intensive methods of farming, which at the time had risen to a kind of agricultural creed. As a natural consequence of the decline in prices, extensification of agriculture was inevitably to follow.

The years of depression also caused some shifts among crops cultivated. Sugar-beets and barley were reduced. Rye and potatoes, on the contrary, which are predominant crops and form the backbone of a self-contained peasant farming, considerably increased in area. The total yields of the six principal crops show the result of the shifts in area and changes in output per acre (Table II).

It would be incomparably more difficult to give a similar estimate of animal production. For butter and eggs rough guesses only are

available. For meat and particularly for pork one may rely on more or less correct figures of slaughterings (Table III).

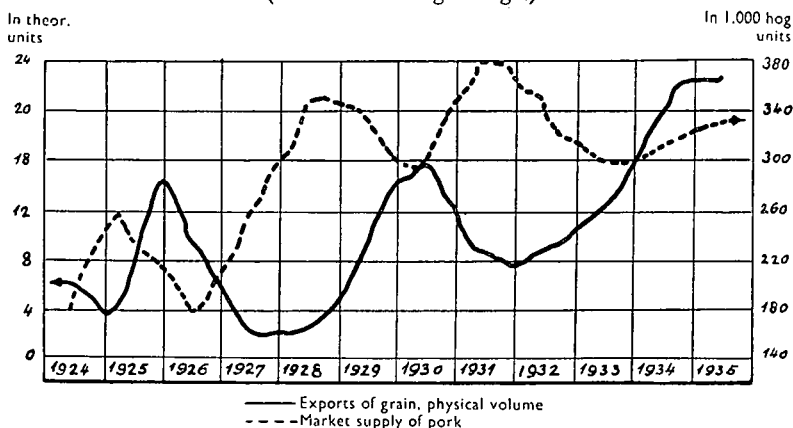
While the production of beef remained almost stationary there was a steady growth of pork supply interrupted only by regular

TABLE III. *Production of Meat*

(According to slaughterings in thousand tons*)

	1927	1928	1929	1930	1931	1932	1933	1934	1935
Beef .	167.9	..	183.0	174.2	180.9	205.9	194.4	158.6	165.8
Pork .	398.17	459.13	418.96	410.66	485.06	431.49	391.51	439.11	462.74

* Exports of live hogs included.

CHART I. SUPPLY OF PORK AND EXPORTS OF GRAIN, POLAND, 1924-35
(12 months moving averages)

cyclical fluctuations (Chart 1). This trend also finds its reflection in the yearly censuses of animals (Table IV). They clearly show that the growth of hog population was accounted for by the slow but constant rate at which the purchasing power of hogs in Poland, judged by the index of agricultural products, was advancing in favour of hogs.

The domestic market, upon which the agricultural production of Poland depends, is rather narrow. The present structure of the population is not of a kind to create a strong market, three-quarters of the occupied persons being engaged in farming.

The migration from the towns, which started after the War, was checked by the last depression. The stronger rate at which city population rose for some time has been reversed in favour of rural population which has begun to advance again. Rates of natural

increase, indices of real growth of city and rural population, and total population figures are given in Table V, for the years 1927 to 1935 respectively.

TABLE IV. *Live-stock Censuses**

(In numbers, 000 omitted)

	Cattle	Hogs
1927	8,601	6,333
1928 . . . .	..	..
1929	9,057	4,829
1930	9,399	6,047
1931	9,786	7,321
1932	9,461	5,844
1933	8,985	5,753
1934	9,253	7,089
1935	9,760	6,723

* Calculated from official publications of Główny Urząd Statystyczny, Warszawa.

TABLE V. *Population*

	Rate of natural increase per 1,000 inhabitants	Indices of real growth 1929 = 100			Total population in millions
		Poland	Cities*	Country*	
1927 . . .	14.3	97.4	98.0	97.2	30.3
1928 . . .	15.9	98.7	98.9	98.6	30.7
1929 . . .	15.3	100.0	100.0	100.0	31.1
1930 . . .	17.0	101.3	100.9	101.4	31.5
1931 . . .	14.7	102.6	102.0	102.8	31.9
1932 . . .	13.8	104.2	103.0	104.6	32.4
1933 . . .	12.3	105.5	104.0	106.0	32.8
1934 . . .	12.1	106.7	105.0	107.4	33.2
1935 . . .	12.1	108.3	106.1	108.8	33.6

* Estimates.

