AGRICULTURAL EFFICIENCY AND RURAL WELFARE

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It is appropriate, at an international meeting such as this, for us to give thought to the efficiency of agriculture and to the welfare of farm people. The concepts of efficiency and welfare, however, are beset with difficulties when one endeavours to use them to compare the relative efficiency of agriculture, or the welfare of farm peoples of particular countries.

It is my purpose to examine in a preliminary way some of the production and consumption effects of economic organization upon agriculture. In this task I shall consider efficiency and welfare as two important attributes of economic organization. I shall endeavour to use the concept of efficiency to gauge the organization (allocation) of resources for production and that of welfare to rate the organization (distribution) of products and services for consumption.

To begin with, let us take the simple and elementary proposition that each country, at any given short interval of time, has available for production a particular collection of resources. This collection may be large or small relative to the size of the population and diverse or specialized as to possible products and services. We observe that the resources of a country, even when they are small and quite specialized, can be organized to produce various combinations of products and services. For instance, they may be used to produce primarily industrial wares and relatively few farm products or conversely; and, within agriculture, to produce mainly meats, poultry, and dairy products, or largely food crops. We take it to be true that it is possible for any country to produce more than one combination of products with the collection of resources available to that particular country. We shall look upon such a set of possible combinations of products as representing the production possibilities curve of the country.

We can now give some meaning to the general concept of efficiency. For a country to be efficient in production, it must, first, succeed in reaching some point on its production possibilities curve and, then, that point which provides for the community the preferred combination of products. Whenever the two conditions im-
plicit in the preceding statement are met, an efficiency organization of production of the collection of resources available to the particular country has been achieved. It is doubtful, however, that any country ever reaches this ideal, that is, the maximum preferred output point on its production possibilities curve. Accordingly, we would expect every country to be less than efficient as defined above. More precisely, whenever a country is producing at a point which is to the left or below its production possibilities curve or which is on this curve but not at the preferred point in terms of the combination of products, we shall refer to it as being sub-efficient. The extent of the sub-efficiency may be large or small; it may vary from time to time for a particular country, and it may vary, also, from country to country.

The concept of welfare in the organization of consumption is not nearly as meaningful or useful as is that of efficiency related to production possibilities. One cannot escape introducing a value judgement. However, here again, we shall take a very simple and elementary approach, namely that the personal distribution of the national product available to a particular country may be very unequal, relatively equal, or perfectly equal among families or individuals. We shall introduce the value judgement that an equal distribution of personal income will maximize the welfare that a community can achieve from consumption.

Whether the national product of a particular country is large or small in relation to its population will depend primarily upon the collection of resources available to the country and upon the efficiency with which production is organized. A rich country, meaning by this one with a relatively high ratio of resources to population, is capable of producing a larger per capita income than can the economy of a poor country. When a country, whether it is rich or poor, achieves an efficient organization of production, it will have a larger per capita income than would be the case were it to settle at a point to the left and below its production possibilities curve. Therefore, both the collection of resources and the efficiency of organization of production affect per capita income and thus, also, the well-being of a people. But regardless of the size of the national product in relation to the population, its personal distribution may depart very far from equality. We shall restrict the concept of welfare to the organization of consumption in relation to the personal distribution of the national product available for consumption.

Even with these elementary ideas, we can put to rest one of the great confusions that always appear when international comparisons
are made and we can, also, indicate a fourfold classification of countries with regard to efficiency and welfare.

Because a particular country happens to produce a large and abundant *per capita* income does not imply that it is either efficient in the organization of production or that welfare is served in its organization of consumption. Clearly, a country with as rich a collection of resources as is characteristic of the United States could generate a very large national product relative to its population even though it were quite inefficient in production. Moreover, the national product could be distributed very unequally.

Similarly, the fact that a country produces a pitifully small *per capita* income does not imply that it is sub-efficient or that the personal distribution of the national product departs appreciably from equality. This statement simply means that a country with a poor collection of resources relative to its population, for example the existing situation of India, may organize its production ever so efficiently and still it could not achieve a large *per capita* income. Nor does a low level of *per capita* income necessarily indicate how satisfactorily on welfare grounds consumption is being organized.

It is an error, therefore, to identify efficiency in the organization of production, and welfare in the organization of consumption, with a high level of *per capita* income. A serious, common error, however, runs the other way; individuals living in rich countries are often inclined to the view that the low output per person characteristic of the so-called under-developed countries is a consequence of widespread sub-efficiency in the way production is organized in such countries.

I am afraid I shall be somewhat taxonomic in setting forth the fourfold classification of countries that emerges from the two concepts which I have introduced. These classes are:

1. **Efficient and high in welfare.** This class would include countries that are at or near the production possibilities curve confronting them, that produce the preferred combination of products and that achieve a personal distribution of income which is approximately equal. I doubt that any country is so organized with regard either to production or consumption.