Making allowance for the growth of population we can calculate quotas of production per head. These indicate that all agricultural products increased in the years 1927 to 1930 ahead of population growth, but gains remained constant in pork only. Crops lost their gains very soon. For sugar, with the greatest drop, barley and oats, the loss was never regained; potatoes are coming back to high figures; and rye and wheat are now keeping almost in step with the growth of population (Table VI).

Production figured out per head cannot, of course, be taken as the amount available for domestic use. Exports must be subtracted in order to get approximate amounts of what, *ceteris paribus*, might be consumed within the country. Thus we get residuals of production per head.

Differences in residuals are, taken in absolute figures, rather small. In order to examine them I have constructed a special index in which the proportion of exports to residuals in the three-year average

TABLE VI. *Production of Population per head*

(Three-year moving averages in kg.)

	<i>Wheat</i>	<i>Rye</i>	<i>Barley</i>	<i>Oats</i>	<i>Potatoes</i>
1927-9 . . .	55	206	48	81	926
1928-30 . . .	60	214	50	83	957
1929-31 . . .	67	209	49	79	979
1930-2 . . .	61	197	45	72	952
1931-3 . . .	60	195	45	74	914
1932-4 . . .	57	201	44	77	925
1933-5 . . .	64	203	44	78	939

	<i>Beef</i>	<i>Pork</i>
1927 . . .	5'5	13'1
1928 . . .	..	15'0
1929 . . .	5'9	13'5
1930 . . .	5'5	13'0
1931 . . .	5'7	15'2
1932 . . .	6'4	13'3
1933 . . .	5'9	11'9
1934 . . .	4'8	13'2
1935 . . .	4'9	13'8

1927-9 is taken as a basis. On this base, index numbers of the following averages (three-year moving averages) are calculated (Table VII).

An investigation of the residual indices conceived in such a way reveals an interesting picture. It shows that the proportion of exports to residuals increases strikingly for some products. This is particularly true of wheat in spite of the very low production per head. Even a slightly increased production *per capita* was over-compensated by exports rising at a still higher rate. Resulting from this we get steadily decreasing residuals of wheat available for domestic use.

The decline of wheat residuals is very significant and, I think, manifests itself in the indices of residuals. It may be taken as an indicator of the influence which the great depression exercised upon our standard of living. Further on, on more exact figures, we shall see the development of wheat-bread consumption in the cities. Taking this into account makes me convinced that the trend in wheat residuals should be primarily attributed to the catastrophic impoverishment of the peasant farmer. Furthermore, the consumption of wheat by the rural population grows almost to a prohibitive resistance and, as such, should account for increasing exports.

A similar but a far less marked movement in residuals can be traced as far as rye is concerned, while the indices of barley residuals seem to change least.

Residuals of oats—which are not exported—are equal to the

TABLE VII. *Residuals of Production*

(Three-year moving averages)

1927-9 = 100

	1927-9	1928-30	1929-31	1930-2	1931-3	1932-4	1933-5
Wheat							
R. per head in q.*	0.55	0.60	0.65	0.60	0.58	0.55	0.62
Indices†	100	1,410	2,292	4,041	3,750	4,701	4,250
Rye							
R. per head in q.	2.04	2.09	1.98	1.88	1.87	1.89	1.90
Indices	100	276	441	382	373	538	635
Wheat and Rye							
R. per head in q.	2.59	2.69	2.63	2.48	2.45	2.44	2.52
Indices	100	292	460	442	432	607	689
Barley							
R. per head in q.	0.45	0.44	0.42	0.40	0.40	0.38	0.37
Indices	100	165	180	161	138	188	238
Sugar							
R. per head in q.	0.12	0.12	0.13	0.13	0.08	0.08	0.07
Indices	100	117	100	65	7	5	5

	1927	1928	1929	1930	1931	1932	1933	1934	1935
Pork									
R. per head in kg.	10.9	11.3	10.3	10.1	12.5	11.1	10.4	12.9	12.7
Indices	73	116	110	106	81	75	56	37	32

* Residuals per head in quintals.

† Indices of ratio: exports to residuals per head.

production per head, which is steadily decreasing. On the contrary, potatoes, which also are not exported, are, after a sharp drop, rising again in available supply. The self-contained small peasant and his shift from bread to potato consumption is responsible for this rise. Depression times are in wealthy industrial countries characterized by increasing bread consumption. In the same circumstances in Poland, shifts from bread to potatoes constitute the characteristic feature.

There is no other product which could be compared with sugar. Sugar production shrunk per head, which was due to the impossibility of maintaining exports by dumping at any price. But at the same time domestic consumption was handicapped by the very high processing tax still in force. Thus the rapid rate at which, according

to indices, the proportion of exports to residuals is dropping does not help in any way to lift consumption. The latter falls too.

A similar but comparatively moderate decline in exports of pork was accompanied by somewhat rising residuals available for domestic use. Together with higher production the room for consumption was growing.

Residuals of beef are represented by production figures per head (as above), beef exports being relatively insignificant.

Residuals of production per head are, as it was pointed out, equal to quantities available for domestic use. In the case of small grains and potatoes, however, they do not reflect the net average human consumption. The latter is undergoing wider fluctuations which are under the influence of the demand for feeding animals, hogs particularly.

There is in Poland a growing competition for crops between men and animals, in which the hog cycle plays a special role. Hogs are the main source of cash income for the small peasant; they are his last refuge. Hence, the increasing hog population causes, by the continuous waves of the cycle, important changes in quantities used for feed. They are not confined only to barley and potatoes—the main hog foodstuffs. They affect as well rye, used extensively in substitution for barley, and wheat by causing occasional shifts in human diet.

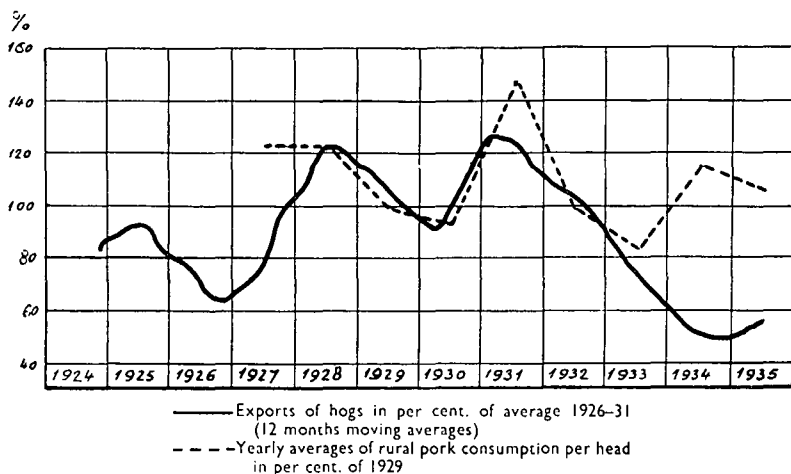
This is the reason why we witness the flow of hog and small grain exports replacing each other and showing clearly the interdependence existing between both, as illustrated by Chart 1.

We find another correlation between the changes in residuals and net consumption, which seems to be very symptomatic. Growing residuals of pork supply have not the same effect upon consumption in the bigger cities as in the remaining part of the country. The latter, being to a high degree influenced by the demand of the rural population, undergoes fluctuations corresponding to the hog cycle. A high supply of hogs together with comparatively low exports means always an increase in the pork ration of the country population. Indices of rural pork consumption were rising distinctly in 1928 and 1931, the years of cyclical up-swings in supply. The rise was greater in 1931, due to increased production, while the volume of exports remained stationary. The next rise, 1934-5, corresponded again to the supply growing and was accompanied by a very low level of exports (Table VIII, and Charts 1 and 2).

The development of consumption in cities represented by the capital city and some bigger towns shows a somewhat different picture. The pork ration is not affected by the growing supply of

hogs; it rather changes along the lines of the increasing purchasing power of the consumer's money and business activity. Hence, in 1931, in a year of very severe depression, increased purchasing power

CHART 2. EXPORTS OF HOGS AND RURAL CONSUMPTION OF PORK

TABLE VIII. *Indices of Pork Consumption (per head)*

1929 = 100

	1927	1928	1929	1930	1931	1932	1933	1934	1935
Consumption as a whole	105	109	100	98	121	108	101	117	123
Capital city and some bigger towns	89	98	100	100	97	115	118	118	141
The remaining country	123	122	100	96	147	100	83	116	106

of złoty brought about steadily increasing consumption. The latter was marked in 1934-5 by improving business. This makes it possible for an increased share of residuals from the last up-swing in supply being sold on the domestic market, thus weakening the influence of lower exports.