2. **Sub-efficient and high in welfare.** The attributes of this class are clear from the definition of terms which we have already given. I believe it is true that most countries, whether they are rich or poor, are sub-efficient. I shall consider some differences among them a little later. Countries in which property is held by many, where education is available to all, compulsory for as long as from eight to
twelve years and publicly financed, and where progressive income and inheritance taxes are firmly established and fairly administered, are likely to rate relatively high with regard to our welfare criterion. Some of the Western countries clearly satisfy this condition better than do most of the under-developed countries.

3. Efficient and low in welfare. We have already said that few, if any, countries appear to have the first of these two attributes; many, however, qualify on the second, that is, rate low in welfare in the way personal income is distributed.

4. Sub-efficient and low in welfare. Unfortunately, we find that most countries fall into this class. It is, therefore, too large and analytically quite unwieldy.

Our next step, therefore, is to consider some of the more important circumstances that give rise to sub-efficiency within countries. I shall leave aside for the most part any further consideration of the problem of welfare and, also, at this point turn more specifically to agriculture and consider three major functions entailed in organizing agricultural production, namely (1) that of making decisions which are acted upon within the confines of a farm with product and factor prices given to this firm, (2) that of allocating factors (inputs) between agriculture and the rest of the economy, and (3) that of ‘producing’ and distributing new agricultural techniques.

The first of these is the province of farm management. The micro-approach implicit in farm management has given us many insights; most of our comparative statistics, both good and bad, are from this source. But when I compare the findings of Arthur Mosher, which appear in his Ph.D. thesis,\(^1\) on the effects of religion and tradition on farm production in India with the better farm management studies that have appeared in Iowa, Illinois, and Indiana, there is a strong presumption that given the institutional conditions under which the cultivator in India operates he does about as satisfactory a job of farming as does the corn-belt farmer under other and much more favourable circumstances. Farm management may help establish certain operating skills in a farm population where a community is rich enough to afford this kind of education and the investment in the human agent that this occupational education implies. It then becomes an additional capital input.

A farmer acting within the confines of his firm cannot correct some types of the malfunctioning of factor markets for he can act

only on the factor prices presented to him. Nor can a farmer produce
for his firm new and better production techniques, for the size of his
business is altogether too small to permit him to do the necessary
research and experimenting. It may well be, as I suspect to be the
case, that differences in the way farms are managed (when we abstract
from differences in the amount of capital including capital invested
in the human agent, differences in techniques, differences in the way
factor markets work and institutional arrangements which are for
all practical purposes given to a particular farmer) do not explain
most of the observable variations in efficiency within agriculture
when we come to international comparisons.

We now turn to the second, namely to the allocation of factors
between agriculture and the rest of the economy. Here we have an
important and fundamental source of the sub-efficiency that charac­
terizes agriculture in most Western countries. One observes that agri­
culture usually produces a much smaller output than does the rest of
the economy per comparable worker. The governing circumstances
are fairly simple and straightforward, i.e. the changes in basic supplies
of factors and in the demands for products that come about as a
consequence of economic development place particular stresses and
strains on the factor markets that serve agriculture. As economic
development proceeds, it becomes necessary for many human agents
to transfer out of farming and this always means a change in occupa­
tion and usually the migration to a new location; and, it also becomes
necessary to use more capital in agriculture, especially to purchase
additional inputs for farming from the non-agricultural sectors of
the economy. We find that the more rapid the economic growth and
development of a country, the greater the mal-allocations in re­
sources between agriculture and the rest of the economy when one
compares two countries which are similar in size and diversity.

The uneven economic development within agriculture in the
United States where some large farming communities have fallen
far behind in output per farm worker is a special case of the mal­
functioning of the relevant factor markets which has given rise to
the kind of sub-efficiency that is under consideration. (For studies
of this problem, see various papers by D. Gale Johnson, the report
by the Joint Committee of Congress on the Economic Report, Under­
employment in Agriculture, prepared by W. W. Wilcox and W. E.
Hendrix and Parts I and III of my book, The Economic Organization
of Agriculture, McGraw-Hill, 1952.)

During recent decades the agriculture of the United States has
been less efficient than that of the United Kingdom and the agri­
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The efficiency of agriculture of the United Kingdom, in turn, has been less efficient than that of France measured in terms of the allocation of resources between agriculture and the rest of the economy of the particular country. This is the conclusion that emerges from Procter Thomson's study, 'The Productivity of the Human Agent in Agriculture: An International Comparison'. The explanation advanced by Thomson for the fact that the output of people engaged in farming in France was about the same as that of people engaged in industry is as follows: most important, France experienced relatively little economic growth and development from 1900 to 1949 (certainly compared with that which occurred in the United Kingdom and the United States); and, in addition, the birth-rate in agricultural communities in France dropped about as fast as the death-rate and the two rates were not seriously out of balance; agriculture in France did not adopt important new production techniques requiring more capital and relatively less labour (this is merely one aspect of economic growth and development); and France has, to some extent, sheltered her agriculture from external competition, thus maintaining the terms of trade to agriculture somewhat more favourable than they would otherwise have been.

A third and important organizational function is that of 'producing' and distributing new and better agricultural techniques. In this department the Western, technically advanced countries, are far ahead of the under-developed countries; there are, however, marked differences among the Western countries; and it can be shown that even the United States—with its vast array of State agricultural experiment stations and with the U.S.D.A. with its large technical research programmes, which is allocating currently altogether about 100 million dollars of resources annually to the 'production' of new agricultural techniques—is spending all too little on the basis of probable marginal returns from inputs in this 'enterprise' compared with that obtained in most other agricultural and industrial enterprises. (For data and a detailed analysis, see chapter 7 of my book, The Economic Organization of Agriculture.)

When we take the long view, it can be demonstrated that the efficiency of agriculture is dependent importantly upon the allocation of a large (much larger than is now the case) volume of resources to the 'production' of new and better agricultural techniques. As already said, in the performance of this particular function, the

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1 An unpublished thesis at the University of Chicago. Some of the master tables are on file in the Office of Agricultural Economics Research at the University. This study was made possible by a grant from the Rockefeller Foundation.
advantage, at present, is all with a small number of Western countries. The under-developed countries are at a marked disadvantage; they are poor; they are not organized to ‘produce’ these techniques; and they lack trained research personnel. The widespread belief that under-developed countries can draw heavily and successfully upon the agricultural research under way, say, in the United States and some other Western countries represents, in the main, an unsatisfactory approach because the new techniques that become available in these countries are not altogether suitable to the technical, economic and social conditions of such under-developed countries.

Before I bring this paper to a close, let me merely call attention to another set of issues somewhat related to my topic. There is the basic question: What are the consequences of substantial divergencies between the output of agriculture and the income of farm people? I am concerned, here, about social and public arrangements which either support the income of farm people at a level which exceeds the value of their production or depresses the income of farm people so that it is less than the value of their production.

One of the observable social and public attributes associated with economic development and industrialization in Western countries has been the emergence of substantial economic ‘shelter’ for agriculture. One might well have expected the growing urban-industrial population to have used its political majority to tip the economic scales against agriculture and farm people. The political process, however, has come to support a divergency favourable to farm people. One observes this in a striking way in a country as highly industrialized as is the United Kingdom. I do not wish to imply that per capita farm incomes are necessarily maintained at a level as high or higher than in the rest of the economy; this has not been in the main the outcome. What I am calling attention to are the public efforts to maintain farm product prices above their competitive level in some long run competitive conditions. Relatively rich Western countries can afford to do this; clearly, the poor under-developed countries cannot. A few countries, for example the A.B.C. constellation in Latin America and notably Argentina, have in one way or another turned relative product prices sharply against agriculture and farm people within their respective countries. The production consequences in the Argentine have been sufficiently drastic for all to see.

Divergencies in either direction have the effect of impairing the efficiency of the organization of production; the per capita income
of farm people, at least in the short run, in the one case are increased somewhat and in the other, depressed. The welfare implications, that is, the effects of these policies upon the personal distribution of income either within agriculture or between agriculture and other sectors is most difficult to determine; in any event the outcome on this score is far from clear.

In this paper I have endeavoured to relate particular attributes of efficiency and welfare. I have noted that a high per capita income is usually the result of a rich collection of resources; this is the observable relation even though they are employed sub-efficiently. On the other hand, a country with a poor collection of resources, relative to the size of its population, cannot achieve a high per capita income even though it uses all of its resources efficiently. Most of the vast differences in per capita income that exist between and among countries are not the consequences of differences in efficiency in the organization of production.

I have presented a fourfold classification of countries based on the concepts of efficiency and welfare set forth in this paper. On welfare grounds, as defined herein, some Western countries rate much higher than do the under-developed countries generally, not because of differences in per capita income but because these particular Western countries have achieved greater equality in the personal distribution of income.

A potent engine of sub-efficiency in agriculture in most Western countries arises from the malfunctioning of the factor markets that serve agriculture under conditions of rapid economic development. The resulting mal-allocation of resources between agriculture and other sectors is one of the major consequences of economic development. This kind of sub-efficiency does not exist presently in the under-developed countries but in all probability it will put in its appearance when such countries start up the road of substantial economic growth and development and for the same basic reasons. Much sub-efficiency in agriculture also arises from an inadequate allocation of resources to the ‘production’ of new techniques. This kind of mal-allocation is most pronounced in the under-developed countries, although as yet most Western countries, including the United States, allocate all too few resources to this important function.