What has already been said shows the value and importance of what we call social income and its distribution in the amount and character of the products consumed. So far dependence of consumption on social income has been discussed indirectly. Now in the concluding part of my paper I shall proceed to a direct attack on this problem.

Estimates of aggregate money income and real income for Poland in 1929 and 1933 were made by M. Kalecki and L. Landau.¹ Accord-

¹ L. Landau i M. Kalecki, *Dochód społeczny w roku 1929*, Wydawnictwo Instytutu spraw społecznych, Warszawa 1935, and L. Landau i M. Kalecki, *Szacunek dochodu społecznego na rok 1933 i.t.d.*, Wydawnictwo Instytutu spraw społecznych, Warszawa, 1935, and *Mały Rocznik Statystyczny*, Warszawa, 1936.

ing to them the aggregate money incomes in 1929 and 1933 were 28.3 and 15.5 milliard zloty, respectively, which was equal to 910 zloty (equal to £21) per head in 1929.

Corresponding records for Britain calculated by Bowley and Stamp, and recently revised by Pigou and Clark,¹ show a money income per head in 1929 of £85.5. It hardly need be repeated, I think, that making direct comparisons between British and Polish social incomes on terms of their absolute height is somewhat precarious. Even if the methods used for calculating estimates of social income did not differ from one another, we should be careful in using comparisons for drawing bold conclusions.

But what, I find, may be compared are the trends in development as presented by indices of social income per head, provided that there is no great difference in methods of construction. As far as methods used by British and Polish authorities are concerned attention must be called to the fact that Landau and Kalecki do not subtract costs of public administration. On the other hand, they differ from the British scholars in including a large volume of unpaid services performed by peasants on their own farms. These services are not very important in Britain, but the neglect of them in Poland would leave a huge part of the social income derived from agriculture out of any consideration.

Instead of making original remarks on these figures I confine myself to citing a passing statement by such an authority as G. Cassel. 'Poland', he says, 'deflated her currency most energetically and thus succeeded in maintaining its gold par, but only at the cost of reducing her industrial production to the lowest relative level of any country for which an index of production is published.'²

More telling in the developments of our standard of living are the changes in the aggregate purchasing power for consumption goods. Landau and Kalecki³ compute the latter by subtracting from the aggregate social income items of income used for investments and those of public administration costs. Their records show aggregate consumption power in 1929 and 1933 respectively: 23.5 milliard zloty (or figured out per head 741 zloty, equal to £17.1) and 12.9 milliard zloty. Further investigation shows, however, that distribution of the aggregate income in Poland is out of proportion to the number of population engaged in agriculture and in the remaining industries.

Taking the figures of social income for 1929 as a basis we get,

¹ A. C. Pigou and C. Clark, *The Economic Position of Great Britain*, Mem. No. 60, Royal Economic Society, June 1936.

² G. Cassel, *The Downfall of the Gold-Standard*, Oxford, 1936, p. 115.

³ Op. cit.

for Britain and Poland, index numbers of real income per head (Table IX). Agriculture has a comparatively small share in the aggregate consumption power, and thus indices based like those in Table IX upon total figures may be misleading. Taking account of this, Landau and Kalecki divide the aggregate purchasing power into that of the cities and that of the country population.

TABLE IX. *Index Numbers of Real Income per head in Britain and Poland*

	Britain	Poland
1929 . . .	100	100
1930 . . .	..	95
1931 . . .	..	86
1932 . . .	94	79
1933 . . .	..	76
1934 . . .	104	77
1935 . . .	109	..

Considering the purchasing power of the country population by itself, distinction must be made between the large share of unpaid services and the much smaller one for which money payments are made. The estimate of the first share is rather precarious. Several errors are apt to be implied in its origin. As retail prices of food are used in order to make figures comparable with the corresponding items of city consumption, it may easily be subject to over-estimation.

Let us now look at the figures arrived at. The aggregate rural purchasing power for consumption goods in 1929 amounted to 10.3 milliard zloty—8.2 milliard zloty of unpaid services and only 2.1 milliard zloty of money payments. The corresponding figures computed per head show 456 zloty (equal to £10 10s.); 363 zloty (equal to £8 7s.), and 93 zloty (equal to £2 3s.).