In closing, I give you a question which I trust has been answered in this paper: Is it not true that the efficiency of agriculture suffers seriously both in the under-developed, relatively poor, and in the technically advanced, relatively rich, countries and that the existing
sub-efficiency arises from quite different circumstances in the two groups?

M. Rossi-Doria, University of Naples, Italy

For many years Professor Schultz has endeavoured to review the essential concepts and viewpoints of agricultural economics and policy, relating them to a rigorous interpretation of the concept of efficiency and welfare—efficiency as a criterion of the organization or allocation of resources for production, and welfare as the criterion of the organization or distribution of products and services for consumption. He is now trying to see if these concepts can be useful in comparing the position of agriculture in different countries, that is, if they can be used in studying today's problems. Some of his conclusions can be accepted as true and illuminating; with others I believe he goes too fast. As a newcomer I know I am taking a risk in making such a valuation, but having been asked to open the discussion I shall try to put forward the reasons both for my agreement and for my doubts.

Professor Schultz, in his paper, does four things. First, he defines the concepts of efficiency and welfare. Second, he exposes the logical consequences of such definitions—particularly the arbitrariness of some current judgements—and a possible classification of various countries in the light of those definitions. Third, he indicates three main groups of reasons for sub-efficiency in agriculture. Fourth, he adds observations on the character, either supporting or deleterious, of different economic policies and their effects on the efficiency of agriculture.

It seems to me, with the exception of a doubt as to the advisability of defining welfare as 'the more equal distribution of personal income', that all Professor Schultz's statements are meaningful, correct, and useful, and that the conclusions he draws from them are correct. But, when I come to the conclusions he draws in the last part of his paper, it seems to me that some of them are wrong. For instance, it is at least doubtful whether a high per capita income is the inevitable result of a rich collection of resources even though they are employed sub-efficiently. There are many examples of countries which have rich collections of resources but which do not make use of them and which are characterized by low per capita incomes. In the same way I doubt whether it is true to say that 'a country with a poor collection of resources relative to the size of its population cannot achieve a high per capita income even though it uses all of its resources efficiently'. There are some countries, above all Switzerland, which
demonstrate the contrary. For the same reason I believe the third conclusion of Professor Schultz is not tenable—that 'most of the vast differences in per capita income that exist between and among countries are not the consequences of differences in efficiency in organization of production'; nor his fourth conclusion when he says that the superiority of some Western countries over the under-developed ones comes out 'not because of differences in per capita income, but because the particular Western countries have achieved greater equality in the personal distribution of income'.

If I try to explain to myself the reasons for the contradictions into which I fall in accepting the analysis and rejecting some of the conclusions, I think they can be found first in the probability that I do not understand quite clearly the meaning which Professor Schultz gives to the term 'collection of resources', and secondly that I do not see how he relates his definition of the concept of efficiency to the circumstances which, as he indicates, give rise to sub-efficiency within countries.

It seems to me that we should arrive at different conclusions according to whether we regard the 'collection of resources' of a country as the simple collection of natural resources, or as these natural resources in addition to the wealth of technical experience and of capital accumulated throughout its history. But I believe the contradiction would disappear and the conclusions be different if (i) we did not abstract, as Professor Schultz does intentionally, 'from differences in the amount of capital including capital invested in human agents, differences in techniques, differences in the way factor markets work and institutional arrangements', (ii) we recognized in them, as is true, the main sources of differences in efficiency, and (iii) we stressed, as Professor Schultz does explicitly in one section of his paper, that 'the efficiency of agriculture is dependent importantly upon the allocation of a large volume of resources to the production of new and better agricultural techniques'.

I am aware that my doubts and considerations may arise from a misinterpretation, but I hope they will, nevertheless, serve to open the discussion on the fascinating subject introduced in Professor Schultz's serious paper.

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I have had the same difficulty as the previous speaker in knowing just what Professor Schultz implied by his term 'collection of resources'. If one includes in that collection not only natural resources but, as of a given point in time, the existing technologies, the existing
amount of capital available for use, the existing institutional factors, &c., all of which determine, or help to determine, the production potential of a country, then I find myself in substantial agreement with all that Professor Schultz has said. And I shall go ahead on the assumption that that is his interpretation.

I take it that on the production side a desirable long-term objective for both so-called advanced and under-developed countries is to produce the maximum per capita output of preferred goods and services that can be sustained over time. In other words, both groups of countries have the same long-term economic objective. Every society will have certain cultural values, of course, which it will not sacrifice for additional output but, subject to this modification, the common major goal is maximum per capita output over time. It seems to me that Professor Schultz's paper is extremely useful in pointing out three basic sets of questions or problems, one of which he has discussed in considerable detail.

1. What are the factors which at a given time limit a country's production potential? To what extent can these factors be modified, and what are the problems in modifying them? Or, stated in other terms, how does a country go about shifting its production possibilities curve to the right? Professor Schultz places strong emphasis on the importance of producing and distributing new and better agricultural techniques. And with that, of course, I am in full agreement. I would emphasize, however, that the problem in getting new techniques produced and, equally important, in getting them into use is not only a matter of allocating resources to their production and distribution, or in other words allocating resources to agricultural research and extension; but, if new techniques once produced are to be used to maximum advantage, important changes in institutional arrangements and even cultural factors may be required. This is true for the so-called advanced countries as well as for those which are less well developed. In the United States, for example, I think it is true that modification in our agricultural credit machinery, to cite one example, has had a very important influence on the rate of adoption of new agricultural techniques during the past twenty-five years. This, of course, is not to disagree with the basic importance of getting the techniques produced in the first instance. I am dealing here with some of the problems which are involved in getting them actually put into use. And institutional arrangements which affect the distribution of income between agricultural and non-agricultural groups, as well as the distribution of income within agriculture, may also have important influences on the use of new production tech-
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Professor Schultz has pointed out that in recent years, in this country and in many others, the public action of doing what he calls ‘sheltering agriculture to tip the scales of income distribution’ has undoubtedly been one factor that has affected the application of new techniques once they have been developed.

2. Assuming a given potential in terms of natural resources, population in a short run, technology, capital, and institutional factors, how does a country go about achieving maximum production efficiency, as defined by Professor Schultz? In dealing with this question it seems to me Professor Schultz has done an excellent job and I have only one comment to make. In the allocation of resources on the individual farm, as well as between agriculture and other segments of the economy, it seems to me that economists, and agricultural economists in particular, have an especially important role to play during a period of rapid change when, as Professor Schultz points out, the mal-allocation of resources is likely to be greatest both between agriculture and other segments of the economy as well as on individual farms. What we are interested in doing here is eliminating the lag in the efficient use of resources. I think there can be no doubt on the part of anyone who has studied agriculture in the United States, that one of the results of rapid technological change is the fact that the human factor may not move out of agriculture fast enough and capital may not flow in fast enough to achieve maximum efficiency. I might say in passing, however, that I am inclined to believe that economists often fail to appreciate fully the extent of the risks involved, both to the human element and to the capital element, in investing or in shifting when rapid changes in agriculture are taking place. For example, the shift from a single crop to a livestock-crop type of operation involves a substantial amount of risk, and while our studies may very well show that the farmer who has shifted is doing very much better economically than the farmer who has not, we are not able, I think, to assess very accurately the risks of shifting to the individual who may lack the necessary managerial skills or who may not even be certain whether his particular resources are suited to the new type of agriculture.

3. Assuming maximum production of output, goods, and services as a major objective, is it likely to be more advantageous to a given country at a given time to place major emphasis on achieving maximum efficiency as defined by Professor Schultz, or will it be better to place major emphasis on trying to increase the production potential by improving technology, by changing institutional arrangements, or by other means? As Professor Schultz has pointed out, it
is quite possible that per capita output may be greater with a high potential output and relatively low efficiency than it will be with high efficiency and a low potential. Of course, the long-run objective is both to increase the potential and achieve maximum efficiency in the use of available resources in the wide sense of that term. It seems to me, however, that, for a time at least, we can put up with some inefficiency in resource allocation in the interests of rapid economic development, if this development, as is frequently the case, actually results in an increased per capita output and rising standards of living. But that is not to say, of course, that we should not strive to achieve both objectives.

A. W. ASHBY, Institute for Research in Agricultural Economics, University of Oxford, England

I very much appreciated the opportunity of hearing this paper because for many years I have been interested in the processes of raising efficiency in agriculture, and in some measures of efficiency. I will take issue with Schultz from the very beginning and say that he has not in this paper, and I doubt if he ever has, clearly defined efficiency. As far as one can find in this paper he is using a strange concept of efficiency which depends on some form, some degree, of allocation of resources between agriculture and industries in various economies.

In simple terms, if movement of workers from agriculture to other industries would raise the national income, agriculture is inefficient. Or, if movement from agriculture to other industries would not raise production per person, and national income, agriculture is efficient. In other words, if other industries are inefficient, the agricultural system ipso facto becomes efficient. Obviously, there must be some relativity in measures of efficiency of agriculture under different circumstances, but the above propositions might result in some systems of agriculture of low productivity per acre or per man ranking fairly high in efficiency.