What strikes one about these figures is that the ratio of unpaid services is very high, the share of money payments being less than 20 per cent. Moreover, it seems apparent from the figures that the daily menu of the rural population can hardly contain foods bought outside. The peasant farmer on the average cannot afford to consume oranges, and he rarely even takes beef or sugar. In spite of this his ration may be entirely satisfactory from the physiological point of view. But it consists mostly of potatoes and cereals (rye mainly) which furnish 37 and 49 per cent., whereas milk and lard supply together about 14 per cent. of the calories.

Shifts in the diet from cereals (rye bread) towards potatoes have been observed in recent years, owing to the fact that cereals are a

more marketable product than potatoes, and the latter furnish a unit of calories at much lower prices (Table X).

TABLE X. *Prices paid for 1,000 Calories in Some Foods*
Year 1935

	Price in grosz	Price-indices. 1,000 calories in potatoes = 100
Potatoes . . .	9.2	100
Rye bread . . .	14.2	154
Sugar . . .	29.9	325
Lard . . .	16.4	178
Pork . . .	28.1	305
Milk . . .	36.1	392
Butter . . .	40.0	435
Beef . . .	102.2	1,111

Shifts in the diet are also closely related to the changes which occur in the money-payments share of the rural income. Calculations of the latter per head result in the following indices (Table XI):

TABLE XI. *Index Numbers of Real Income of Rural Population, 1927-35*
(1929 = 100)

1927 . . .	103	1932 . . .	52
1928 . . .	97	1933 . . .	44
1929 . . .	100	1934 . . .	40
1930 . . .	85	1935 . . .	46
1931 . . .	71		

Cutting the interest on the farmers' debts and converting them into long-term credit are in my opinion mostly responsible for the rise that occurred in 1935. Fortunately enough the purchasing power of towns—though subject to jealousy on the part of the country population—has developed along different lines. It was reckoned for the year 1929 at 1,547 zloty, equal to £35 12s., per head (aggregate figure amounting to 13.2 milliard zloty). This makes it possible to maintain in the cities a standard of living which, though far from being abundant, may be considered as quite satisfactory.

The higher standard of living of the city population is reflected in a rough comparison of the average ration of a manual worker employed in industry. The latter shows the respective shares of calories supplied by potatoes and cereals to be equal to 20 and 45 per cent. respectively, whereas milk, beef, pork, and sugar furnish together some 35 per cent., proportions which differ considerably from those of the country population.

Wheat bread, sugar, and meat, which are only occasionally consumed by the peasant, together with milk, may be taken as representative for fluctuations in city consumption. They reveal a picture shown in Table XII.

TABLE XII. *Indices of Consumption (Sugar, Wheat Bread, Milk, and Beef)*

	<i>Sugar*</i> 1928 = 100	<i>Wheat Bread</i> (Cities only) 1928 = 100	<i>Milk</i> (Upper Silesian Industrial District) 1930 = 100	<i>Beef</i> (Capital City only) 1927-9 = 100
1927	92.2	94	..	86
1928	100	100	..	105
1929	103.5	101.2	..	109
1930	99.4	108.5	100	105
1931	92.3	98.5	90	79
1932	86.8	93.9	79	83
1933	83.9	88.0	69	77
1934	88.7	91.6	75	85
1935	..	..	82	178

* L. Landau and M. Kalecki, *Szacunek dochodu*, 1933.

The respective indices prove that the rise in consumption since 1933-4 is related to the real purchasing power of the cities per head. This purchasing power, after a depression, seems slowly to improve again. Its corresponding indices with the year 1929 taken as a basis clearly point out that the drop has been checked (Table XIII):

TABLE XIII. *Index Numbers of Purchasing Power per head of City Population, 1927-35*
(1929 = 100)

1927	.	.	.	90	1932	.	.	.	86
1928	.	.	.	98	1933	.	.	.	84
1929	.	.	.	100	1934	.	.	.	85
1930	.	.	.	99	1935	.	.	.	85
1931	.	.	.	93					

It is to be expected that a further improvement in business will push the figures to a still higher level, and that, with this, the migration from the country to the cities, stopped for some time by the depression, will be taken up again. That will contribute towards the broadening of the domestic market which, in view of the present difficulties which international trade is facing, seems to be for Poland an unavoidable necessity.