The term efficiency we have taken over from engineering. Its meaning is perfectly simple. Efficiency, or the measure of efficiency, is a ratio between input and output. If efficiency means anything else, in any context, it should be defined. Like Schultz, I cannot give a close and yet adequate definition of welfare. From my own point of view, which is in general the point of view of Western civilization, welfare depends upon a high level of supply of material goods and services and on equitable distribution of those supplies. Beyond that, welfare lies in the minds and hearts of individuals and families. But
if we begin to take what appears to be Schultz's measure of efficiency—the allocation of resources between agriculture and industry within any economy—and look at his paper, we find that he is saying that criteria such as little economic growth, balance of birth- and death-rates, and the little or no adoption of new production techniques, may be conditions of efficiency. Actually, if we are going to take this sort of concept of efficiency, we are going to deny the whole of agricultural progress and the whole of the service which agricultural progress has rendered to the rest of the community. The history of all the progressive industrial nations is a continuously falling proportion of people in agriculture, a continuously rising supply of agricultural commodities and other commodities and services which give us the high level of supplies which give the material basis of welfare. But when Schultz, at the end of his paper, says that high output in agriculture is associated with a rich collection of resources and a low output is connected with a poor collection of resources, surely he must use another term—a rich collection in use, a poor collection in use, because no one has been able to measure the potential resources of China, and it is very difficult to measure the potential resources of India. General economic resources may be very much greater than have ever been taken into use, because of handicaps of various institutions and circumstances. When we use these terms we are merely saying that low output is connected with a poor technology, or low application—little search for resources that could be brought into use for the increase in supplies of material goods—rather than with a poor collection of resources. We must use this extra term—rich collection of resources in use—poor collection of resources in use; otherwise the terms have little meaning.

As we go on to consider what has been called the substantial divergence between output of agriculture and the income of farm people, we are again in need of clear concepts. In some communities, perhaps, you can measure output per head in agriculture in terms of gross output, sales plus human consumption; in other communities you have to take the quantity of net output which is sales plus human consumption minus things that are brought to one farm from another or from one farming community into another farming community. Now, the concepts which are absent from Schultz's paper are those concerning physical efficiency and money value efficiency—that farming efficiency is determined on two levels. The first is that of using physical materials and energies, physical supplies, for the production of physical results which are commodities. On that level, who has measured—or who can measure—
the relative efficiency of agriculture and any other industry? Perhaps rough measures are possible. Measures of single inputs such as land, or labour, even capital, have been used against the outputs of complex inputs. For comparisons between farms, and sometimes between agricultural systems, such measures have a limited utility. Unfortunately there is no common measure of combined physical inputs except their money values. Consequently, the second level on which the efficiency of agriculture, or of farmers, is determined is that of the use of factors of production with their money values in the production of commodities with their money values. That is the efficiency which for the most part Schultz is using, but there we are concerned not only with efficiency in production but also with ability in market manipulation, which is an entirely different thing. Since 1870 or thereabouts the agricultural communities of the world have been in a relatively weak position in respect of exercising pressures on markets and the valuation of their products. That is where agricultural incapacity, possibly inefficiency, has been most marked—in being unable to set standards of value upon labour, standards of value upon capital, and unable to impress those standards of value on the markets in which products have been sold. Consequently, it is very difficult to know what is the divergence between the value of the output of agriculture or the output of a farm and the income of the industry or of a farm. We know what inputs, outputs, incomes, have been in terms of market values; but we do not know what they would have been in terms of equitable values. If, for instance, the International Federation of Agricultural Producers were able to put enormous economic and social pressures on the markets, values of agricultural products would go up, and consequently efficiency in these terms would go up, although physical efficiency might remain exactly the same. But here is the situation. In the United States, from about 1800 to 1850 or thereabouts, the average level of income in agriculture apparently did not exceed 50 per cent. of the average level of income in the non-agricultural communities. And even during the last few years, with all the price supports given to agriculture, the average level of income in agriculture in the farming communities has not much exceeded 70 per cent. of the average level in the non-agricultural industries. In my own country the average level of income in agriculture in 1870 was almost exactly equal to the average level of income in the non-agricultural classes. Other ratios have been: 1900, 66 per cent.; 1930, 63 per cent.; 1938, 65 per cent. Recently, with the price supports for agriculture, average agricul-

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1 1900, 62 per cent.; 1938, 51 per cent.; 1947-50, circa 67 per cent.
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Agricultural and non-agricultural incomes appear to have reached near parity, but only partly through rise in productive efficiency; otherwise through political action. There are no measures of relative efficiencies of agriculture and those in the rest of the community except the values we can place on our products in the markets. As agriculturists are weak in the markets and strong in politics there is good reason why they should raise commercial efficiency by using political tools and thus get some additions to agricultural incomes. Recent experience indicates three levels of efficiency in agriculture—productive efficiency; commercial capacity and efficiency; political capacity and efficiency.

L. H. Bean, Office of the Secretary, U.S.D.A., Washington, D.C.

I want to address myself for a moment to the question of tipping the scales in favour of agriculture and to give you a fact or two perhaps supplementing the last remarks of Mr. Ashby. I have recently had occasion to educate myself on this question of how far in the United States the scales have been tipped in favour of agriculture. Here are the two or three broad factual impressions. For the entire period from 1910 to 1940 there appears to have been a sort of 'norm' in the relationship between the per capita money income of the farm population and the per capita income for the country as a whole. That ratio appears to have been approximately 45 per cent. During World War I, under the most favourable conditions, that ratio rose to about 70 per cent. Under the most unfavourable depression conditions in 1932 that ratio dropped to less than 35 per cent. In recent years as a result of the combination of many factors favouring agriculture (foreign and domestic demand, and price supports) that ratio has averaged approximately 60 per cent., having declined from about 70 during the most prosperous years of World War II. There you have a rough measure of the extent to which the scales have been purposely tipped in favour of agriculture as contrasted with the norm that prevailed during the years when six million or more unorganized farmers sold their products on relatively organized markets.

I am sure Dr. Schultz will say, as he has said many times, that it is not proper to compare aggregate incomes of agriculture (averaging in the poor with the rich farmers) with the rest of the country, so I want to give you a few additional facts. In the United States we appear to be a 3 per cent. country. I mean that if you take the lowest 20 per cent. of the population in terms of income in any part of the country, whether east, west, north, or south, that lowest 20 per
L. H. Bean

cent. receives approximately 3 per cent. of all of the income. In agriculture much the same kind of maldistribution of income prevails except that if you allow the farm population some value for the

**FARMERS’ SHARE OF NATIONAL INCOME**

*Compared with “Equality” and “Parity”*

![Graph showing farmers' share of national income compared to equality and parity.](image)

**Maldistribution of Farm and Non-farm Income**

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage of income</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U.S.</td>
</tr>
<tr>
<td>Farm Families*</td>
<td></td>
</tr>
<tr>
<td>Lowest fifth</td>
<td>5</td>
</tr>
<tr>
<td>Middle three-fifths</td>
<td>46</td>
</tr>
<tr>
<td>Highest fifth</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Non-farm Families</td>
<td></td>
</tr>
<tr>
<td>Lowest fifth</td>
<td>3</td>
</tr>
<tr>
<td>Middle three-fifths</td>
<td>51</td>
</tr>
<tr>
<td>Highest fifth</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

* Obtained by adding the following percentages (to allow for home-grown food and rental value of owned homes) to the census totals of 100 per cent. for the U.S., and the four regions, and distributing these additions equally to each quintile: U.S., 20; South, 35; North-east, 20; North central, 15; and West, 10.

*Source:* Derived from published and unpublished tabulations supplied by the Bureau of the Census.
food they produce for their own home consumption, the lowest 20 per cent. of the population in agriculture receives approximately 3 per cent. of the agricultural income and by regions that proportion may vary from 4 to 7 per cent.

One final remark—I think much of the concern about tipping the scales too far on the side of agriculture may stem from the relatively novel fact that it is now possible to find prosperous farms just as it has been common to find non-agricultural enterprises in prosperous conditions. We ought not to be misled by a novel situation in agriculture which many people think ought to be as permanent as prosperity in non-agricultural occupations. The real question is whether agricultural prosperity is excessive and that cannot be answered without reference to the prevalence of prosperity in the non-agricultural segments of the economy.

These points may be seen more clearly by reference to the chart, 'Farmers’ Share of National Income compared with “Equality” and “Parity”, and the table 'Maldistribution of Farm and Non-farm Income', both taken from my article, ‘Are Farmers Getting Too Much?’ in the Harvard Review of Economic Statistics, August 1952.

J. D. Black, Harvard University, U.S.A.

When I first raised my hand for recognition by the Chairman, I was not expecting to comment on what Mr. Bean has just offered. Now I shall have to do so. It happens that what he has just told you will appear in the next issue of the Harvard Review of Economic Statistics, but accompanying it will be two reviews, one by Professor Gale Johnson of the University of Chicago and one by myself. These reviews point out failures in Mr. Bean’s analysis that result in making his 60 per cent. for recent years too low. A more nearly true figure would be 80 per cent. Moreover, if an average were made for the United States excluding the South, the 80 per cent. would become 100 per cent. Let us hope that land improvements, shifts to grassland and livestock farming, farm enlargement, mechanization, and migration will be strong enough in the next two decades so that the South will no longer bring down the national average for agriculture.

What I originally had in mind relates to the discussion of efficiency as Professor Ashby has used the term. Professor Hill has talked of a lag in the adoption of technology that keeps efficiency at too low a level. It need not always do so if we have economic efficiency in mind. At present in New England, 45 per cent. of the milk delivered in the Boston and adjoining milk sheds is selling at Class II prices, or lower.
If the lag in adoption of known technology were to disappear, the 45 per cent. would become 60 per cent. and even more, and the blended price (average of Class I and Class II) would fall. The net income of the milk producers could easily fall under these circumstances. This would not represent economic efficiency, or best use of the resources of the dairy farms.

Professor Ashby, of course, needs to convert his physical outputs per unit of labour, of land, and of other input factors into money units before he can combine them. But he says that the prices in the market place may be monopolistically distorted. What prices, then, will he use in determining economic efficiency? He might say, perhaps, the prices that would exist if free competition prevailed. But who knows what these prices would be? Furthermore, would this really optimize the returns to the producers? Does not the farmer have to balance his cost of marginal output against the marginal price in the market as it is? This suggests a conflict between efficiency as a concept in private economy and as a concept in welfare economics.

E. F. Nash, University College of Wales, Aberystwyth, Great Britain

I have to be very brief, but not because I did not enjoy the paper. What I would like to do is just to say one thing about what Professor Schultz said in regard to the sheltering of agriculture, particularly with reference to Great Britain—not in any wish to defend the price policy of the British Government in regard to agricultural products but because I think the facts are perhaps not properly appreciated. I doubt whether today the amount of protection which British agriculture receives (if you measure it by the difference between the prices our farmers get and those paid in other countries) is as great as is commonly supposed, and I think it is considerably less than it was before the war. That is partly of course because the pound sterling has been devalued. If you make a comparison between the movement of American farm prices and the movement of British farm prices you get something like this result: translating American farm prices into pounds sterling, their level today or in recent months is about 3½ times the pre-war level. British farm prices I think are somewhat below 3 times their pre-war level as measured by our official index number and our official index number tends to exaggerate the amount by which prices have risen because of its method of construction. I recently tried to make a comparison of the farm price level for comparable products in the United States and the United Kingdom before the war and today. Before the war the British farm price level was about 37 per cent. higher than the American but
in 1950 it comes out on the average at 6 per cent. below. Of course, there are many products which are produced in the U.S.A. for which we do not have any output at all in Great Britain and obviously those have to be left out of such comparisons.

May I add one further thing in regard to the question of agricultural and non-agricultural income? Back in 1870 it appears that average agricultural and non-agricultural incomes were about equal in the United Kingdom. The most recent national income statistics show that in the last few years about 5 per cent. of the British national income represents income of farmers or farm workers and the proportion of the population which those two sections represent is also about 5 per cent. In other words, there is again a situation of approximate equality in income per head between the occupied population in agriculture and the general average.

M. EZEKIEL, Economics Division, F.A.O., Rome, Italy

I sympathize greatly with both Professor Ashby’s and Dr. Black’s emphasis on the need to distinguish between efficiency in quantitative terms and efficiency in monetary terms. I would suggest to Dr. Black that there is conceivably a possibility of working out under any set of circumstances a production function which would show in quantitative terms for each type of farming the product that could be expected for a given combination of the various input factors, so that it would be possible to express relative efficiency from one farm to another by how far the physical production actually achieved on each farm compared with that which should be achieved if it got the normal output for the inputs used. A similar quantitative production function might be worked out between countries (broadly) for land, labour, and capital if it could be used to measure input-output ratios and so to compare efficiency between countries on a quantitative basis. That, however, is a very complicated thing and I simply point out the theoretical possibility. As soon as you start comparing in monetary terms, under conditions when prices and values are no longer determined by free competition, then your calculations simply do not mean what they appear to mean and you get the confusion which Dr. Schultz I think was trying in one part to clear up.

For my second point I should like to add just one footnote to the evidence that Dr. Schultz presented. I quite agree with him as to the tendency of economic development—the inevitable necessity in economic development of transferring workers from agriculture to industry having a normal tendency to depress the earnings of agriculture. But there is another factual footnote I would add—the
tendency which he points out for the income of agriculture to be supported by net subsidies from government funds in the most highly developed countries, of which the U.S.A., the U.K., and Switzerland are examples, and the tendency, which he mentions in the A.B.C. countries of Latin America, for the income of agriculture to be depressed—these tendencies are very much more widespread than he indicated. A great many of the under-developed countries of the world at the present time have price control systems—in the Far East, to some extent in the Near East, in Africa, and in other places—which pay the farmers less for their products than they would otherwise obtain as judged by any kind of free market. Some of the slowness of agricultural development in these countries, as well as some of the slowness of their response to the high demand for farm products, reflects these systems of price management, even though the funds obtained are used in some part to finance agricultural development in some of the countries concerned.